CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for submission of CPAs that apply a small-scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The C/ME shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated in the SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

1 The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

2 At the time of requesting validation/registration, the C/ME is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

"Programmatic CDM of Industrial Thermal Energy Generation by Indigenous Renewable Fuel Wood for the XXXX in Sri Lanka"

Version 1
dd/mm/20yy

A.2. Description of the small-scale CPA:

Description of the CPA:
This CDM Project Activity (hereafter, "CPA") is implemented under the Programmatic of Activity (hereafter, "PoA"), " Programmatic CDM of Industrial Thermal Energy Generation by Indigenous Renewable Fuel Wood in Sri Lanka". The coordinating/managing entity (hereafter, "C/ME") of this Project is the Bio Energy Association of Sri Lanka (hereafter, "BEASL"), which is a Non-Government Organization promoting the use of indigenous resources for renewable energy generation to reduce the increasing dependence on imported fossil fuels throughout Sri Lanka. This PoA is a voluntary project implemented by the BEASL.

The indigenous biomass resources used in this CPA is mainly Gliricidia (*Gliricidia Sepium*) which is one of the major short rotation crops[3] in Sri Lanka. This project intends to utilize Gliricidia that has not been utilized and has been left to decay in fields. By promoting the utilization of the biomass, greenhouse gas (hereafter, "GHG") emissions will be reduced by replacing industrial thermal energy currently generated from fossil fuel combustion with renewable thermal energy using renewable biomass resources. Furthermore, the implementation of CPA will generate additional income for the local farmers which will help them enhance their quality of life.

In Sri Lanka, where agriculture plays a dominant role in its economy, biomass energy has been a major source of industrial thermal energy. However, areas where biomass is located are different from areas with energy demand. This hinders the sustainable supply of the biomass resources. For industries located in remote areas (in terms of biomass generating areas) or those not familiar with handling biomass resources, the usage of biomass resources is a risky option. For these industries, additional work that is required for handling biomass resources is regarded as an unnecessary burden and a big risk that may affect the stable operation of their core business. Therefore, biomass resources utilization has not materialized for these industries.

This CPA aims to generate biomass thermal energy at a factory of the XXXX in XXXX area, XXXX District of Sri Lanka. The generated thermal energy will replace the existing fossil fuel based thermal energy supplied to the factory. Therefore, the implementation of the CPA will reduce the overall emissions of GHG. At present, the estimated annual amount of energy supply to the factory is equivalent to XXXX t of furnace oil. Annual emission reduction from the CPA is expected to be XXXX t CO_2 equivalent (a total of XXXX t CO_2 equivalent during the crediting period).

[3] "Short Rotation Crops" means woody crops such as willows, poplars, Robinia and Eucalyptus with coppicing abilities (International Energy Agency: http://www.shortrotationcrops.org/)

The implementer of the CPA is XXXX, who is the owner of the biomass energy generation facility and responsible for operation and management of the facility. In this CPA, thermal energy from biomass resources is generated at the factory of XXXX. The main facilities to be installed include biomass gasifier, biomass storage, dust collector and water tank in the site as illustrated in Figure 1.

Project site layout

Figure1. Project site of the CPA

Purpose of the CPA:
The purpose of the CPA is to "co-benefit" both the global environmental aim to reduce GHG emissions, as well as to improve the local socio-economic condition through implementation of renewable biomass thermal energy generation. This CPA contributes to the sustainable development of Sri Lanka by bringing about the following economic, social and environmental benefits:

Economic/Social Benefits

- Enhancement of energy security of Sri Lanka (Sustainable alternative energy source development): The domestic energy demand in Sri Lanka is on the rise following economic development. Hydroelectricity, which used to be the main source of energy, has peaked and the country is relying more on the import of fossil fuel. With the increase in the price of fossil fuel, the country is facing a major drain of foreign currency. According to an estimate by BEASL, the domestic energy supply potential from Gliricidia, which is a sustainable indigenous biomass resource, is 4,000 MW. If it is assumed that 50% of the energy demand of the country is supplied from Gliricidia, then it is expected to result in a saving of LKR 600 million/y worth of foreign currency. This saving can contribute to the socioeconomic development of agricultural communities throughout Sri Lanka.
- Enhancement of rural economy: In the remote areas of Sri Lanka where the low income population is concentrated, apart from the income from the cultivation and usage of Gliricidia wood, the economic impacts on rural economy (such as soil enhancement, replacement of chemical fertilizer by leaves as a by-product) are expected to be significant. This can contribute to tackle the problem of poverty in the rural area.
- Investments from foreign countries to the local economy: Investment from foreign countries such as Japan will be expected for the implementation of the Project.
- Creation of job opportunities: Through implementation of this CPA, new jobs will be created in operation and maintenance of the gasifier facility and also in the area of handling biomass resources (collection and transportation).

Environmental Benefits

- Reduction of GHGs
- Emissions Reduction of air pollutants (SOx, Nox): SOx, NOx emission will be reduced through the replacement of conventional fossil fuel based thermal energy with biomass based energy. Especially where fuel oil is used, a lot of air pollutants are currently emitted to the air.

A.3. Entity/individual responsible for the small-scale CPA:

- C/ME of this PoA is Bio Energy Association of Sri Lanka (BEASL).
- The implementer and responsible entity of the CPA is XXXX

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

A.4.1.1. Host Party:

Democratic Socialist Republic of Sri Lanka (Sri Lanka)

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

The project site (location of the biomass thermal energy generation facility) is located at XXXX area in XXXX sub-district, XXXX district, XXXX province of Sri Lanka. Latitude of the project site is N XX XX' XX . XX ", and longitude is E XX XX' XX . XX " E.

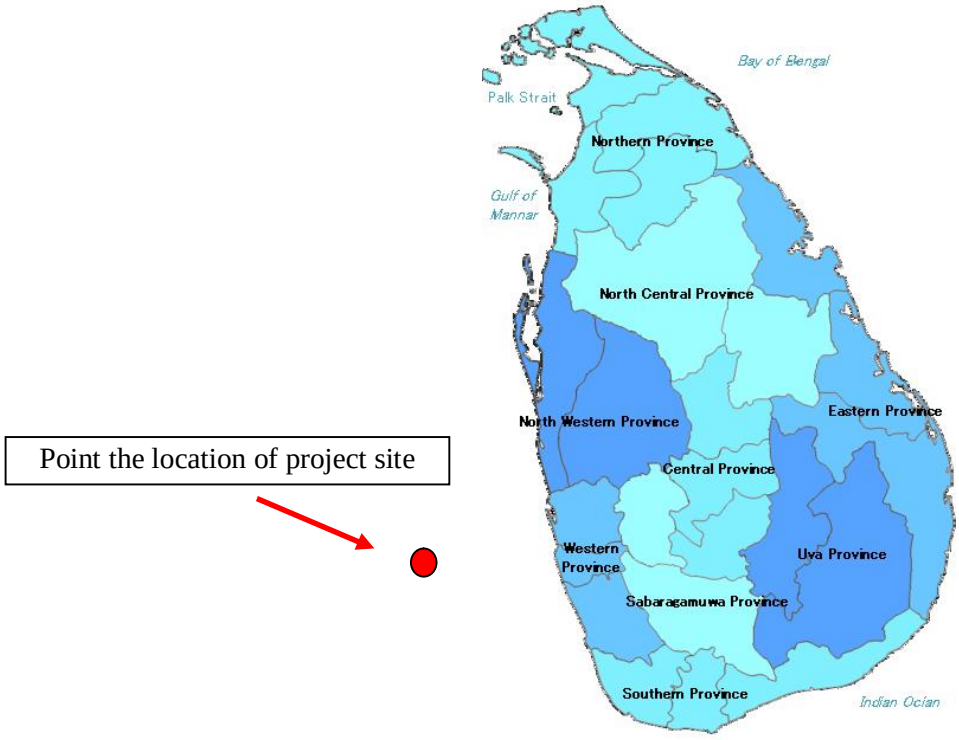

Figure2. Location of the Project Site

Detail map

Figure3. Location of the Project Site (2)

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

This starting date of this CPA is dd/mm/20yy, which is the the date of (purchase order of the gasifier facility / board decision of the responsible company of the CPA)

A.4.2.2. Expected operational lifetime of the small-scale CPA:

XX years

A.4.3. Choice of the crediting period and related information:

Fixed Crediting period

A.4.3.1. Starting date of the crediting period:

The starting date of the crediting period is the same date as the registration date.

