



**Monitoring report form for CDM project activity
(Version 07.0)**

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

MONITORING REPORT

Title of the project activity	Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system	
UNFCCC reference number of the project activity	UNFCCC reference number 1351	
Version number of the PDD applicable to this monitoring report	05	
Version number of this monitoring report	05	
Completion date of this monitoring report	23/07/2019	
Monitoring period number	7 th Monitoring Report	
Duration of this monitoring period	01/01/2013 to 28/12/2017 (Both days included)	
Monitoring report number for this monitoring period	1	
Project participants	The project participant is Delhi Metro Rail Corporation (DMRC)	
Host Party	India	
Applied methodologies and standardized baselines	AMS III.C. "Emission reduction by low greenhouse gas emitting vehicles" Version: 10	
Sectoral scopes	7	
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
	-	226,516 tCO ₂
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	242,713 ¹ tCO ₂	

¹Ex-ante for the year 2017 (01/01/2017 to 31/12/2017) as per PDD is 51,577 tCO₂, however we are considering period from 01/01/2017 to 28/12/2017 as the crediting period of the project is till 28/12/2017, therefore, we are taking ex-ante value as 51,153 tCO₂ (51,577*362/365).

SECTION A. Description of project activity

A.1. General description of project activity

>>

Purpose of the project activity and the measures taken to reduce greenhouse gas emissions.

The project activity operates low GHG emitting rolling stocks having regenerative braking system in Delhi Metro Rail Corporation (DMRC). The project activity replaces the conventional electro-dynamic rheostatic braking technology, with regenerative braking technology fitted rolling stocks. The regenerated electrical energy reduces the consumption of equivalent grid electrical energy required by the powering trains, thereby conserving electrical energy and subsequently leading to GHG emission reduction.

Brief description of the installed technology and equipments.

Delhi Metro Rail Corporation (DMRC) has electrical driven Mass Rapid Transport System, which uses 4/6/8 car rolling stocks on different service lines

The project was registered for 280 cars employed on 70 rolling stock with 4 car configuration. A typical four car rolling stock used by DMRC consists of two units. Each unit in the rolling stock comprise of two cars, a Driving Trailer car (DT) and a Motor Car (M). The Delhi Metro System is designed for rolling stock where coaches are equipped with 3 phase AC traction motors with regenerative braking system. The regenerative braking technology employed in DMRC is different from the prevalent system adopted by metro system in the country, which uses conventional electro-dynamic rheostatic braking system. The electro-dynamic rheostatic braking system converts the kinetic energy of decelerating Rolling stock into the thermal energy of rheostats, which is dissipated as heat without regenerating electrical energy while decelerating. Hence, the choice made by DMRC for using regenerative braking technology displays the environmental consciousness of the management.

During the monitoring period, similar units were added to existing four car configuration and thus making them six/eight car configuration rolling stock. Since, the additional units are not part of registered PDD, hence these have not been considered in the monitoring period of 2013-2017.

The technology for regenerative braking system in the rolling stock is provided by Mitsubishi Electric Corporation, Japan without any technology transfer. The regenerative braking system works on the principle of converting kinetic energy of the rolling stock while decelerating, into electrical energy using 3 phase Induction motor and Variable Voltage Variable Frequency Control (VVVF) Technology. In the regenerative mode, the traction motors work as generators and the Converter- Inverter (CI) converts the electrical energy regenerated to Direct Current (DC). The DC is subsequently converted to single-phase line frequency AC voltage, which is stepped up by transformer to the level of 25 kV. The single phase line frequency AC voltage is then fed back to the Over Head Equipment (OHE). The regenerated electrical energy supplied back to the OHE is used by other accelerating Rolling stock in the same service line. The regenerated electrical energy reduces the consumption of equivalent amount of grid electrical energy which would otherwise have been consumed by the accelerating trains, thereby conserving electrical energy and reducing GHG emissions.

All the 70 Rolling Stocks were under operation during the monitoring period i.e. 01/01/2013 to 28/12/2017. No special event took place during the monitoring period i.e. 01/01/2013 to 28/12/2017. Further no equipment related to project activities has been exchanged.

No events or situations took place during current monitoring period which would have impacted the applicability of the methodology used in the project activity.

Total emission reductions achieved in this monitoring period.

Emission reductions during monitoring period are as follows:

For the Monitoring Period from 01/01/2013 to 31/12/2013: 44,474

For the Monitoring Period from 01/01/2014 to 31/12/2014: 42,822

For the Monitoring Period from 01/01/2015 to 31/12/2015: 44,031

For the Monitoring Period from 01/01/2016 to 31/12/2016: 48,351

For the Monitoring Period from 01/01/2017 to 28/12/2017: 46,838

Total Emission Reduction: 226,516 tCO₂

A.2. Location of project activity

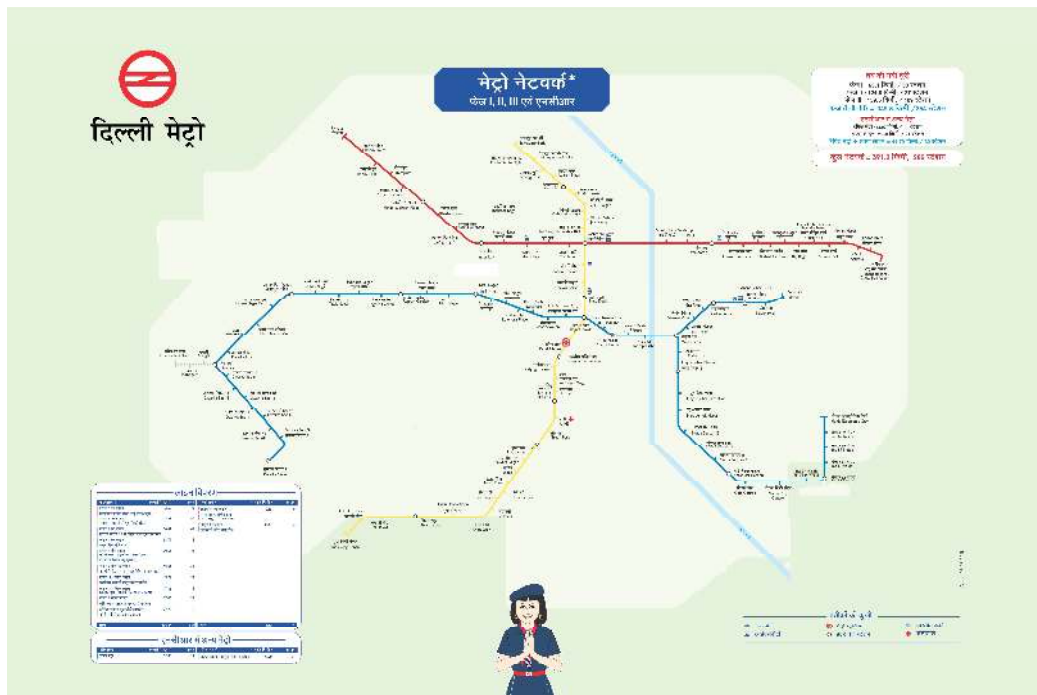
>>

The project activity has been implemented in Delhi, India. The geographical details of the project site are given below:

Longitude	77.23 ⁰ E
Latitude	28.61 ⁰ N

The project activity has been implemented in Delhi on the following metro corridors:

- Dilshad Garden- Rithala
- Samaypur Badli - Huda City Center
- Noida City Centre- Dwarka Sector 21
- Vaishali-Yamuna Bank



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 Party)	Delhi Metro Rail Corporation	No

A.4. References to applied methodologies and standardized baselines

>>

Title: AMS III.C. "Emission reduction by low greenhouse gas emitting vehicles"

Version: 10

The methodology is available at following link:

<https://cdm.unfccc.int/methodologies/DB/AWVYMI7E3FP9BDRQ646203OVPKFPQB>

Date: 23/12/2006

Reference: "Appendix B- Indicative Simplified Baseline and monitoring Methodologies for Selected Small Scale CDM Project Activities"

Type III – Other project activities

A.5. Crediting period type and duration

>>

Fixed; 10 years starting from 29/12/2007

SECTION B. Implementation of project activity**B.1. Description of implemented project activity**

>>

The introduction of low GHG emitting rolling stocks having regenerative braking system in Delhi Metro Rail Corporation (DMRC) has been commissioned in the three corridors (four service lines).

There are five different depots on these operational lines. The depots on various service lines are as follows:

Service Line	Corridor	Operational depots
1	Dilshad Garden- Rithala	Shastri Park Depot (SPD)
2	Jahangirpuri - Huda City Center	Khyber Pass Depot (KPD) and Sultanpur Depot (SLPD)
3 & 4	Noida City Centre - Dwarka Sec 21, Vaishali – Yamuna Bank	Yamuna Bank Depot (YBD) and Najafgarh Depot (NJFD)
70		

The distributions of Rolling stock on different lines at the end of 6th crediting period (year 2012) and the distributions of Rolling stock on different lines at the end of year 2013 are same and is reproduced below:

S. No.	Service Line	Operational Depot	Number of Rolling Stock
1.	1	Shastri Park Depot (SPD)	29
2.	2	Khyber Pass Depot (KPD)	10
		Sultanpur Depot (SLPD)	-

3.	3 & 4	Najafgarh Depot (NFD)	31
		Yamuna Bank Depot (YBD)	-

The Rolling stock No. TS#30 and TS#31 were shifted from NFD (Service Line – 3 & 4) to YBD (Service Line – 3 & 4) in the month of January 2014 and the Rolling Stock No. MC 01 and MC 02 were shifted from KPD (Service Line – 2) to SLPD (Service Line - 2) in the month of April 2014.

