	Monitoring report form for CDM project activity (Version 07.0)	
MONITORING REPORT		
Title of the project activity	125 MW Wind Power Project in Karnataka, India	
UNFCCC reference number of the project activity	0315	
Version number of the PDD applicable to this monitoring report	03	
Version number of this monitoring report	01	
Completion date of this monitoring report	23/07/2020	
Monitoring period number	07	
Duration of this monitoring period	01/01/2013 to 21/03/2014 (first date and last date included)	
Monitoring report number for this monitoring period	01	
Project participants	MSPL Limited	
Host Party	Government of India	
Applied methodologies and standardized baselines	Methodologies Used: ACM0002 ver. 4 - Consolidated methodology for grid-connected electricity generation from renewable sources. Standardized baselines used: N/A	
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	279,564 tCO ₂ e	
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	308,744 tCO ₂ e	

SECTION A. Description of project activity

A.1. General description of project activity

The purpose of the project activity is to mitigate greenhouse gas emissions by generating electricity from wind power. Electricity generation in conventional grid-connected power plants, which consists of primarily thermal power plants, is displaced by the project activity, thereby reducing greenhouse gas emissions.

The Project activity has capacity to generate 125.15 MW of clean electricity with efficient utilization of the available Wind Energy through adoption of an efficient and modern technology. The project activity contributes to sustainable development and conservation of environment through use of wind, a renewable resource. The power produced by this project activity is sold to the ESCOMS in the state.

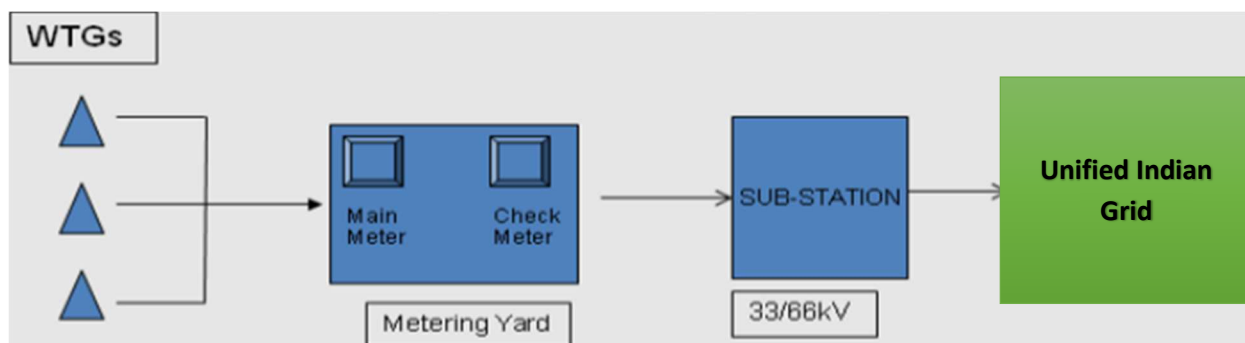
The project activity consists of 107 WTGs, owned by MSPL, RMMPL, and PVS & Brothers. The 125 MW Wind Power Project comprises of 83 No.'s, 17 No.'s & 7 No.'s of Wind Energy Generators (WEG's) each of capacities 1250 KW, 950 KW & 750 KW respectively.

Table 1: Technical Details of WTGs

Phase	Company	Number of WTGs	Capacity (kW per WTG)	Total Capacity (kW)	Make	Meter IDs
I	MSPL	7	750	5,250	NEG Micon	GRHP-01, GRHP-08, GRHP-09, GRHP-05, GRHP-06, GRHP-14, JMT-01
		17	950	16,150	NEG Micon	
		5	1,250	6,250	Suzlon	
II	MSPL	41	1,250	51,250	Suzlon	MRB-03-K131,MRB-03- K140, JJK-08, JJK-05, JMT-03, JMT-05
II	RMMPL	31	1,250	38,750	Suzlon	JJK-07, JJK-06,MRB-03- K147,MRB-03- K161
II	PVS & Brothers	6	1,250	7,500	Suzlon	MRB-03-K141
	Total	107	-	1,25,150	-	-

The project activity exports power to the Unified Indian Grid of India through sub-stations where the generated power is stepped up from 33kV to 66KV. Schematic diagram of project activity is shown below:

Figure 1: Schematic Diagram of project activity



Project's Contribution towards Sustainable Development:

The project primarily assists the state of Karnataka and India as a whole in stimulating and accelerating the commercialization of grid-connected renewable energy technologies. In addition to this, wind power projects of this magnitude, as conceptualized by this project activity demonstrates the viability of larger grid-connected wind farms, which improve energy security, air quality and local livelihoods, as well as assisting the development of a domestic sustainable renewable energy industry. The specific goals of the project are:

- Sustainable development through generation of eco-friendly power;
- To increase the share of Renewable energy power generation in the regional and national grid;
- To bridge India's energy deficit in the business as usual scenario.
- Providing national energy security, especially when global fossil fuel reserves threatens the long-term sustainability of the Indian economy;
- To strengthen India's rural electrification coverage;
- Reduction of GHG emissions compared to a business-as-usual scenario;
- To reduce other pollutants (SOx, NOx, PM, etc.) resulting from power generation industry;
- Contribute towards reducing power shortage especially in the state of Karnataka, India;
- Demonstrate and help in stimulating the growth of the wind power industry in India;
- Enhancing local employment in the vicinity of the project, which is a rural area;
- Capacity building and empowerment of vulnerable sections of the rural communities dwelling in the project area;
- Power Generation from Renewable Energy sources paves way for energy security of future generations
- Conserving natural resources including land, forests, minerals, water and ecosystems;

On present monitoring period (1st January, 2013 to 21st March, 2014) the net anthropogenic GHG removal is 279,564 tCO₂e.

