Monitoring report form for CDM project activity (Version 09.0)

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT			
Title of the project activity	Shandong Gaotang 30MW Biomass Power Generation Project		
UNFCCC reference number of the project activity	1375		
Version number of the PDD applicable to this monitoring report	10		
Version number of this monitoring report	01		
Completion date of this monitoring report	31/01/2022		
Monitoring period number	4th Monitoring period		
Duration of this monitoring period	20/03/2015-31/12/2020		
Monitoring report number for this monitoring period	/		
Project participants	National Bio Energy Co., Ltd. (Project Owner)		
Host Party	P.R. China		
Applied methodologies and standardized baselines	The approved consolidated baseline and monitoring methodology ACM0006 “Consolidated methodology for grid-connected electricity generation from biomass residues Version 04”		
Sectoral scopes	1: Energy industries (renewable-/non-renewable sources)		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	/	775,316tCO_2	/
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	715,441tCO_2		

SECTION A. Description of project activity

A.1. General description of project activity

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The Shandong Gaotang 30MW Biomass Power Generation Project (hereafter referred to as the Project), developed by National Bio Energy Co., Ltd, is located in Gaotang County, Shandong Province, P.R.China. The Project collects and utilizes biomass residues (cotton straw, wood residues and wheat bran) to generate electricity and realizes biomass comprehensive utilization in the province served as a demonstration project in China.

The total installed capacity of the Project is 30 MW. And the straw-fired boiler is imported from Demark BWE Company, which is a world leading company in biomass boilers production and biomass cogeneration. So the project has also assisted in transferring advanced biomass technology to China. Electricity generated by the Project is exported into the Shandong provincial power grid that is a part of the North China Grid (NCG) to replace the capacity of coal-fired power plants and help reduce greenhouse gas (GHG) emission from the high-growth, coal-dominated power generation of NCG. Furthermore, the Project also accomplishes an extra benefit of GHG mitigation derived from a reduction of methane emission from biomass dumping or uncontrolled burning. The estimated annual GHG emission reductions are 180,881 tCO_2e in the approved changed PDD version 07, and the claimed annual GHG emission reductions shall be capped at the average annual emission reductions estimated in the original registered PDD, i.e. 140,695 tCO2e.

This Project was constructed since 01/04/2006. It was put into trial operation on 29/01/2007 and in full commercial operation since April 2008. It is estimated that the Project can deliver 187,626 MWh of electricity to NCG with a biomass residues consumption of 247,506 tonnes per year (on wet base).

In this monitoring period, the total emission reductions achieved are 775,316 tCO_2e.

Further information on this project can be found on the UNFCCC website:
https://cdm.unfccc.int/Projects/DB/TUEV-SUED1191857086.36/view?cp=1

A.2. Location of project activity

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The Project site is located in Gaotang Economic Development Zone, Gaotang County, Liaocheng City, Shandong Province, P.R.China. The Project has geographical coordinates with east longitude of 116°10′39″ and north latitude of 36°54′36″.

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
P.R. China (Host)	National Bio Energy Co., Ltd. (project owner)	No

A.4. References to applied methodologies and standardized baselines

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The baseline and monitoring methodology applied to this project includes:

ACM0018: “Electricity generation from biomass residues in power-only plants” (Version 03.0)

In line with the application of the ACM0018 methodology the project refers to the following tools:
"Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" (Version 03.0.1).
Tool to calculate the emission factor for an electricity system" (Version 04.0).
"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (Version 02).
"Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01)
"Project and leakage emissions from transportation of freight" (Version 01.1.0).

More information about the methodology can be found on the website:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

A.5. Crediting period type and duration

>>
The renewable crediting period (7yr*3) is adopted. The start date of the first crediting period of the Project is 20/03/2008.

The first Crediting period is 20/03/2008–19/03/2015. The second crediting period is from 20/03/2015 to 19/03/2022.

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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The total installed capacity of the Project is 30MW. The technology employed by the Project is from domestic and international advanced technologies. One biomass residues direct burning boiler of 130t/h with high temperature and high pressure is imported from Denmark BWE Company, with burning completely and no knotting residue. One 30MW steam turbines and one suited generator of 30MW have been applied in the Project.
The electricity output is transmitted through a transformer at the site to Huixin Substation, and then connected to Shandong Provincial Grid that is an integral part of NCG.

Table 1 to Table 3 list the key specifications of the main equipments, and Figure B.1 shows the technical diagram of the Project.

Table 1. Key technical specifications of BWE boiler

Boiler		
Parameters Name	**Unit**	**Data**
Boiler maximum continuous rating	t/h	130
Superheated steam pressure	MPa	9.2
Superheated steam temperature	°C	540
Boiler feed-water temperature	°C	210
Boiler exhaust temperature	°C	130
Boiler efficiency	%	≥92
Boiler dirt-discharge Rate	%	2

Table 2: Key technical specifications of turbine

Steam turbine		
Parameters Name	**Unit**	**Data**
Model	/	N30-8.83/535
Rated output	MW	30

Rated rotation speed	r/min	3000
Rated flow	t/h	120
Rated pressure	Mpa	8.83
Rated temperature	°C	535

Table 3: Key technical specifications of generator

Generator		
Model	/	QF-30-2
Rated output	MW	30
Rated voltage	kV	6.3
Rated electric current	A	3473
Rated rotation speed	r/min	3000

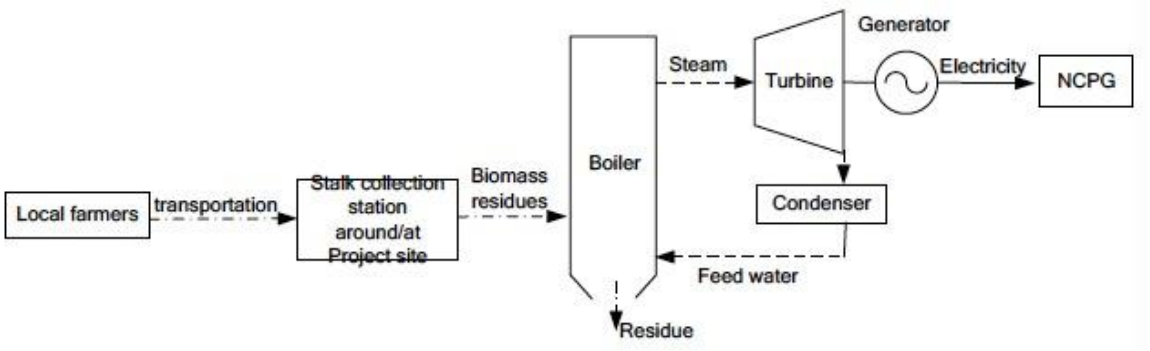

Figure 1. Technical Diagram

The Project started to construct since 01/04/2006. It was put into trial operation on 29/01/2007 and in full commercial operation since April 2008.

During this monitoring period, all the monitoring equipments and facilities have been managed by responsible person, and the Project has been running normally. Local surplus biomass residues (cotton straw, wood residues and wheat bran) have been utilized by the Project for electricity generation. Data record and management system were in place and managed by designated persons.

There was no special event or situation may impact the applicability of the methodology occurred over this monitoring period

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

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There is no temporary deviation from registered monitoring plan or applied methodology or applied standardized baseline in this monitoring period.

B.2.2. Corrections

>>

No corrections.

B.2.3. Changes to the start date of the crediting period

>>
No changes to start date of crediting period.

B.2.4. Inclusion of monitoring plan

>>
Not applicable.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

>>
The revised monitoring plan has been approved with the revised PDD by EB on 02/03/2012 during the verification of the first monitoring period.

B.2.6. Changes to project design

>>
Two permanent changes from project description in registered PDD occurred during the project actual activities, include:

Change1: three types of biomass residues (cotton straw, wood residues and wheat bran) have been applied to the project;

Change2: higher power generation.
These changes in revised PDD version7 have been approved by EB on 02/03/2012 during the verification of the first monitoring period.

B.2.7. Changes specific to afforestation or reforestation project activity

>>
Not applicable.

SECTION C. Description of monitoring system

>>
The application of monitoring mainly includes two parts, data management system and CDM working group. The main framework is shown are shown below:

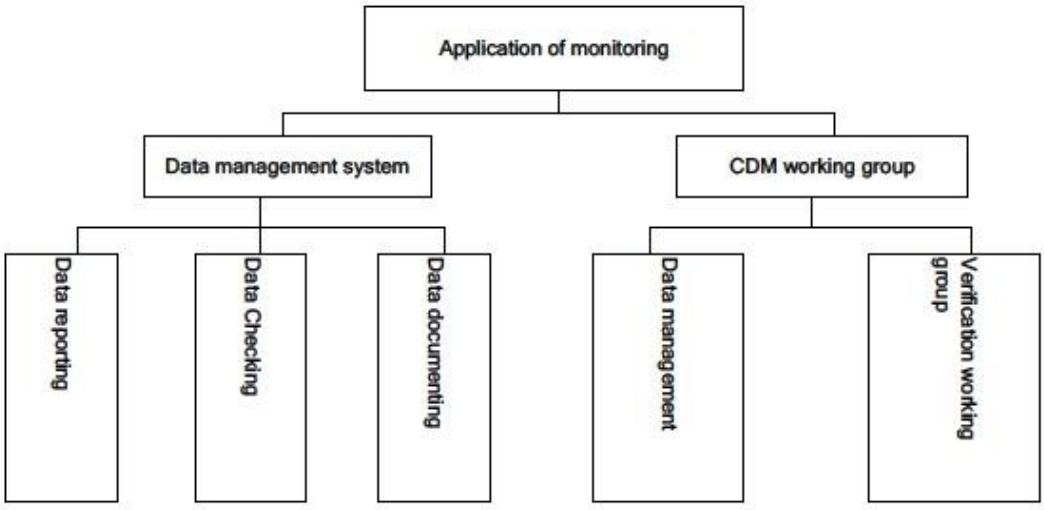

Figure 2. Organizational Structure

1. Responsibility

Overall responsibility for daily monitoring and reporting lies with the project company. A CDM group will be established within the project company to carry out the monitoring work. Its staffs will include all relevant people relevant to the data management system and be trained by the experts of the project consultancy.

2. Calibration of Meters & Metering

All meters and instruments are maintained and calibrated regularly as per industry practices.
Maintenance and calibration of meters will be implemented according to national standards and rules. And all the records are documented and maintained by the project owner.

3. Monitoring
All relevant parameters listed in Section B 7.1 will be monitored according to the methodology requirements and description of measurement methods and procedures to be applied. The results and data will be recorded and well documented. The data and meter reading will be readily accessible for DOE. Calibration tests records will be maintained for verification.

4. Quality Assurance and Quality Control
The quality assurance and quality control procedures for recording, maintaining and archiving data shall be improved as part of this CDM project activity. This is an on-going process that will be ensured through the CDM in terms of the need for verification of the emissions on an annual basis according to this PDD and the CDM manual.

5. Disposal of urgency
Disposal of urgency will be implemented according to the stipulations in the Power Purchase Agreement, Parallel Operation Agreement, Fuel Purchase Agreement, and so on. If other fossil fuels are combusted except diesel, the species and amount of the fossil fuel should be recorded in details.

6. Data management system
This provides information on record keeping of the data collected during monitoring. Record keeping is the most important exercise in relation to the monitoring process. Without accurate and efficient record keeping, project emission reductions cannot be verified. Below follows an outline of how project related records would be managed.

Overall responsibility for monitoring of GHG emissions reduction will rest with the CDM responsible persons of the working group. The CDM manual sets out the procedures for tracking information
from the primary sources to the end-data calculations in paper document format. It is the responsibility of the working group to provide additional necessary data and information for validation and verification requirements of respective DOE. Physical documentation such as paper-based maps, diagrams and environmental assessment will be collated for monitoring, if they are necessary. All paper-based information will be stored by the working group and kept at least one copy.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{electricity,y}$
Unit	CO_2e/MWh
Description	The combined margin emission factor
Source of data	Chinese DNA (2014 Baseline Emission Factors for Regional Power Grids in China)

Value(s) applied	0.6702
Choice of data or measurement methods and procedures	National public data
Purpose of data/parameter	Baseline/ Project emission calculations
Additional comments	/

Data/Parameter	**GWP_{CH4}**
Unit	tCO_2e/tCH_4
Description	Global warming potential for CH_4
Source of data	IPCC AR5
Value(s) applied	28
Choice of data or measurement methods and procedures	IPCC default value
Purpose of data/parameter	Baseline/ Project emission calculations
Additional comments	/

Data/Parameter	Biomass residues categories and quantities used for the selection of the baseline scenario selection and assessment of additionality
Unit	Type ; Source; Fate in the absence of the project activity (Scenarios B); Use in the project scenario (Scenarios P); Quantity (tonnes on dry-basis)
Description	Refer to Table B-2 in section B.4 of renewal PDD.
Source of data	Operation data according to the accepted revised PDD (Version 07)
Value(s) applied	
Choice of data or measurement methods and procedures	Operation data according to the accepted revised PDD (Version 07)

Biomass residues category (k)	Biomass residues type	Biomass residues source	Biomass residues fate in the absence of the project activity	Biomass residues use in the project scenario	Biomass residues quantity (tonnes on dry-basis)
1	Cotton stalk	Off-site from local farmers and retailers	Dumped (B1)	Electricity generation on-site (biomass only boiler)	67,833
2	Wood residues	Off-site from wholesalers and retailers	Dumped (B1)	Electricity generation on-site (biomass only boiler)	96,795
3	Wheat bran	Off-site from certain supplier	Dumped (B1)	Electricity generation on-site (biomass only boiler)	12,498

Purpose of data/parameter	This parameter is related to the procedure for the selection of the baseline scenario selection and assessment of additionality
Additional comments	/

D.2. Data and parameters monitored

Data/Parameter	**$EG_{facility,y}$**
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Measured/calculated/ default	Measured
Source of data	On-site measurements by electricity meter at Huixin substation
Value(s) of monitored parameter	1,121,741.280
Monitoring equipment	$EG_{faciltiy,y}$ is monitored continuously by a bidirectional electricity meter installed at Huixin Substation.