Also, Rolling stock No. TS#27, TS#28 and TS#29 were shifted from NFD (Service Line – 3 & 4) to YBD (Service Line – 3 & 4) in the month of September 2014 and Rolling stock No. TS#26 was shifted from NFD (Service Line – 3 & 4) to YBD (Service Line – 3 & 4) in the month of November 2014.

The revised Number of Rolling stocks at the end of year 2014 are as follows:

S. No.	Service Line	Operational Depot	Number of Rolling Stock
1.	1	Shastri Park Depot (SPD)	29
2.	2	Khyber Pass Depot (KPD)	8
		Sultanpur Depot (SLPD)	2
3.	3 & 4	Najafgarh Depot (NFD)	25
		Yamuna Bank Depot (YBD)	6

The distributions of Rolling stock on different lines at the end of year 2015 are as follows:

S. No.	Service Line	Operational Depot	Number of Rolling Stock
1.	1	Shastri Park Depot (SPD)	29
2.	2	Khyber Pass Depot (KPD)	8
		Sultanpur Depot (SLPD)	2
3.	3 & 4	Najafgarh Depot (NFD)	25
		Yamuna Bank Depot (YBD)	6

The distributions of Rolling stock on different lines at the end of year 2016 are as follows:

S. No.	Service Line	Operational Depot	Number of Rolling Stock
1.	1	Shastri Park Depot (SPD)	29
2.	2	Khyber Pass Depot (KPD)	8
		Sultanpur Depot (SLPD)	2
3.	3 & 4	Najafgarh Depot (NFD)	25
		Yamuna Bank Depot (YBD)	6

The Rolling Stock No. MC#1 was shifted from SLPD (Service Line – 2) to SPD (Service Line – 1) in the month of November 2017 and another Rolling stock No. MC#3 was shifted from KPD (Service Line – 2) to SPD (Service Line – 1) in the month of December 2017. The revised Number of Rolling stocks at the end of year 2017 are as follows:

S. No.	Service Line	Operational Depot	Number of Rolling Stock
1.	1	Shastri Park Depot (SPD)	31
2.	2	Khyber Pass Depot (KPD)	7
		Sultanpur Depot (SLPD)	1
3.	3 & 4	Najafgarh Depot (NFD)	25
		Yamuna Bank Depot (YBD)	6

All the 70 Rolling Stocks were under operation during the monitoring period i.e. 01/01/2013 to 28/12/2017.

No special event took place during the monitoring period i.e. 01/01/2013 to 28/12/2017. Further no equipment related to project activities has been exchanged.

No events or situations took place during current monitoring period which would have impacted the applicability of the methodology used in the project activity.

B.2. Post-registration changes

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

>> NA

B.2.2. Corrections

>>

Post Registration Changes (PRC) reference no. is PRC-1351-002 and it has been approved by UNFCCC on 21/12/2013.

The PDD version number changed. The average CERs also got changed to 47,053 tCO₂. These changes are due to changes in design, which does not affect the Applicability, Additionality and scale of project activity. The CERs changed due to the extensions of Corridor length of service line 1, line 2 and line 3, the respective extensions of all the three lines commissioning documents has been checked as well as verified during the site visit also mentioning of actual values already accepted by UNFCCC in the earlier verifications.

The project is realized in three Phases, Phase I, Phase II and Phase III. Phase II & Phase III are added in section B.3 of the PDD to include all project phases of the three service lines (Red, Yellow & Blue Lines) explicitly in the project boundary.

Phase III considers an extension of the metro system by 9.989 km. Accordingly, the ex-ante emission reductions have been estimated and the value has changed from 47,890 tCO₂ to 51,577 tCO₂

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

>> NA

B.2.4. Inclusion of monitoring plan

>> NA

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

>>

Post Registration Changes (PRC) reference no. is PRC-1351-002 and it has been approved by UNFCCC on 21/12/2013.

The monitoring plan has been updated with respect to emergency procedure for monitoring of data in case the data monitoring system fails. This is in compliance with the monitoring methodology.

B.2.6. Changes to project design

>>

Post Registration Changes (PRC) reference no. is PRC-1351-002 and it has been approved by UNFCCC on 21/12/2013.

The PDD has been updated now in line with the actual situation. The PDD provides now the details of the three phase implementation, the actual status, the already conducted extension in relation to registered PDD and planned future extension, along with specific details of the extension for each line in each project phase. The changes to the registered PDD are only applicable to the three service lines, Red Line (as Line 1), Yellow (as Line 2) and Line Blue (as Line 3 & 4) of the Delhi Metro Railway System. The PDD has been updated and clearly states that only these lines are to be considered under this project activity. Related section on project boundary has been updated as well. The rolling stock numbers will remain 70 but might be interchanged from one line to another. Now the revised PDD mentions the extensions and planned extensions.

Due to the extension of the corridors, the potential emission reduction increases. Accordingly, the revised PDD section mentions that the CERs will increase as the corridor length increased but will be less than 60,000 tCO₂/year which is the threshold limit for small scale project criteria.

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

>> NA

SECTION C. Description of monitoring system

>>

As per Type III C, monitoring shall track the number of low emission vehicles Operated under the small-scale CDM project activity and the annual units of service for a sample of the vehicles. Emissions from electricity shall be taken into account for electric vehicles.

As per the provisions of paragraph 14 of Draft simplified modalities and procedures for small scale CDM project activities (FCCC/CP/2002/7/Add3, English, page 21) the "Project participants may use the simplified baseline and monitoring methodologies specified in appendix B for their project category" if they meet the applicability criteria of small scale CDM project activity. Since the project activity is a small-scale CDM project of Type III.C category, the monitoring methodology and plan has been developed in line with the guidance provided in paragraph 8 under Type III.C of Appendix B.

The project activity is to install low GHG emitting rolling stock having regenerative braking technology instead of conventional electro-dynamic rheostatic braking system. The emission reduction quantity depends on the number of rolling stock and annual units of service provided by rolling stock units in all the four service lines of DMRC project activity. The monitoring of the all electrical energy data required for estimation of baseline and project emissions for the project activity is through state of the art electronic like Train Integration Management System (TIMS). This is an electronic device very high accuracy of measurement and recording.

The projects activity represent all the rolling stock trains of all the service lines for which electrical energy data is monitored through TIMS during the project activity. The emission reductions from the project activity are estimated by monitoring following parameters annually:

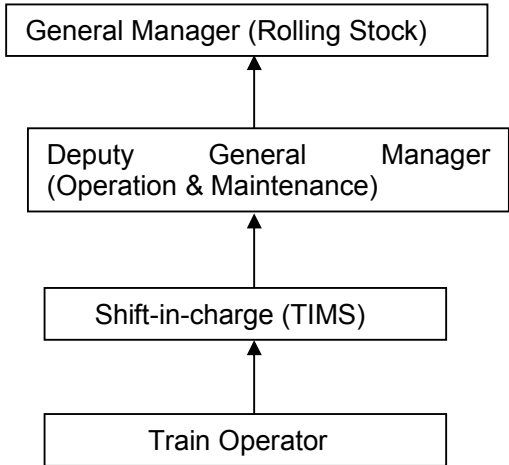
- a) Number of rolling stock in a line
- b) Electrical energy consumed by each rolling stock in a line
- c) Electrical energy regenerated by each rolling stock in a line.

The operation and maintenance staff downloads the TIMS recorded data from the rolling stock on a regular basis and stores this data on a Computer for further records. The parameters are well documented and numbered. The documented parameters are duly signed by respective Rolling Stock Depot in-charges and forwarded to CDM co-coordinator on a monthly basis. The parameters are documented according to the standard procedures quite similar to the ISO requirements. The report received from O&M department is compiled and maintained by CDM coordinator. The report would be retained till 2 years after the end of crediting period or the last issuance of CERs for the project activity whichever occurs later.