A.2. Location of project activity

Host Party: India

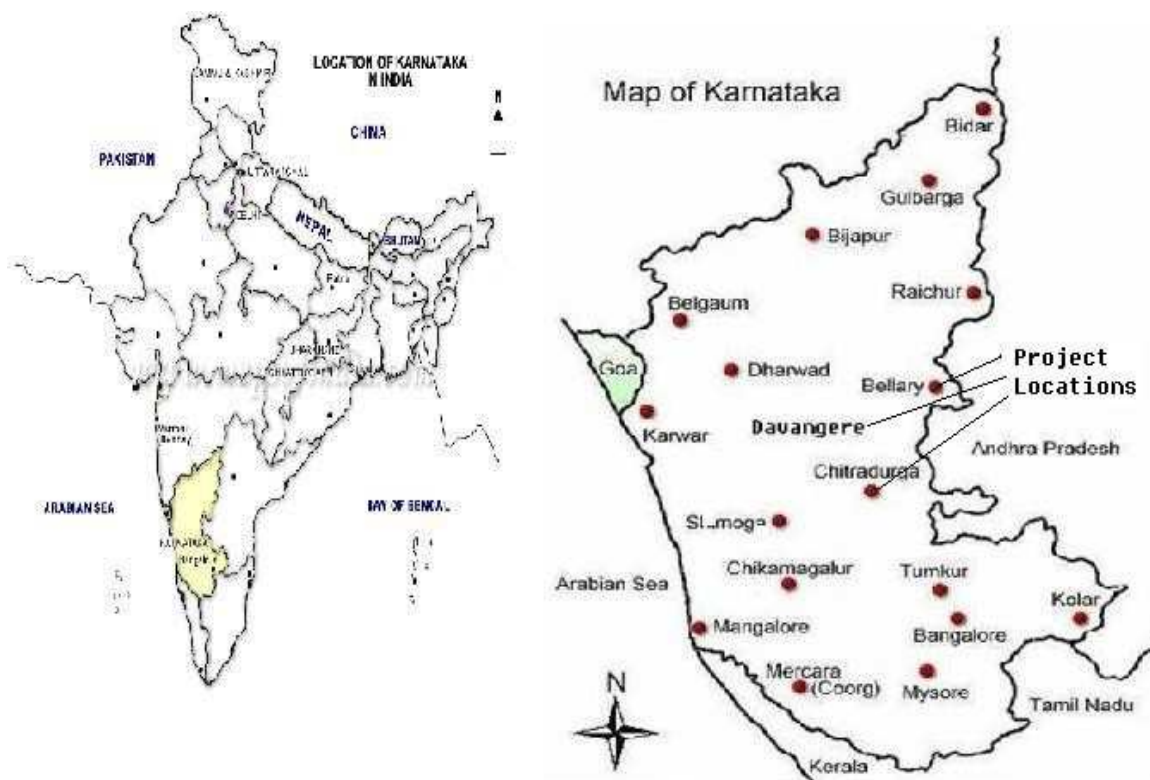
Region/State/Province etc.: Karnataka

City/Town/Community etc: Chitradurga, Bellary and Davangere districts

Detail of physical location:

The project sites are located at Sogi, Jogimatti and Jajikalgudda respectively in the districts of Bellary, Chitradurga and Davangere in the Indian state of Karnataka. Bellary, Chitradurga and Davangere are approximately at 300, 200 and 317 kms from Bangalore, the capital city of Karnataka. The sites of Sogi, Jogimatti and Jajikalgudda are located at a latitude and longitude of around 14°10' N – 14°55' N and 75°59' E and 76°22' E respectively. They are at 850, 1120 and 750 meters respectively from the mean sea level. These sites have been identified as

ideally suited for wind power generation based on the micro-siting studies and data analysis based on annual wind speed and frequency distribution, carried out by eminent agencies like Indian Institute of Tropical Meteorology and Karnataka Renewable Energy Development Limited. The feasibility of these sites for wind power production has been established by reputed consultants (Garrard Hassan, UK). The location of the project sites in the state map of Karnataka (India) is shown below:



A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (Host Country)	MSPL Limited (Project Promoter) Private Entity	No

A.4. References to applied methodologies and standardized baselines

ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

Reference is taken from the available UNFCCC document available for approved consolidated baseline methodology ACM0002, Version 04, 28th November 2005.

Reference:

https://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_YRBRBUU2ON10D2S9SE0RFK0V1R2TNL/eb22_repan6_ACM002version4.pdf?t=Tkh8cWRpYnR3fDDvLd0GPprT007_JudITCnB

Tool used - "Tool for the demonstration and assessment of additionality"¹.

¹ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

A.5. Crediting period type and duration

The project proponent opts for a fixed crediting period of 10 years. The duration of crediting period of this project activity is from 22 Mar 2004 - 21 Mar 2014 (Fixed).

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

The project activity employs state-of-art Horizontal axis wind turbines. The WEG's comprising the project activity generate clean green power which is then exported to the nearest receiving station of KPTCL (220/66/11 KV substation at Chitradurga). The plant is grid connected and houses the metering, switch gear and other protection equipment. Power Purchase Agreements have been signed with KPTCL for a term of 20 years, extendable by another term of 10 years.

Wind Turbine Generators are manufactured as per stringent European quality standards in accordance with Indian climatic conditions. All the WEG's are three bladed stall regulated Wind Turbine Generators.

Table 2: Commissioning of WTGs

Meter ID	No. of WTGs	Capacity per WTG (kW)	Total capacity (MW)	Commissioning date	WTG Location Nos.
GRHP-05	4	950	3.8	31/03/2004	MSPL22 to MSPL25
GRHP-06	3	950	2.85	31/03/2004	MSPL26 to MSPL28
GRHP-08	2	750	1.5	16/04/2004	MSPL-15, MSPL-16
	3	950	2.85	08/09/2004	MSPL-11, MSPL-12A, MSPL-12B
	1	950	0.95	24/12/2004	MSPL-14
GRHP-09	2	750	1.5	08/09/2004	MSPL-17, MSPL-18
	3	750	2.25	16/04/2004	MSPL-19, MSPL-20, MSPL-21
GRHP-14	1	950	0.95	08/09/2004	MSPL-29
	1	950	0.95	19/05/2004	MSPL-30
GRHP-01	4	950	3.8	18/03/2004	MSPL-7, MSPL-8, MSPL-9, MSPL-10
JJK-05	13	1,250	16.25	31/03/2005	K-188 to K-200
JJK-06	6	1,250	7.5	31/03/2005	K-168 to K-172, K180
	3	1,250	3.75	31/05/2005	K-174, K-175 & K-177
	5	1,250	6.25	30/04/2005	K-167, K-173, K-176, K-178, K-179
JJK-07	2	1,250	2.5	31/03/2005	K-181, K-183
	1	1,250	1.25	31/05/2005	K-182
JJK-08	1	1,250	1.25	30/04/2005	K-184
	2	1,250	2.5	31/03/2005	K-185, K-186
	1	1,250	1.25	31/05/2005	K-187
JMT-01	3	1,250	3.75	31/03/2004	K-23, K-24, K-25
	2	1,250	2.5	10/04/2004	K-26, K27
JMT-03	3	1,250	3.75	22/03/2005	K-33 to K-35
JMT-05	1	1,250	1.25	22/03/2005	K-28