Type	Serial Number	Accuracy class	Calibrated on	Valid till
MK6E	210299720	0.2S	01/01/2015	31/12/2015
DTZ178	370110034832228	0.5S	21/12/2015	20/12/2016
			29/11/2016	28/11/2017
			22/11/2017	21/11/2018
			15/11/2018	14/11/2109
			11/11/2019	10/11/2020
			04/11/2020	03/11/2021

Measuring/reading/recording frequency	Measuring continuously and the readings are aggregated Monthly
Calculation method (if applicable)	/
QA/QC procedures	The meter is calibrated annually. The data is monitored through the electricity meter and crosschecked with the electricity sales receipt from power corporation.
Purpose of data/parameter	Baseline emission calculations
Additional comments	The electricity imported from grid is included in $EC_{PJ,j,y}$, which is more conservative for emission reduction calculation.

Data/Parameter	**$EC_{PJ,j,y}$**
Unit	MWh
Description	Quantity of electricity consumed by the project electricity consumption source *j* in year *y*
Measured/calculated/ default	Measured
Source of data	On-site measurement by electricity meter at Huixin substation and meters at collection stations

<table>
<tr><td>Value(s) of monitored parameter</td><td>2247.960</td></tr>
<tr><td>Monitoring equipment</td><td>The electricity imported from grid to the power plant is monitored by the bidirectional electricity meter installed at Huixin substation.

<table>
<tr><td>Type</td><td>Serial Number</td><td>Accuracy class</td><td>Calibrated on</td><td>Valid till</td></tr>
<tr><td>MK6E</td><td>210299720</td><td>0.2S</td><td>01/01/2015</td><td>31/12/2015</td></tr>
<tr><td rowspan="6">DTZ178</td><td rowspan="6">370110034832228</td><td rowspan="6">0.5S</td><td>21/12/2015</td><td>20/12/2016</td></tr>
<tr><td>29/11/2016</td><td>28/11/2017</td></tr>
<tr><td>22/11/2017</td><td>21/11/2018</td></tr>
<tr><td>15/11/2018</td><td>14/11/2109</td></tr>
<tr><td>11/11/2019</td><td>10/11/2020</td></tr>
<tr><td>04/11/2020</td><td>03/11/2021</td></tr>
</table>
There were 7 collection stations outside of the project site. However, these 7 site collection stations were not used since previous monitoring period and there was no electricity consumed in these stations in this monitoring period.</td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Measuring continuously and aggregated Monthly</td></tr>
<tr><td>Calculation method (if applicable)</td><td>/</td></tr>
<tr><td>QA/QC procedures</td><td>The data is monitored through the electricity meter and crosschecked with the electricity sales receipt.
The electricity meter is calibrated according to national standards.</td></tr>
<tr><td>Purpose of data/parameter</td><td>Project emission calculations</td></tr>
<tr><td>Additional comments</td><td></td></tr>
</table>

Data/Parameter	$TDL_{j,y}$
Unit	-
Description	Average technical transmission and distribution losses for providing electricity to the Northeast China Power Grid in year y.
Measured/calculated/ default	Default
Source of data	“Methodological Tool: Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01)
Value(s) of monitored parameter	20%
Monitoring equipment	-Not applicable
Measuring/reading/recording frequency	-Not applicable
Calculation method (if applicable)	-Not applicable
QA/QC procedures	-Not applicable
Purpose of data/parameter	Project emission calculations
Additional comments	/

<table>
<tr><td>Data/Parameter</td><td>Biomass residues categories and quantities used in the project activity</td></tr>
<tr><td>Unit</td><td>-Type;
- Source;
- Fate in the absence of the project activity (Scenario B);
- Use in the project scenario (Scenario P);
- Quantity (tonnes on dry-basis)</td></tr>
<tr><td>Description</td><td>Biomass residues categories and quantities used in the project activity</td></tr>
<tr><td>Measured/calculated/ default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>On-site measurements</td></tr>
<tr><td>Value(s) of monitored parameter</td><td>
<table>
<tr><th>Biomass residues category(k)</th><th>Biomass residues type</th><th>Biomass residues source</th><th>Biomass residues fate in the absence of the project activity</th><th>Biomass residues use in project scenario</th><th>Biomass residues quantity (dry basis)</th></tr>
<tr><td>1</td><td>Cotton stalk</td><td>Off-site from local farmers and retailers</td><td>Dumped (B1) and burnt (B3)</td><td>Electricity generation on-site (biomass only boiler)</td><td>344,497.98</td></tr>
<tr><td>2</td><td>Wood residues</td><td>Off-site from wholesalers and retailers</td><td>Dumped (B1)</td><td>Electricity generation on-site (biomass only boiler)</td><td>481,440.09</td></tr>
<tr><td>3</td><td>Wheat bran</td><td>Off-site from certain supplier</td><td>Dumped (B1)</td><td>Electricity generation on-site (biomass only boiler)</td><td>100,441.37</td></tr>
<tr><td>4</td><td>Maize stalk</td><td>Off-site from certain supplier</td><td>Dumped (B1)</td><td>Electricity generation on-site (biomass only boiler)</td><td>250,201.92</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment</td><td>Use weight meters (two electric truck scales) . Adjust for the moisture content in order to determine the quantity of dry biomass
<table>
<tr><td></td><td>Electric truck scale #1</td><td>Electric truck scale #2</td></tr>
<tr><td>location</td><td>East weight house</td><td>West weight house</td></tr>
<tr><td>Type</td><td>SCS-30</td><td>SCS-30</td></tr>
<tr><td>Accuracy class</td><td>class III</td><td>class III</td></tr>
<tr><td>Serial Number</td><td>20061206</td><td>20070701</td></tr>
<tr><td>Calibrated date</td><td>12/11/2014
09/11/2015
06/11/2016
04/11/2017
03/11/2018
02/11/2019
28/10/2020</td><td>12/11/2014
09/11/2015
06/11/2016
04/11/2017
03/11/2018
02/11/2019
28/10/2020</td></tr>
<tr><td>Valid till</td><td>27/10/2021</td><td>27/10/2021</td></tr>
</table>
</td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Measuring continuously and aggregated Monthly</td></tr>
</table>

Calculation method (if applicable)	/
QA/QC procedures	The electric truck scales are calibrated according to national standard. The data is crosschecked with energy balance that is based on purchased quantities and stock changes
Purpose of data/parameter	Baseline emission and Project emission calculations
Additional comments	/

Data/Parameter	**$BR_{n,B1/B3,y}$ ($BR_{PJ,n,y}$)**
Unit	Tonnes on dry-basis
Description	Quantity of biomass residues of category *n* used in power plants which are located at the project site and included in the project boundary in year *y*
Measured/calculated/ default	Measured
Source of data	On-site measurements
Value(s) of monitored parameter	
Monitoring equipment	Use weight meters (two electric truck scales). Adjust for the moisture content in order to determine the quantity of dry biomass
Measuring/reading/recording frequency	Measuring continuously and aggregated Monthly
Calculation method (if applicable)	/
QA/QC procedures	The electric truck scales are calibrated according to national standard. The data is crosschecked with energy balance that is based on purchased quantities and stock changes
Purpose of data/parameter	Baseline emission and Project emission calculations

Biomass residues category(k)	Biomass residues type	Biomass residues quantity(wet basis, tonnes)	Biomass residues quantity(dry basis, tonnes)
1	Cotton stalk	515579	344,497.98
2	Wood residues	696,839.00	481,440.09
3	Wheat bran	125,060.00	100,441.37
4	Maize stalk	355,666.00	250,201.92

	Electric truck scale #1	Electric truck scale #2
Type	SCS-30	SCS-30
Accuracy class	class III	class III
Serial Number	20061206	20070701
Calibrated date	12/11/2014 09/11/2015 06/11/2016 04/11/2017 03/11/2018 02/11/2019 28/10/2020	12/11/2014 09/11/2015 06/11/2016 04/11/2017 03/11/2018 02/11/2019 28/10/2020
Valid till	27/10/2021	27/10/2021

Additional comments	/

Data/Parameter	**For biomass residues categories for which scenarios B1, B2 or B3 is deemed a plausible baseline alternative, project participants shall demonstrate that this is a realistic and credible alternative scenario**
Unit	Tonnes
Description	- Quantity of available biomass residues of type n in the region - Quantity of biomass residues of type n that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region; - Availability of a surplus of biomass residues type n (which cannot be sold or utilized) at the ultimate supplier to the project and a representative.
Measured/calculated/ default	Measured
Source of data	Surveys or statistics
Value(s) of monitored parameter	Please refer to table 10 of section E.3
Monitoring equipment	/
Measuring/reading/recording frequency	At the validation stage for biomass residues categories identified ex ante, and always that new biomass residues categories are included during the crediting period
Calculation method (if applicable)	/
QA/QC procedures	The available amount, and the other use excluding the project is surveyed by third party.
Purpose of data/parameter	Determine leakage emission
Additional comments	/

Data/Parameter	$EF_{BR,n,y}$
Unit	tCH_4/GJ
Description	CH4 emission factor for uncontrolled burning of the biomass residues category n during the year y
Measured/calculated/ default	Default values in ACM0018 (Version 03.0)
Source of data	Default value coming from Tables 4 and 5 of the baseline methodology
Value(s) of monitored parameter	0.00197 To determine the CH_4 emission factor, project participants may undertake measurements or use referenced default values. In the absence of more accurate information, it is recommended to use 0.0027 tCH4 per ton of biomass as default value for the product of NCV_k and $EF_{burning,CH4,k,y.}$ Considering the uncertainty of the CH_4 emission factor ($EF_{BR,n,y}$) is greater than 100 per cent, a conservativeness factor of 0.73 is applied. Thus, emission factor of $0.001971 tCH_4/t$ biomass should be used.
Monitoring equipment	-Not applicable
Measuring/reading/recording frequency	-Not applicable
Calculation method (if applicable)	-Not applicable

QA/QC procedures	-Not applicable
Purpose of data/parameter	Baseline emission calculations
Additional comments	/

Data/Parameter	**Moisture content of the biomass residues**
Unit	% water content
Description	Moisture content of each biomass residue type *k*
Measured/calculated/ default	Measured
Source of data	On-site measurements by moisture analyzer
Value(s) of monitored parameter	Please see the column of moisture content for each kind of biomass in Table 5 of section E.
Monitoring equipment	Moisture content of the biomass residues is on site measured by moisture analyzer.

Type	Model	Serial Number	Accuracy class	Calibration date	Valid till
Moisture analyzer	SDTGA300	3506073	0.01	29/03/2014	28/03/2015
				27/03/2015	26/03/2016
				26/03/2016	25/03/2017
				24/03/2017	23/03/2018
				22/03/2018	21/03/2019
				20/03/2019	19/03/2021

Measuring/reading/recording frequency	Continuous on-site measurements and summarized in monthly measure report
Calculation method (if applicable)	The moisture content should be monitored for each batch of biomass of homogeneous quality. Weighted average values calculated for each kind of biomass residues are used in the calculations.
QA/QC procedures	The moisture analyzer is calibrated according to national standard.
Purpose of data/parameter	Baseline emission calculations and Project emission calculations
Additional comments	/

Data/Parameter	$NCV_{n,y}$
Unit	GJ / ton of dry matter
Description	Net Calorific Value of biomass residues of category n in year y
Measured/calculated/ default	Measured
Source of data	On-site measurements
Value(s) of monitored parameter	Please see the columns of $NCV_{n,y}$ for biomass residues in table 8 of section E.