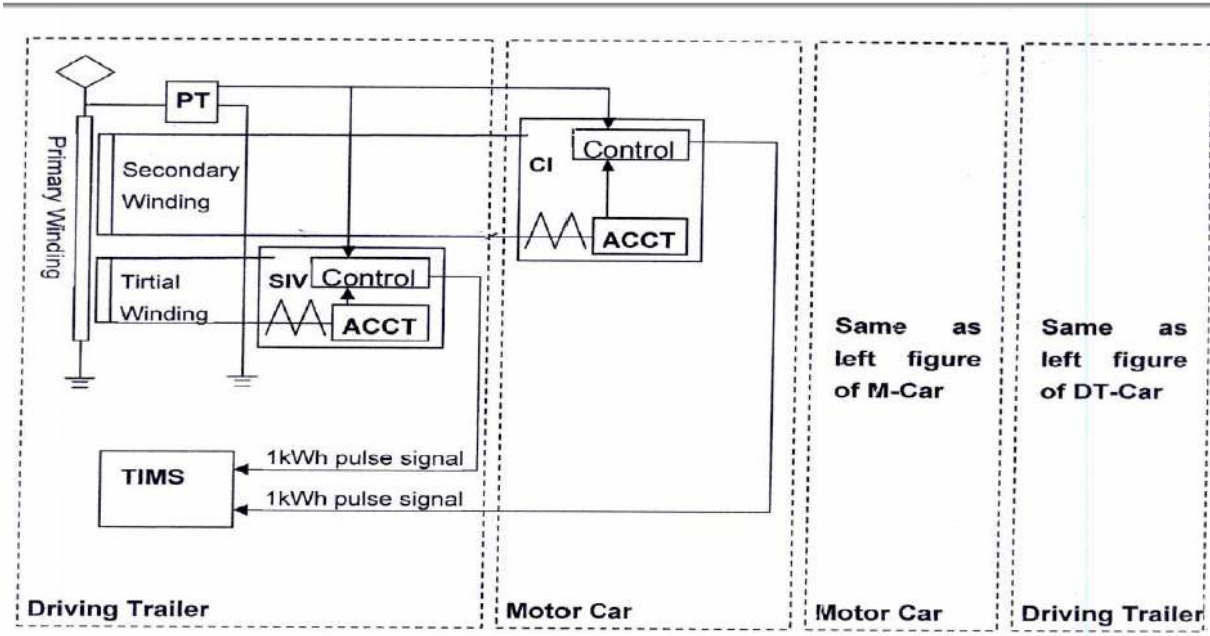
To ascertain the Quality Control and Quality Assurance of the monitored parameters, following procedure is adopted:

- The monitored data is reviewed by conducting an inter-department review meeting once in six months. The Coordinator CDM will discuss the data (received from O&M department) with CDM Team member of concerned department. Once the data is compiled and checked, it will be handed over to Verifier (DMRC official) for verification. After data verification, Auditor (DMRC official) will be invited to carry out the audit for concerned data.
- TIMS in an electronic device which monitors performance of variation subassemblies of the train though a sophisticated software. Hence, no calibration is required on this item.

A comprehensive CDM manual is prepared to illustrate the roles and responsibility of each and every person involved in project activity. The CDM manual also consist of procedure for monitoring of various associated parameters, frequency of monitoring, procedure for data storage and protection procedure for review meetings and procedure for non-conformance of data etc. CDM manual also comprises specimen copy of data formats of technical department.



Metering Diagram



Basic components

- Potential transformer (PT)
- Main transformer
- Current transformer (CT)
- SIV
- CI
- TIMS

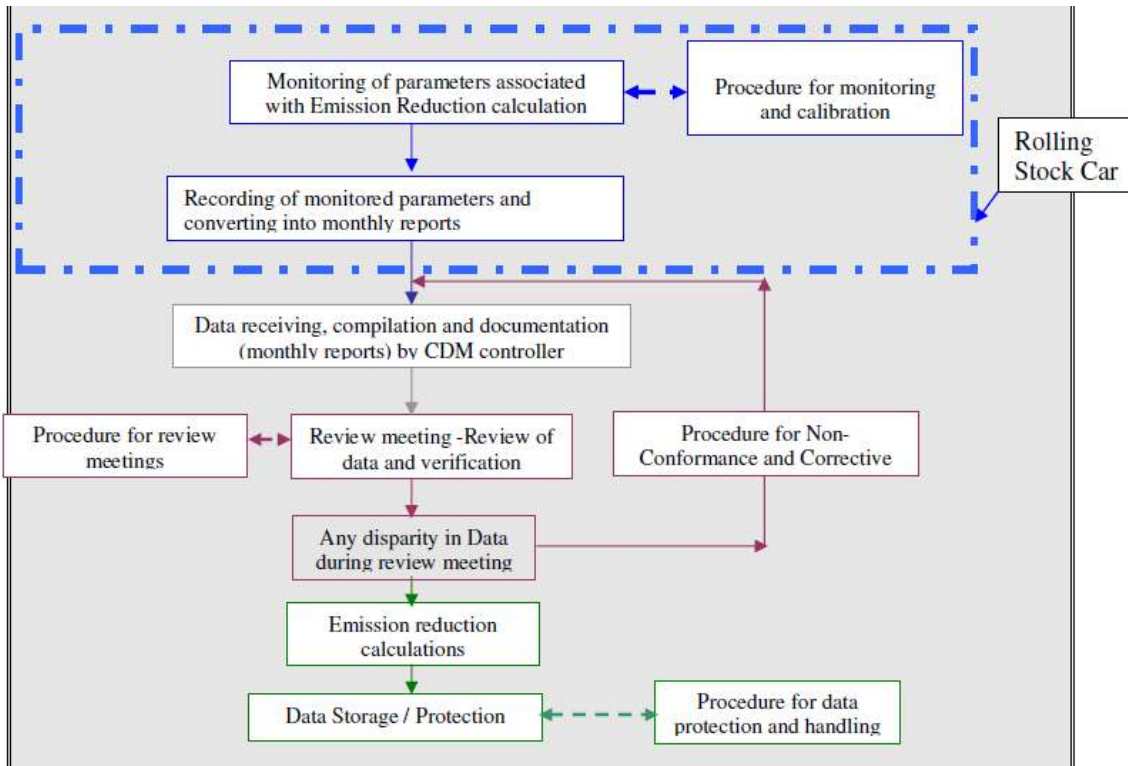
Voltage from pantograph is supplied to both CI and SIV (Main function of CI is to convert AC power to 1900V DC. This 1900V DC is converted into 3 phase AC variable voltage variable frequency by the inverter and supplied to Traction Motors. On the other hand SIV change the input AC power (AC25kV) to 3 phase AC power (AC415V) and supplies the stable 3 phase AC power). Main transformer consists of one primary, two secondary and one tertiary winding. Secondary winding of main transformer is connected to CI, whereas tertiary winding is connected to SIV. Two measuring instrument one CT (Current Transformer) & another one PT (Potential Transformer) is

also placed in the line. PT is placed in parallel of the circuit to measure the voltage where as CT is placed in series for current measurement. Pulse signal of 1kWh each from CI and SIV control panel is supplied to TIMS for indication & monitoring. On TIMS cumulative readings of CI & SIV are recorded.

During failure of main monitoring system, it will not possible to capture the data manually, hence DMRC has decided not to claim CERs for that duration.

The procedure for data monitoring, storage and recording is as per the flow chart mentioned below:

Flow Chart for CDM Data Monitoring, Recording and Storage



The operation and maintenance (O&M) staff downloads the TIMS recorded data from the rolling stock on a regular basis and stores this data on a Computer for further records. The parameters concerned are well documented and numbered. The documented parameters are duly signed by respective Rolling Stock Depot in-charges and forwarded to CDM co-coordinator on a monthly basis. The parameters are documented according to the standard procedures. The report received from O&M department is compiled and maintained by CDM coordinator.

Calibration Procedure:

As per registered PDD of the proposed project, the energy data (EGi, Wr) is measured with TIMS which is software based electronic equipment with high degree of accuracy and it does not require calibration from time to time. However, PP does the calibration of CT/PT on sampling basis and the details of the same can be found in section D2 of this document.

SECTION D. Data and parameters**D.1. Data and parameters fixed ex ante***(Copy this table for each data or parameter.)*

Data/Parameter	EF_y
Unit	tCO ₂ /GWh
Description	Emission Factor for northern grid
Source of data	CO ₂ Emission Factor database, version 2.0 as given by Central Electricity Authority a statutory body under Ministry of Power, Government of India.
Value(s) applied	800
Choice of data or measurement methods and procedures	http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver2.pdf
Purpose of data/parameter	Baseline
Additional comments	Emission Factor from Carbon Emission Database Latest Version 2.0 of Central Electricity Authority, Ministry of Power, Government of India.

D.2. Data and parameters monitored*(Copy this table for each data or parameter.)*

Data/Parameter	EG_{i, wr}
Unit	GWh/year
Description	Electrical energy consumed by the operational rolling stock 'i'
Measured/calculated/default	Measured /Calculated /Default: Measured & Calculated
Source of data	Train Integration and Management System (TIMS) reading
Value(s) of monitored parameter	143.630805 (2013) 140.966359 (2014) 144.344633 (2015) 158.082864 (2016) 154.137179 (2017) (for further details refer Annex 1 of this Monitoring Report)

Monitoring equipment	<p>Electrical energy consumed by each rolling stock is the sum of the electrical energy consumed by the rolling stock 'i' for motoring (M) and the Auxiliary electricity consumption (SIV), both of which are monitored by TIMS. The energy data for monitoring is downloaded from TIMS of Rolling Stock using a maintenance terminal. Since TIMS is software based electronic equipment it has a high degree of accuracy (+0.01%) and as per manufacturer specifications requires no calibration from time to time.</p> <p>Calibration details of CT/PT which are done on sampling basis are mentioned below:</p> <p>CT Sr. No. CT045275, CT045288 Date of Calibration: 17/10/2015</p> <p>CT002844, CT 125493, CT 062839 , CT 080065 Date of Calibration: 26/07/2016</p> <p>PT Sr. No: DMRC/PT-01 Date of calibration: 17/10/2015</p> <p>DMRC/PT-01, DMRC/PT-02 Date of calibration: 26/07/2016</p>
Measuring/reading/recording frequency	The readings are cumulative. These readings are noted daily and downloaded monthly using a maintenance terminal.
Calculation method (if applicable)	The cumulative readings are downloaded from TIMS. Then monthly energy consumption is calculated in Excel sheet and then summed up for the year.
QA/QC procedures	The TIMS data is recorded by CDM team member (From each service line depot) of the Rolling Stock Department and is forwarded to the CDM Coordinator of the project. A data review meeting is conducted once in 6 months which is chaired by CDM Chairman. In this meeting, data compiled by CDM coordinator is cross checked with service line data of all the rolling stock. Subsequently to check further the data authenticity and accuracy, data is verified, audited and signed by senior officials from DMRC.
Purpose of data/parameter	The data is used for Baseline emission calculation.
Additional comments	Nil.