MRB-03-K131	7	1,250	8.75	21/03/2005	K-123 to K-125, K-127 to K-130
	4	1,250	5	28/03/2005	K-121, K-122, K-126 & K-131
MRB-03-K140	1	1,250	1.25	31/12/2005	K-132
	8	1,250	10	21/03/2005	K-133 to K-140
MRB-03-K141	6	1,250	7.5	28/03/2005	K-141 to K-146
MRB-03-K147	6	1,250	7.5	28/03/2005	K-147 to K-150, K-153, K-154
	2	1,250	2.5	13/06/2005	K-155, K-156
MRB-03-K161	6	1,250	7.5	26/03/2005	K-161 to K-166
TOTAL	107		125.15		

B.2 Post-registration changes

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

There are no temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents. Hence, this section is not applicable.

B.2.2. Corrections

There are no corrections. Hence, this section is not applicable

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

There are no changes to the start date of the crediting period. Hence, this section is not applicable

B.2.4. Inclusion of monitoring plan

There is no inclusion in monitoring plan.

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

There are no changes from the registered monitoring plan or the applied methodology during the current monitoring period.

However, post the registration of the project activity, prior to submitting the request for issuance for the third monitoring period, the monitoring plan has been revised and the revision was approved by UNFCCC on 24 December, 2010.

The revised monitoring plan has the following changes:

Table 3: Changes in Monitoring Plan

Description	Old Monitoring Plan	Revised Monitoring Plan
CDM Team	It consist of Executive Director, GM (purchase), GM(Power), Incharge (Fin & Accts), Manager(Wind Power), Site Engineers, Site Assts and O & M Contractor.	It consists of Board, Business Head- Wind Division, MSPL Wind Division – Management & Corporate Staff, O & M Contractors, Site Personnel, KPTCL & BESCOM.
Net Export Electricity Calculation	Transmission and Distribution loss are neglected while calculating net exported electricity by project activity to the grid.	Net exported electricity is calculated subtracting transmission loss and 115% electricity imported from the gross generation.

The revised monitoring plan can be found on the project's webpage:

<https://cdm.unfccc.int/Projects/DB/DNV-CUK1142448670.58/view>

B.2.6. Changes to project design

There is no changes in project design.

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

The project activity is a wind power project and hence this section is not applicable.

SECTION C. Description of monitoring system

As emission reductions from the project are determined by the number of units supplied to the grid, it is mandatory to have a monitoring system in place and ensure that the project activity produces and exports the rated power at the stipulated norms. The sole objective of having a monitoring system is to have a constant watch on the emission reductions.

The electricity exported and imported from the project activity is noted monthly during joint meter readings of energy meters, for which KPTCL officials as well as representatives of the project promoters are present. Joint Meter Reading (JMR) statements, also referred to as Form B, are prepared based on the readings and signed by both parties. The JMR Statements also report transmission losses, calculated by KPTCL as per the methodology specified in the PPA and official notifications/circulars. In accordance with PPAs, the project promoters are billed for electricity exported, less 115% of electricity imported, less transmission losses.

QA/QC Procedures:

The monitoring team cross-checks all values reported in the JMR statements with the values reported in Pro Forma Invoices (statements on bill payment towards power purchased by BESCOM) and in the case of any discrepancy the most conservative values is applied for calculation of emission reductions.

The main and check energy meters installed for monitoring of the project activity are electronic trivector energy meters of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of MSPL and KPTCL, in the presence of its authorised representatives. All main and check meters are tested for accuracy annually by KPTCL with reference to portable standard meters which are of a minimum accuracy class of 0.1%. As the instruments are calibrated and marked at regular intervals, the accuracy of measurement can be assured at all times.

For calculation of transmission losses, the following equation from the PPA is applied:

Transmission losses = $X1 \times Z\%$

where,

X1 is the reading of the energy meter installed at the Project Site

Z is the percentage transmission line loss incurred in the transmission line between the project and receiving station and is determined as:

$$Z = \left\{ \frac{(X_1 + X_2 + X_3 + X_4 + \dots) - Y}{(X_1 + X_2 + X_3 + X_4 + \dots)} \right\} \times 100\%$$

Where,

Y is the reading of the bulk energy meter installed on the 66 KV side of the receiving station

X₂, X₃, X₄, etc. are the readings of the energy meters installed at the various other individual wind power projects connected to the receiving station.

Data Management and Data Archiving:

Copies of JMR Statements and Pro Forma Invoices (statements on bill payment towards power purchased by BESCOM) are retained by the monitoring team for the entire monitoring period. Monthly generation reports are also produced by monitoring team and copies of the same are maintained. All documents are archived electronically for the entire crediting period plus two years.

Project Performance Reviews:

Site personnel are responsible for carrying out internal audits to review the project performance. Performance against the following functions of the CDM Team are audited internally:

- Collection of monitoring data for power generation by the project activity
- Maintenance of records and backup of relevant data for verification
- Coordination with KPTCL for maintenance and calibration of monitoring equipment
- Coordination with O&M contractors to ensure continuous functioning of WEGs