<table>
<tr><td>Monitoring equipment</td><td>Measurements are carried out at reputed laboratory using oxygen bomb calorimeter according to national standards. Measure the NCV on dry basis. The information of oxygen bomb calorimeter is shown as follows:
<table>
<tr><th>equipment</th><th>Model</th><th>Serial Number</th><th>Accuracy class</th><th>Calibration date</th><th>Valid till</th></tr>
<tr><td rowspan="8">oxygen bomb calorimeter</td><td rowspan="8">SDACM3000</td><td rowspan="8">1406128</td><td rowspan="8">±60J/g</td><td>23/11/2014</td><td>22/05/2015</td></tr>
<tr><td>07/04/2015</td><td>06/04/2016</td></tr>
<tr><td>25/03/2016</td><td>24/03/2017</td></tr>
<tr><td>20/03/2017</td><td>19/03/2018</td></tr>
<tr><td>13/03/2018</td><td>12/03/2019</td></tr>
<tr><td>05/03/2019</td><td>04/03/2020</td></tr>
<tr><td>28/02/2020</td><td>27/02/2021</td></tr>
</table></td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>At least every six months, taking at least three samples for each Measurement.</td></tr>
<tr><td>Calculation method (if applicable)</td><td>/</td></tr>
<tr><td>QA/QC procedures</td><td>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. Ensure that the NCV is determined on the basis of dry biomass</td></tr>
<tr><td>Purpose of data/parameter</td><td>Project emission calculation</td></tr>
<tr><td>Additional comments</td><td>/</td></tr>
</table>

Data/Parameter	$EF_{CH4,BR}$
Unit	tCH_4/GJ
Description	CH_4 emission factor for the combustion of biomass residues in the project plant
Measured/calculated/ default	Default value
Source of data	Default value in ACM0018 version 03.0
Value(s) of monitored parameter	IPCC default value is used to determine the CH_4 emission factor, according to the IPCC default value provided in ACM0018, the CH_4 emission factor of combustion of biomass of wood waste is 0.03 tCH_4/TJ. Considering a conservativeness factor of 1.37, the CH_4 emission factor in this PDD is taken as 0.0000411 tCH_4/GJ.
Monitoring equipment	/
Measuring/reading/recording frequency	/
Calculation method (if applicable)	/
QA/QC procedures	/
Purpose of data/parameter	Project emission calculation
Additional comments	/

Data/Parameter	$D_{f,m}$
Unit	Km
Description	Return trip distance between the origin and destination of freight transportation activity f in monitoring period m
Measured/calculated/ default	Measured
Source of data	Records by project participants.
Value(s) of monitored parameter	100
Monitoring equipment	Determined once for each freight transportation activity f for a reference trip using the vehicle odometer or any other appropriate sources.
Measuring/reading/recording frequency	Recording distance when every truck arrived at project site.
Calculation method (if applicable)	/
QA/QC procedures	/
Purpose of data/parameter	Project emission calculations
Additional comments	/

Data/Parameter	$FR_{f,m}$
Unit	tonnes
Description	Total mass of freight transported in freight transportation activity f in monitoring period m
Measured/calculated/ default	Measured
Source of data	Records by project participants
Value(s) of monitored parameter	The value is shown in table 7 of section E.
Monitoring equipment	The amount is weighted by weight meter (electric truck scales). The information of electric truck scales are shown as follows:
Measuring/reading/recording frequency	Recording distance when every truck arrived at project site.
Calculation method (if applicable)	/
QA/QC procedures	The weight meters are calibrated periodically by qualified third party(ies) in line with national standard.

	Electric truck scale #1	Electric truck scale #2
Type	SCS-30	SCS-30
Accuracy class	class III	class III
Serial Number	20061206	20070701
Calibrated date	12/11/2014 09/11/2015 06/11/2016 04/11/2017 03/11/2018 02/11/2019 28/10/2020	12/11/2014 09/11/2015 06/11/2016 04/11/2017 03/11/2018 02/11/2019 28/10/2020
Valid till	27/10/2021	27/10/2021

Purpose of data/parameter	Project emission calculations
Additional comments	/

Data/Parameter	$EF_{CO2,f}$
Unit	gCO_2/km
Description	Default CO_2 emission factor for freight transportation activity f
Measured/calculated/ default	Default
Source of data	Tool: Project and leakage emissions from transportation of freight, Version 01.1.0.
Value(s) of monitored parameter	129 for heavy vehicles
Monitoring equipment	/
Measuring/reading/recording frequency	/
Calculation method (if applicable)	/
QA/QC procedures	/
Purpose of data/parameter	Project emission calculations
Additional comments	/

Data/Parameter	ρ_{diesel}
Unit	Kg/liter
Description	Density of diesel
Measured/calculated/ default	Default
Source of data	The national standard “automobile diesel fuel GB 19147-2013” or other equivalent /substitutional standards
Value(s) of monitored parameter	0.85
Monitoring equipment	/
Measuring/reading/recording frequency	/
Calculation method (if applicable)	/
QA/QC procedures	Default value from national standards will be used and reviewed as appropriate
Purpose of data/parameter	Project emission calculations
Additional comments	/

Data/Parameter	$FC_{i,j,y}$
Unit	Litre/yr
Description	Quantity of fossil fuel type i combusted in the project plant during the year y (i=diesel).
Measured/calculated/ default	Measured

<table>
<tr><td>Source of data</td><td>On-site measurement</td></tr>
<tr><td>Value(s) of monitored parameter</td><td>1,422,162.64</td></tr>
<tr><td>Monitoring equipment</td><td>Flow meter
<table>
<tr><th>Type</th><th>Model</th><th>Serial Number</th><th>Accuracy class</th><th>Calibration date</th><th>Valid till</th></tr>
<tr><td rowspan="8">Flow meter</td><td rowspan="8">JDK50C111</td><td rowspan="8">0606082</td><td rowspan="8">0.3%</td><td>13/05/2014</td><td>12/05/2015</td></tr>
<tr><td>13/05/2015</td><td>12/05/2016</td></tr>
<tr><td>12/05/2016</td><td>11/05/2017</td></tr>
<tr><td>11/05/2017</td><td>10/05/2018</td></tr>
<tr><td>10/05/2018</td><td>09/05/2019</td></tr>
<tr><td>09/05/2019</td><td>08/05/2020</td></tr>
<tr><td>08/05/2020</td><td>07/05/2021</td></tr>
</table></td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Continuously</td></tr>
<tr><td>Calculation method (if applicable)</td><td>-Not applicable</td></tr>
<tr><td>QA/QC procedures</td><td>Cross-check the measurements with an annual energy balance that is based on purchased quantities and stock changes. The quantity shall be cross-checked with the quantity of fuel purchase receipts and stock changes.</td></tr>
<tr><td>Purpose of data/parameter</td><td>Project emission calculations</td></tr>
<tr><td>Additional comments</td><td>/</td></tr>
</table>

Data/Parameter	$NCV_{i,y}$
Unit	GJ/ton
Description	Net calorific value of the fossil fuel type i in year y (i=diesel)
Measured/calculated/ default	Default
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) of monitored parameter	43.3
Monitoring equipment	/
Measuring/reading/recording frequency	Any future revision of the IPCC Guidelines should be taken into account
Calculation method (if applicable)	/
QA/QC procedures	Default value from IPCC
Purpose of data/parameter	Project emission calculations
Additional comments	/

Data/Parameter	$EF_{CO2,FF,i}$
Unit	tCO_2/GJ
Description	CO_2 emission factor for fossil fuel type i
Measured/calculated/	Default

default	
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) of monitored parameter	$EF_{CO2,FF,diesel}$ = 0.0748
Monitoring equipment	/
Measuring/reading/recording frequency	Any future revision of the IPCC Guidelines should be taken into account
Calculation method (if applicable)	/
QA/QC procedures	Default value from IPCC
Purpose of data/parameter	Project emission calculations
Additional comments	/

D.3. Implementation of sampling plan

>>
Not applicable.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

>>
The GHG emission reductions of the proposed project are from two major sources: CO_2 emission reductions due to displacement of electricity generation in NEPG, CH_4 emission reductions due to natural decay or burning of anthropogenic sources of biomass residues.

Based on the description of the renewed PDD, the emission reductions by the project activity during a given year y can be calculated as follows:

$$\mathbf{ER_y=BE_y-PE_y-LE_y} \quad (1)$$

Where
ER_y= emissions reductions during year y (tCO_2)
BE_y= baseline emissions during year y (tCO_2)
PE_y=Project emissions during the year y (tCO_2/yr)
L_y =Leakage emissions during the year y (tCO_2/yr)

$$BE_y=BE_{EL,y}+BE_{BR,y} \quad (2)$$

Where
$BE_{EL,y}$= Baseline emissions due to generation of electricity in year y (tCO_2)
$BE_{BR,y}$= Baseline emissions due to uncontrolled burning or decay of biomass residues in year y (tCO_2e)

a) Calculation of $BE_{EL,y}$

According to the registered PDD for the second crediting period

$$BE_{EL,y}= EG_{facility,y} * EF_{BL,EL,y} \quad (3)$$

Where

$EG_{facility,y}$= Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh), which is conservative

$EF_{BL,EL,y}$= Emission factor for electricity generation in the baseline in year y (tCO_2/MWh). According to the registered PDD for the second crediting period, the $EF_{BL,EL,y}$ =0.6702tCO_2/MWh.

$EG_{facility,y}=EG_{PJ\ to\ GRID,y}-EG_{GRID\ to\ PJ,y}$ （4）

$EG_{PJ\ to\ GRID,y}$ Quantity of electricity supplied by the Project to the grid in year y (MWh)

$EG_{GRID\ to\ PJ,y}$ Quantity of electricity delivered to the Project from the grid in year y (MWh)

Table 4. Monitored electricity data and calculation of $BE_{EL,y}$

Monitoring period	$EG_{PJ\ to\ GRID,y}$ (MWh)	$EG_{GRID\ to\ PJ,y}$ (MWh)	$EG_{facility,y}$ (MWh)	$EF_{electricity,y}$ (tCO_2e/MWh)	$BE_{EL,y}$ (tCO_2e)
26/03/2015-25/04/2015	17,777.760	0.000	17,777.760	0.6702	11915
26/04/2015-25/05/2015	18,552.600	59.400	18,493.200	0.6702	12394
26/05/2015-25/06/2015	17,344.800	0.000	17,344.800	0.6702	11624
26/05/2015-25/07/2015	17,523.000	6.600	17,516.400	0.6702	11739
26/07/2015-25/08/2015	14,931.840	0.000	14,931.840	0.6702	10007
26/08/2015-25/09/2015	14,199.240	75.240	14,124.000	0.6702	9466
26/09/2015-25/10/2015	17,969.160	71.280	17,897.880	0.6702	11995
26/10/2015-25/11/2015	14,257.320	0.000	14,257.320	0.6702	9555
26/11/2015-25/12/2015	18,254.280	117.480	18,136.800	0.6702	12155
26/12/2015-25/01/2016	13,487.760	121.440	13,366.320	0.6702	8958
26/01/2016-25/02/2016	16,781.160	0.000	16,781.160	0.6702	11247
26/02/2016-25/03/2016	15,591.840	47.520	15,544.320	0.6702	10418
26/03/2016-25/04/2016	18,428.520	0.000	18,428.520	0.6702	12351
26/04/2016-25/05/2016	17,581.080	0.000	17,581.080	0.6702	11783
26/05/2016-25/06/2016	17,924.280	0.000	17,924.280	0.6702	12013
26/06/2016-25/07/2016	5,912.280	166.320	5,745.960	0.6702	3851
26/07/2016-25/08/2016	18,582.960	0.000	18,582.960	0.6702	12454
26/08/2016-25/09/2016	18,903.720	0.000	18,903.720	0.6702	12669
26/09/2016-25/10/2016	18,095.880	0.000	18,095.880	0.6702	12128
26/10/2016-25/11/2016	13,955.040	71.280	13,883.760	0.6702	9305
26/11/2016-25/12/2016	12,782.880	154.440	12,628.440	0.6702	8464
26/12/2016-25/01/2017	10,810.800	114.840	10,695.960	0.6702	7168
26/01/2017-25/02/2017	18,948.600	0.000	18,948.600	0.6702	12699
26/02/2017-	15,230.160	60.720	15,169.440	0.6702	10167

25/03/2017					
26/03/2017-25/04/2017	18,588.240	0.000	18,588.240	0.6702	12458
26/04/2017-25/05/2017	17,765.880	0.000	17,765.880	0.6702	11907
26/05/2017-25/06/2017	18,330.840	0.000	18,330.840	0.6702	12285
26/06/2017-25/07/2017	14,170.200	83.160	14,087.040	0.6702	9441
26/07/2017-25/08/2017	18,431.160	0.000	18,431.160	0.6702	12353
26/08/2017-25/09/2017	18,468.120	0.000	18,468.120	0.6702	12377
26/09/2017-25/10/2017	17,571.840	0.000	17,571.840	0.6702	11777
26/10/2017-25/11/2017	15,413.640	91.080	15,322.560	0.6702	10269
26/11/2017-25/12/2017	18,099.840	0.000	18,099.840	0.6702	12131
26/12/2017-25/01/2018	18,171.120	0.000	18,171.120	0.6702	12178
26/01/2018-25/02/2018	7,972.800	236.280	7,736.520	0.6702	5185
26/02/2018-25/03/2018	16,135.680	0.000	16,135.680	0.6702	10814
26/03/2018-25/04/2018	14,337.840	52.800	14,285.040	0.6702	9574
26/04/2018-25/05/2018	17,585.040	7.920	17,577.120	0.6702	11780
26/05/2018-25/06/2018	18,303.120	0.000	18,303.120	0.6702	12267
26/06/2018-25/07/2018	16,818.120	0.000	16,818.120	0.6702	11272
26/07/2018-25/08/2018	17,393.640	0.000	17,393.640	0.6702	11657
26/08/2018-25/09/2018	15,894.120	26.400	15,867.720	0.6702	10635
26/09/2018-25/10/2018	16,214.880	18.480	16,196.400	0.6702	10855
26/10/2018-25/11/2018	17,662.920	0.000	17,662.920	0.6702	11838
26/11/2018-25/12/2018	16,604.280	0.000	16,604.280	0.6702	11128
26/12/2018-25/01/2019	12,083.280	128.040	11,955.240	0.6702	8012
26/01/2019-25/02/2019	11,305.800	150.480	11,155.320	0.6702	7476
26/02/2019-25/03/2019	16,687.440	0.000	16,687.440	0.6702	11184
26/03/2019-25/04/2019	16,728.360	39.600	16,688.760	0.6702	11185
26/04/2019-25/05/2019	17,670.840	0.000	17,670.840	0.6702	11843
26/05/2019-25/06/2019	18,140.760	0.000	18,140.760	0.6702	12158
26/06/2019-25/07/2019	17,396.280	0.000	17,396.280	0.6702	11659
26/07/2019-25/08/2019	17,548.080	0.000	17,548.080	0.6702	11761
26/08/2019-25/09/2019	12,046.320	64.680	11,981.640	0.6702	8030
26/09/2019-25/10/2019	17,373.840	0.000	17,373.840	0.6702	11644
26/10/2019-25/11/2019	17,241.840	0.000	17,241.840	0.6702	11555