Data/Parameter	EGi, R
Unit	GWh/year
Description	Electrical energy regenerated by the operational rolling stock 'i'
Measured/calculated/default	Electrical energy regenerated by each rolling stock is monitored by TIMS. The energy data for monitoring is downloaded from TIMS of Rolling Stock using a maintenance terminal.
Source of data	TIMS reading
Value(s) of monitored parameter	55.592828 (2013) 53.527700 (2014) 55.039283 (2015) 60.439253 (2016) 58.547761 (2017) (for further details refer Annex 1 of this Monitoring Report)
Monitoring equipment	Electrical energy regenerated by each rolling stock is monitored by TIMS. The energy data for monitoring is downloaded from TIMS of Rolling Stock using a maintenance terminal. Since TIMS is software based electronic equipment it has a high degree of accuracy ($\pm 0.01\%$) and as per manufacture specifications requires no calibration from time to time.
Measuring/reading/recording frequency	The readings are cumulative. These readings are noted daily and downloaded monthly using a maintenance terminal.

Calculation method (if applicable)	The monthly readings are calculated in Excel Sheet, which are then calculated for a year.
QA/QC procedures	The TIMS data is recorded by CDM team member (From each service line depot) of the Rolling Stock Department and is forwarded to the CDM Coordinator of the project. A data review meeting is conducted once in 6 months which is chaired by CDM Chairman. In this meeting, data compiled by CDM coordinator is cross checked with service line data of all the rolling stock. Subsequently to check further the data authenticity and accuracy, data is verified, audited and signed by senior officials from DMRC.
Purpose of data/parameter	The data are used for Baseline emission calculation.
Additional comments	Nil.

Data/Parameter	S_i
Unit	Km
Description	Total distance covered by the rolling stock 'i'
Measured/calculated/default	The distance travelled by each rolling stock is monitored by TIMS. The distance data of the total distance covered by the rolling stock for monitoring is downloaded from TIMS of Rolling Stock using a maintenance terminal.
Source of data	Train Integration and Management System (TIMS) reading
Value(s) of monitored parameter	9,433,875 (2013) 9,282,847 (2014) 9,456,082 (2015) 10,167,772 (2016) 10,015,194 (2017) (for further details refer Annex 1 of this Monitoring Report)
Monitoring equipment	Since TIMS is software based electronic equipment it has a high degree of accuracy (+ 0.01%). Since TIMS is an electronic device operated through software it requires no calibration from time to time.
Measuring/reading/recording frequency	The readings are cumulative. These readings are noted daily and downloaded monthly using a maintenance terminal.
Calculation method (if applicable)	The monthly readings are calculated in Excel Sheet and then calculated for Year.
QA/QC procedures	The data is monitored by the operation and maintenance department of DMRC
Purpose of data/parameter	The data are used for Baseline emission calculation.
Additional comments	Nil.

Data/Parameter	N
Unit	Nos.
Description	Total number of operational Rolling stocks in the three service lines in each year y
Measured/calculated/default	Unique Identification number of each Rolling stock is identified and verified at the regular monitoring interval
Source of data	Rolling Stock Department Log Book
Value(s) of monitored parameter	70
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Not applicable
Calculation method (if applicable)	Not applicable
QA/QC procedures	The data is monitored by the operation and maintenance department of DMRC.

Purpose of data/parameter	The data are used for Baseline emission calculation
Additional comments	Nil

D.3. Implementation of sampling plan

>> NA

SECTION E. Calculation of emission reductions or net anthropogenic removals**E.1. Calculation of baseline emissions or baseline net removals**

>>

>> For the Monitoring Period 2013

$$BE = EG_{wr} * EF$$

Where:

$$EG_{wr} = \left[\sum_{i=1}^N (EG_{i,wr}/S_i) * S_i \right]$$

- EF CO₂ emission factor of the northern grid (t CO₂e / GWh)
EG_{wr} total electrical energy consumed by rolling stocks without regenerative braking (GWh)
EG_{i,wr} total energy consumed by the rolling stock 'i' without regenerative braking (GWh)
S_i total distance covered by the rolling stock 'i' (km)
N total number of operational rolling stocks

Calculation:-

$$EG_{wr} = 143,630,805 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$BE = 143,630,805 * 800/1000000$$

$$\mathbf{BE = 114,904 \text{ tCO}_2}$$

>> For the Monitoring Period 2014

$$BE = EG_{wr} * EF$$

Where:

$$EG_{wr} = \left[\sum_{i=1}^N (EG_{i,wr}/S_i) * S_i \right]$$

- EF CO₂ emission factor of the northern grid (t CO₂e / GWh)
EG_{wr} total electrical energy consumed by rolling stocks without regenerative braking (GWh)
EG_{i,wr} total energy consumed by the rolling stock 'i' without regenerative braking (GWh)
S_i total distance covered by the rolling stock 'i' (km)
N total number of operational rolling stocks

Calculation:-

$$EG_{wr} = 140,966,359 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$BE = 140,966,359 * 800/1000000$$

$$\mathbf{BE = 112,773 \text{ tCO}_2}$$

>> For the Monitoring Period 2015

$$BE = EG_{wr} * EF$$

Where:

$$EG_{wr} = \left[\sum_{i=1}^N (EG_{i,wr}/S_i) * S_i \right]$$

- EF CO₂ emission factor of the northern grid (t CO₂e / GWh)
EG_{wr} total electrical energy consumed by rolling stocks without regenerative braking (GWh)

$EG_{i,wr}$ total energy consumed by the rolling stock 'i' without regenerative braking (GWh)
 S_i total distance covered by the rolling stock 'i' (km)
 N total number of operational rolling stocks

Calculation:-

$$EG_{wr} = 144,344,633 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$BE = 144,344,633 * 800/1000000$$

$$\mathbf{BE = 115,475 \text{ tCO}_2}$$

>> For the Monitoring Period 2016

$$BE = EG_{wr} * EF$$

Where:

$$EG_{wr} = \left[\sum_{i=1}^N (EG_{i,wr}/S_i) * S_i \right]$$

EF CO₂ emission factor of the northern grid (t CO₂ e / GWh)

EG_{wr} total electrical energy consumed by rolling stocks without regenerative braking (GWh)

$EG_{i,wr}$ total energy consumed by the rolling stock 'i' without regenerative braking (GWh)

S_i total distance covered by the rolling stock 'i' (km)

N total number of operational rolling stocks

Calculation:-

$$EG_{wr} = 158,082,864 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$BE = 158,082,864 * 800/1000000$$

$$\mathbf{BE = 126,466 \text{ tCO}_2}$$

>> For the Monitoring Period 2017 (01/01/2017 to 28/12/2017):

$$BE = EG_{wr} * EF$$

Where:

$$EG_{wr} = \left[\sum_{i=1}^N (EG_{i,wr}/S_i) * S_i \right]$$

EF CO₂ emission factor of the northern grid (t CO₂ e / GWh)

EG_{wr} total electrical energy consumed by rolling stocks without regenerative braking (GWh)

$EG_{i,wr}$ total energy consumed by the rolling stock 'i' without regenerative braking (GWh)

S_i total distance covered by the rolling stock 'i' (km)

N total number of operational rolling stocks

Calculation:-

$$EG_{wr} = 154,137,179 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$BE = 154,137,179 * 800/1000000$$

$$\mathbf{BE = 123,310 \text{ tCO}_2}$$

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

>>

>> For the Monitoring Period 2013

$$PE = \left[\left\{ \sum_{i=1}^N \left\{ (EG_{i,wr} / S_i) - (EG_{i,R} / S_i) \right\} * S_i \right\} \right] * EF$$

Where,

$$EG_R = \left[\sum_{i=1}^N (EG_{i,R} / S_i) * S_i \right]$$

EF CO₂ emission factor of the northern grid (t CO₂e / GWh)
 EG_R total electrical energy regenerated with regenerative braking (GWh)
 EG_{i,R} total energy regenerated by the rolling stock 'i' with regenerative braking (GWh)