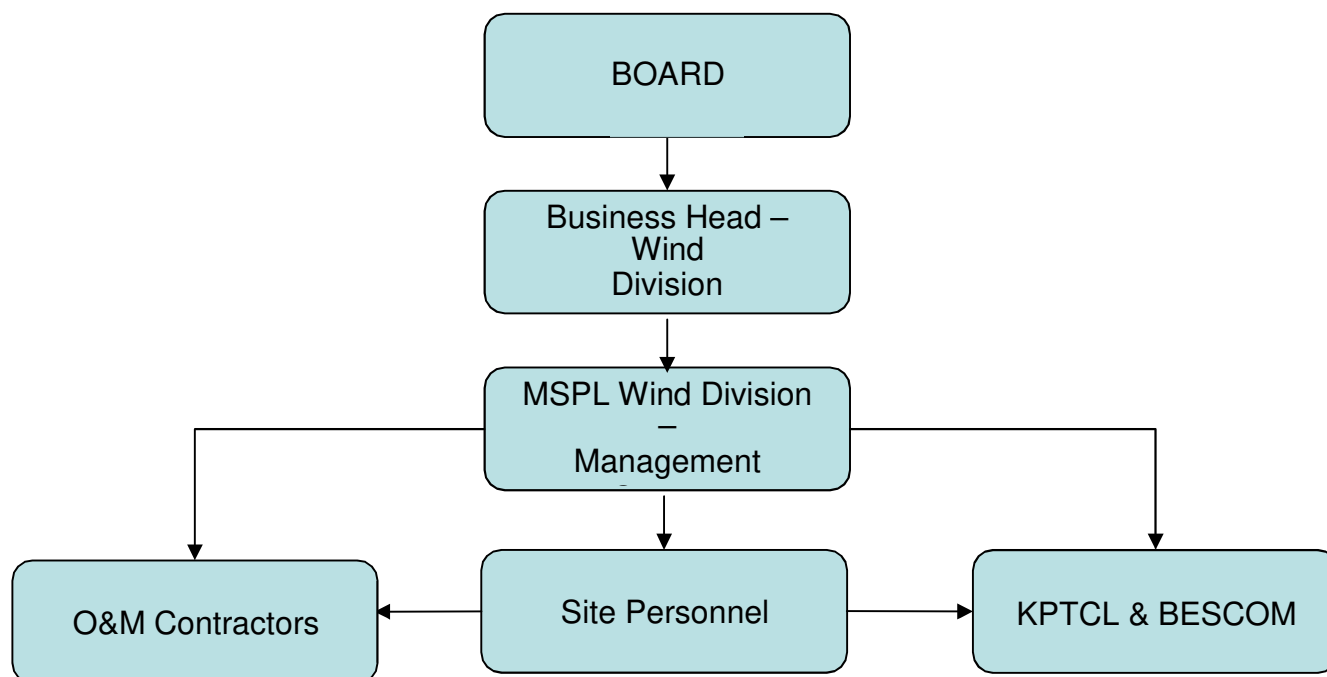
Procedures for Data Adjustments/Uncertainties

KPTCL and BESCOM consider main meter readings for billing (generation of Pro Forma Invoices and payments to project promoters) by default if main meters are working within the specified accuracy class. However if the main meter malfunctions and the check meter is working within its accuracy class, check meter readings rather than main meter readings are considered for billing.

For determination of emission reductions, if the main meters are working within their accuracy class, the main meter readings are to be considered in accordance with values reported in JMR Statements and Pro Forma Invoices. In the event that KPTCL reports a malfunctioning of a particular main meter and adopts the respective check meter readings for billing, check meter readings can be considered for emission reduction calculations in accordance with the parameters reported in the respective JMR Statements and Pro Forma Invoices.

In the rare event that both the main meter and respective check meter malfunction, the percentage of error reported by KPTCL officials (if applicable) can be noted by the monitoring team and adjustments to emission reductions would be made on a conservative basis.

MSPL Limited has formulated a CDM Team to ensure proper and continuous monitoring of the performance of turbines and generation of power. The CDM Team is headed by the Board of MSPL and the structure is as follows.



Functions of the CDM Team:

The Wind Division reports to the Business Head of the Wind Division who reports directly to the Board of MSPL Limited. The Management and Corporate Staff of the MSPL Wind Division are responsible for coordinating with Site Personnel as well as the O&M contractors and the power off-takers (KPTCL & BESCOM). Site personnel are located at individual sites and are responsible for collection and transfer of monitored data from respective sites to the corporate office. The CDM team has the following overall functions:

- Collection of monitoring data for power generation by the project activity
- Maintenance of records and backup of relevant data for verification
- Coordination with KPTCL for maintenance and calibration of monitoring equipment
- Coordination with O&M contractors to ensure continuous functioning of WEGs

Functions of KPTCL & BESCOM:

In presence of MSPL representatives, KPTCL staff note the meter readings every month and generate a record for the power supplied to the grid. KPTCL issues Joint Meter Reading Statements every month. Based on the monthly Joint Meter Reading Statements, Pro Forma Invoices are generated, on which basis BESCOM issues payments against electricity supplied to grid. The energy meters used are sealed and cannot be accessed by the project promoters independently of KPTCL officials. KPTCL officials are responsible for attending to any malfunctioning of the energy meters and associated equipment. KPTCL officials are also responsible for carrying out calibration of the energy meters.

Functions of O&M Contractors:

The O & M contractor operates and maintains the project activity through a full fledged trained service organization stationed at the site. The Service set up consists of site in-charge, service engineers, machine operators and security personnel. The number of personnel depends on the size of the site. The service engineers at site have been professionally trained. The service set up at site is equipped with motor cycles and other utility vehicles for immediate access to the machines. Essential spares

are stocked at site stores apart from the other stocks kept at Central storage location. The service organization carries out the following activities:

Shall perform the following services in relation to the Equipment in accordance with

- The O&M Manuals, the safety management plans and procedures and as per the manufacturers recommendations, where applicable or
- In accordance with accepted industry practices

Services involving Labour only:

- Routine Maintenance Services involving labour work

Routine Maintenance Labour Work involves making available suitable manpower for operation and maintenance of the equipment and covers periodic preventive maintenance, cleaning and upkeep of the equipment including -

- Tower Torquing
- Blade Cleaning
- Nacelle Torquing and Cleaning
- Transformer Oil Filtration
- Control Panel & LT Panel Maintenance
- Site and Transformer Yard Maintenance

- Security Services

This service includes watch and ward and security of the wind farm and the equipment.

- Management Services

- a) Data logging in for power generation, grid availability, machine availability.
- b) Preparation and submission of monthly performance report in agreed format.
- c) Taking monthly meter reading jointly with UTILITY, of power generated at Customer's Wind Farm and supplied to UTILITY Grid from the meter/s maintained by UTILITY for the purpose and co-ordinate to obtain necessary power credit report/ certificate.

- Technical Services

- Visual inspection of the WTGs and all parts thereof.
- Technical Assistance including checking of various technical, safety and operational parameters of the Equipment, trouble shooting and relevant technical services.