26/11/2019-25/12/2019	17,892.600	0.000	17,892.600	0.6702	11992
26/12/2019-25/01/2020	14,483.040	0.000	14,483.040	0.6702	9707
26/01/2020-25/02/2020	10,565.280	0.000	10,565.280	0.6702	7081
26/02/2020-25/03/2020	15,836.040	0.000	15,836.040	0.6702	10613
26/03/2020-25/04/2020	17,223.360	0.000	17,223.360	0.6702	11543
26/04/2020-25/05/2020	20,269.920	165.000	20,104.920	0.6702	13474
26/05/2020-25/06/2020	17,705.160	0.000	17,705.160	0.6702	11866
26/06/2020-25/07/2020	16,113.240	59.400	16,053.840	0.6702	10759
26/07/2020-25/08/2020	17,540.160	0.000	17,540.160	0.6702	11755
26/08/2020-25/09/2020	14,358.960	58.080	14,300.880	0.6702	9584
26/09/2020-25/10/2020	17,649.720	0.000	17,649.720	0.6702	11829
26/10/2020-25/11/2020	16,818.120	0.000	16,818.120	0.6702	11272
26/11/2020-25/12/2020	17,302.560	0.000	17,302.560	0.6702	11596
Total	**1,121,741.280**	**2,247.960**	**1,119,493.320**	/	**750,284**

b) Baseline emissions due to natural decay or uncontrolled burning of anthropogenic sources of biomass ($BE_{Biomass, y}$)

According to ACM0018 (Version 03.0) and Section B.4 of registered PDD for 2nd crediting period:

$$BE_{BR,B1/B3,y}=GWP_{CH4}* \sum BRn_{,B1/B3,y}*NCV_{n,y}*EF_{BR,n,y} \quad (5)$$

Where

$BE_{BR,B1/B3,y}$ = Baseline emissions due to aerobic decay or uncontrolled burning of biomass residues in year y (tCO_2)

$GWP_{CH4.}$ =the Global Warning Potential for methane valid for the second commitment period (tCO_2/tCH_4),

$BR_{n,B1/B3,y}$ = Amount of biomass residues category n used in the project plant(s) included in the project boundary in year y for which B1 or B3 has been identified as the most plausible baseline scenario (tonnes on dry basis)

$NCV_{n,y}$ =net calorific value of the biomass residue category n in year y (GJ/tonnes on dry basis)

$EF_{BR,n,y}$ =CH_4 emission factor for uncontrolled burning of the biomass residue category n during the year y (tCH_4/GJ)

To determine the CH_4 emission factor, project participants may undertake measurements or use referenced default values. In the absence of more accurate information, it is recommended to use 0.0027 tCH4 per ton of biomass as default value for the product of NCVn,y and $EF_{BR,n,y}$ [1].

Considering the uncertainty of the CH_4 emission factor ($EF_{BR,n,y}$) is greater than 100 per cent, a conservativeness factor of 0.73 is applied. Thus, emission factor of 0.001971tCH_4/t biomass should be used.

Therefore, $NCV_{n,y}*EF_{BR,n,y}$=0.001971 tCH_4/ton is applied in this monitoring period.

[1] 2006 IPCC guidelines, volume 4, table 2.5, default value for agriculture residues.

Table 5. Monitored biomass fuel quantities $BRn_{,B1/B3,y}$, and calculation of $BE_{n,B1/B3,y}$

	BF1, wet base (t)	Moisture 1 (%)	BF1, dry base (t)	BF2, wet base (t)	Moisture 2 (%)	BF2, dry base (t)	BF3, wet base (t)	Moisture 3 (%)	BF3, dry base (t)	BF4, wet base (t)	Moisture 4 (%)	BF4, dry base (t)	NCVn,y * EFBR,n,y (t CH4/t biomass)	GWPCH4 (tCO2e/tCH4)	BEbiomass,y (tCO2e)
26/03/2015-25/04/2015	16,606.00	38.08%	10,282.44	279.00	20.96%	220.52	2,823.00	13.79%	2,433.71	2,616.00	23.81%	1,993.13	0.001971	28	824
26/04/2015-25/05/2015	24,573.00	40.14%	14,709.40	126.00	22.30%	97.90	2,843.00	20.01%	2,274.12	2,170.00	25.39%	1,619.04	0.001971	28	1,032
26/05/2015-25/06/2015	24,848.00	33.09%	16,625.80	193.00	25.10%	144.56	1,831.00	19.60%	1,472.12	293.00	21.02%	231.41	0.001971	28	1,020
26/05/2015-25/07/2015	23,040.00	34.73%	15,038.21	13.00	26.93%	9.50	4,007.00	19.39%	3,230.04	126.00	28.56%	90.01	0.001971	28	1,014
26/07/2015-25/08/2015	15,310.00	38.91%	9,352.88	0.00	29.00%	0.00	7,369.00	20.85%	5,832.56	0.00	31.60%	0.00	0.001971	28	838
26/08/2015-25/09/2015	18,371.00	36.87%	11,597.61	0.00	34.49%	0.00	2,111.00	23.43%	1,616.39	1,359.00	46.53%	726.66	0.001971	28	769
26/09/2015-25/10/2015	28,188.00	34.78%	18,384.21	48.00	31.59%	32.84	4,761.00	21.48%	3,738.34	16,057.00	46.65%	8,566.41	0.001971	28	1,695
26/10/2015-25/11/2015	15,559.00	37.62%	9,705.70	108.00	35.36%	69.81	7,411.00	25.90%	5,491.55	22,149.00	41.87%	12,875.21	0.001971	28	1,553
26/11/2015-25/12/2015	13,069.00	38.61%	8,023.06	1,044.00	34.87%	679.96	5,887.00	29.18%	4,169.17	27,363.00	39.52%	16,549.14	0.001971	28	1,624
26/12/2015-25/01/2016	5,523.00	21.99%	4,308.49	1,584.00	26.89%	1,158.06	2,269.00	23.12%	1,744.41	13,033.00	26.07%	9,635.30	0.001971	28	930
26/01/2016-25/02/2016	7,771.00	27.19%	5,658.07	998.00	21.31%	785.33	3,707.00	12.61%	3,239.55	17,308.00	22.20%	13,465.62	0.001971	28	1,278
26/02/2016-25/03/2016	6,827.00	37.01%	4,300.33	66.00	24.81%	49.63	4,323.00	22.37%	3,355.94	14,023.00	23.91%	10,670.10	0.001971	28	1,014
26/03/2016-25/04/2016	13,189.00	30.45%	9,172.95	369.00	19.16%	298.30	6,602.00	21.05%	5,212.28	9,812.00	29.30%	6,937.08	0.001971	28	1,193
26/04/2016-25/05/2016	14,660.00	28.26%	10,517.08	0.00	35.58%	0.00	10,438.00	23.31%	8,004.90	2,698.00	23.17%	2,072.87	0.001971	28	1,137

26/05/2016-25/06/2016	14,677.00	28.38%	10,511.67	0.00	24.95%	0.00	12,746.00	17.94%	10,459.37	1,062.00	30.54%	737.67	0.001971	28	1,198
26/06/2016-25/07/2016	4,329.00	27.10%	3,155.84	0.00	41.91%	0.00	4,664.00	15.08%	3,960.67	497.00	27.54%	360.13	0.001971	28	413
26/07/2016-25/08/2016	16,099.00	32.97%	10,791.16	0.00	20.01%	0.00	10,851.00	11.45%	9,608.56	499.00	28.63%	356.14	0.001971	28	1,145
26/08/2016-25/09/2016	15,950.00	32.36%	10,788.58	0.00	24.84%	0.00	10,951.00	21.14%	8,635.96	388.00	22.59%	300.35	0.001971	28	1,089
26/09/2016-25/10/2016	13,265.00	28.08%	9,540.19	2,493.00	31.78%	1,700.72	6,166.00	19.70%	4,951.30	3,500.00	25.85%	2,595.25	0.001971	28	1,037
26/10/2016-25/11/2016	2,727.00	34.72%	1,780.19	9,372.00	32.14%	6,359.84	0.00	18.11%	0.00	7,519.00	31.73%	5,133.22	0.001971	28	733
26/11/2016-25/12/2016	393.00	36.53%	249.44	12,354.00	20.64%	9,804.13	0.00	21.21%	0.00	14,459.00	22.64%	11,185.48	0.001971	28	1,172
26/12/2016-25/01/2017	246.00	32.30%	166.54	6,728.00	29.15%	4,766.79	0.00	11.92%	0.00	8,285.00	27.86%	5,976.80	0.001971	28	602
26/01/2017-25/02/2017	3,241.00	30.01%	2,268.38	13,822.00	22.00%	10,781.16	17.00	18.77%	13.81	10,275.00	31.99%	6,988.03	0.001971	28	1,107
26/02/2017-25/03/2017	4,295.00	27.78%	3,101.85	13,373.00	36.50%	8,491.86	62.00	15.35%	52.48	3,422.00	25.63%	2,544.94	0.001971	28	783
26/03/2017-25/04/2017	5,294.00	37.29%	3,319.87	16,505.00	35.01%	10,726.60	58.00	21.28%	45.66	3,771.00	25.86%	2,795.82	0.001971	28	932
26/04/2017-25/05/2017	4,862.00	35.45%	3,138.42	17,912.00	31.95%	12,189.12	65.00	18.99%	52.66	2,080.00	25.94%	1,540.45	0.001971	28	934
26/05/2017-25/06/2017	6,585.00	30.69%	4,564.06	18,768.00	22.25%	14,592.12	108.00	17.56%	89.04	545.00	31.97%	370.76	0.001971	28	1,083
26/06/2017-25/07/2017	4,274.00	33.29%	2,851.19	15,090.00	32.58%	10,173.68	352.00	15.31%	298.11	349.00	31.77%	238.12	0.001971	28	748
26/07/2017-25/08/2017	6,589.00	33.58%	4,376.41	17,591.00	34.74%	11,479.89	741.00	17.23%	613.33	840.00	21.57%	658.81	0.001971	28	945
26/08/2017-25/09/2017	665.00	31.15%	457.85	16,526.00	39.21%	10,046.16	1,157.00	11.79%	1,020.59	1,069.00	29.08%	758.13	0.001971	28	678
26/09/2017-25/10/2017	7,036.00	33.56%	4,674.72	14,088.00	23.50%	10,777.32	435.00	20.29%	346.74	2,900.00	27.32%	2,107.72	0.001971	28	988

26/10/2017-25/11/2017	4,888.00	32.87%	3,281.31	11,073.00	37.98%	6,867.47	113.00	21.52%	88.68	5,204.00	30.03%	3,641.24	0.001971	28	766
26/11/2017-25/12/2017	7,285.00	33.39%	4,852.54	10,832.00	20.66%	8,594.11	46.00	11.06%	40.91	10,590.00	29.83%	7,431.00	0.001971	28	1,154
26/12/2017-25/01/2018	5,363.00	33.86%	3,547.09	11,479.00	29.04%	8,145.50	324.00	22.49%	251.13	8,027.00	27.56%	5,814.76	0.001971	28	980
26/01/2018-25/02/2018	3,660.00	24.36%	2,768.42	4,013.00	23.69%	3,062.32	165.00	22.55%	127.79	3,562.00	23.49%	2,725.29	0.001971	28	479
26/02/2018-25/03/2018	7,193.00	24.94%	5,399.07	5,774.00	27.60%	4,180.38	82.00	20.02%	65.58	9,523.00	23.90%	7,247.00	0.001971	28	932
26/03/2018-25/04/2018	6,566.00	37.39%	4,110.97	12,051.00	39.25%	7,320.98	324.00	18.55%	263.90	1,557.00	22.58%	1,205.43	0.001971	28	712
26/04/2018-25/05/2018	8,201.00	32.02%	5,575.04	14,963.00	26.18%	11,045.69	474.00	12.88%	412.95	1,326.00	30.45%	922.23	0.001971	28	991
26/05/2018-25/06/2018	6,923.00	27.65%	5,008.79	18,516.00	32.68%	12,464.97	685.00	19.57%	550.95	553.00	27.18%	402.69	0.001971	28	1,017
26/06/2018-25/07/2018	6,941.00	34.73%	4,530.39	16,852.00	31.15%	11,602.60	1,098.00	16.40%	917.93	0.00	30.82%	0.00	0.001971	28	941
26/07/2018-25/08/2018	6,993.00	25.31%	5,223.07	17,136.00	40.25%	10,238.76	918.00	13.80%	791.32	195.00	31.26%	134.04	0.001971	28	904
26/08/2018-25/09/2018	6,137.00	37.86%	3,813.53	14,327.00	19.83%	11,485.96	476.00	16.22%	398.79	2175.00	31.93%	1,480.52	0.001971	28	948
26/09/2018-25/10/2018	5,722.00	36.91%	3,610.01	9,262.00	39.47%	5,606.29	429.00	21.80%	335.48	7619.00	26.37%	5,609.87	0.001971	28	837
26/10/2018-25/11/2018	5,576.00	24.07%	4,233.86	11,205.00	33.91%	7,405.38	431.00	16.81%	358.55	7449.00	26.27%	5,492.15	0.001971	28	965
26/11/2018-25/12/2018	5,003.00	27.66%	3,619.17	11,674.00	28.52%	8,344.58	72.00	13.28%	62.44	6330.00	29.99%	4,431.63	0.001971	28	908
26/12/2018-25/01/2019	3,508.00	29.58%	2,470.33	10,835.00	22.41%	8,406.88	16.00	18.43%	13.05	2249.00	31.01%	1,551.59	0.001971	28	687
26/01/2019-25/02/2019	3,175.00	25.68%	2,359.66	11,663.00	35.26%	7,550.63	32.00	13.47%	27.69	414.00	29.03%	293.82	0.001971	28	565
26/02/2019-	4,188.00	31.17%	2,882.60	17,438.00	26.59%	12,801.24	305.00	20.04%	243.88	986.00	27.56%	714.26	0.00197	28	918