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

10 years

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

Table 1. Estimated amount of emission reductions

Years	**Estimation of annual emission reductions (tCO_2e)**
2011	XXXX
2012	XXXX
2013	XXXX
2014	XXXX
2015	XXXX
2016	XXXX
2017	XXXX
2018	XXXX
2019	XXXX
2020	XXXX
Total emission reductions (tCO_2e)	XXXX
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tCO_2e)	XXXX

A.4.5. Public funding of the CPA:

No public funding is involved in this CPA. This CPA does not also include any diversion of ODA funds.

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

As highlighted in Appendix 13 of EB 54 report "Guidelines on Assessment on Debundling for SSC Project Activities", a proposed small-scale CPA of a PoA shall be deemed to be a debundled component of a large project activity if there is already an activity, which satisfies both conditions (a) and (b) below:

(a) Has the same activity implementer as the proposed small scale CPA or has a C/ME, which also manages a large scale PoA of the same technology/measure, and;
(b) The boundary is within 1 km of the project boundary of the proposed small-scale CPA, at the closest point.

The project participant of the CPA is XXXX. This CPA is the first and only CPA that XXXX is part of. Explanation to be described (example: the CPA is not a debundled component as there is neither registered small scale CDM nor other CPA which has the same project participant under this PoA)

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

There is no registered CDM project within project area or the same physical area.

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

"Programmatic CDM of Industrial Thermal Energy Generation by Indigenous Renewable Fuel Wood in Sri Lanka"
Version 1

B.2. Justification of why the small-scale CPA is eligible to be included in the Registered PoA :

This CPA is eligible to be included in the registered PoA since it satisfies the criteria defined in A.4.2.2. in CDM-SSC-PoA-DD of the registered PoA as described below.

Table 2. Justification of Inclusion in the Registered PoA

Criteria	Justification of Applicability
(1) Generic Eligibility Criteria	
a. Located within Sri Lanka	Applicable. The location of this CPA is in Sri Lanka as described in A.4.1.2.
b. A project to implement baseline and monitoring methodology AMS-I.C. "Thermal energy production with or without electricity (Ver.18)"	Applicable. CDM-SSC-PoA-DD was developed based on AMS-I.C.(Ver.18)
c. A project to generate thermal energy from renewable biomass resources which replaces fossil fuel origin industrial thermal energy	Applicable. This CPA will replace fossil fuel (XX oil) currently used at XXXX by renewable fuel wood as described in A.2. The justification of renewable biomass is described in P.9-11.
d. The technology to be applied is gasification technology	Applicable. This CPA applies gasifier technology to generate thermal energy.
e. The maximum thermal energy generation volume is less than or equal to 45MWth	Applicable. The maximum thermal energy generation capacity (XXMW) is less than 45MWth as shown in A.2.)
f. Monitors and collects appropriate data on the parameters listed in A.4.4.2 of CDM-SSC-PoA-DD	Applicable. Monitoring items in A.4.4.2. of CDM-SSC-PoA-DD of the PoA is applied.
g. When selling energy produced from biomass fuel to other businesses within the project boundary, an understanding should be reached between the supplier and the buyer that only the entity producing energy is entitled to the emission credits.In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.	Not applicable. Description such as: In this proposed project, the supplier and the recipient of the generated energy is the same entity.
h. No CDM project or CPA should be registered within the project area of the same physical area.	Applicable. There is no registered CDM project within project area or the same physical area as described in A.4.7.
i. The project must be approved by the C/ME prior to its incorporation into the PoA.	Applicable. This project was approved by C/ME.
j. Biomass resources used by a project activity are biomass residues only or biomass from dedicated plantations complying with the applicability conditions of AM0042 "Grid-connected electricity generation using biomass from newly developed dedicated plantations".	Applicable. As elaborated in B.5.2 (p.XX~XX)., fuel wood consumed in this CPA is biomass residue and does not involve new cultivation of biomass resources.
k. Biomass used by the project facility is not stored for more than one year	Applicable. This factor is included as the monitoring item of this CPA.
(2) Eligibility criteria for new biomass cultivation	
a. When CPAs use biomass fuel procured from newly cultivated land, CPAs need a written clarification between the cultivator and C/ME describing that the biomass resources are procured from the cultivation land which was developed for supplying biomass fuel to CPA(s) implemented under the PoA. The clarification must be done prior to the CPA being incorporated into the PoA	Not applicable in this CPA.

b. The land area where the dedicated plantation will be established, prior to project implementation, is severely degraded and in absence of the project activity would have not been used for any other agricultural or forestry activity. The land degradation can be demonstrated using one or more of the following indicators (unutilized area within coconut plantation is included in the criteria). i) Vegetation degradation, e.g., · crown cover of pre-existing trees has decreased in the recent past for reasons other than sustainable harvesting activities; ii) Soil degradation, e.g., · soil erosion has increased in the recent past; · soil organic matter content has decreased in the recent past. iii) Anthropogenic influences, e.g., · there is a recent history of loss of soil and vegetation due to anthropogenic actions; and · demonstration that there exist anthropogenic actions/activities that prevent possible occurrence of natural regeneration.	Not applicable in this CPA. If any new cultivation will be done for this CPA in the future, C/ME shall confirm the applicability of this criterion.
c. Any national or regional forestry, agriculture and nature conservation regulations are complied with,	
d. The dedicated plantation will be planted by direct planting and/or seeding,	
e. The biomass to be used in this project are to be short rotation crops[4] that naturally regenerate in a short time after harvesting,	
f. Grazing will not occur within the plantation, and No irrigation is carried out for the biomass plantations.	
g. No irrigation is carried out for the biomass plantations.	

[Justification of Renewable Biomass]
The "Definition of Renewable Biomass (EB23,Annex18)" defines "Renewable Biomass" as shown below. When a biomass satisfies the shown criteria, it is regarded as renewable and if the criteria are not satisfied then it is regarded as non renewable.

Table 3. Applicability Criteria and Justification

Biomass category	Applicability criteria	Justification of Applicability
The biomass is originating from land areas that are **forests**	(a) The land area remains a forest[5]; and (b) Sustainable management practices are undertaken on these land areas to ensure in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and	N/A (No biomass from forests are utilized under this PoA)

[4] "Short Rotation Crops" means woody crops such as willows, poplars, Robinia and Eucalyptus with coppicing abilities (International Energy Agency: http://www.shortrotationcrops.org/)
[5] The forest definitions as established by the country in accordance with the decisions 11/CP.7 and 19/CP.9 should apply.

	(c) Any national or regional forestry and nature conservation regulations are complied with	
2.The biomass is **woody biomass** and originates from **croplands and/or grasslands**	(a) The land area remains cropland and/or grasslands or is reverted to forest; and (b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and (c) Any national or regional forestry, agriculture and nature conservation regulations are complied with	N/A (In this CPA, new cultivation is not carried out)
3. The biomass is **non-woody** biomass and originates from **croplands and/or grasslands**	(a) The land area remains cropland and/or grasslands or is reverted to forest; and (b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and (c) Any national or regional forestry, agriculture and nature conservation regulations are complied with	N/A (Non-woody biomass and originates from croplands and/or grasslands are not \used in this CPA.)
4. The biomass is a **biomass residue** and the use of that biomass residue in the project activity does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas where the biomass residues are originating from. For example, if bagasse from sugar production would in the absence of the CDM be dumped or left to decay and is used for energy generation under the CDM, it can be assumed that the use of the bagasse does not affect the sugar cane cultivation practices and hence the carbon pools of the respective soils. In contrast, where a CDM project involves the collection of dead wood from a forest which would not be collected in the absence of the CDM, the extracted biomass cannot be regarded as renewable, since it would result in a decrease of carbon stocks		(Description of the justification) The primary biomass to be used under this PoA is Gliricidia wood which has been left to decay in farm lands or home gardens as shades, live fences or a companion plant. The branches are pruned periodically but are not used and are left to decay in farm lands. For biomass residue other than Gliricidia, similarly, biomass that are not currently used are utilised. Hence, the biomass to be used in this project is renewable biomass because the biomass satisfies the condition that states - "biomass residue and the usage of biomass residue in the project activity does not result in the carbon pool of the area (especially dead tree, fallen leaves and branches or soil organic carbon)".
5. The biomass is the non-fossil fraction of an **industrial** or **municipal waste**.		The biomass to be used in this CPA is non-fossil fraction.

Hence, biomass used in this project is concluded as renewable.