- Crane Services for attending Breakdown Repairs

- a. This involves providing Crane whenever required for attending Breakdown repairs.

Maintenance & Repair Work involving Labour & Material

- I - Maintenance Work involving labour and materials

This involves labour as well as use of materials and consumables such as lubricants and oils, minor/ low value electrical and mechanical parts, etc. for preventive maintenance and upkeep of the Equipment including –

- HT Line and Electrical Maintenance
- Greasing of Rotor Bearings, Gear Box and Generator
- Topping up of Gear Box, Hydraulic and Transformer Oil

➤ II - Breakdown Repair Work involving labour and materials

The Breakdown repair Work involve labour and use of components, spares and consumables in the event of any breakdown or suspected breakdown due to operational reasons in the Equipment or any part thereof. The breakdown shall be attended as soon as practically possible to put the Equipment back into operation. The breakdown repairs cover cost of labour, spares/ materials and other works, which includes,

- a) Spares repairs/replacement
- b) Major breakdown as mentioned below -
 - a. Repairs/replacement of Generator and Motors
 - b. Repairs/replacement of Gear Box
 - c. Repairs/replacement of Transformers
 - d. Repairs/replacement of VCB
 - e. Repairs/replacement of Blades
 - f. Repairs/replacement of Controller and Control Panel
 - g. Repairs/replacement of Tower structure
- d) Total replacement of oil in Gear Boxes and Transformers
- e) Painting of Equipment

The individual/group of WTGs of the project activity is/are connected to 18 metering points (the meter Ids are provided in annexure 1: Energy Meter Specifications) which are all located at the project site. These are then, in turn, connected to 33/66 kV receiving substations. An illustration of the same is provided in figures 1 to 4 below.

Metering location	No. of WTGs	Connected substation
MRB-03-K131, MRB-03-K140, MRB-03-K147, MRB-03-K161, MRB-03-K141	40	33/66 kV Suzlon substation at Sogi
JMT-03, JMT-05, JMT-01	9	33/66 kV Suzlon substation at Chitradurga
GRHP-01, GRHP-08, GRHP-09, GRHP-05, GRHP-06, GRHP-14	24	33/66 kV NEG Micon substation at Chitradurga
JJK-07, JJK-06, JJK-08, JJK-05	34	33/66 kV Suzlon substation at Jajjikalgudda

Figure 2: Schematic of WTGS connected to Suzlon 33/66 kV Substation at Sogi

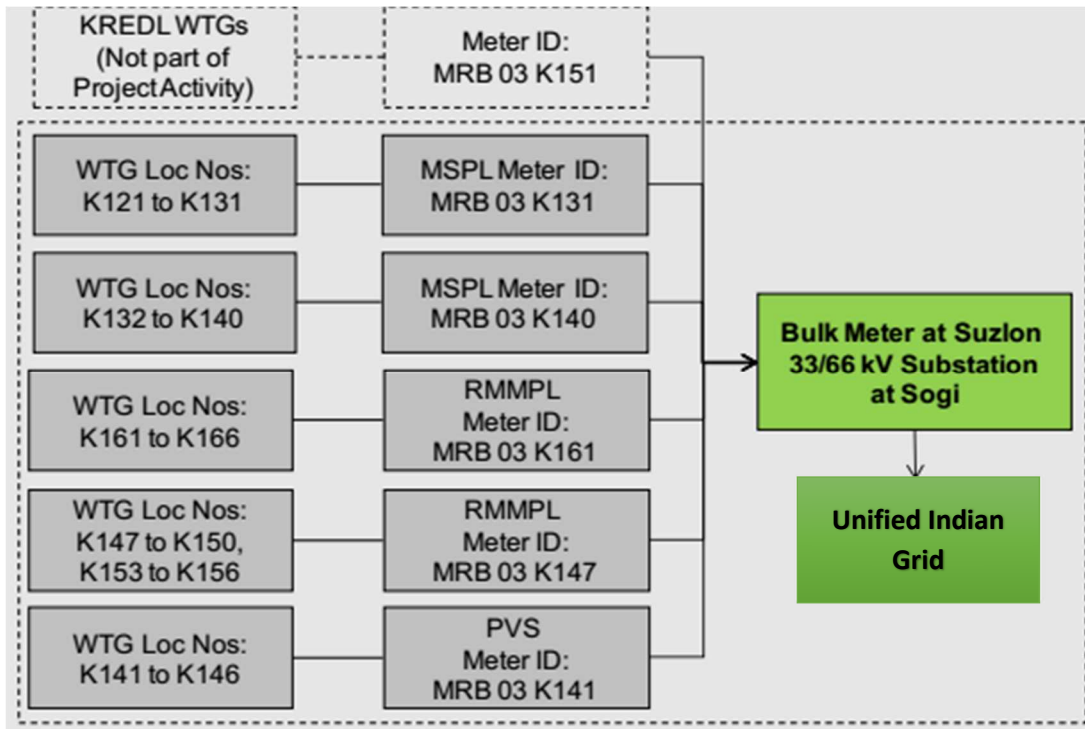


Figure 3: Schematic of WTGs connected to Suzlon 33/66 kV Substation at Chitradurga

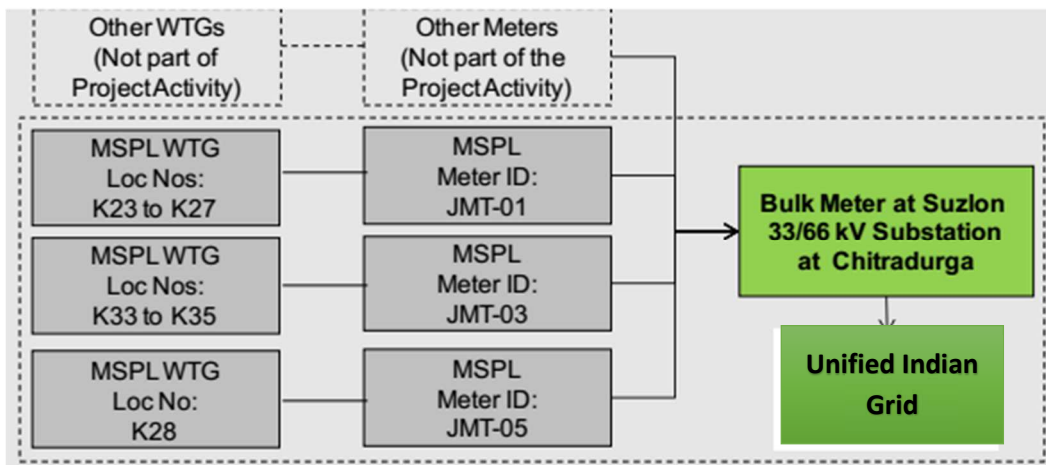


Figure 4: Schematic of WTGs connected to NEG Micon 33/66 KV Substation at Chitradurga