Calculation:-

$$EG_{i,wr} = 143,630,805 \text{ kWh}$$

$$EG_{i,R} = 55,592,828 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$PE = (EG_{i,wr} - EG_{i,R}) * EF$$

$$PE = (143,630,805 - 55,592,828) * 800 / 1000000$$

$$PE = 70,430 \text{ tCO}_2$$

>> For the Monitoring Period 2014

$$PE = \left[\left\{ \sum_{i=1}^N \left\{ (EG_{i,wr} / Si) - (EG_{i,R} / Si) \right\} * Si \right\} \right] * EF$$

Where,

$$EG_R = \left[\sum_{i=1}^N (EG_{i,R} / Si) * Si \right]$$

EF CO₂ emission factor of the northern grid (t CO₂e / GWh)
 EG_R total electrical energy regenerated with regenerative braking (GWh)
 EG_{i,R} total energy regenerated by the rolling stock 'i' with regenerative braking (GWh)

Calculation:-

$$EG_{i,wr} = 140,966,359 \text{ kWh}$$

$$EG_{i,R} = 53,527,700 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$PE = (EG_{i,wr} - EG_{i,R}) * EF$$

$$PE = (140,966,359 - 53,527,700) * 800 / 1000000$$

$$PE = 69,951 \text{ tCO}_2$$

>> For the Monitoring Period 2015

$$PE = \left[\left\{ \sum_{i=1}^N \left\{ (EG_{i,wr} / Si) - (EG_{i,R} / Si) \right\} * Si \right\} \right] * EF$$

Where,

$$EG_R = \left[\sum_{i=1}^N (EG_{i,R} / Si) * Si \right]$$

EF CO₂ emission factor of the northern grid (t CO₂e / GWh)
 EG_R total electrical energy regenerated with regenerative braking (GWh)
 EG_{i,R} total energy regenerated by the rolling stock 'i' with regenerative braking (GWh)

Calculation:-

$$EG_{i,wr} = 144,344,633 \text{ kWh}$$

$$EG_{i,R} = 55,039,283 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$PE = (EG_{i,wr} - EG_{i,R}) * EF$$

$$PE = (144,344,633 - 55,039,283) * 800 / 1000000$$

$$PE = 71,444 \text{ tCO}_2$$

>> For the Monitoring Period 2016

$$PE = \left[\left\{ \sum_{i=1}^N \left\{ (EG_{i,wr} / Si) - (EG_{i,R} / Si) \right\} * Si \right\} \right] * EF$$

Where,

$$EG_R = \left[\sum_{i=1}^N (EG_{i,R} / Si) * Si \right]$$

EF CO₂ emission factor of the northern grid (t CO₂e / GWh)

EG_R total electrical energy regenerated with regenerative braking (GWh)

EG_{i,R} total energy regenerated by the rolling stock 'i' with regenerative braking (GWh)

Calculation:-

$$EG_{i,wr} = 158,082,864 \text{ kWh}$$

$$EG_{i,R} = 60,439,253 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$PE = (EG_{i,wr} - EG_{i,R}) * EF$$

$$PE = (158,082,864 - 60,439,253) * 800 / 1000000$$

$$PE = 78,115 \text{ tCO}_2$$

>> For the Monitoring Period 2017 (01/01/2017 to 28/12/2017):

$$PE = \left[\left\{ \sum_{i=1}^N \{ (EG_{i,wr} / Si) - (EG_{i,R} / Si) \} * Si \right\} * EF \right]$$

Where,

$$EG_R = \left[\sum_{i=1}^N (EG_{i,R} / Si) * Si \right]$$

EF CO₂ emission factor of the northern grid (t CO₂e / GWh)

EG_R total electrical energy regenerated with regenerative braking (GWh)

EG_{i,R} total energy regenerated by the rolling stock 'i' with regenerative braking (GWh)

Calculation:-

$$EG_{i,wr} = 154,137,179 \text{ kWh}$$

$$EG_{i,R} = 58,547,761 \text{ kWh}$$

$$EF = 800 \text{ tCO}_2\text{e/GWh}$$

$$PE = (EG_{i,wr} - EG_{i,R}) * EF$$

$$PE = (154,137,179 - 58,547,761) * 800 / 1000000$$

$$PE = 76,472 \text{ tCO}_2$$

E.3. Calculation of leakage emissions

>>

No leakage calculation is required as per the paragraph 7 of the applied methodology i.e. AMS III.C Ver. 10 and registered PDD.

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)		
				Before 01/01/2013	From 01/01/2013	Total amount
2013	114,904	70,430	0	-	44,474	44,474
2014	112,773	69,951	0	-	42,822	42,822
2015	115,475	71,444	0	-	44,031	44,031
2016	126,466	78,115	0	-	48,351	48,351
2017	123,310	76,472	0	-	46,838	46,838
Total	592,928	366,412	0	-	226,516	226,516

For Year 2013:

Service Lines	Total Electrical Energy Consumed (kWh)	Total Energy Regenerated (kWh)	Total Distance covered (km)
Line-1	57,696,479	22,692,710	3,981,976
Line-2	20,390,960	6,850,166	1,243,975
Line-3	65,543,366	26,049,952	4,207,927
Total	143,630,805	55,592,828	9,433,875

Emission factor of

northern regional grid 800 tCO₂/GWh (ex-ante value of registered PDD)

Baseline emissions (2013) 114,904 tCO₂

Project emissions (2013) 70,430 tCO₂

Leakage emissions 0 tCO₂

$$ER = BE - (PE + LE)$$

Calculation:-

$$ER = 114,904 - (70,430 + 0)$$

Emission Reduction (2013) = 44,474 t CO₂

For Year 2014:

Service Lines	Total Electrical Energy Consumed (kWh)	Total Energy Regenerated(kWh)	Total Distance covered (km)
Line-1	58,387,443	22,383,503	3,928,949
Line-2	18,769,578	5,981,204	1,138,081
Line-3	63,809,338	25,162,993	4,215,817
Total	140,966,359	53,527,700	9,282,847

Emission factor of

northern regional grid 800 tCO₂/GWh (ex-ante value of registered PDD)

Baseline emissions (2014) 112,773 tCO₂

Project emissions (2014) 69,951 tCO₂

Leakage emissions 0 tCO₂

$$ER = BE - (PE + LE)$$

Calculation:-

$$ER = 112,773 - (69,951 + 0)$$

Emission Reduction (2014) = 42,822 t CO₂

For Year 2015:

Service Lines	Total Electrical Energy Consumed (kWh)	Total Energy Regenerated(kWh)	Total Distance covered (km)
Line-1	60,631,266	23,518,912	4,039,768
Line-2	19,104,477	5,990,053	1,155,462
Line-3	64,608,890	25,530,318	4,260,852
Total	144,344,633	55,039,283	9,456,082

Emission factor of

Northern regional grid 800 tCO₂/GWh (ex-ante value of registered PDD)

Baseline emissions (2015) 115,475 tCO₂

Project emissions (2015) 71,444 tCO₂

Leakage emissions 0 tCO₂

$$ER = BE - (PE+LE)$$

Calculation:-

$$ER = 115,475 - (71,444 + 0)$$

Emission Reduction (2015) = 44,031 t CO₂

For Year 2016:

Service Lines	Total Electrical Energy Consumed (kWh)	Total Energy Regenerated(kWh)	Total Distance covered (km)
Line-1	65,683,134	25,500,148	4,336,488
Line-2	19,871,512	6,127,103	1,133,665
Line-3	72,528,218	28,812,002	4,697,619
Total	158,082,864	60,439,253	10,167,772

Emission factor of

northern regional grid 800 tCO₂/GWh (ex-ante value of registered PDD)

Baseline emissions (2016) 126,466 tCO₂

Project emissions (2016) 78,115 tCO₂

Leakage emission 0 tCO₂

$$ER = BE - (PE+LE)$$

Calculation:-

$$ER = 126,466 - (78,115 + 0)$$

$$ER = 48,351 \text{ t CO}_2$$

Emission reduction (2016) = 48,354 tCO₂

For Year 2017 (01/01/2017 to 28/12/2017):

Service Lines	Total Electrical Energy Consumed (kWh)	Total Energy Regenerated(kWh)	Total Distance covered (km)
Line-1	64,166,520	24,619,124	4,267,058
Line-2	20,249,421	6,269,386	1,190,678
Line-3	69,721,238	27,659,251	4,557,459
Total	154,137,179	58,547,761	10,015,194

Emission factor of

northern regional grid 800 tCO₂/GWh (ex-ante value registered PDD)

Baseline emissions (2017) 123,310 tCO₂

Project emissions (2017) 76,472 tCO₂

Leakage emissions 0 tCO₂

$$ER = BE - (PE+LE)$$

Calculation:-

$$ER = 123,310 - (76,472 + 0)$$

Emission Reduction (2017) = 46,838 t CO₂

Further details on each rolling stock in the respective service lines (1, 2 and 3&4) are detailed in following Annexure 1.

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)
226,516	242,713

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

>> As per the PDD, the ex-ante value for year 2013 to 2016 i.e. from 01/01/2013 to 31/12/2016 is 47,890 tCO₂/year and for the year 2017 i.e. 01/01/2017 to 31/12/2017 is 51,577 tCO₂. Since, the crediting period of the project is till 28/12/2017, therefore, for the year 2017, the period is taken as 01/01/2017 to 28/12/2017 and the ex-ante value is taken as 51,153 tCO₂ (51,577*362/365).