B.3. Assessment and demonstration of additionality of the small-scale CPA , as per eligibility criteria listed in the Registered PoA:

In the absence of the PoA, thermal energy generation for industrial purpose will not be carried out at XXXX. Thermal energy for the brewery will be supplied from existing thermal energy generation facilities whose energy sources is furnace oil.

According to the "Guidelines for Demonstrating Additionality of Renewable Energy Projects =< 5 MW[6] and Energy Efficiency Projects with Energy Saving <= 20GWH Per Year", project activities employ specific renewable energy technologies/measures recommended by the host country DNA and approved by the Board to be additional in the host country is regarded as additional (conditions apply: The total installed capacity of technology/measure contributes less than or equal to 5% to national annual electricity generation).

This project can be regarded additional once the CDM Executive board approves the technology to be applied in this CPA because of the following reasons:

1) Size of the project
The operating capacity of this project is XX MW which is below 15 MW_{th}.

2) Technology applied
In this PoA, project activities employ gasifier technology which provides thermal energy installation capacity equivalent to 10MW which is less than 1.0 % of the industrial thermal energy generation. Currently the recommendation letter by the DNA of the host country is under preparation in order to be approved by the Board.

Therefore, additionality of the CPA is demonstrated as described above.

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

The boundary applies to each CPA under the PoA and includes the physical and geographic location of each biomass thermal energy generating facility. Significant amounts of GHG emissions is expected to be reduced within the project boundary of the PoA because grid electricity to be used for operating the facility is not large compared to the amount of fossil fuel currently used at thermal energy generating facility and fossil fuel to be used for transporting biomass resources after the project implementation is considered negligible.

The project activity emissions included within the project boundary of CPAs under the PoA are emissions that occurred due to the project activity and are shown below:

i) Carbon dioxide (CO2) emissions from on-site consumption of fossil fuels due to the project activity,
ii) Carbon dioxide (CO2) emissions from electricity consumption by the project activity,

The baseline emission included in the project boundary is as follows:

i) Carbon dioxide (CO2) emissions from steam/heat displaced by the project activity

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

[6] 15MW thermal energy equivalent

Detailed information on the data and parameters that do not require monitoring are described below. Data and parameters used for ex-ante calculation that need to be monitored after project implementation are shown in B.6.1.

Data / Parameter:	$\eta_{BL,thermal}$
Data unit:	-
Description:	The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity
Source of data used:	Historical data of XXXX
Value applied:	XXXX
Justification of the choice of data or description of measurement methods and procedures actually applied:	Maximum value measured by a third party based on international standard measurement method.
Any comment:	According to SSC AMS I.C.(ver.18) determined by adopting one of the following criteria: a) Highest measured operational efficiency over the full range of operating conditions of a unit with similar specifications, using baseline fuel. The efficiency tests shall be conducted following the guidance provided in relevant national/international standards; b) Highest of the efficiency values provided by two or more manufacturers for units with similar specifications, using the baseline fuel; c) Default efficiency 100%

Data / Parameter:	Specific gravity of the fossil fuel oil that would have been used in the baseline
Data unit:	t/kL
Description:	Specific gravity of the XXXX(kind of fossil fuel to be displaced) in t/kL
Source of data used:	Energy data 2007, Sustainable Energy Authority, Table "Conversion Factors and Coefficients"
Value applied:	XXXX
Justification of the choice of data or description of measurement methods and procedures actually applied:	Official released statistic; publicly accessible and reliable data source
Any comment:	

Data / Parameter:	$FC_{i,y}$
Data unit:	M3/y, t/y
Description:	Amount of fossil fuel type i consumed in the grid system in year y
Source of data used:	Sustainable Energy Authority, Energy Data 2007, Table “Summary”
Value applied:	Provided in Table 7, Annex 3: Baseline information
Justification of the choice of data or	Official released statistic; publicly accessible and reliable data source (data for 2005-2007)

description of measurement methods and procedures actually applied:	
Any comment:	Used for calculation of OM

Data / Parameter:	$NCV_{grid,i,y}$
Data unit:	GJ /t
Description:	Net calorific value of the fossil fuel type i in year y
Source of data used:	Sustainable Energy Authority, Energy Data 2007, Table "Conversion Factors and Coefficients" and IPCC default values at average value provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value applied:	Provided in Table 8, Annex 3: Baseline information
Justification of the choice of data or description of measurement methods and procedures actually applied:	For the local data which is out of uncertainty range provided in IPCC default values in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories, the closest IPCC default value is applied.
Any comment:	Annual monitoring for this parameter is not required during this crediting period, as Vintage of Data is chosen as Option 1 under this PoA.

Data / Parameter:	$EF_{grid,CO2,i,y}$
Data unit:	tCO2/GJ
Description:	CO2 emission factor of fuel type i in year y
Source of data used:	IPCC default values at average value provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value applied:	Provided in Table 9, Annex 3: Baseline information
Justification of the choice of data or description of measurement methods and procedures actually applied:	One of the options described in the "Tool to calculate the emission factor for an electricity system (ver.02)".
Any comment:	Annual monitoring for this parameter is not required during this crediting period, as Vintage of Data is chosen as Option 1 under this PoA.

Data / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year y
Source of data used:	Sustainable Energy Authority, Energy Data 2007
Value applied:	Provided in Table 13-15, Annex 3: Baseline information
Justification of the	Official released statistic; publicly accessible and reliable data source

choice of data or description of measurement methods and procedures actually applied:	(data for 2005-2007)
Any comment:	Used for calculation of OM. Annual monitoring for this parameter is not required during this crediting period, as Vintage of Data is chosen as Option 1 under this PoA.

Data / Parameter:	$OXID_i$
Data unit:	-
Description:	Oxidation factor for fossil fuels
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2: Energy, Table 1.4, pg 1.23-1.24
Value applied:	1.00
Justification of the choice of data or description of measurement methods and procedures actually applied:	Standard value recommended by UNFCCC (Neither the plant specific data nor the national / regional data is available.)
Any comment:	Used for calculation of OM. Annual monitoring for this parameter is not required during this crediting period, as Vintage of Data is chosen as Option 1 under this PoA.

B.5.2. Ex-ante calculation of emission reductions:

I. BASELINE EMISSIONS

Based on SSC AMS-I.C., the baseline emissions for steam/heat produced using fossil fuels are calculated as follows:

$$BE_{thermal,CO2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO2} \quad \ldots\ldots\ldots(1)$$

Where,

$BE_{thermal,CO2,y}$: The baseline emissions from steam/heat displaced by the project activity during the year y (tCO2e)

$EG_{thermal,y}$: The net quantity of steam/heat supplied by the project activity during the year y (GJ)

$EF_{FF,CO2}$: The CO2 emission factor of the fossil fuel that would have been used in the baseline plant, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used (tCO2 / GJ)

$\eta_{BL,thermal}$: The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity

For ex-ante calculation, $(EG_{thermal,y}/\eta_{BL,thermal})$ is derived by equation (2).

$EG_{thermal,y}/\eta_{BL,thermal} = FF_{BL,y} * NCV_{FF}$ .....(2)

Where,

$FF_{BL,y}$	:	Amount of fossil fuel to be replaced by the biomass fuel(t/y)
NCV_{FF}	:	Heat value of the fossil fuel to be replaced by biomass fuel (GJ/t)

Therefore, equation (1) can be translated as equation (3) as follows:

$BE_{thermal,CO2,y}$ ($tCO2_{eq}/y$)	=	$FF_{BL,y}$ (t/y)	×	NCV_{FF} (GJ/t)	×	$EF_{FF,CO2}$ (tCO_2e /GJ)	..... (3)
	=	XXXX	×	XXXX	×	XXXX	
	=	XXXX					

Where,

$BE_{thermal,CO2,y}$	:	The baseline emissions from steam/heat displaced by the project activity during the year y (tCO2e)
$FF_{BL,y}$	:	Amount of fossil fuel to be replaced by the biomass fuel(t/y)
NCV_{FF}	:	Net calorific value of the fossil fuel to be replaced by biomass fuel (GJ/t)
$EF_{FF,CO2}$	:	The CO2 emission factor of the fossil fuel that would have been used in the baseline plant, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used (tCO2 / GJ)

Parameter	Figure	Unit	Data Source
$BE_{thermal,CO2,y}$	XXXX	t $CO2_{eq}$/year	Equation (3)
$FF_{BL,y}$	XXXX	t/y	Average of 2008~2010 of Lion Beer operation data
NCV_{FF}	XXXX	GJ/t	"Furnace oil" of Table "Conversion Factors and Coefficients", Energy Data 2007, Sustainable Energy Authority
$EF_{FF,CO2}$	XXXX	tCO2 / GJ	Table 1.4, Chapter 1, Vol.2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories

II. PROJECT EMISSIONS

Project emissions are composed of the following two components:

A) CO2 emissions from on-site consumption of fossil fuels due to the project activity

B) CO2 emissions from electricity consumption by the project activity

$$PE_y = \{PE_{on\text{-}site,y} + PE_{EC,y}\} \ldots\ldots\ldots(4)$$

Where,

$PE_{on\text{-}site,y}$	:	Project CO2 emissions from on-site consumption of fossil fuels in year *y* (tCO_2e/y)
$PE_{EC,y}$	:	Project CO2 emissions from electricity consumption in year *y* (tCO_2e/y)

A) CO2 emissions from on-site consumption of fossil fuels due to the project activity ($PE_{on\text{-}site,y}$)

The emission amount when fossil fuel is consumed onsite during project activity is obtained from the following equation based on the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (ver.02)". Due to the lack of data required for option A, option B is applied for calculation.

$$\underset{(tCO2_{eq}/y)}{PE_{on\text{-}site,y}} = \underset{(t/y)}{FF_{PJ,i.y}} \times \underset{(GJ/t)}{NCV_{FF,i,y}} \times \underset{(tCO_2e/GJ)}{EF_{FF,CO2,i,y}} \quad \ldots\ldots (5)$$

$$= XXXX$$

Where,

$PE_{on\text{-}site,y}$	:	Project emissions from fossil fuel consumption in year y ($tCO2_e$)
$FF_{PJ,i,y}$	:	Quantity of fuel type i combusted in process j during the year y (t/y)
$NCV_{FF,i,y}$	:	Net calorific value of the fossil fuel to be replaced by biomass fuel (GJ/t)
$EF_{FF,CO2,i,y}$	:	The CO2 emission factor of the fossil fuel that would have been used in the baseline plant, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used (tCO_2e/GJ)

Parameter	Figure	Unit	Data Source
$FF_{PJ,y}$	XXXX	t/y	No fossil fuel is not expected to be used
NCV_{FF}	XXXX	GJ/t	-
$EF_{FF,CO2}$	XXXX	tCO2 / GJ	-

B) CO2 emissions from electricity consumption by the project activity ($PE_{EC,y}$)

STEP 1. Emission Factor Calculation

Step 1-1. Select an Emission Factor Option

According to the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption (ver.01)", Option A1 of Scenario A is applied for this PoA.

Scenario A:
Electricity consumption from the grid

Option A1:
Calculate the combined margin emission factor of the applicable electricity system, using the procedures in the latest approved version of the "Tool to calculate the emission factor for an electricity system (ver.02)" .

The emission is the electricity generation (MWh) produced by the renewable generating unit multiplied by an emission factor (tCO2e/MWh) calculated in a transparent and conservative manner as:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'.

OR

(b) The weighted average emissions (in kg CO2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

This PoA applied option (a) for calculation of the emission factor.

Step 1-2. Determination of OM Emission Factor Calculation Method

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch data analysis OM, or
(d) Average OM.

The annual load duration curve and grid system dispatch data is necessary for Method (b) and (c) respectively. However, these data are not publicly available. Therefore, Methods (b) and (c) cannot be applied to this PoA.

Renewable energy (hydro, geothermal, wind, biomass, solar) and nuclear power are considered as sources of low-cost/must-run power generation. Therefore, Method (a) is obtained by the weighted average of the unit electricity generation volume of power plants excluding renewable energy and nuclear power plants. Method (d) is the average emission factor of all power plants connecting to the grid.

Method (a) can be used only if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

Based on "Tool to calculate the emission factor for an electricity system(ver.02)", this PoA will utilize Method (a) if the 5-year generation-weighted average data indicates that the percentage of electricity generated from low-cost/must-run power plants is less than/equal to 50% of the total electricity generated within the grid. If this percentage is above 50%, Method (d) will be applied.

Based on the above, with the currently available data, the OM calculation method to be applied to each grid system in Sri Lanka is determined as shown in Table 4.

Table 4. OM Calculation Method to Be Applied to the Grid Systems in Sri Lanka

Proportion of Electricity Supply by Low-cost/Must-run Power Plants (2004-2008)	Option applied
41.8% < 50%	Simple OM

Step 1-3. Calculate The OM Emission Factor According to The Selected Method.

Calculation of Simple OM [Method (a)]

The Simple OM emission factor ($EF_{grid,OM,y}$) is calculated as the generation-weighted average emissions per electricity unit (tCO_2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants. It can be calculated by using the following three options based on the obtained data.

- Based on data on fuel consumption and net electricity generation of each power plant / unit4 (Option A), or
- Based on data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit (Option B), or
- Based on data on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system (option C)

According to the data available in Sri Lanka, option A is considered as the most suitable method by using the Ex ante option. The calculation is a 3-year average based on most recent statistics available in the year 2006-2008.. The formula used is shown in based on data on fuel consumption and net electricity generation of each power plant / unit (Option A).

$$EF_{grid,OM,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot NCV_{grid,i,y} \cdot EF_{\text{grid,CO2},i,y}}{\sum_{m} EG_{m,y}} \quad \text{..... (6)}$$

Where,

$EF_{grid,OMsimple,y}$	:	Simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$FC_{i,m,y}$	:	Amount of fossil fuel type *i* consumed by power plant / unit m in year *y* (mass or volume unit)
$NCV_{grid,i,y}$	:	Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{grid,CO2,i,y}$	:	CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
$EG_{,m,y}$	:	Net electricity generated and delivered to the grid by power plant / unit m, not including low-cost / must-run power plants / units in year *y* (MWh)
M	:	All power plants / units serving the grid in year y except low-cost / must-run power plants / units
I	:	All fossil fuel types combusted in power plant / unit *m* in year *y*

Y : Three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option)

Step 1-4. Identify the Cohort of Power Units to Be Included in The Build Margin (BM) . Sample Group of Power Units

The sample group of power units m used to calculate the build margin consists of either:

(a) The set of five power units that have been built most recently, or

(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

Project participants should use the set of power units that comprises the larger annual generation.

Capacity additions from retrofits of power plants should not be included in the calculation of the build margin emission factor.

Vintage of Data

In terms of vintage of data, project participants can choose between one of the following two options:

Option 1.

For the first crediting period, calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the Designated Operational Entity for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the Designated Operational Entity. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2.

For the first crediting period, the build margin emission factor shall be updated annually, ex-post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex-ante, as described in option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

For this PoA, Option 1 is applied.

Step 1-5. Calculate The Build Margin Emission Factor.

The build margin emissions factor is the generation-weighted average emission factor (tCO2/MWh) of all power units m during the most recent year y for which power generation data is available, and is calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \quad \ldots\ldots(7)$$

Where,

$EF_{grid,BM,y}$	:	Build margin CO2 emission factor in year y (tCO2/MWh)
$EG_{m,y}$	:	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	:	CO2 emission factor of power unit m in year y (tCO2/MWh)
m	:	Power units included in the build margin
y	:	Most recent historical year for which power generation data is available

The CO2 emission factor of each power unit m ($EF_{EL,m,y}$) will be determined as per Step1-3. Method (a) for the simple OM using "y" for the most recent historical year for which power generation data is available, and using "m" for the power units included in the build margin.

Step 1-6. Calculate The Combined Margin (CM) Emissions Factor.

According to the above equations, the emission factor of the system power supply (combined margin, CM) is determined by the CO2 emission factor of system power supply (CEF_y). CEF is average of OM and BM as described below:

$$CEF_y = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad \ldots\ldots(8)$$

Where,

CEF_y	:	CO2 emission factor of system power supply ($tCO2_{eg}$ /MWh)
$EF_{grid,OM,y}$	:	Operating margin CO2 emission factor in year y ($tCO2_{eg}$ /MWh)
$EF_{grid,BM,y}$	:	Build margin CO2 emission factor in year y ($tCO2_{eg}$ /MWh)
w_{OM}	:	Weighting of operating margin emissions factor (%)
w_{BM}	:	Weighting of build margin emissions factor (%)

w_{OM} = 0.5 and w_{BM} = 0.5 for this crediting period.

According to the above equation, the latest emission factor of the system power supply (combined margin) for this PoA is determined as shown in the Table 5. CPAs under PoA can use these figures if new electricity generation statistic data is not available.