25/03/2019													1		
26/03/2019-25/04/2019	4,083.00	32.82%	2,742.96	17,603.00	23.32%	13,497.98	359.00	19.77%	288.03	1544.00	21.89%	1,206.02	0.001971	28	979
26/04/2019-25/05/2019	4,169.00	35.11%	2,705.26	16,602.00	29.71%	11,669.55	264.00	13.45%	228.49	3356.00	22.22%	2,610.30	0.001971	28	950
26/05/2019-25/06/2019	3,862.00	27.73%	2,791.07	18,608.00	29.83%	13,057.23	206.00	13.01%	179.20	2337.00	26.19%	1,724.94	0.001971	28	980
26/06/2019-25/07/2019	3,715.00	37.53%	2,320.76	19,428.00	40.69%	11,522.75	272.00	15.99%	228.51	766.00	27.15%	558.03	0.001971	28	807
26/07/2019-25/08/2019	4,621.00	24.90%	3,470.37	19,571.00	35.82%	12,560.67	184.00	17.29%	152.19	360.00	21.92%	281.09	0.001971	28	909
26/08/2019-25/09/2019	3,016.00	34.04%	1,989.35	13,580.00	32.15%	9,214.03	31.00	22.16%	24.13	335.00	21.08%	264.38	0.001971	28	634
26/09/2019-25/10/2019	5,141.00	34.40%	3,372.50	14,589.00	40.32%	8,706.72	48.00	19.45%	38.66	4,149.00	29.92%	2,907.62	0.001971	28	829
26/10/2019-25/11/2019	547.00	28.64%	390.34	11,880.00	25.71%	8,825.65	8.00	18.14%	6.55	11,293.00	27.08%	8,234.86	0.001971	28	963
26/11/2019-25/12/2019	397.00	29.58%	279.57	11,963.00	36.09%	7,645.55	16.00	21.92%	12.49	12,147.00	30.44%	8,449.45	0.001971	28	904
26/12/2019-25/01/2020	863.00	27.62%	624.64	14,207.00	38.54%	8,731.62	0.00	21.42%	0.00	5,164.00	30.57%	3,585.37	0.001971	28	714
26/01/2020-25/02/2020	3,318.00	37.25%	2,082.05	9,261.00	24.81%	6,963.35	0.00	13.26%	0.00	3563.00	23.49%	2,726.05	0.001971	28	650
26/02/2020-25/03/2020	4,020.00	36.01%	2,572.40	10,388.00	34.09%	6,846.73	33.00	13.33%	28.60	9611.00	25.19%	7,189.99	0.001971	28	918
26/03/2020-25/04/2020	3,560.00	32.46%	2,404.42	11,148.00	19.38%	8,987.52	58.00	22.23%	45.11	11218.00	26.61%	8,232.89	0.001971	28	1,086
26/04/2020-25/05/2020	4,917.00	37.36%	3,080.01	19,005.00	25.36%	14,185.33	67.00	21.68%	52.47	6056.00	31.72%	4,135.04	0.001971	28	1,184
26/05/2020-25/06/2020	3,234.00	25.71%	2,402.54	18,855.00	28.17%	13,543.55	478.00	20.19%	381.49	2030.00	30.20%	1,416.94	0.001971	28	979
26/06/2020-25/07/2020	4,101.00	36.01%	2,624.23	15,765.00	38.99%	9,618.23	872.00	14.68%	743.99	1545.00	25.83%	1,145.93	0.001971	28	780

26/07/2020-25/08/2020	7,244.00	37.53%	4,525.33	14,117.00	39.53%	8,536.55	564.00	21.25%	444.15	2763.00	23.53%	2,112.87	0.001971	28	862
26/08/2020-25/09/2020	6,371.00	24.99%	4,778.89	13,308.00	30.26%	9,281.00	377.00	23.38%	288.86	765.00	27.32%	556.00	0.001971	28	823
26/09/2020-25/10/2020	3,846.00	31.98%	2,616.05	14,078.00	19.39%	11,348.28	201.00	22.28%	156.22	6032.00	26.51%	4,432.92	0.001971	28	1,024
26/10/2020-25/11/2020	4,253.00	29.05%	3,017.50	12,138.00	27.48%	8,802.48	79.00	12.24%	69.33	6320.00	26.07%	4,672.38	0.001971	28	914
26/11/2020-25/12/2020	4,918.00	38.81%	3,009.32	12,202.00	39.88%	7,335.84	198.00	19.93%	158.54	6086.00	24.72%	4,581.54	0.001971	28	833
Total	515,579.00	/	344,497.98	696,839.00		481,440.09	125,060.00	/	100,441.37	355,666.00	/	250,201.92	0.001971	28	64933

E.2. Calculation of project emissions or actual net removals

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$PEy=PE_{FF,y}+PE_{EL,y}+ PE_{TR,y}+PE_{BR,y}+PE_{ww,y}$ （6）

Where
PEy= project emissions during the year y（tCO_2e/year）;
PE_{FFy} =Emissions during the year y due to fossil fuel consumption (tCO_2),
$PE_{EL,y}$ =Emissions during the year y due to electricity use off-site for the processing of biomass residues (tCO_2).
$PE_{TR,y}$ =Emissions during the year y due to transportation of the biomass to the project (tCO_2e/year）
$PE_{BR,y}$= Emissions from the combustion of biomass residues during the year y (tCO_2e)
$PE_{ww,y}$= Emissions from waste water generated from the treatment of biomass residues in year y (tCO_2e)

a) Carbon dioxide emissions due to fossil fuel consumption (PE_{FFy})

The following emission sources should be included in determining $PE_{FF,y}$:

(a) Emissions from on-site fossil fuel consumption for the generation of electric power. This includes all fossil fuels used at the project site in heat generators (e.g. boilers) for the generation of electric power;

(b) Emissions from on-site fossil fuel consumption of auxiliary equipment and systems related to the generation of electric power. This includes fossil fuels required for the operation of auxiliary equipment related to the power plants (e.g. for pumps, fans, cooling towers, instrumentation and control, etc.) which are not accounted in the first bullet;

(c) Fossil fuels required for the operation of equipment related to the on-site or off-site preparation, storage, processing and transportation of fuels and biomass residues (e.g. for mechanical treatment of the biomass, conveyor belts, driers, pelletization, shredding, briquetting processes, etc.);

(d) If any fossilized or non-biodegradable materials are used in the processing of biomass residues and incorporated in the processed biomass residues (e.g. binders) then emissions arising from those materials should be accounted for when the processed biomass residues are combusted. For that purpose those materials should be deemed as fossil fuels. If net calorific values, carbon content and/or emission factors of those materials are available they should be used, otherwise the net calorific values, carbon content and/or emission factors of the most carbon intensive fossil fuel available in the country should be used.

As the Project does not co-fire fossil fuel and does not use any fossilized or non-biodegradable materials in the processing of biomass residues, only emission source (c) and emission source (d) listed above need to be considered.

In this monitoring period, diesel is consumed in some machines which are for the preparation and on-site transportation.

$$PEFF_y = \sum_{i,j} FF_{j,i,y} * COEF_{i,y} \quad （7）$$

Where
$FF_{j,i,y}$ =the quantity of fuel type i combusted in process j during the year y (mass or volume unit /yr).

$COEF_{i,y}$ =the CO_2 emission coefficient of fossil fuel type i in year y (tCO_2/mass or volume unit of fossil fuel); i : the fuel types combusted in process j during the year y, which is diesel for this project.

As per the Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (Ver.2), since the necessary data is not available for Option A to calculate COEFi,y , Option B is implemented as follows:

$COEF_{i,y} = NCV_{i,y} * EF_{CO2,,FF,i}$ （8）

Where,
$NCV_{i,y}$ =weighted average net calorific value of fossil fuel type i in year y (GJ/mass or volume unit), which is 43.3 GJ/ton for diesel14.
$EF_{CO2,FF,i}$ =CO_2 emission factor for the fossil fuel type i (tCO_2/GJ), which can be estimated at 0.0748 tCO_2/GJ for diesel15.

Table 6. Carbon dioxide emissions due to fossil fuel consumption (PE_{FFy})

Monitoring period	Volume (liter)	ρ_{diesel} (kg/liter)	$FF_{i,i,y}$ (t)	$NCV_{i,y}$ (GJ/ton)	$EF_{CO2,FF,I}$ (tCO_2/GJ)	$PE_{FF,y}$ (tCO_2e)
26/03/2015-25/04/2015	19,987.05	0.85	16.99	43.3	0.0741	55
26/04/2015-25/05/2015	19,361.95	0.85	16.46	43.3	0.0741	53
26/05/2015-25/06/2015	19,452.20	0.85	16.53	43.3	0.0741	54
26/05/2015-25/07/2015	18,263.75	0.85	15.52	43.3	0.0741	50
26/07/2015-25/08/2015	20,040.25	0.85	17.03	43.3	0.0741	55
26/08/2015-25/09/2015	21,522.25	0.85	18.29	43.3	0.0741	59
26/09/2015-25/10/2015	27,166.20	0.85	23.09	43.3	0.0741	75
26/10/2015-25/11/2015	22,076.10	0.85	18.76	43.3	0.0741	61
26/11/2015-25/12/2015	24,008.40	0.85	20.41	43.3	0.0741	66
26/12/2015-25/01/2016	21,454.80	0.85	18.24	43.3	0.0741	59
26/01/2016-25/02/2016	22,586.25	0.85	19.20	43.3	0.0741	62
26/02/2016-25/03/2016	20,613.10	0.85	17.52	43.3	0.0741	57
26/03/2016-25/04/2016	20,741.35	0.85	17.63	43.3	0.0741	57
26/04/2016-25/05/2016	25,352.65	0.85	21.55	43.3	0.0741	70
26/05/2016-25/06/2016	23,859.25	0.85	20.28	43.3	0.0741	66
26/06/2016-25/07/2016	11,923.45	0.85	10.13	43.3	0.0741	33
26/07/2016-25/08/2016	18,038.60	0.85	15.33	43.3	0.0741	50
26/08/2016-25/09/2016	22,389.89	0.85	19.03	43.3	0.0741	62
26/09/2016-25/10/2016	20,885.75	0.85	17.75	43.3	0.0741	57
26/10/2016-25/11/2016	22,820.90	0.85	19.40	43.3	0.0741	63
26/11/2016-25/12/2016	18,800.50	0.85	15.98	43.3	0.0741	52
26/12/2016-25/01/2017	5,073.00	0.85	4.31	43.3	0.0741	14
26/01/2017-25/02/2017	20,002.25	0.85	17.00	43.3	0.0741	55
26/02/2017-25/03/2017	28,371.75	0.85	24.12	43.3	0.0741	78
26/03/2017-25/04/2017	23,246.50	0.85	19.76	43.3	0.0741	64
26/04/2017-25/05/2017	19,894.90	0.85	16.91	43.3	0.0741	55
26/05/2017-25/06/2017	20,377.50	0.85	17.32	43.3	0.0741	56
26/06/2017-25/07/2017	19,380.00	0.85	16.47	43.3	0.0741	53
26/07/2017-25/08/2017	17,551.25	0.85	14.92	43.3	0.0741	48
26/08/2017-25/09/2017	17,679.50	0.85	15.03	43.3	0.0741	49
26/09/2017-25/10/2017	23,854.50	0.85	20.28	43.3	0.0741	66
26/10/2017-25/11/2017	26,448.00	0.85	22.48	43.3	0.0741	73
26/11/2017-25/12/2017	24,690.50	0.85	20.99	43.3	0.0741	68
26/12/2017-25/01/2018	26,809.00	0.85	22.79	43.3	0.0741	74
26/01/2018-25/02/2018	19,484.50	0.85	16.56	43.3	0.0741	54
26/02/2018-25/03/2018	19,513.00	0.85	16.59	43.3	0.0741	54
26/03/2018-25/04/2018	21,042.50	0.85	17.89	43.3	0.0741	58
26/04/2018-25/05/2018	22,439.00	0.85	19.07	43.3	0.0741	62
26/05/2018-25/06/2018	21,346.50	0.85	18.14	43.3	0.0741	59
26/06/2018-25/07/2018	20,596.00	0.85	17.51	43.3	0.0741	57
26/07/2018-25/08/2018	19,760.00	0.85	16.80	43.3	0.0741	54
26/08/2018-25/09/2018	21,669.50	0.85	18.42	43.3	0.0741	60
26/09/2018-25/10/2018	25,574.00	0.85	21.74	43.3	0.0741	70