So, the ex-ante value for the monitoring period viz. 01/01/2013 to 28/12/2017 is considered as 242,713 tCO₂ (47,890*4 + 51,153*1).

E.6. Remarks on increase in achieved emission reductions

>> NA

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

>> CERs generated in each year from this project activity are less than 60,000 tCO₂/year, which is the threshold limit for small scale project criteria, therefore, it is a small scale project activity.

Apportionment of Emission Reduction for Monitoring Period of 2017 (01/01/2017 to 28/12/2017)

As per the monitoring methodology, the parameters as defined in Section D.2 (Data and Parameters monitored) were monitored on monthly basis.

The project is registered till 28/12/2017, whereas the monitored values were available for 31/12/2019. Hence, the value of Emission Reduction for period of 3 days of December 2017 was to be apportioned and deducted from Emission Reduction for 2017. To carry out apportionment, following two methods are considered:

- To evaluate average emission reduction per day based on yearly basis (Jan to Dec 2017)
- To evaluate average emission reduction per day on monthly basis (for December 2017 only).

The detailed calculation for both is as follows:

- To evaluate Emission Reduction for 3 days in December 2017, the average emission reduction on yearly basis was calculated. Based on data and parameters monitored:

Monitored values for Year 2017 (01/01/2017 to 31/12/2017):

Service Lines	Total Electrical Energy Consumed (kWh)	Total Energy Regenerated(kWh)	Total Distance covered (km)
Line-1	64,698,287	24,823,150	4,302,420
Line-2	20,417,234	6,321,342	1,200,545
Line-3	70,299,038	27,888,471	4,595,228
Total	155,414,559	59,032,963	10,098,193

Emission factor of
 Northern regional grid 800 tCO₂/GWh (ex-ante value of registered PDD)
 Baseline emissions (2017) 124,331.64 tCO₂
 Project emissions (2017) 77,105.27 tCO₂
 Leakage emissions: 0 tCO₂

ER = BE – (PE+LE)

Calculation:-

ER= 124,331.64 – (77,105.27+ 0)
 Emission Reduction (2017) = 47,226.37 t CO₂

Emission Reduction per day: 129.387 tCO₂

Emission Reduction for 2017 (01/01/2017 to 28/12/2017) = 47,226.37 – (3 x 129.387)
 = **46,838.209 tCO₂**

- B. As another alternative, to evaluate Emission Reduction for 3 days in December 2017, the average emission reduction for December 2017 was calculated.

Monitored values for month of December 2017 (01/01/2017 to 31/12/2017):

Service Lines	Total Electrical Energy Consumed (kWh)	Total Energy Regenerated(kWh)	Total Distance covered (km)
Line-1	4,653,547	1,995,075	355,412
Line-2	1,066,317	354,626	70,997
Line-3	5,218,244	2,341,454	389,360
Total	10,938,108	4,691,155	815,769

Emission factor of
 northern regional grid 800 tCO₂/GWh (ex-ante value of registered PDD)
 Baseline emissions (2017) 8,750.48 tCO₂
 Project emissions (2017) 4,997.55 tCO₂
 Leakage emissions: 0 tCO₂

ER = BE – (PE+LE)

Calculation:-

ER= 8,750.48 – (4,997.55 + 0)
Emission Reduction (2017) = 3,752.93 t CO₂

Emission Reduction per day: 121.066 tCO₂/day

For apportionment,

Therefore, Emission Reduction for year 2017 (01/01/2017 to 28/12/2017) = 47,226.37- (3 x 121.066)
= 46,863 tCO₂

On comparison of two values, it was observed that considering the average on annual basis will yield more conservative values of Emission Reduction for 2017.

Hence, the Emission Reduction for year 2017 is 46, 838 tCO₂.

Annexure I: Data**Service Line 1:**

Service line 1	Electrical Energy Consumed (kWh)		Energy Regenerated (kWh)		Distance covered (km)	
	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013
TS01	1,023,689	1,056,939	412,408	418,371	71,073	72,113
TS02	1,048,172	1,052,725	421,928	421,428	70,669	72,253
TS03	1,064,891	1,006,195	410,980	387,740	70,618	68,059
TS04	1,035,091	1,005,385	413,358	398,054	71,266	67,996
TS05	964,846	1,023,066	385,830	408,383	65,204	70,722
TS06	1,061,086	1,034,121	400,062	386,169	72,815	71,260
TS07	1,032,721	988,750	410,631	383,826	74,776	69,464
TS08	989,360	993,261	396,084	400,823	64,781	66,925
TS09	1,021,821	1,026,284	408,763	403,504	68,624	69,749
TS10	1,074,428	1,023,075	417,317	395,298	73,263	70,612
TS11	862,855	1,015,132	334,615	403,647	57,322	70,059
TS12	953,661	957,930	359,412	357,418	64,725	65,699
TS13	937,170	1,062,853	357,298	398,835	64,636	71,906
TS14	929,294	1,091,011	373,604	437,954	62,962	75,056
TS15	908,159	1,047,866	344,980	386,149	63,103	71,724
TS16	873,685	1,064,113	359,580	423,140	64,526	73,107
TS17	907,507	980,322	370,077	394,025	63,670	67,516
TS18	958,913	1,013,246	377,399	396,802	71,220	74,454
TS19	1,011,242	992,139	410,685	401,605	75,779	66,032
TS20	1,070,159	1,002,628	431,614	395,614	74,425	70,310
TS21	1,004,339	1,017,986	395,032	403,255	71,346	71,182
TS22	1,022,785	1,099,707	387,122	401,155	72,254	72,397
TS23	970,665	876,561	371,104	342,958	66,194	59,843
TS24	996,826	920,783	401,650	367,500	69,942	65,036
TS25	987,968	923,337	409,690	375,575	67,939	63,120
TS26	979,483	890,303	396,174	357,515	67,940	61,424
TS27	1,021,189	881,476	402,169	340,808	68,738	60,132
TS28	1,013,884	923,604	402,917	360,168	70,348	61,928
TS29	981,751	1,018,041	381,137	401,371	71,148	70,592
Sub Total	28,707,640	28,988,839	11,343,620	11,349,090	1,991,306	1,990,670

Service line 1	Electrical Energy Consumed (kWh)		Energy Regenerated (kWh)		Distance covered (km)	
	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014
TS01	864,860	1,002,381	341,075	378,725	59,216	62,878
TS02	914,083	984,452	368,610	388,749	63,877	66,891
TS03	921,803	983,514	357,978	379,034	63,770	67,164
TS04	932,290	942,170	375,074	361,781	65,094	63,175

CDM-MR-FORM

TS05	880,786	977,445	347,077	377,699	61,085	66,764
TS06	807,684	1,019,353	309,766	384,546	56,380	68,487
TS07	943,899	1,033,379	381,360	401,103	67,155	70,436
TS08	789,453	974,648	311,949	380,388	53,755	65,380
TS09	1,025,577	1,113,976	400,327	416,144	69,229	71,932
TS10	1,015,736	1,114,974	386,392	407,249	69,696	73,257
TS11	985,296	1,083,567	382,922	404,391	65,791	71,236
TS12	945,052	1,024,801	355,733	372,673	67,742	71,129
TS13	1,053,970	1,066,855	397,591	385,289	71,283	68,961
TS14	1,050,550	1,059,529	412,001	394,990	71,030	68,133
TS15	1,026,784	1,084,953	378,913	383,844	69,676	71,007
TS16	1,037,375	1,094,777	407,781	412,689	70,133	70,596
TS17	999,147	1,070,191	397,475	412,901	68,171	70,971
TS18	963,838	993,529	371,088	366,819	67,171	65,922
TS19	992,875	1,114,333	391,121	422,857	64,081	72,013
TS20	992,202	1,027,365	374,262	371,654	67,492	66,656
TS21	981,777	1,060,760	384,879	393,859	67,689	70,171
TS22	989,485	1,101,638	384,350	422,690	65,932	72,453
TS23	1,000,471	1,076,340	380,447	393,890	67,180	69,380
TS24	1,018,096	1,053,266	402,713	396,269	70,968	70,663
TS25	1,039,522	1,014,364	419,147	393,681	71,757	67,169
TS26	952,811	964,599	406,839	391,450	69,613	67,399
TS27	978,899	1,022,412	381,328	380,252	66,789	66,822
TS28	1,055,046	1,105,835	397,543	408,836	70,988	72,056
TS29	1,012,440	1,050,230	394,846	398,464	68,396	68,709
Sub Total	28,171,807	30,215,636	11,000,587	11,382,916	1,931,139	1,997,810

Service Line 1	Electrical Energy Consumed (kWh)		Energy Regenerated (kWh)		Distance covered (km)	
	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015
TS01	884,480	1,062,607	347,824	410,983	59,558	70,817
TS02	957,291	947,794	405,201	386,633	66,811	65,026
TS03	869,591	1,041,783	352,281	418,500	59,979	71,378
TS04	848,982	1,007,637	347,528	410,070	58,140	69,117
TS05	962,783	986,145	388,981	393,748	65,472	67,175
TS06	949,430	1,030,855	371,920	397,521	65,856	71,311
TS07	912,325	1,070,411	374,583	425,849	63,238	73,125
TS08	901,732	1,001,370	372,277	406,015	61,587	68,362
TS09	1,067,599	1,041,579	419,393	391,615	70,621	62,219
TS10	1,062,595	1,087,263	402,746	399,650	71,155	72,026
TS11	1,091,371	1,188,367	418,763	439,899	70,397	69,907
TS12	957,395	980,178	363,208	362,281	66,388	67,390