Table 5. Emission Factor of the System Power Supply (CEF_y)

OM ($tCO2_{eg}$ /MWh)	BM ($tCO2_{eg}$ /MWh)	CM ($tCO2_{eg}$ /MWh)
0.686	0.705	0.695

STEP 2. Calculation of Project Emissions

Project emission is calculated by using equation (9).

Renewable energy generation volume (MWh) for the project emission calculations was derived utilizing data with high transparency. Project emissions from system power supply are determined as follows with CEF_y shown in the Table 5.

$$PE_{y,power} (tCO2_{eq}/y) = E_{PJ,y} (MWh/y) \times CEF_y (tCO2_{eg}/MWh) \quad \text{…… (9)}$$

$$= XXXX \times 0.695$$

$$= XXXX$$

Where,

$PE_{y,power}$: Annual project emissions from system power supply ($tCO2_{eq}$/year)

$E_{PJ,y}$: Electricity requirement of installed plant (MWh)

CEF_y : CO2 emission factor of system power supply ($tCO2_{eg}$ /MWh)

Parameter	Figure	Unit	Data Source
$E_{PJ,y}$	XXXX	MWh	Site specific data
CEF_y	0.695	$tCO2_{eg}$ /MWh	Calculated in Step1-6

III. LEAKAGE EMISSIONS

A) Leakage emissions associated to biomass utilization

For the CPAs under this PoA, the determination of leakage shall be done following the procedures included in the leakage section of AM0042.

In AM0042, during the calculation of related leakage, the method used involves the setting of the most accurate baseline scenario according to the type of biomass and selecting the calculation approach .In this project, scenario B1 is applicable. Where scenario B1 applies, approaches L1, L2 and/or L3 are to be used.

[Baseline scenario]

B1	The biomass residues are dumped or left to decay under mainly aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields.

[Approaches to rule out leakage]

L1	・Demonstrate that at the sites where the project activity is supplied from with biomass residues, the biomass residues have not been collected or utilized (e.g. as fuel, fertilizer or feedstock) but have

	been dumped and left to decay, land-filled or burnt without energy generation (e.g. field burning) prior to the implementation of the project activity. • Demonstrate that this practice would continue in the absence of the CDM project activity, e.g. by showing that in the monitored period no market has emerged for the biomass residues considered or by showing that it would still not be feasible to utilize the biomass residues for any purposes (e.g. due to the remote location where the biomass residue is generated).
L2	• Demonstrate that there is an abundant surplus of the in the region of the project activity which is not utilized. For this purpose, demonstrate that the quantity of available biomass residues of type *k* in the region is at least 25% larger than the quantity of biomass residues of type *k* that are utilized (e.g. for energy generation or as feedstock), including the project plant.
L3	• Demonstrate that suppliers of the type of biomass residue in the region of the project activity are not able to sell all of their biomass residues. For this purpose, project participants shall demonstrate that the ultimate supplier of the biomass residue (who supplies the project) and a representative sample of suppliers of the same type of biomass residue in the region had a surplus of biomass residues (e.g. at the end of the period during which biomass residues are sold), which they could not sell and which are not utilized.

- In order to use approaches L2 to assess leakage effects, project proponents shall clearly define the geographical boundary of the region and document it in the draft CDM-PDD. In defining the geographical boundary of the region, project participants should take the usual distances for biomass transports into account[7]. In any case, the region should cover a radius around the project activity of at least 20 km but not more than 200 km. Once defined, the region should not be changed during the crediting period(s).

- If for a certain biomass residue type k used in the project leakage effects cannot be ruled out with one of the approaches above, leakage effects for the year y shall be calculated as follows:

$$LE_y = EF_{CO2,LE} \cdot \sum_n BF_{LE,n,y} \cdot NCV_n \quad \text{.....(10)}$$

Where,

LE_y	:	Leakage emissions during the year *y* (tCO2/yr)
$EF_{CO2,LE}$	:	CO2 emission factor of the most carbon intensive fuel used in the country (tCO2/GJ)
$BF_{LE,n,y}$	:	Quantity of biomass residue type *n* used for heat generation as a result of the project activity during the year *y* and for which leakage cannot be ruled out using one of the approaches L1, L2, L3 or L4 (tons of dry matter or liter)
NCV_n	:	Net calorific value of the biomass residue type *n* (GJ/ton of dry matter or GJ/liter)
n	:	Biomass residue type *n* for which leakage can not be ruled out using one of the approaches L1, L2, L3 or L4

- In case of approach L1, $BF_{LE,n,y}$ corresponds to the quantity of biomass residue type n that is obtained from the relevant source or sources.

[7] i.e. if biomass residues are transported up to 50 km, the region may cover a radius of 50 km around the project activity

- In case of approaches L2 or L3, $BF_{LE,n,y}$ corresponds to the quantity of biomass residue type k used in the project plant as a result of the project activity during the year y ($BF_{LE,n,y} = BF_{PJ,k,y,}$ where n=k).

[Application to the CPA]
In Sri Lanka there is no publicly available information to prove the fact stated above (L1, L2 and L3) as Gliricidia has not been utilized and the market is very small. However, under this PoA a survey was carried out to estimate the generated amount and the utilization situation of Gliricidia wood. The result of the survey showed that domestically in Sri Lanka, branches of Gliricidia were hardly used and generally, after periodic pruning, the branches were left at back yards of farms (L1) . Hence, it can be said that suppliers of Gliricidia fuel wood in Sri Lanka have a surplus of biomass residues, which they cannot sell and which are not utilized (L3).

Biomass assessment was conducted to identify the available amount of Gliricidia in procurement boundary of the CPA (50km from the site). This procurement boundary cannot be changed during the crediting period. According to the report, the storage amount within radius 50 km is more than 3 times greater than the required amount of biomass even in an extremely conservative case, and hence it is concluded that it is not necessary to consider the leakage.

b) Other leakage emissions
According to AMS-I.C., other leakage emissions are composed of the following three components:

- If the energy generating equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered.
- If biomass residues are transported over a distance of more than 200 km due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected.
- In processing of biomass residues, electricity will be used, however, this can be neglected because this is negligibly small.

For CPAs under the PoA, all the above three leakage can be neglected since there is no leakage effect from equipment transferred from another unit to other units in the project boundary and any CPA will transport the biomass residue more than 200 km (it is also too costly to transport for that distance). Each CPA will determine the boundary of biomass residue procurement, which will not be beyond 200km. .

(iv) Emissions Reduction of GHG

GHG emissions reduction is calculated as indicated in equation (11).

ER_y ($tCO2_{eq}/y$)	=	BE_y ($tCO2_{eq}/y$)	− (	PE_y ($tCO2_{eq}/y$)	+	$Leakage_y$ ($tCO2_{eq}/y$)	)	……(11)
	=	XXXX	− (	XXXX	+	0	)	
	=	XXXX						

Where,

ER_y : Emissions reduction in year "y" ($tCO2_{eq}$ /y)

BE_y : Baseline emissions in year "y" ($tCO2_{eq}$ /y)

PE_y : Project emissions in year "y" ($tCO2_{eq}$ /y)

$Leakage_y$: Emissions due to leakage in year y ($tCO2_{eq}$ /y)

B.5.3. Summary of the ex-ante estimation of emission reductions:

Table 6. Summary of Ex-ante Estimation of Emission Reduction

Year	Estimation of project activity emissions (tCO_2 e)	Estimation of baseline emissions (tCO_2 e)	Estimation of leakage (tCO_2 e)	Estimation of overall emission reductions (tCO_2 e)
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
XXXX	XXXX	XXXX	0	XXXX
Total (tCO_2e)	XXXX	XXXX	0	XXXX

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

(i) Monitoring and reporting framework

Monitoring and reporting framework is shown in Figure 4 below. The operation and management of biomass thermal energy generation facility is carried out by XXXX. Based on monitoring manual provided by the BEASL as C/ME, XXXX will monitor the monitoring items specified below and will report to BEASL, who will then undertake data checking, calculation of emission reduction, site visits and provision of advice to the CPAs. BEASL will also be responsible for communication with Designated Operational Entity for verification procedures.