26/10/2018-25/11/2018	23,047.00	0.85	19.59	43.3	0.0741	63
26/11/2018-25/12/2018	19,446.50	0.85	16.53	43.3	0.0741	54
26/12/2018-25/01/2019	21,935.50	0.85	18.65	43.3	0.0741	60
26/01/2019-25/02/2019	12,264.50	0.85	10.42	43.3	0.0741	34
26/02/2019-25/03/2019	19,199.50	0.85	16.32	43.3	0.0741	53
26/03/2019-25/04/2019	21,549.80	0.85	18.32	43.3	0.0741	59
26/04/2019-25/05/2019	24,993.55	0.85	21.24	43.3	0.0741	69
26/05/2019-25/06/2019	21,641.00	0.85	18.39	43.3	0.0741	60
26/06/2019-25/07/2019	16,748.50	0.85	14.24	43.3	0.0741	46
26/07/2019-25/08/2019	20,311.00	0.85	17.26	43.3	0.0741	56
26/08/2019-25/09/2019	0.00	0.85	0.00	43.3	0.0741	0
26/09/2019-25/10/2019	34,447.00	0.85	29.28	43.3	0.0741	94
26/10/2019-25/11/2019	22,135.00	0.85	18.81	43.3	0.0741	61
26/11/2019-25/12/2019	19,845.50	0.85	16.87	43.3	0.0741	55
26/12/2019-25/01/2020	11,467.45	0.85	9.75	43.3	0.0741	32
26/01/2020-25/02/2020	9,214.05	0.85	7.83	43.3	0.0741	26
26/02/2020-25/03/2020	22,944.40	0.85	19.50	43.3	0.0741	63
26/03/2020-25/04/2020	16,301.05	0.85	13.86	43.3	0.0741	45
26/04/2020-25/05/2020	39,718.55	0.85	33.76	43.3	0.0741	109
26/05/2020-25/06/2020	15,846.00	0.85	13.47	43.3	0.0741	44
26/06/2020-25/07/2020	17,651.00	0.85	15.00	43.3	0.0741	49
26/07/2020-25/08/2020	17,062.00	0.85	14.50	43.3	0.0741	47
26/08/2020-25/09/2020	19,503.50	0.85	16.58	43.3	0.0741	54
26/09/2020-25/10/2020	23,360.50	0.85	19.86	43.3	0.0741	64
26/10/2020-25/11/2020	24,196.50	0.85	20.57	43.3	0.0741	66
26/11/2020-25/12/2020	21,185.00	0.85	18.01	43.3	0.0741	58
Total	1,422,162.64	/	1,208.84	/	/	3,918

b) Carbon dioxide emissions from electricity consumption ($PE_{EL,y}$)

According to ACM0018 (Version 03.0), $PE_{EL,y}$ should account only for the off-site use of electricity, using "Methodological Tool: Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01) as below:

The off-site electricity is imported from the grid, according to "Methodological Tool: Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01), 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" (Version 04.0) is chosen for the $PE_{EL,y}$ calculation.

$$PE_{EL,y} = \sum_{j} EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y}) \quad (9)$$

Where:

$PE_{EC,y}$ is the project emissions from electricity consumption by the project activity during the year y （tCO_2e/year）.

$EC_{PJ,j,y}$ = Quantity of electricity consumed by the project electricity consumption source j （at the biomass collection station outside of the project site） in year y (MWh/yr)

$EF_{EL,j,y}$= Emission factor for electricity generation for source j in year y (tCO_2/MWh)

$TDL_{j,y}$ = average technical transmission and distribution losses for providing electricity to source j in year y

According to “Methodological Tool: Tool to calculate baseline, project and/or leakage emissions from electricity consumption”(Version 01),

$EF_{EL,j,y}=EF_{grid,CM,y}=0.6702tCO_2/MWh$

$TDL_{j,y}$ =20%

The biomass collection stations outside of the project site have not been used since previous monitoring period, therefore, $EC_{PJ,j,y}=0$

$PE_{EL,y}=0$

C） Emissions due to transportation of the biomass to the project ($PE_{TR,y}$)

$$PE_{TR,m} = \sum_{f} D_{f,m} \times FR_{f,m} \times EF_{CO2,f} \times 10^{-6} \quad (10)$$

Where
$PE_{TR,m}$= Project emissions from road transportation of freight monitoring period m (tCO_2e)
$D_{f,m}$= Return trip distance between the origin and destination of freight transportation activity f in monitoring period m (km)
$ER_{f,m}$= Total mass of freight transported in freight transportation activity f in monitoring period m (t)
$EF_{CO2,f}$= Default CO_2 emission factor for freight transportation activity f (g CO_2/t km)
f= Freight transportation activities conducted in the project activity in monitoring period m

Table 7. Monitored data for transport emissions and calculation of $PE_{TR,y}$

Monitoring period	$FR_{f,m}$ (tonnes)	$D_{f,y}$ (Max,km)	$EF_{CO2,f}$ (gCO_2/t km)	$PE_{TR,y}$ (tCO_2e)
26/03/2015-25/04/2015	30,296	100.00	129	391
26/04/2015-25/05/2015	4,417	100.00	129	57
26/05/2015-25/06/2015	938	100.00	129	13
26/05/2015-25/07/2015	52,576	100.00	129	679
26/07/2015-25/08/2015	269	100.00	129	4
26/08/2015-25/09/2015	19,193	100.00	129	248
26/09/2015-25/10/2015	42,229	100.00	129	545
26/10/2015-25/11/2015	16,370	100.00	129	212
26/11/2015-25/12/2015	12,132	100.00	129	157
26/12/2015-25/01/2016	34,204	100.00	129	442
26/01/2016-25/02/2016	15,440	100.00	129	200
26/02/2016-25/03/2016	45,286	100.00	129	585
26/03/2016-25/04/2016	38,423	100.00	129	496
26/04/2016-25/05/2016	40,155	100.00	129	518
26/05/2016-25/06/2016	26,060	100.00	129	337
26/06/2016-25/07/2016	19,671	100.00	129	254
26/07/2016-25/08/2016	25,662	100.00	129	332
26/08/2016-25/09/2016	25,607	100.00	129	331
26/09/2016-25/10/2016	34	100.00	129	1
26/10/2016-25/11/2016	35,313	100.00	129	456
26/11/2016-25/12/2016	722	100.00	129	10
26/12/2016-25/01/2017	1,416	100.00	129	19
26/01/2017-25/02/2017	755	100.00	129	10
26/02/2017-25/03/2017	988	100.00	129	13

26/03/2017-25/04/2017	939	100.00	129	13
26/04/2017-25/05/2017	623	100.00	129	9
26/05/2017-25/06/2017	574	100.00	129	8
26/06/2017-25/07/2017	692	100.00	129	9
26/07/2017-25/08/2017	557	100.00	129	8
26/08/2017-25/09/2017	615	100.00	129	8
26/09/2017-25/10/2017	897	100.00	129	12
26/10/2017-25/11/2017	49,132	100.00	129	634
26/11/2017-25/12/2017	23,603	100.00	129	305
26/12/2017-25/01/2018	27,014	100.00	129	349
26/01/2018-25/02/2018	10,837	100.00	129	140
26/02/2018-25/03/2018	26,523	100.00	129	343
26/03/2018-25/04/2018	34,397	100.00	129	444
26/04/2018-25/05/2018	25,055	100.00	129	324
26/05/2018-25/06/2018	26,167	100.00	129	338
26/06/2018-25/07/2018	22,546	100.00	129	291
26/07/2018-25/08/2018	19,944	100.00	129	258
26/08/2018-25/09/2018	31,155	100.00	129	402
26/09/2018-25/10/2018	40,952	100.00	129	529
26/10/2018-25/11/2018	25,204	100.00	129	326
26/11/2018-25/12/2018	25,678	100.00	129	332
26/12/2018-25/01/2019	27,493	100.00	129	355
26/01/2019-25/02/2019	8,325	100.00	129	108
26/02/2019-25/03/2019	37,013	100.00	129	478
26/03/2019-25/04/2019	42,679	100.00	129	551
26/04/2019-25/05/2019	34,435	100.00	129	445
26/05/2019-25/06/2019	17,821	100.00	129	230
26/06/2019-25/07/2019	17,821	100.00	129	230
26/07/2019-25/08/2019	14,090	100.00	129	182
26/08/2019-25/09/2019	18,956	100.00	129	245
26/09/2019-25/10/2019	23,484	100.00	129	303
26/10/2019-25/11/2019	46,909	100.00	129	606
26/11/2019-25/12/2019	36,831	100.00	129	476
26/12/2019-25/01/2020	19,887	100.00	129	257
26/01/2020-25/02/2020	7,863	100.00	129	102
26/02/2020-25/03/2020	31,869	100.00	129	412
26/03/2020-25/04/2020	48,458	100.00	129	626
26/04/2020-25/05/2020	38,107	100.00	129	492
26/05/2020-25/06/2020	16,965	100.00	129	219
26/06/2020-25/07/2020	23,492	100.00	129	304
26/07/2020-25/08/2020	15,355	100.00	129	199
26/08/2020-25/09/2020	47,116	100.00	129	608
26/09/2020-25/10/2020	45,070	100.00	129	582
26/10/2020-25/11/2020	20,040	100.00	129	259
26/11/2020-25/12/2020	17,288	100.00	129	224
Total	**1,538,619**	/	/	**19,885**

d) Methane emissions from combustion of biomass residues ($PE_{BR,y}$)

It was established in the PDD that the emissions can be calculated from the quantity of biomass that would not be used in absence of the project activity, with the net caloric value and the appropriate emissions factor, as follows:

$$PE_{BR,y} = GWP_{CH4} \times EF_{CH4,BR} \times \sum_{n} BR_{PJ,n,y} \times NCV_{n,y} \quad (11)$$

Where

GWP_{CH4} = Global Warming Potential for methane valid for the relevant commitment period (tCO_2/tCH_4)
$EF_{CH4,BR}$ = CH_4 emission factor for the combustion of the biomass residues in the project plant (tCH_4/TJ).
$BR_{PJ,n,y}$ = Quantity of biomass residues of category n used in power plants which are located at the project site and included in the project boundary in year y (tonnes on dry-basis/yr)
$NCV_{n,y}$ = Net calorific value of the biomass residues category n in year y (GJ/tonnes on dry basis)

Since cotton stalk, wood residues and wheat bran are all belonged to wood waste, IPCC default value is used to determine the CH_4 emission factor, according to the IPCC default value provided in ACM0018, the CH_4 emission factor of combustion of biomass of wood waste is 0.03 tCH_4/TJ. Considering a conservativeness factor of 1.37, the CH_4 emission factor in this PDD is taken as 0.0000411 tCH_4/GJ.

Table 8. Monitored biomass fuel quantities $BF_{PJ,n,y}$, $NCV_{n,y}$ and calculation of $PE_{Biomass,CH4,y}$