TS13	1,065,604	1,081,311	399548	387258	69,905	69,311
TS14	1,022,927	1,121,691	403,340	426,447	67,254	72,115
TS15	1,040,211	1,149,361	375,456	400,132	67,927	74,181
TS16	1,052,126	1,172,197	414,283	442,473	69,301	74,904
TS17	1,045,547	1,144,808	417,365	441,432	70,147	75,624
TS18	1,062,900	1,125,191	411,665	415,712	72,499	73,199
TS19	1,043,475	1,139,700	410,007	434,529	68,455	73,534
TS20	1,049,153	1,049,366	414,158	409,211	70,436	70,283
TS21	1,081,194	1,124,472	422,718	423,744	75,152	77,311
TS22	1,060,436	1,144,431	418,082	432,154	70,485	73,451
TS23	1,086,905	1,170,466	415,270	428,158	71,115	74,764
TS24	1,062,292	1,126,095	410,246	432,396	72,052	75,443
TS25	1,048,527	1,088,735	428,464	432,232	71,538	72,926
TS26	955,477	925,521	403,636	385,248	68,725	65,623
TS27	1,093,649	1,112,611	419,058	413,335	72,280	72,298
TS28	1,017,401	1,085,663	394,885	405,069	67,615	70,204
TS29	1,065,978	1,103,782	420,639	423,093	70,849	71,807
Sub Total	29,319,376	31,311,390	11,543,525	11,975,387	1,974,937	2,064,831

Service Line-1	Electrical Energy Consumed (kWh)		Energy Regenerated (kWh)		Distance covered (km)	
	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016
TS01	1,057,668	1,108,118	416,063	438,584	71,060	74,621
TS02	1,076,194	1,063,304	431,803	422,751	72,262	71,446
TS03	1,064,621	1,156,903	425,949	463,673	71,901	77,827
TS04	1,108,922	1,104,182	450,853	447,788	75,450	75,138
TS05	1,104,629	1,082,449	442,296	432,917	74,401	72,787
TS06	1,079,249	1,066,546	413,683	410,617	73,859	72,626
TS07	1,103,637	1,079,820	444,887	436,311	74,853	73,127
TS08	1,030,521	1,080,206	424,347	438,285	69,784	71,945
TS09	1,193,914	1,226,009	461,188	475,488	76,432	78,814
TS10	1,137,820	1,166,739	432,653	439,831	75,616	77,578
TS11	1,181,161	1,102,887	443,757	415,446	74,864	69,802
TS12	1,082,910	1,079,730	408,547	409,181	74,122	73,996
TS13	1,114,277	1,208,382	410,335	445,385	71,829	77,951
TS14	1,143,364	1,180,821	444,104	459,547	73,862	76,547
TS15	1,148,879	1,222,171	410,806	438,440	74,513	78,650
TS16	1,117,524	1,241,631	428,456	481,334	71,188	79,693
TS17	1,060,443	1,168,215	417,910	461,523	69,963	76,965
TS18	1,153,954	1,124,198	438,790	422,915	76,500	73,486
TS19	1,106,224	1,138,005	434,001	431,338	72,834	74,249
TS20	1,156,785	1,192,456	456,668	471,520	75,575	77,924

CDM-MR-FORM

TS21	1,192,742	1,202,974	460,813	465,700	77,238	77,103
TS22	1,161,200	1,216,442	445,467	462,717	74,823	78,358
TS23	1,126,271	1,260,535	418,361	475,394	71,811	80,785
TS24	1,156,553	1,208,227	452,673	453,021	77,934	80,474
TS25	1,086,391	1,083,203	435,977	432,971	72,256	71,995
TS26	1,020,996	1,024,544	433,578	432,201	72,188	71,864
TS27	1,147,312	1,111,131	434,408	418,061	75,226	73,035
TS28	1,195,991	1,127,632	460,339	426,713	78,613	73,156
TS29	1,180,015	1,165,507	459,140	452,644	77,390	76,199
Sub Total	32,490,167	33,192,967	12,637,852	12,862,296	2,148,347	2,188,141

Service Line - 1	Electrical Energy Consumed (kWh)		Energy Regenerated (kWh)		Distance covered (km)	
	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017
TS01	1,034,391	1,097,930	415,210	435,711	70,578	75,715
TS02	1,079,458	1,044,760	428,440	402,002	73,297	72,163
TS03	1,080,960	1,017,883	430,950	390,092	72,614	68,520
TS04	1,093,499	1,080,213	440,942	415,342	74,044	74,061
TS05	1,070,519	1,125,283	433,481	441,970	72,378	76,237
TS06	1,030,420	1,119,958	388,708	417,451	68,996	77,122
TS07	1,123,603	1,081,668	450,623	416,803	75,911	73,061
TS08	1,092,692	1,144,591	455,842	460,984	74,140	77,912
TS09	1,207,453	1,224,742	469,040	465,249	77,266	79,630
TS10	1,145,864	1,155,461	431,599	426,107	76,147	77,691
TS11	1,209,537	1,099,065	470,383	410,208	77,751	71,292
TS12	1,031,612	1,094,687	390,028	398,356	70,210	74,595
TS13	1,144,465	1,110,296	421,587	399,225	73,585	72,743
TS14	1,154,786	1,203,736	448,881	452,605	74,699	78,463
TS15	1,149,182	1,127,480	413,613	387,100	74,271	73,372
TS16	1,165,055	1,062,101	451,234	407,096	74,764	71,734
TS17	1,163,995	1,072,603	461,933	410,988	76,134	71,863
TS18	1,119,580	1,139,793	425,563	413,721	73,911	75,130
TS19	1,163,873	1,060,594	453,343	407,908	76,410	70,493
TS20	1,206,942	1,023,995	479,586	380,970	79,412	66,295
TS21	1,140,967	1,168,713	437,987	433,748	73,188	75,199
TS22	1,181,065	1,219,281	448,582	445,505	76,210	78,655
TS23	1,185,656	1,111,835	449,000	407,157	76,597	73,006
TS24	1,087,614	1,162,964	418,180	442,543	71,965	78,650
TS25	1,178,691	1,035,780	471,890	410,281	78,125	71,435
TS26	1,036,122	1,029,795	430,546	411,048	72,524	72,191
TS27	1,110,644	1,066,674	414,096	400,365	72,673	72,916
TS28	1,199,993	1,079,739	460,333	409,594	78,693	74,083
TS29	1,129,049	987,419	433,008	378,236	73,181	66,334
TS30	-	31,224	-	19,988	-	2,165
TS32	-	337	-	189	-	20
Sub Total	32,717,687	31,980,600	12,724,608	12,098,542	2,159,674	2,142,746

Service Line 2:

Service Line-2	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013
MC # 01	1,021,553	1,004,504	355,299	341,885	64,683	61,644
MC # 02	1,009,616	1,041,023	336,001	337,336	62,543	61,121
MC # 03	1,206,924	877,716	420,543	299,221	75,339	53,007
MC # 04	1,074,620	983,849	365,257	332,160	68,060	59,018
MC # 05	1,151,209	988,797	405,416	333,143	71,535	59,353
MC # 06	1,147,419	942,411	392,895	302,587	72,616	56,410
MC # 07	1,051,378	927,221	363,681	307,787	64,533	54,186
MC # 08	1,039,835	914,586	349,810	296,642	64,846	54,488
MC # 09	1,053,094	954,328	360,206	306,581	65,612	56,512
MC # 10	1,121,532	879,345	364,285	279,431	67,546	50,923
TOTAL	10,877,180	9,513,780	3,713,393	3,136,773	677,313	566,662

Service Line-2	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014
MC # 01	879,603	1,018,156	293,247	335,665	55,767	63,054
MC # 02	927,973	873,632	309,498	261,670	58,380	52,037
MC # 03	903,794	1,061,464	295,869	342,013	54,811	64,084
MC # 04	957,191	982,216	321,677	305,166	58,793	57,886
MC # 05	973,757	891,735	330,111	279,963	60,699	52,156
MC # 06	966,677	974,089	317,400	304,227	61,745	59,417
MC # 07	859,628	1,048,774	287,449	328,773	52,565	62,407
MC # 08	839,750	924,345	276,217	259,959	52,937	50,911
MC # 09	841,134	998,897	267,385	292,884	51,980	58,618
MC # 10	876,337	970,426	280,099	291,932	53,285	56,549
TOTAL	9,025,844	9,743,734	2,978,952	3,002,252	560,962	577,119