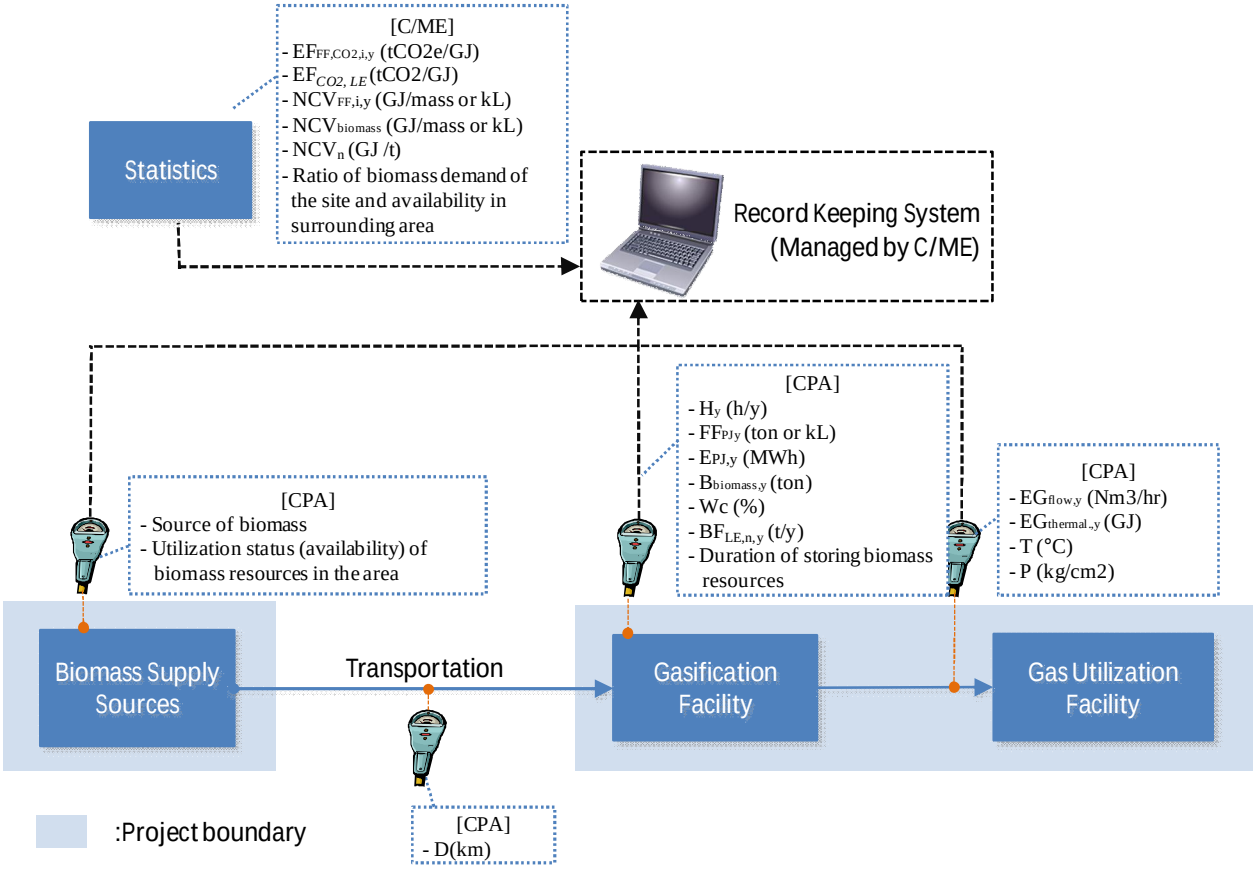

Figure 4. Layout of Record Keeping System

(ii) Monitoring method

Detailed information of the monitoring items and their monitoring methods are described below.

Data / Parameter:	H_y
Data unit:	h/y
Description:	Operation hours of system (Continuous operation of the equipment/system)
Source of data to be used:	On-site measurement at CPA level
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Estimating the annual hours of operation of a system. Annual hours of operation can be estimated from total output (e.g. tonnes of grain dried) and output per hour if an accurate value of output per hour is available. If the project site has more than one system, record annually the number of systems operating (evidence of continuing operation, such as on-going rental/lease payments could be a substitute), if necessary using survey methods.

QA/QC procedures to be applied:	-
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity. In the case the project site has more than one system, annual check of all appliances or a representative sample thereof to ensure that they are still operating or are replaced by an equivalent in service appliance.

Data / Parameter:	$EF_{FF,CO2,i,y}$
Data unit:	tCO2/GJ
Description:	CO2 emission factor of the fossil fuel in the baseline
Source of data to be used:	2006 IPCC Guideline for National Greenhouse Gas inventories, Table 1.4 For this CPA, d) in the table below is applied due to unavailability of a) ~c).

Data source	Conditions for using the data source
a)Values provided by the fuel supplier in invoices	This is the preferred source
b)Measurements by the project participants	If a) is not available
c)Regional or national default values	If a) is not available These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as national energy balances)
d)IPCC default values provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If a) is not available

Natural gas liquids	0.642
Other kerosene	0.719
Gas/diesel	0.741
Furnace oil (residual oil)	0.774
Naphtha:	0.733
Natural gas	0.561

Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Any future revision of the IPCC Guidelines should be taken into account
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$EG_{flow,y}$
Data unit:	NM3/hr

Description:	Quantity of hot air or steam
Source of data to be used:	Measurements undertaken by the facility operator of each CPA
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Continuous monitoring by automatic flow meter. integrated hourly and at least monthly recording For measuring hot air, where it is not feasible (e.g. because of too high temperature), spot measurements can be used through sampling with a 90% confidence level and a 10% precision
QA/QC procedures to be applied:	Meters will be periodically calibrated according to manufacturer specifications. If applicable, measurement results shall be cross checked with records for sold/purchased electricity (e.g. invoices/receipts).
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity. A parameter used to calculate $EG_{thermal,y}$

Data / Parameter:	$EG_{thermal}$
Data unit:	GJ
Description:	Net quantity of thermal energy supplied by the project activity during the year y
Source of data to be used:	Calculated by $EG_{flow,y}$ (t/y or m3/y)[8], T and P
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Continuous monitoring, aggregated annually
QA/QC procedures to be applied:	-

8 Heat generation is determined as the difference of the enthalpy of the steam or hot fluid and/or gases generated by the heat generation equipment and the sum of the enthalpies of the feed-fluid and/or gases blow-down and any condensate returns. The respective enthalpies should be determined based on the mass (or volume) flows, the temperatures and, in case of superheated steam, the pressure. Steam tables or appropriate thermodynamic equations may be used to calculate the enthalpy as a function of temperature and pressure. In case of equipment that produces hot water/oil this is expressed as difference in the enthalpy between the hot water/oil supplied to and returned by the plant. In case of equipment that produces hot gases or combustion gases, this is expressed as difference in the enthalpy between the hot gas produced and all streams supplied to the plant. The enthalpy of all relevant streams shall be determined based on the monitored mass flow, temperature, pressure, density and specific heat of the gas. In case the project activity is exporting heat to other facilities, the metering shall be carried out at the recipients end and measurement results shall be cross checked with records for sold/purchased thermal energy (e.g. invoices/receipts). Metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient

Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	$FF_{PJ,i,y}$
Data unit:	t/y
Description:	Quantity of fossil fuel type i combusted on-site in the project scenario in year y
Source of data to be used:	Onsite measurements at CPA level
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	· Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements (on a daily basis or per shift); · Accessories such as transducers, sonar and piezoelectronic devices are accepted if they are properly calibrated with the ruler gauge and receiving a reasonable maintenance; · In case of daily tanks with pre-heaters for heavy oil, the calibration will be made with the system at typical operational conditions.
QA/QC procedures to be applied:	· The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. · Where the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity. Meters should be installed, maintained and calibrated according to equipment manufacturer instructions and be in line with national standards, or, if these are not available, international standards (e.g. IEC, ISO).