Monitoring period	BF1, dry base (t)	BF2, dry base (t)	BF3, dry base (t)	BF4, dry base (t)	NCV1,dry base (GJ/t)	NCV2,dry base (GJ/t)	NCV3,dry base (GJ/t)	NCV4,dry base (GJ/t)	$EF_{CH4,BF}$ (tCH_4/GJ)	$PE_{biomass,CH4,y}$ (tCH_4)
26/03/2015-25/04/2015	10,282.44	220.52	2,433.71	1,993.13	14.56	16.55	12.50	11.84	0.0000411	8
26/04/2015-25/05/2015	14,709.40	97.90	2,274.12	1,619.04	14.56	16.55	12.50	11.84	0.0000411	10
26/05/2015-25/06/2015	16,625.80	144.56	1,472.12	231.41	14.01	15.87	12.04	15.71	0.0000411	10
26/05/2015-25/07/2015	15,038.21	9.50	3,230.04	90.01	14.01	15.87	12.04	15.71	0.0000411	10
26/07/2015-25/08/2015	9,352.88	0.00	5,832.56	0.00	14.01	15.87	12.04	15.71	0.0000411	8
26/08/2015-25/09/2015	11,597.61	0.00	1,616.39	726.66	14.01	15.87	12.04	15.71	0.0000411	7
26/09/2015-25/10/2015	18,384.21	32.84	3,738.34	8,566.41	14.01	15.87	12.04	15.71	0.0000411	12
26/10/2015-25/11/2015	9,705.70	69.81	5,491.55	12,875.21	14.01	15.87	12.04	15.71	0.0000411	8
26/11/2015-25/12/2015	8,023.06	679.96	4,169.17	16,549.14	13.94	16.90	12.85	13.13	0.0000411	7
26/12/2015-25/01/2016	4,308.49	1,158.06	1,744.41	9,635.30	13.94	16.90	12.85	13.13	0.0000411	4
26/01/2016-25/02/2016	5,658.07	785.33	3,239.55	13,465.62	13.94	16.90	12.85	13.13	0.0000411	5
26/02/2016-25/03/2016	4,300.33	49.63	3,355.94	10,670.10	13.94	16.90	12.85	13.13	0.0000411	4
26/03/2016-25/04/2016	9,172.95	298.30	5,212.28	6,937.08	13.94	16.90	12.85	13.13	0.0000411	8
26/04/2016-25/05/2016	10,517.08	0.00	8,004.90	2,072.87	13.94	16.90	12.85	13.13	0.0000411	10
26/05/2016-25/06/2016	10,511.67	0.00	10,459.37	737.67	14.00	15.33	12.95	17.31	0.0000411	12
26/06/2016-25/07/2016	3,155.84	0.00	3,960.67	360.13	14.00	15.33	12.95	17.31	0.0000411	4
26/07/2016-25/08/2016	10,791.16	0.00	9,608.56	356.14	14.00	15.33	12.95	17.31	0.0000411	11
26/08/2016-25/09/2016	10,788.58	0.00	8,635.96	300.35	14.00	15.33	12.95	17.31	0.0000411	11
26/09/2016-25/10/2016	9,540.19	1,700.72	4,951.30	2,595.25	14.00	15.33	12.95	17.31	0.0000411	9
26/10/2016-25/11/2016	1,780.19	6,359.84	0.00	5,133.22	14.00	15.33	12.95	17.31	0.0000411	5
26/11/2016-25/12/2016	249.44	9,804.13	0.00	11,185.48	14.10	16.76	12.70	15.87	0.0000411	7
26/12/2016-25/01/2017	166.54	4,766.79	0.00	5,976.80	14.10	16.76	12.70	15.87	0.0000411	3
26/01/2017-25/02/2017	2,268.38	10,781.16	13.81	6,988.03	14.10	16.76	12.70	15.87	0.0000411	9
26/02/2017-25/03/2017	3,101.85	8,491.86	52.48	2,544.94	14.10	16.76	12.70	15.87	0.0000411	8
26/03/2017-25/04/2017	3,319.87	10,726.60	45.66	2,795.82	14.10	16.76	12.70	15.87	0.0000411	9
26/04/2017-25/05/2017	3,138.42	12,189.12	52.66	1,540.45	14.10	16.76	12.70	15.87	0.0000411	10
26/05/2017-25/06/2017	4,564.06	14,592.12	89.04	370.76	14.78	15.26	11.65	16.57	0.0000411	12
26/06/2017-25/07/2017	2,851.19	10,173.68	298.11	238.12	14.78	15.26	11.65	16.57	0.0000411	8
26/07/2017-25/08/2017	4,376.41	11,479.89	613.33	658.81	14.78	15.26	11.65	16.57	0.0000411	10
26/08/2017-25/09/2017	457.85	10,046.16	1,020.59	758.13	14.78	15.26	11.65	16.57	0.0000411	7
26/09/2017-25/10/2017	4,674.72	10,777.32	346.74	2,107.72	14.78	15.26	11.65	16.57	0.0000411	10
26/10/2017-25/11/2017	3,281.31	6,867.47	88.68	3,641.24	14.78	15.26	11.65	16.57	0.0000411	6
26/11/2017-25/12/2017	4,852.54	8,594.11	40.91	7,431.00	14.18	15.64	12.94	13.86	0.0000411	8
26/12/2017-25/01/2018	3,547.09	8,145.50	251.13	5,814.76	14.18	15.64	12.94	13.86	0.0000411	7
26/01/2018-25/02/2018	2,768.42	3,062.32	127.79	2,725.29	14.18	15.64	12.94	13.86	0.0000411	4
26/02/2018-25/03/2018	5,399.07	4,180.38	65.58	7,247.00	14.18	15.64	12.94	13.86	0.0000411	6

26/03/2018-25/04/2018	4,110.97	7,320.98	263.90	1,205.43	14.18	15.64	12.94	13.86	0.0000411	7
26/04/2018-25/05/2018	5,575.04	11,045.69	412.95	922.23	14.18	15.64	12.94	13.86	0.0000411	11
26/05/2018-25/06/2018	5,008.79	12,464.97	550.95	402.69	14.00	15.50	11.73	15.12	0.0000411	11
26/06/2018-25/07/2018	4,530.39	11,602.60	917.93	0.00	14.00	15.50	11.73	15.12	0.0000411	10
26/07/2018-25/08/2018	5,223.07	10,238.76	791.32	134.04	14.00	15.50	11.73	15.12	0.0000411	10
26/08/2018-25/09/2018	3,813.53	11,485.96	398.79	1,480.52	14.00	15.50	11.73	15.12	0.0000411	10
26/09/2018-25/10/2018	3,610.01	5,606.29	335.48	5,609.87	14.00	15.50	11.73	15.12	0.0000411	6
26/10/2018-25/11/2018	4,233.86	7,405.38	358.55	5,492.15	14.00	15.50	11.73	15.12	0.0000411	7
26/11/2018-25/12/2018	3,619.17	8,344.58	62.44	4,431.63	14.89	16.62	11.95	13.26	0.0000411	8
26/12/2018-25/01/2019	2,470.33	8,406.88	13.05	1,551.59	14.89	16.62	11.95	13.26	0.0000411	7
26/01/2019-25/02/2019	2,359.66	7,550.63	27.69	293.82	14.89	16.62	11.95	13.26	0.0000411	7
26/02/2019-25/03/2019	2,882.60	12,801.24	243.88	714.26	14.89	16.62	11.95	13.26	0.0000411	11
26/03/2019-25/04/2019	2,742.96	13,497.98	288.03	1,206.02	14.89	16.62	11.95	13.26	0.0000411	11
26/04/2019-25/05/2019	2,705.26	11,669.55	228.49	2,610.30	14.89	16.62	11.95	13.26	0.0000411	10
26/05/2019-25/06/2019	2,791.07	13,057.23	179.20	1,724.94	13.75	16.18	12.31	12.10	0.0000411	10
26/06/2019-25/07/2019	2,320.76	11,522.75	228.51	558.03	13.75	16.18	12.31	12.10	0.0000411	9
26/07/2019-25/08/2019	3,470.37	12,560.67	152.19	281.09	13.75	16.18	12.31	12.10	0.0000411	10
26/08/2019-25/09/2019	1,989.35	9,214.03	24.13	264.38	13.75	16.18	12.31	12.10	0.0000411	7
26/09/2019-25/10/2019	3,372.50	8,706.72	38.66	2,907.62	13.75	16.18	12.31	12.10	0.0000411	8
26/10/2019-25/11/2019	390.34	8,825.65	6.55	8,234.86	13.75	16.18	12.31	12.10	0.0000411	6
26/11/2019-25/12/2019	279.57	7,645.55	12.49	8,449.45	14.30	16.94	12.81	16.23	0.0000411	5
26/12/2019-25/01/2020	624.64	8,731.62	0.00	3,585.37	14.30	16.94	12.81	16.23	0.0000411	6
26/01/2020-25/02/2020	2,082.05	6,963.35	0.00	2,726.05	14.30	16.94	12.81	16.23	0.0000411	6
26/02/2020-25/03/2020	2,572.40	6,846.73	28.60	7,189.99	14.30	16.94	12.81	16.23	0.0000411	6
26/03/2020-25/04/2020	2,404.42	8,987.52	45.11	8,232.89	14.30	16.94	12.81	16.23	0.0000411	8
26/04/2020-25/05/2020	3,080.01	14,185.33	52.47	4,135.04	14.30	16.94	12.81	16.23	0.0000411	12
26/05/2020-25/06/2020	2,402.54	13,543.55	381.49	1,416.94	14.90	16.83	12.59	16.14	0.0000411	11
26/06/2020-25/07/2020	2,624.23	9,618.23	743.99	1,145.93	14.90	16.83	12.59	16.14	0.0000411	9
26/07/2020-25/08/2020	4,525.33	8,536.55	444.15	2,112.87	14.90	16.83	12.59	16.14	0.0000411	9
26/08/2020-25/09/2020	4,778.89	9,281.00	288.86	556.00	14.90	16.83	12.59	16.14	0.0000411	9
26/09/2020-25/10/2020	2,616.05	11,348.28	156.22	4,432.92	14.90	16.83	12.59	16.14	0.0000411	10
26/10/2020-25/11/2020	3,017.50	8,802.48	69.33	4,672.38	14.90	16.83	12.59	16.14	0.0000411	8
26/11/2020-25/12/2020	3,009.32	7,335.84	158.54	4,581.54	14.77	15.56	11.81	16.88	0.0000411	7
Total	**344,497.98**	**481,440.09**	**100,441.37**	**250,201.92**	/	/	/		/	**225**

(Note: BF1=cotton straw, BF2=wood residues, BF3=rice husk, BF4=maize stalks)

Table 9. Project Emission (PE_y) calculation

Monitoring period	$PE_{biomass,CH4,y}$ (tCH_4)	GWP_{CH4} (tCO_2e/tCH_4)	$PE_{TR,y}$ (tCO_2e)	$PE_{FF,y}$ (tCO_2e)	$PE_{EC,y}$ (tCO_2e)	PE_y (tCO_2e)
26/03/2015-25/04/2015	7.55	28	391.00	54.51	0.00	658
26/04/2015-25/05/2015	10.04	28	57.00	53.00	0.00	392
26/05/2015-25/06/2015	10.40	28	13.00	54.00	0.00	359
26/05/2015-25/07/2015	10.26	28	679.00	50.00	0.00	1017
26/07/2015-25/08/2015	8.27	28	4.00	55.00	0.00	291
26/08/2015-25/09/2015	7.48	28	248.00	59.00	0.00	517
26/09/2015-25/10/2015	12.46	28	545.00	75.00	0.00	969
26/10/2015-25/11/2015	8.35	28	212.00	61.00	0.00	507
26/11/2015-25/12/2015	7.27	28	157.00	66.00	0.00	427
26/12/2015-25/01/2016	4.19	28	442.00	59.00	0.00	619
26/01/2016-25/02/2016	5.50	28	200.00	62.00	0.00	416
26/02/2016-25/03/2016	4.27	28	585.00	57.00	0.00	762
26/03/2016-25/04/2016	8.22	28	496.00	57.00	0.00	784
26/04/2016-25/05/2016	10.25	28	518.00	70.00	0.00	876
26/05/2016-25/06/2016	11.62	28	337.00	66.00	0.00	729
26/06/2016-25/07/2016	3.92	28	254.00	33.00	0.00	397
26/07/2016-25/08/2016	11.32	28	332.00	50.00	0.00	700
26/08/2016-25/09/2016	10.80	28	331.00	62.00	0.00	696
26/09/2016-25/10/2016	9.20	28	1.00	57.00	0.00	316
26/10/2016-25/11/2016	5.03	28	456.00	63.00	0.00	660
26/11/2016-25/12/2016	6.90	28	10.00	52.00	0.00	256
26/12/2016-25/01/2017	3.38	28	19.00	14.00	0.00	128
26/01/2017-25/02/2017	8.75	28	10.00	55.00	0.00	310
26/02/2017-25/03/2017	7.67	28	13.00	78.00	0.00	306
26/03/2017-25/04/2017	9.34	28	13.00	64.00	0.00	339
26/04/2017-25/05/2017	10.24	28	9.00	55.00	0.00	351
26/05/2017-25/06/2017	11.97	28	8.00	56.00	0.00	400
26/06/2017-25/07/2017	8.26	28	9.00	53.00	0.00	294
26/07/2017-25/08/2017	10.15	28	8.00	48.00	0.00	341
26/08/2017-25/09/2017	7.07	28	8.00	49.00	0.00	255
26/09/2017-25/10/2017	9.77	28	12.00	66.00	0.00	352
26/10/2017-25/11/2017	6.34	28	634.00	73.00	0.00	885
26/11/2017-25/12/2017	8.37	28	305.00	68.00	0.00	608
26/12/2017-25/01/2018	7.44	28	349.00	74.00	0.00	632
26/01/2018-25/02/2018	3.65	28	140.00	54.00	0.00	297
26/02/2018-25/03/2018	5.87	28	343.00	54.00	0.00	562
26/03/2018-25/04/2018	7.24	28	444.00	58.00	0.00	705
26/04/2018-25/05/2018	10.57	28	324.00	62.00	0.00	682
26/05/2018-25/06/2018	11.09	28	338.00	59.00	0.00	708
26/06/2018-25/07/2018	10.44	28	291.00	57.00	0.00	641
26/07/2018-25/08/2018	9.91	28	258.00	54.00	0.00	590
26/08/2018-25/09/2018	9.70	28	402.00	60.00	0.00	734

26/09/2018-25/10/2018	5.81	28	529.00	70.00	0.00	762
26/10/2018-25/11/2018	7.33	28	326.00	63.00	0.00	595
26/11/2018-25/12/2018	7.95	28	332.00	54.00	0.00	609
26/12/2018-25/01/2019	7.26	28	355.00	60.00	0.00	619
26/01/2019-25/02/2019	6.62	28	108.00	34.00	0.00	328
26/02/2019-25/03/2019	10.63	28	478.00	53.00	0.00	829
26/03/2019-25/04/2019	11.04	28	551.00	59.00	0.00	920
26/04/2019-25/05/2019	9.74	28	445.00	69.00	0.00	787
26/05/2019-25/06/2019	10.35	28	230.00	60.00	0.00	580
26/06/2019-25/07/2019	9.09	28	230.00	46.00	0.00	531
26/07/2019-25/08/2019	10.39	28	182.00	56.00	0.00	529
26/08/2019-25/09/2019	7.26	28	245.00	0.00	0.00	449
26/09/2019-25/10/2019	7.72	28	303.00	94.00	0.00	614
26/10/2019-25/11/2019	6.09	28	606.00	61.00	0.00	838
26/11/2019-25/12/2019	5.49	28	476.00	55.00	0.00	685
26/12/2019-25/01/2020	6.45	28	257.00	32.00	0.00	470
26/01/2020-25/02/2020	6.07	28	102.00	26.00	0.00	299
26/02/2020-25/03/2020	6.29	28	412.00	63.00	0.00	652
26/03/2020-25/04/2020	7.69	28	626.00	45.00	0.00	887
26/04/2020-25/05/2020	11.71	28	492.00	109.00	0.00	929
26/05/2020-25/06/2020	11.04	28	219.00	44.00	0.00	573
26/06/2020-25/07/2020	8.65	28	304.00	49.00	0.00	596
26/07/2020-25/08/2020	8.91	28	199.00	47.00	0.00	496
26/08/2020-25/09/2020	9.50	28	608.00	54.00	0.00	928
26/09/2020-25/10/2020	9.53	28	582.00	64.00	0.00	913
26/10/2020-25/11/2020	7.97	28	259.00	66.00	0.00	549
26/11/2020-25/12/2020	6.60	28	224.00	58.00	0.00	467
Total	573.69	/	19,885.00	3,917.51	0.00	39,902

E.3. Calculation of leakage emissions

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The main potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. Changes in carbon stocks in the LULUCF sector are expected to be insignificant since this methodology is limited to biomass residues, as defined in the applicability conditions above. The baseline scenarios for biomass residues for which this potential leakage is relevant are B5, B6, B7 and B8.