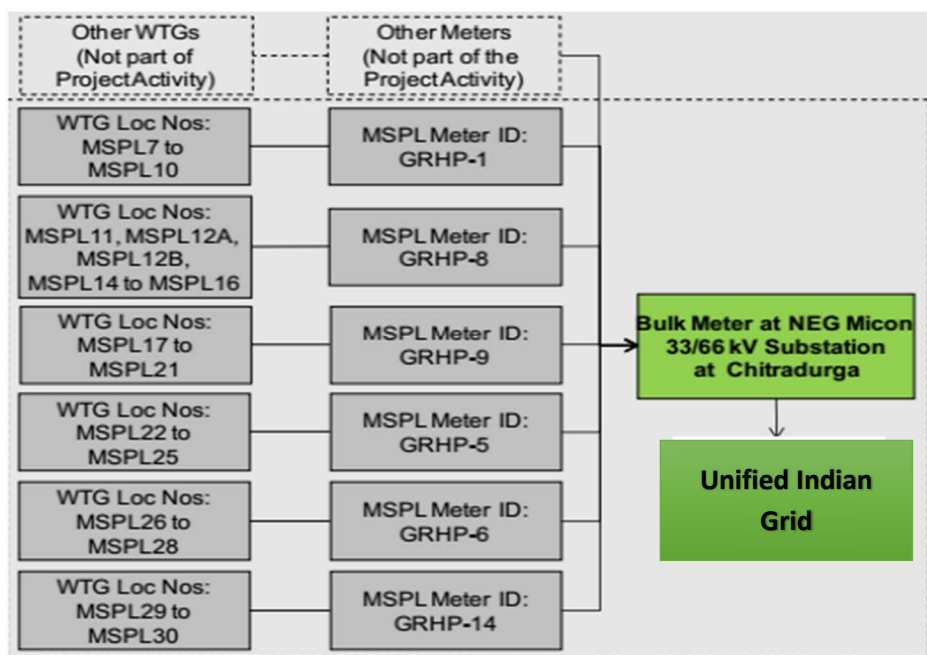
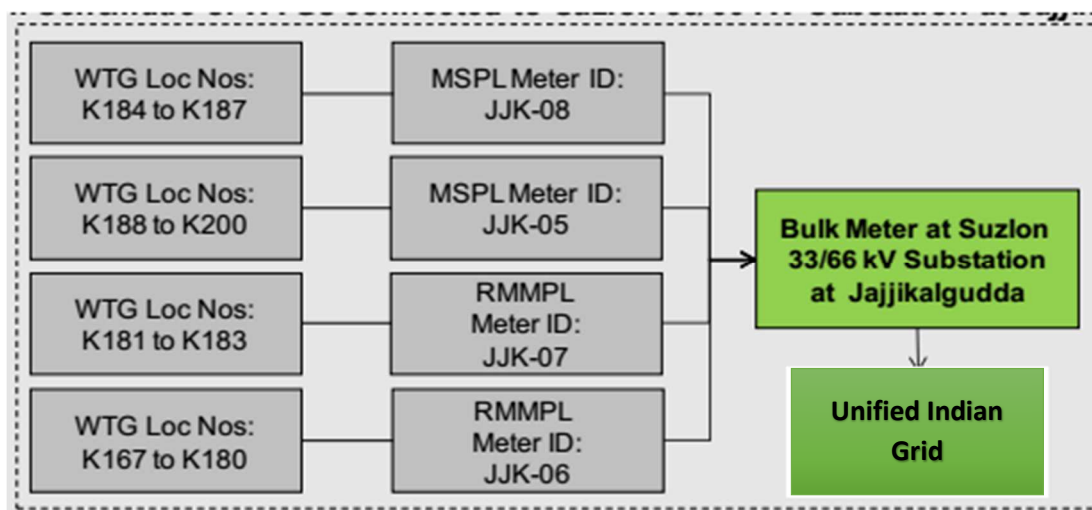


Figure 5: Schematic of WTGs connected to Suzlon 33/66 KV Substation at Jajjikalgudda



SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF _y
Unit	tCO ₂ /MWh
Description	CO ₂ emission factor of the grid
Source of data	KPTCL/CEA
Value(s) applied	0.9071
Choice of data or measurement methods and procedures	The value applied is taken from the plant from CEA reviews.
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is calculated once at the beginning of the crediting period (i.e. fixed ex-ante).

Data/Parameter	EF_{OM, y}
Unit	tCO ₂ /MWh
Description	CO ₂ operating margin emission factor of the grid
Source of data	KPTCL/CEA
Value(s) applied	1.18519
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is calculated once at the beginning of the crediting period (i.e. fixed ex-ante).

Data/Parameter	EF_{BM, y}
Unit	tCO ₂ /MWh
Description	CO ₂ build margin emission factor of the grid
Source of data	KPTCL/CEA
Value(s) applied	0.629
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is calculated once at the beginning of the crediting period (i.e. fixed ex-ante).

Data/Parameter	F_{i,j, y}
Unit	Tons
Description	Amount of fossil fuel i, consumed by each power source/plant in year y
Source of data	KPTCL/CEA
Value(s) applied	Refer annexure 2 “Ex-ante Values”
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is calculated once at the beginning of the crediting period (i.e. fixed ex-ante).

Data/Parameter	CO_{EFi,j, y}
Unit	tCO ₂ /ton of fuel
Description	CO ₂ emission factor of each fuel type i
Source of data	IPCC/local
Value(s) applied	Refer annexure 2 “Ex-ante Values”
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is calculated once at the beginning of the crediting period (i.e. fixed ex-ante).