Data / Parameter:	$E_{PJ,y}$
Data unit:	MWh/y
Description:	Amount of grid electricity used at on-site in the project scenario
Source of data to be used:	On-site measurement at CPA level
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods	Continuous monitoring by meter integrated hourly, at least monthly recording

and procedures to be applied:	
QA/QC procedures to be applied:	Meters will be periodically calibrated according to manufacturer specifications.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	$B_{biomass,PJ,y}$ (each type of fuel)
Data unit:	t/y
Description:	Biomass consumption during the year *y* in tons
Source of data to be used:	Own measurement at CPA level
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Use mass or volume based measurements. Adjust for the moisture content in order to determine the quantity of dry biomass. And/or perform an annual energy/mass balance that is based on purchased quantities and stock. If more than one type of biomass fuel is consumed, each shall be monitored separately
QA/QC procedures to be applied:	Measurement devices will be periodically calibrated according to manufacturer specifications. The amount will be double checked by the purchasing bills.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	Wc
Data unit:	% water
Description:	Moisture content of the biomass residues
Source of data to be used:	Information provided by each biomass supplier (on site record) # In case of dry biomass, monitoring of this parameter is not necessary.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	The moisture content of biomass of homogeneous quality shall be monitored at least on a monthly basis. The weighted average should be calculated for each monitoring period and used in the calculations
QA/QC procedures to be applied:	Double checked by responsible persons of each CPA.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	T
Data unit:	°C

Description:	Temperature of the energy produced
Source of data to be used:	Measurements undertaken by the facility operator of each CPA
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Continuous monitoring by calibrated thermometer, integrated hourly and at least monthly recording
QA/QC procedures to be applied:	Meters will be periodically calibrated according to manufacturer specifications.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity. A parameter used to calculate $EG_{thermal,y}$

Data / Parameter:	P
Data unit:	kg/cm2
Description:	Pressure of the energy produced
Source of data to be used:	Measurements undertaken by the facility operator of each CPA
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Continuous monitoring by calibrated meters, integrated hourly and at least monthly recording
QA/QC procedures to be applied:	Meters will be periodically calibrated according to manufacturer specifications.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity. A parameter used to calculate $EG_{thermal,y}$

Data / Parameter:	$NCV_{FF,i,y}$
Data unit:	TJ /kt
Description:	Net calorific value of the fossil fuel type i in year y
Source of data to be used:	The applied data is shown in the Table 9 Annex 3

<table>
<tr><td>Value of data applied for the purpose of calculating expected emission reductions in section B.5</td><td>-</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>The values of “Energy Data 2007 (Sustainable Energy Authority)” are applied and only the value which is out of the uncertainty range specified in IPCC guideline, the closest figure of the uncertainty range is to be applied.</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>· Verify if the values under a), b) and c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines.
<table>
<tr><th>Type of fuel</th><th>Lower</th><th>Upper</th></tr>
<tr><td>Natural gas liquids</td><td>40.9</td><td>46.9</td></tr>
<tr><td>Other kerosene</td><td>42.4</td><td>45.2</td></tr>
<tr><td>Gas/diesel</td><td>41.4</td><td>43.3</td></tr>
<tr><td>Residual fuel oil (Furnace oil)</td><td>39.8</td><td>41.7</td></tr>
<tr><td>Naphtha</td><td>41.8</td><td>46.5</td></tr>
<tr><td>Natural gas</td><td>46.5</td><td>50.4</td></tr>
</table>
· If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements.
· The laboratories in a), b) or c) should have ISO17025 accreditation or justify that they can comply with similar quality standards.</td></tr>
<tr><td>Any comment:</td><td>Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.
Meters should be installed, maintained and calibrated according to equipment manufacturer instructions and be in line with national standards, or, if these are not available, international standards (e.g. IEC, ISO).</td></tr>
</table>

Data / Parameter:	$NCV_{biomass}$
Data unit:	TJ/t, TJ/M3 (use a dry matter basis for biomass)
Description:	The net calorific value of the biomass
Source of data to be used:	Measurement by CM/E
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Measurement in laboratories according to relevant national/international standards. Measure the NCV based on dry biomass. Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines (7.9~31.0 TJ/kt for wood/wood waste). If the measurement results differ significantly from previous measurements or

	other relevant data sources, conduct additional measurements
QA/QC procedures to be applied:	Meters will be periodically calibrated according to manufacturer specifications. Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	D
Data unit:	Km
Description:	Distance of biomass transportation
Source of data to be used:	Information provided by each biomass supplier (on site record)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Source of biomass to be reported by each supplier and recorded at each CPA level.
QA/QC procedures to be applied:	Double checked by responsible persons of each CPA.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	-
Data unit:	-
Description:	Source of biomass used as fuel at project site
Source of data to be used:	Information provided by each biomass supplier (on site record)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Source of biomass to be reported by each supplier and recorded at each CPA level.
QA/QC procedures to be applied:	-
Any comment:	Data will be archived electronically and be kept at least for 2 years after the

	end of the last issuance of CERs for this activity.

Data / Parameter:	-
Data unit:	-
Description:	Duration of storing biomass resources (not exceeding 1 year)
Source of data to be used:	On-site measurement
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	When managing the storage period, make sure that the delivery date is written in the container of the biomass fuel.
QA/QC procedures to be applied:	-
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	-
Data unit:	-
Description:	Ratio of required amount of biomass type i by the project site to the amount of biomass of the same kind in the boundary of procurement
Source of data to be used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	Meters will be periodically calibrated according to manufacturer specifications.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	$EF_{CO2, LE}$
Data unit:	tCO2/GJ
Description:	CO2 emission factor of the most carbon intensive fuel used in the country
Source of data to be used:	According to Table 9 of Annex 3: Furnace oil (residual oil)

Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.774
Description of measurement methods and procedures to be applied:	Any future revision of the IPCC Guidelines should be taken into account
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$BF_{LE,n,y}$
Data unit:	t/y
Description:	Quantity of biomass residue type *n* used for heat generation as a result of the project activity during the year *y* and for which leakage cannot be ruled out using one of the approaches L1, L2, L3 or L4 (tons of dry matter or liter)
Source of data to be used:	Own measurement at CPA level
Value of data applied for the purpose of calculating expected emission reductions in section B.5	XXXX
Description of measurement methods and procedures to be applied:	Use mass or volume based measurements. Adjust for the moisture content in order to determine the quantity of dry biomass. And/or perform an annual energy/mass balance that is based on purchased quantities and stock. If more than one type of biomass fuel is consumed, each shall be monitored separately
QA/QC procedures to be applied:	Measurement devices will be periodically calibrated according to manufacturer specifications. The amount will be double checked by the purchasing bills.
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

Data / Parameter:	NCV_n
Data unit:	GJ /t
Description:	Net calorific value of the biomass residue type *n*
Source of data to be used:	XXXX
Value of data applied for the purpose of calculating expected emission reductions in section B.5	XXXX
Description of measurement methods	Any future revision of the IPCC Guidelines should be taken into account

and procedures to be applied:	
QA/QC procedures to be applied:	-
Any comment:	Data will be archived electronically and be kept at least for 2 years after the end of the last issuance of CERs for this activity.

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

☐ Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

As described in C.1. CDM SSC-PoA-DD, the level of conducting environmental analysis is as shown in Table 7. Therefore, environmental analysis only for procurement of biomass resources is conducted at CPA level.

Table 7. The level of Conducting Environmental Analysis

Item to be analysed	PoA level	CPA level
a) Procurement of biomass resources		✓ (analysis is required when new cultivation is involved)
b) Utilization of biomass resources (new thermal energy generation facility)	✓	

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Elaborated in CDM SSC-PoA-DD.

C.3. Please state whether an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA), in accordance with the host Party laws/regulations:

In Sri Lanka, projects that require Environmental Impact Assessment (EIA) are composed of 31 items and listed in the Gazette on 772/22 of 24th June, 1993 and 859/14 of 23rd February 1995. Regarding the EIA for this project, it is necessary to determine the need of EIA for both of a) Procurement of biomass resources and b) Utilization of biomass resources (building and operating biomass based thermal energy generating facilities).

a) Procurement of biomass resources

Regarding the procurement of biomass resources, according to the Gazette on 772/22 of 24th June, 1993 and 859/14 of 23rd February 1995, the project proponent must conduct EIA when using biomass from new plantations under the following conditions:

[Project items for EIA]

- Reclamation of wetland area exceeding 4 hectares.(No.2)
- Extraction of timber covering land area exceeding 5 hectares.(No.3)

- Conversion of forests covering an area exceeding 1 hectare into non-forest uses.(No.4)
- Clearing of land areas exceeding 50 hectares.(No.5)

The items listed above are not applicable, and hence, EIA is not necessary for this CPA since the biomass resources to be procured for the CPA are biomass residue that are currently abandoned and not utilized effectively. The sources of biomass resources for the CPA will be monitored to make sure that they are not procured from dedicated plantations of wood biomass resources.

b) Utilization of biomass resources (building and operating biomass based thermal energy generating facilities)

This project is excluded from the EIA requirements of the Host Country and EIA at the CPA level is not required as elaborated in CDM SSC-PoA-DD.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

☒ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

As indicated in the proposed PoA, interviews with the stakeholders at the PoA level were conducted. They were given the opportunity to discuss and provide comments to the PoA.

In addition to the interviews at the PoA level, comments from responsible persons of local agencies and citizens who are related to the Project will be collected at a later date through interviews at the CPA level.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

In addition to the interviews at the PoA level, comments from responsible persons of local agencies and citizens who are related to the Project will be collected at a later date through interviews at the CPA level.