According to the analysis of baseline scenario in section B.4, the baseline for use of biomass residues is B1, which is the biomass residues are dumped or left to decay under mainly aerobic conditions. Therefore leakage effects do not need to be addressed according to consolidated methodology ACM0018, i.e. LEy=0 tCO_2e

Table 10. Demonstration of abundant surplus of biomass availability

Unit : 10^4ton	**Year 2015**			
	Cotton straw	**Wood residues**	**Rice husk**	**Maize stalk**
Available Biomass in the region	104.50	124.36	11.80	22.52

Biomass utilized out of the project	21.12	32.25	1.45	1.2
Biomass utilized by the project from Apr. 2015 to Dec.2015	17.96	0.18	3.90	7.21
Biomass utilized by the project from Jan. 2015 to Mar. 2015	0.63	3.59	0.88	0.00
Biomass utilized by the project	18.59	3.78	4.78	7.21
Total biomass utilized, including the project	39.71	36.03	6.23	8.41
Available Biomass/Total biomass utilized	263%	345%	189%	268%
Available Biomass/Total biomass utilized -100%	163%	245%	89%	168%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes

Unit: 10^4ton	**2016**			
	Cotton Straw	**Wood residues**	**Wheat bran**	**Maize stalk**
Available Biomass in the region	105.91	125.62	12.84	24.24
Biomass utilized out of the project	21.20	32.31	1.50	1.22
Biomass utilized by the project	11.54	2.72	7.27	8.48
Total biomass utilized, including the project	32.74	35.03	8.77	9.70
Available Biomass/Total biomass utilized	323%	359%	146%	250%
Available Biomass/Total biomass utilized -100%	223%	259%	46%	150%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes

Unit: 10^4ton	**2017**			
	Cotton Straw	**Wood residues**	**Wheat bran**	**Maize stalk**
Available Biomass in the region	106.33	126.68	13.93	25.28
Biomass utilized out of the project	21.24	33.42	1.62	1.32
Biomass utilized by the project	5.53	17.23	0.32	4.93
Total biomass utilized, including the project	26.77	50.65	1.94	6.25
Available Biomass/Total biomass utilized	397%	250%	720%	404%
Available Biomass/Total biomass utilized -100%	297%	150%	620%	304%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes

Unit：10^4ton	2018			
	Cotton Straw	**Wood residues**	**Wheat bran**	**Maize stalk**
Available Biomass in the region	106.45	127.99	14.15	26.43
Biomass utilized out of the project	21.37	34.55	1.62	1.55
Biomass utilized by the project	7.43	14.73	0.55	4.83
Total biomass utilized, including the project	28.80	49.28	2.17	6.38
Available Biomass/Total biomass utilized	370%	260%	653%	414%
Available Biomass/Total biomass utilized -100%	270%	160%	553%	314%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes

Unit：10^4ton	2019			
	Cotton Straw	**Wood residues**	**Wheat bran**	**Maize stalk**
Available Biomass in the region	107.50	128.59	15.26	26.72
Biomass utilized out of the project	22.14	34.68	1.88	1.69
Biomass utilized by the project	4.04	18.38	0.17	3.99
Total biomass utilized, including the project	26.18	53.06	2.05	5.68
Available Biomass/Total biomass utilized	411%	242%	743%	470%
Available Biomass/Total biomass utilized -100%	311%	142%	643%	370%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes

Unit：10^4ton	2020			
	Cotton Straw	**Wood residues**	**Wheat bran**	**Maize stalk**
Available Biomass in the region	108.15	128.78	16.25	26.94
Biomass utilized out of the project	22.55	35.74	2.01	1.85
Biomass utilized by the project	5.06	16.45	0.29	6.12
Total biomass utilized, including the project	27.61	52.19	2.30	7.97
Available Biomass/Total biomass utilized	392%	247%	706%	338%
Available Biomass/Total biomass utilized -100%	292%	147%	606%	238%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes

From table 10, it can be concluded that the available quantity of each kind of biomass in the region is at least 25% larger than the quantity of biomass that is utilized, including the project.

E.4. Calculation of emission reductions or net anthropogenic removals

The project achieves the GHG emissions by the way of CO2 emission reductions through the substitution of electricity generation in Northeast China Power Grid($BE_{EL,y}$), CH_4 emission reductions from a reduction of direct dumping or uncontrolled burning of biomass ($BE_{Biomass,y}$) by deducting the project emissions (PE_y) and leakage emissions (L_y). According to formula (1), emission reductions result in this monitoring period is listed below:

Table 11. Emissions reductions calculation (tCO_2e)

Monitoring period	$ER_{electricity,y}$ (tCO_2e)	$BE_{biomass,y}$ (tCO_2e)	BE_y (tCO_2e)	PE_y (tCO_2e)	L_y (tCO_2e)	ER_y (tCO_2e)
26/03/2015-25/04/2015	11915	824	12738	658	0	12081
26/04/2015-25/05/2015	12394	1032	13426	392	0	13034
26/05/2015-25/06/2015	11624	1020	12644	359	0	12285
26/05/2015-25/07/2015	11739	1014	12753	1017	0	11736
26/07/2015-25/08/2015	10007	838	10845	291	0	10554
26/08/2015-25/09/2015	9466	769	10235	517	0	9718
26/09/2015-25/10/2015	11995	1695	13690	969	0	12722
26/10/2015-25/11/2015	9555	1553	11108	507	0	10601
26/11/2015-25/12/2015	12155	1624	13778	427	0	13352
Total in 2015			**111217**	**5137**	**0**	**106084**
26/12/2015-25/01/2016	8958	930	9887	619	0	9269
26/01/2016-25/02/2016	11247	1278	12524	416	0	12108
26/02/2016-25/03/2016	10418	1014	11431	762	0	10670
26/03/2016-25/04/2016	12351	1193	13543	784	0	12760
26/04/2016-25/05/2016	11783	1137	12919	876	0	12043
26/05/2016-25/06/2016	12013	1198	13210	729	0	12482
26/06/2016-25/07/2016	3851	413	4263	397	0	3867
26/07/2016-25/08/2016	12454	1145	13599	700	0	12900
26/08/2016-25/09/2016	12669	1089	13757	696	0	13062
26/09/2016-25/10/2016	12128	1037	13164	316	0	12849
26/10/2016-25/11/2016	9305	733	10037	660	0	9377
26/11/2016-25/12/2016	8464	1172	9635	256	0	9380
Total in 2016			**137969**	**7211**	**0**	**130766**
26/12/2016-25/01/2017	7168	602	7770	128	0	7643
26/01/2017-25/02/2017	12699	1107	13805	310	0	13496
26/02/2017-25/03/2017	10167	783	10949	306	0	10644
26/03/2017-25/04/2017	12458	932	13389	339	0	13051
26/04/2017-25/05/2017	11907	934	12840	351	0	12490
26/05/2017-25/06/2017	12285	1083	13367	400	0	12968
26/06/2017-25/07/2017	9441	748	10189	294	0	9896
26/07/2017-25/08/2017	12353	945	13297	341	0	12957
26/08/2017-25/09/2017	12377	678	13055	255	0	12800
26/09/2017-25/10/2017	11777	988	12764	352	0	12413
26/10/2017-25/11/2017	10269	766	11035	885	0	10150
26/11/2017-25/12/2017	12131	1154	13284	608	0	12677
Total in 2017			**145744**	**4569**	**0**	**141183**
26/12/2017-25/01/2018	12178	980	13158	632	0	12526
26/01/2018-25/02/2018	5185	479	5664	297	0	5367
26/02/2018-25/03/2018	10814	932	11746	562	0	11184
26/03/2018-25/04/2018	9574	712	10285	705	0	9581
26/04/2018-25/05/2018	11780	991	12771	682	0	12089
26/05/2018-25/06/2018	12267	1017	13283	708	0	12576
26/06/2018-25/07/2018	11272	941	12212	641	0	11572
26/07/2018-25/08/2018	11657	904	12561	590	0	11972

26/08/2018-25/09/2018	10635	948	11582	734	0	10849
26/09/2018-25/10/2018	10855	837	11691	762	0	10930
26/10/2018-25/11/2018	11838	965	12802	595	0	12208
26/11/2018-25/12/2018	11128	908	12036	609	0	11427
Total in 2018			**139791**	**7517**	**0**	**132280**
26/12/2018-25/01/2019	8012	687	8699	619	0	8080
26/01/2019-25/02/2019	7476	565	8040	328	0	7713
26/02/2019-25/03/2019	11184	918	12102	829	0	11273
26/03/2019-25/04/2019	11185	979	12163	920	0	11244
26/04/2019-25/05/2019	11843	950	12792	787	0	12006
26/05/2019-25/06/2019	12158	980	13137	580	0	12558
26/06/2019-25/07/2019	11659	807	12466	531	0	11935
26/07/2019-25/08/2019	11761	909	12669	529	0	12140
26/08/2019-25/09/2019	8030	634	8664	449	0	8215
26/09/2019-25/10/2019	11644	829	12473	614	0	11859
26/10/2019-25/11/2019	11555	963	12518	838	0	11681
26/11/2019-25/12/2019	11992	904	12895	685	0	12211
Total in 2019			**138618**	**7709**	**0**	**130916**
26/12/2019-25/01/2020	9707	714	10420	470	0	9951
26/01/2020-25/02/2020	7081	650	7730	299	0	7431
26/02/2020-25/03/2020	10613	918	11531	652	0	10880
26/03/2020-25/04/2020	11543	1086	12628	887	0	11742
26/04/2020-25/05/2020	13474	1184	14658	929	0	13729
26/05/2020-25/06/2020	11866	979	12845	573	0	12272
26/06/2020-25/07/2020	10759	780	11539	596	0	10943
26/07/2020-25/08/2020	11755	862	12617	496	0	12121
26/08/2020-25/09/2020	9584	823	10407	928	0	9479
26/09/2020-25/10/2020	11829	1024	12852	913	0	11940
26/10/2020-25/11/2020	11272	914	12185	549	0	11637
26/11/2020-25/12/2020	11596	833	12428	467	0	11962
Total in 2020			**141840**	**7759**	**0**	**134087**
Total for this monitoring period			**815179**	**39902**	**0**	**775316**

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	**Project GHG emissions or actual net GHG removals (t CO_2e)**	**Leakage GHG emissions (t CO_2e)**	**GHG emission reductions or net anthropogenic GHG removals (t CO_2e)**			
				Before 01/01/ 2013	**From 01/01/ 2013 until 31/12/ 2020**	**From 01/01/ 2021**	**Total amount**
Total	815,179	39,902	0	0	775,316	0	775,316

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO_2e)	**Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)**
775,316	715,441

E.5.1. Explanation of calculation of "amount estimated ex ante for this monitoring period in the PDD"

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The emission reductions in the renewed PDD are 123,527tCO_2. There are 2114days in this monitoring period, the ex-ante estimation for this monitoring period is 123,527*2,114/365=715,441tCO_2. The actual emission reductions for this monitoring period are 775,316 tCO_2, which is 8% larger than the ex-ante estimation.

According to the registered PDD, the capped emission reductions are 140,695tCO_2/yr. Therefore, the capped emissions reductions for this monitoring period are 140,695*2114/365=814,875tCO_2.

E.6. Remarks on increase in achieved emission reductions

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The 1st reason is that GWP in this monitoring period is 28, which is larger than the data of 25 in the registered PDD. The second reason is that the electricity generation is 3% larger than the PDD.

E.7. Remarks on scale of small-scale project activity

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N/A

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Document information

Version	*Date*	*Description*
09.0	8 October 2021	Revision to: • Ensure consistency with version 03.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN).
08.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*;

Version	*Date*	*Description*
		• Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
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