Data/Parameter	GEN_{j,y}
Unit	MWh/annum
Description	Electricity delivered to the grid by power source j in year y
Source of data	KPTCL/CEA
Value(s) applied	Refer annexure 2 “Ex-ante Values”
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is calculated once at the beginning of the crediting period (i.e. fixed ex-ante).

D.2. Data and parameters monitored

Data / Parameter:	EG_y
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Unit:	MWh
Description:	Electricity supplied to the grid by the project activity
Measured/ Calculated / Default:	Calculated
Source of data:	KPTCL and BESCO records
Value(s) of monitored parameter:	308195.66 (month-wise values can be found in the electronic spreadsheet for emission reductions)
Monitoring equipment:	The parameter is a calculated figure based on the values of gross electricity export from the project activity, electricity import by the project activity and transmission losses.
Measuring/ Reading/ Recording frequency:	Monthly recording
Calculation method (if applicable):	The electricity supplied to the grid by the project activity is calculated as follows: $EG_y = E_{EXP,y} - E_{TL,y} - 115\% * E_{IMP,y}$ Where, $E_{EXP,y}$ = Gross electricity export from the project activity $E_{TL,y}$ = Transmission losses $E_{IMP,y}$ = Electricity import by the project activity
QA/QC procedures:	There are no QA/QC procedures to be followed as the data parameter is a calculated figure.
Purpose of data:	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	$E_{EXP,y}$
Unit:	MWh
Description:	Gross electricity export from the project activity
Measured/ Calculated / Default:	Measured
Source of data:	KPTCL and BESCO records
Value(s) of monitored parameter:	313969.46 (month-wise values can be found in the electronic spreadsheet for emission reductions)
Monitoring equipment:	There are 18 pairs of main and check energy meters connected to the project activity WTGs. All these energy meters are electronic tri-vector meters of accuracy class 0.2%. Other energy meter details (such as serial numbers & calibration details) are provided in Annexure 1.
Measuring/ Reading/ Recording frequency:	Recording frequency: On a monthly basis, joint meter readings (JMRs) of the energy meters located at the 18 metering points are recorded by representatives of the project promoter and the respective government authorities.
Calculation method (if applicable):	Not Applicable

QA/QC procedures:	The values of gross electricity export from the project activity in JMR statements are compared with values in proforma invoices and the more conservative (i.e. lower) among the two have been considered. It is to be noted that during the monitoring period, there are no differences observed in the values of gross electricity export recorded in the JMR and in the proforma invoice.
Purpose of data:	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	E_{IMP, y}
Unit:	MWh
Description:	Electricity import by the project activity
Measured/ Calculated / Default:	Measured
Source of data:	KPTCL and BESCO records
Value(s) of monitored parameter:	753.262 (month-wise values can be found in the electronic spreadsheet for emission reductions)
Monitoring equipment:	There are 18 pairs of main and check energy meters connected to the project activity WTGs. All these energy meters are electronic tri-vector meters of accuracy class 0.2%. Other energy meter details (such as serial numbers & calibration details) are provided in Annexure 1.
Measuring/ Reading/ Recording frequency:	Recording frequency: On a monthly basis, joint meter readings (JMRs) of the energy meters located at the 18 metering points are recorded by representatives of the project promoter and the respective government authorities.
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	The values of electricity import from the project activity in JMR statements are compared with values in proforma invoices and the more conservative (i.e. higher) among the two have been considered. It is to be noted that during the monitoring period, there are no differences observed in the values of electricity import recorded in the JMR and in the proforma invoice.
Purpose of data:	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	E_{TL, y}
Unit:	MWh
Description:	Transmission losses
Measured/ Calculated / Default:	Calculated (month-wise values can be found in the electronic spreadsheet for emission reductions)
Source of data:	KPTCL and BESCO records
Value(s) of monitored parameter:	4907.55
Monitoring equipment:	This is a calculated parameter.

Measuring/ Reading/ Recording frequency:	Monthly recording
Calculation method (if applicable):	This parameter is calculated based on the measured values of electricity export from the bulk meter at the substation and export from individual meters connected to the substation. These electricity export values are measured on an hourly basis and are recorded on a monthly basis. The transmission losses have been calculated from these monthly recordings of electricity export and the transmission loss calculation sheets are submitted by KPTCL every month along with the JMRs. Details on calculation of transmission losses are provided under "Calculation of transmission losses" under section C. "Description of the monitoring system" of this monitoring report.
QA/QC procedures:	The values of transmission losses in JMR statements are compared with values in proforma invoices and the more conservative (i.e. higher) among the two have been considered. It is to be noted that during the monitoring period, there are no differences observed in the values of transmission loss recorded in the JMR and in the proforma invoice.
Purpose of data:	Calculation of baseline emissions
Additional comment:	-

D.3. Implementation of sampling plan

All data and parameters are monitored completely. No sampling approach has been used to determine any of the data or parameters. Hence this section is not applicable.

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

The baseline emissions are calculated as the product of the electricity supplied to the grid by the project activity (EG_y) in MWh and the Baseline Emission Factor (EF_y) of the Unified Indian grid of India in tCO_2/MWh . The baseline emission factor was fixed ex-ante as $0.9071 tCO_2/MWh$. Therefore baseline emissions are calculated as:

$$BE_y = EG_y * EF_y = 308195.66 * 0.9071 = 279564 tCO_2e \text{ (Rounded Down value)}$$

Summary of baseline emissions calculations

Parameter	Units	Period: January 2013 - March 2014	Symbol
Gross electricity export from the project activity ($E_{EXP,y}$)	MWh	313969.46	A
Electricity import by the project activity ($E_{imp,y}$)	MWh	753.262	
Actual electricity imported by project activity ($E_{imp,y} * 115\%$)	MWh	866.25	B
Transmission losses ($E_{TL,y}$)	MWh	4907.55	C
Electricity supplied to the grid by the project activity (EG_y)	MWh	308195.66	D=A-B-C
CO ₂ emission factor of the grid (fixed ex-ante) (EF_y)	tCO_2/MWh	0.9071	E
Baseline Emissions (BE_y)	tCO_2e	279564	DXE

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

In accordance with the applied methodology and the registered PDD, there are no project emissions for the project activity.

Therefore, $PE_y = 0 \text{ tCO}_2\text{e}$

E.3. Calculation of leakage emissions

In accordance with the applied methodology and the registered PDD, there are no leakage emissions for the project activity.