D.3. Summary of the comments received:

Comments from local citizens and related agencies are summarized here.

Summary of the comments received from the interviewees will be described here.

D.4. Report on how due account was taken of any comments received:

The report on how the comments are received will be described here.

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

Organization:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in this CPA and also this CPA does not include any diversion of ODA funds.

Annex 3

BASELINE INFORMATION

Table 8. Electricity Statistical Data of Sri Lanka

Year	Low Cost / Must Run				Thermal Generation					Total	% of low-cost / must run
	CEB Hydro	CEB Wind	SPP Hydro	Total	CEB	IPP	SPP	Hired	Total	Generation	
2003	3,190	3.39	121.0	3,314	2,248	1,746	1.2	394	4,389	7,704	43.0%
2004	2,755	2.70	207.0	2,965	2,507	2,087	1.5	509	5,105	8,069	36.7%
2005	3,223	2.44	280.0	3,505	2,162	3,177	2.3	-	5,341	8,847	39.6%
2006	4,290	2.31	346.4	4,638	1,669	3,136	1.7	-	4,807	9,445	49.1%
2007	3,603	2.27	345.0	3,950	2,336	3,559	1.1	-	5,896	9,846	40.1%
Total	17,060	13.11	1299.4	18,373	10,921	13,705	7.8	903	25,537	43,910	41.8%

Source: Sustainable Energy Authority, Energy Data 2007, Table Summary

Table 9. Net Calorific Value ($NCV_{grid,i,y}$, $NCV_{FF,i,y}$)

Energy Data 2007				2006 IPCC guideline, Vol2, Table 1,2			Applied Figure
Type of fuel	NCV (Mcal/t)	Conversion (TJ/MCal)	NCV (TJ/t)	Type of fuel	Lower (TJ/t)	Upper (TJ/t)	NCV (TJ/t)
Furnace Oil	9,800	4.186×10^{-6}	41.0	Residual fuel oil	0.398	0.417	0.410
Gas/Diesel Oil	10,500	4.186×10^{-6}	44.0	Gas/diesel	0.414	0.433	0.433
Naphtha	10,900	4.186×10^{-6}	45.6	Naphtha	0.418	0.465	0.456
Residual Oil	9,800	4.186×10^{-6}	41.0	Residual fuel oil	0.398	0.417	0.410

Source: Table" Conversion Factors and Coefficients" of Energy Data 2007 (Sustainable Energy Authority), and Table 1.2 of Chapter 1 of Vol.2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories

Table 10. Effective CO2 Emission Factor ($EF_{grid,CO2,i,y}$, $EF_{FF,CO2,i,y,}$)

Fuel Type	Effective CO2 emission factor [EF_i] (tCO2e/TJ)	Remarks
Furnace Oil	77.4	Residual Fuel
Gas/Diesel Oil	74.1	Gas/Diesel Oil
Naphtha	73.3	Naphtha
Residual Oil	77.4	Residual Fuel

Source: 2006 IPCC Guideline for National Greenhouse Gas inventories, Table 1-4

Table 11. Combustion Efficiency ($OXID_i$)

Type of Fuel	Combustion Efficiency
For all types of fuel	1.00

Source: 2006 IPCC Guideline for National Greenhouse Gas inventories, Table 1-4

Table 12. CO2 Emission Coefficient ($COEF_i$)

Fuel Type	Net Calorific Value [NCV] (TJ/t)	Effective CO2 Emission Factor [EF_i] (tCO2e/TJ)	Oxidation Factor [$OXID_i$] -	CO2 Emission Coefficient [$COEF_i$] (tCO2/t)	Remarks
	(a)	(b)	(c)	(a)*(b)*(c)	
Furnace Oil	0.410	77.4	1.0	3.173	Residual Fuel
Gas/Diesel Oil	0.433	74.1	1.0	3.209	Gas/Diesel Oil
Naphtha	0.456	73.3	1.0	3.342	Naphtha
Residual Oil	0.410	77.4	1.0	3.173	Residual Fuel

Table 13. OM Calculation Data (Simple OM, 2005)

Fuel Type	Fuel Consumption 1000kL/y	Density of Fuel t/m3	COEF (tCO2/t_fuel)	Emission (tCO2/y)	Electricity Generation (GWh)	Grid Emission Factor (kg_CO2/kWh)
	(a)	(b)	(c)	(d)	(e)	(f)
Furnace Oil	500	0.972	3.173	1,542,554		
Gas/Diesel Oil	306	0.846	3.209	830,733		
Naphtha	180	0.690	3.342	415,076		
Residual Oil	270	0.972	3.173	832,979		
Total	-	-	-	3,621,343	5,341	0.678
Source	Energy Data 2007, Table "Fuel Consumption in Power Plants"	Energy Data 2007, Table "Conversion Factors and Coefficients"		(a)*(b)*(c)	Energy Data 2007, Table "Summary"	(d)/(e)

Table 14. OM Calculation Data (Simple OM 2006)

Fuel Type	Fuel Consumption 1000kL/y	Density of Fuel t/m3	COEF (tCO2/t_fuel)	Emission (tCO2/y)	Electricity Generation (GWh)	Grid Emission Factor (kg_CO2/kWh)
	(a)	(b)	(c)	(d)	(e)	(f)
Furnace Oil	469	0.972	3.173	1,446,916		
Gas/Diesel Oil	308	0.846	3.209	836,163		
Naphtha	91	0.690	3.342	209,844		
Residual Oil	266	0.972	3.173	820,639		
Total	-	-	-	3,313,561	4,807	0.689
Source	Energy Data 2007, Table "Fuel Consumption in Power Plants"	Energy Data 2007, Table "Conversion Factors and Coefficients"		(a)*(b)*(c)	Energy Data 2007, Table "Summary"	(d)/(e)

Table 15. OM Calculation Data (Simple OM 2007)

Fuel Type	Fuel Consumption 1000kL/y	Density of Fuel t/m3	COEF (tCO2/t_fuel)	Emission (tCO2/y)	Electricity Generation (GWh)	Grid Emission Factor (kg_CO2/kWh)
	(a)	(b)	(c)	(d)	(e)	(f)
Furnace Oil	513	0.972	3.173	1,582,660		
Gas/Diesel Oil	466	0.846	3.209	1,265,103		
Naphtha	138	0.690	3.342	317,303		
Residual Oil	296	0.972	3.173	913,809		
Total	-	-	-	4,078,875	5,896	0.692
Source	Energy Data 2007, Table "Fuel Consumption in Power Plants"	Energy Data 2007, Table "Conversion Factors and Coefficients"		(a)*(b)*(c)	Energy Data 2007, Table "Summary"	(d)/(e)

Table 16. OM Calculation

Fuel Type	2006 (kg_CO2/kWh)	2007 (kg_CO2/kWh)	2008 (kg_CO2/kWh)	Average (kg_CO2/kWh)
Simple OM	0.678	0.689	0.692	0.686

Source: Calculated from Table 13-15

Table 17. Most Recently Built Power Plant Data Used for BM

No.	Plant	Date of Commissioning	Fuel Type	Fuel Consumption (million Ltr)	Generation of the Unit in 2007 (million kWh)
1	ACE- Embilipiyiya	2004, Mar 2005	Furnace Oil	160	663
2	Heladhanavi	Oct 2003	Furnace Oil	158	748
3	AES-Kelanitissa	Mar 2003	Auto Oil	209	789
			Total of 1-3	528	2,200
			Total grid generation (million kWh)		9,814
			Proportion within the grid		22.4%

Source: Generation data is from "Generation Summary", System Control and Operations, Ceylon Electric Board (2008), Fuel consumption data is from the data provided by Sustainable Energy Authority

Table 18. BM Calculation Data

Fuel Type	Fuel Consumption 1000kL/y	Density of Fuel t/m3	COEF (tCO2/t_fuel)	Emission (tCO2/y)	Electricity Generation (GWh)	Grid Emission Factor (kg_CO2/kWh)
	(a)	(b)	(c)	(d)	(e)	(f)
Fuel Oil	318	0.972	3.173	981,681		
Auto Oil	209	0.846	3.209	568,482		
Naphtha	0	0.690	3.342	0		
Heavy Oil	0	0.972	3.173	0		
Total	-	-	-	1,550,163	2,200	0.705
Source	SEA Data	Energy Data 2007, Table "Conversion Factors and Coefficients"		(a)*(b)*(c)	CEB data	(d)/(e)

Annex 4

MONITORING INFORMATION

Refer to Section B.6.1 for the Monitoring Information.

- - - - -