Therefore, $L_y = 0 \text{ tCO}_2\text{e}$

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

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)
Total	279,564	0	0	279,564

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 ₂ e)	Amount estimated ex ante for this monitoring period in the PDD (t CO ₂ e)
279,564	308,744

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

As per the UNFCCC database the amount of reductions for this project activity is 253,240 tCO₂ equivalent per annum. The monitoring period duration is from 1st January, 2013 to 21st March, 2014 which is total of 445 days. So estimated reduction for current monitoring period is calculated with the help of emission value per annum.

Estimated ex-ante for this monitoring period = $253,240 \times (445/365)$
 = 308,744 tCO₂e (Rounded down)

E.6. Remarks on increase in achieved emission reductions

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 308,744 tCO₂e, whereas actual emission reductions achieved are 279,564 tCO₂e, which is approximately 10.44% lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, which are not within the control of the project participant. The lower generation during the current verification period is due to certain natural conditions. Hence, it is acceptable.

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

As the project activity is of 125MW wind power project, so it is a large-scale project activity. Hence, this section is not applicable.

ANNEXURE I: ENERGY METER SPECIFIC ATIONS

Meter ID	No. of WTGs	Main Meter No.	Check Meter No.	Date of last calibration of meters	Schedule date of calibration	Actual Calibration date	Delay in Calibration
RR NO. MRB-03-K-131	11	04249306	11070453	11-Apr-12	10-Apr-13	28-May-13	49 days
RR NO. MRB-03-K-140	9	04249330	04249308	20-Jul-12	19-Jul-13	28-May-13	No delay
RR NO. MRB-03-K141	6	04249305	04249310	19-Jul-12	18-Jul-13	18-July-13 17-Aug-13	No delay
RR NO MRB-03-K147	8	04249354	04249359	19-Jul-12	18-Jul-13	18-Jul-13	No delay
RR NO MRB-03-K-161	6	04249295	04249296	19-Jul-12	18-Jul-13	18-Jul-13	No delay
RR NO JJK-06	14	11070450	04249329	23-Apr-12	22-Apr-13	11-June-2013 17-Sep-2013	51 days
RR NO JJK-07	3	04249320	04249360	23-Apr-12	22-Apr-13	11-June-2013 17-Sep2013	51 days
RR NO JJK-08	4	04249346	04249340	23-Apr-12	22-Apr-13	11-June-2013 17-Sep-2013	51 days
RR NO JJK-05	13	04249322	04249323	23-Apr-12	22-Apr-13	11-June-2013 17-Sep-2013	51 days
RR NO JMT-05	1	09142614	11068954	26-Jun-12	25-Jun-13	11-Mar-13	Nil
RR NO JMT-03	3	09142201	08001367	26-Jun-12	25-Jun-13	11-Mar-13	Nil
RR NO. GRHP-01	4	Old : 2307542 New : 12093142	Old:2307543 New: 09142239	10 May 2012 23 July 2012 21 December 2012	20-Dec-13	24 April 2013 13 January 2014	Nil
RR NO. GRHP-08	6	04186306	04186299	10-May-12	9-May-13	23-Apr-13	Nil
RR NO. GRHP-09	5	09141515	04186304	15-May-12	14-May-13	18-Apr-13	Nil
RR NO. GRHP-05	4	09142205	04179678	10-May-12	9-May-13	24-Apr-13	Nil

RR NO. GRHP-06	3	04179664	04179679	14-Feb-12	13-Feb-13	17-Apr-13	64 days
RR NO. GRHP-14	2	04186311	04186289	10-May-12	9-May-13	23-Apr-13	Nil
RR NO JMT-01	5	04186263	04179544	26-Jun-12	25-Jun-13	11-Mar-13	Nil

ANNEXURE II: EX- AN TE VALUES ²Amount of fossil fuel i, consumed by each power source/plant ($F_{i,j,y}$)

Parameter	Year	Coal	Furnace oil	Diesel oil	LSHS (steam)	Gas	Naphtha	HSD (gas stations)	Natural Gas	Diesel	LSHS (diesel)	Lignite
$F_{i,j,y}$	Unit	Tons/year	Tons/year	Tons/year	Tons/year	m ³ /year	Tons/year	Tons/year	Million m ³ /year	Tons/year	Tons/year	Tons/year
	2001-02	53107000	115103. 7	5821.65	7321.6	0.00	149197. 41	4614.65	3230	648561. 05	0	17318250
	2002-03	65997000	103163. 46	7145.95	5361.84	0	322854. 84	233853. 7	3130	736047. 3	0	17738000
	2003-04	52985000	50275.21	28076.35	4672.8	19322740 00	478596. 51	192933. 85	2010	12667.55	569756. 88	20755000

CO₂ emission factor of each fuel type i ($COEF_{i,j,y}$)

Parameter	Year	Coal	Furnace oil	Diesel oil	LSHS (steam)	Gas	Naphtha	HSD (gas stations)	Natural Gas	Diesel	LSHS (diesel)	Lignite
$COEF_{i,j,y}$	Unit	tCO ₂ /ton of fuel	tCO ₂ /ton of fuel	tCO ₂ /ton of fuel	tCO ₂ /ton of fuel	kgCO ₂ /m ³ of gas	tCO ₂ /ton of fuel	tCO ₂ /ton of fuel	tCO ₂ /million m ³ of gas	tCO ₂ /ton of fuel	tCO ₂ /ton of fuel	tCO ₂ /ton of fuel
	2001-02	1.91	3.19	3.16	3.18	NA	3.284	3.160	2120.024	3.16	3.18	1.09
	2002-03	1.64	3.26	3.00	3.20	NA	3.284	2.996	2120.024	3.00	3.20	1.12
	2003-04	1.51	3.15	3.13	3.13	0.47	3.284	3.127	2120.024	3.13	3.13	1.14

² All values are taken from the registered PDD

Electricity delivered to the grid by power source j in year y ($GEN_{j,y}$)

Parameter	Year	Coal & Lignite	Gas	Diesel
$GEN_{j,y}$	Unit	MWh	MWh	MWh
	2001-02	84031.63	10329.45	4135.12
	2002-03	92053.19	13950.10	4358.50
	2003-04	95898.00	16949.00	3225.00

Document information

Version	Date	Description
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • 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.

<i>Version</i>	<i>Date</i>	<i>Description</i>
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • 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).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

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