Service Line-2	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015
MC # 01	844,324	924,334	274,350	281,251	53,044	55,213
MC # 02	905,588	977,900	280,167	298,643	55,869	58,874
MC # 03	993,513	1,106,897	330,808	357,516	62,283	66,483
MC # 04	845,281	1,010,405	262,837	310,757	50,444	57,746
MC # 05	926,163	996,057	303,843	304,874	57,465	58,030
MC # 06	975,741	1,028,545	316,429	319,790	61,501	61,987
MC # 07	892,201	1,034,502	289,710	323,794	54,430	61,419
MC # 08	816,254	743,382	259,873	224,491	50,916	43,463
MC # 09	1,027,801	1,017,393	318,771	300,772	63,797	59,502
MC # 10	982,534	1,055,662	309,705	321,672	59,885	63,111
TOTAL	9,209,400	9,895,077	2,946,493	3,043,560	569,634	585,828

Service Line-2	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016
MC # 01	902,204	940,227	283,189	289,160	53,141	53,651
MC # 02	888,226	993,850	242,857	287,478	51,109	55,698
MC # 03	963,735	1,044,239	317,394	331,716	56,202	58,521
MC # 04	1,027,196	1,055,102	329,879	334,797	58,825	59,020
MC # 05	965,031	1,049,877	312,541	331,672	56,400	59,530
MC # 06	1,001,766	1,033,840	313,139	309,348	58,981	57,791
MC # 07	1,022,887	1,016,248	329,814	303,316	59,174	56,363
MC # 08	852,737	1,061,154	268,326	333,654	48,364	59,569
MC # 09	966,851	1,043,302	294,815	288,734	55,989	58,556
MC # 10	985,760	1,057,280	302,281	322,993	57,466	59,315
TOTAL	9,576,393	10,295,119	2,994,235	3,132,868	555,651	578,014

Service Line - 2	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017
MC # 01	1,022,935	814,139	329,232	250,601	60,729	48,269
MC # 02	1,020,270	1,092,597	323,214	339,557	59,086	65,692
MC # 03	944,637	939,153	307,278	288,630	54,960	54,507
MC # 04	983,978	1,074,792	317,127	338,841	56,191	62,394
MC # 05	1,002,940	1,144,987	325,651	320,008	59,361	66,559
MC # 06	1,011,448	1,159,066	322,111	357,527	58,955	69,039
MC # 07	964,081	1,023,816	298,966	306,312	56,026	62,478
MC # 08	1,067,291	1,004,451	344,842	314,078	62,618	59,939
MC # 09	966,318	1,065,564	259,685	321,065	56,072	63,691
MC # 10	1,063,901	1,050,870	334,996	321,621	61,820	62,159
TOTAL	10,047,799	10,369,435	3,163,102	3,158,240	585,818	614,727

Service Line 3 & 4:

Service Line-3 & 4	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013	01/01/2013 to 30/06/2013	01/07/2013 to 31/12/2013
TS# 301	1,033,518	1,114,652	424,641	445,486	68,013	71,456
TS#302	876,716	1,158,603	344,351	436,082	57,165	73,557
TS# 303	1,032,042	1,216,628	386,134	460,764	66,254	76,942
TS# 304	1,131,048	1,178,135	453,503	463,676	73,669	75,906
TS# 305	954,483	1,146,253	358,135	431,929	61,677	73,793
TS# 306	1,096,061	1,069,735	423,136	422,262	69,842	68,480
TS# 307	1,119,584	1,060,116	440,238	430,542	72,358	69,139
TS# 308	1,156,590	1,160,401	474,658	473,603	76,017	74,934
TS# 309	1,049,343	1,075,770	401,435	410,898	67,664	68,591
TS# 310	1,050,415	1,224,408	402,224	469,994	66,900	77,151
TS# 311	1,048,337	1,208,672	395,840	460,495	66,803	77,856
TS# 312	1,129,928	1,198,683	443,298	469,477	72,635	76,471
TS# 313	1,072,360	1,210,892	439,148	501,316	69,002	78,386
TS# 314	1,043,423	1,200,654	407,716	476,268	67,534	77,009
TS# 315	1,122,019	1,161,831	463,823	486,836	72,855	75,623
TS# 316	1,065,110	1,113,877	439,784	470,065	68,222	72,148
TS# 317	1,073,725	1,154,317	415,882	451,531	70,264	74,857
TS# 318	1,031,419	1,145,631	422,060	468,402	65,945	74,881
TS# 319	1,043,934	1,101,073	425,433	438,875	66,808	69,658
TS# 320	1,012,192	1,068,668	410,104	426,836	64,341	66,844
TS# 321	947,530	964,593	380,980	379,587	60,617	61,238
TS# 322	975,870	907,353	384,939	356,781	62,169	58,801
TS# 323	1,031,702	942,901	428,143	388,703	66,251	60,727

CDM-MR-FORM

TS# 324	1,048,454	958,234	435,448	381,056	67,896	61,161
TS# 325	1,001,822	655,266	414,420	265,625	64,365	42,301
TS# 326	1,090,529	793,395	414,299	314,327	69,198	50,079
TS# 327	1,180,300	780,017	472,444	310,804	75,317	49,802
TS# 328	1,150,121	754,251	444,894	327,747	72,481	50,513
TS# 329	1,202,009	840,353	482,738	346,315	76,961	54,168
TS# 330	1,191,438	919,771	470,144	362,947	77,076	56,185
TS# 331	1,062,562	1,033,649	411,573	409,158	67,888	65,080
Sub-total	33,024,584	32,518,782	13,111,565	12,938,387	2,124,187	2,083,737

Service Line-3 &4	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014	01/01/2014 to 30/06/2014	01/07/2014 to 31/12/2014
TS# 301	1,002,402	1,155,666	401,395	447,014	66,341	73,540
TS#302	1,097,595	1,166,194	413,155	421,529	71,834	73,015
TS# 303	1,159,043	1,130,504	435,733	407,033	75,341	69,766
TS# 304	1,018,518	1,203,808	397,124	454,868	67,022	77,248
TS# 305	1,137,026	1,190,768	439,779	442,449	75,038	75,130
TS# 306	1,122,659	1,133,772	444,343	430,496	73,884	72,031
TS# 307	1,109,032	1,206,922	448,737	478,553	74,853	79,435
TS# 308	1,114,062	982,302	451,604	383,346	73,483	62,640
TS# 309	1,065,707	1,017,415	411,980	382,143	70,781	65,686
TS# 310	1,121,387	1,028,793	435,761	377,478	73,890	64,475
TS# 311	878,691	1,114,490	344,472	431,140	58,770	73,785
TS# 312	841,859	1,128,843	337,599	445,515	56,620	75,280
TS# 313	1,045,551	976,887	428,870	393,108	70,682	65,438
TS# 314	905,407	1,124,064	344,137	419,068	59,869	74,642
TS# 315	939,293	1,073,204	394,446	438,853	67,395	72,236
TS# 316	974,738	1,122,160	414,528	475,889	65,452	74,871
TS# 317	938,584	1,002,270	372,969	397,906	63,775	67,858
TS# 318	931,548	1,029,164	370,238	408,611	63,689	68,703
TS# 319	1,023,597	1,082,314	416,766	428,196	69,004	72,297
TS# 320	1,093,162	1,102,413	440,276	433,901	73,379	73,487
TS# 321	1,074,571	1,049,870	418,793	401,322	72,210	69,286
TS# 322	704,701	730,174	284,541	281,818	48,652	48,615
TS# 323	1,092,034	1,117,815	458,061	452,013	74,123	74,457
TS# 324	1,090,371	1,084,512	441,039	427,845	73,951	72,604
TS# 325	1,058,522	1,047,360	439,772	426,257	71,669	70,360
TS# 326	1,068,129	1,036,146	434,776	405,309	71,494	66,972
TS# 327	1,087,941	999,702	444,166	397,761	73,921	64,831
TS# 328	991,501	1,007,439	413,607	402,880	65,125	64,676
TS# 329	886,448	965,481	365,764	380,916	59,549	62,383
TS# 330	793,497	872,050	300,158	331,983	51,238	56,459
TS# 331	725,915	833,345	281,941	331,263	46,362	54,215
Sub-total	31,093,491	32,715,847	12,426,530	12,736,463	2,079,396	2,136,421

Service Line-3 & 4	Electrical Energy Consumed (kWh)		Energy regenerated (kWh)		Distance covered (km)	
	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015	01/01/2015 to 30/06/2015	01/07/2015 to 31/12/2015
TS# 301	1,044,083	1,091,497	423,892	432,452	69,345	69,835
TS#302	950,664	1,196,208	355,762	437,706	61,616	75,045
TS# 303	1,065,986	1,183,415	406,602	441,210	69,848	74,797
TS# 304	1,042,430	1,158,884	413,493	458,193	69,971	75,949
TS# 305	1,000,090	1,186,843	391,757	450,508	66,373	75,699
TS# 306	1,040,807	1,226,256	414,132	475,818	68,944	78,699
TS# 307	982,457	1,139,925	401,071	445,989	66,270	74,348
TS# 308	1,075,979	1,138,696	426,400	446,524	71,038	73,549
TS# 309	1,079,650	1,152,796	412,342	427,008	71,307	73,628
TS# 310	1,113,721	1,199,011	419,882	440,113	72,034	75,091
TS# 311	1,090,686	1,184,802	435,053	462,676	73,165	76,948
TS# 312	1,040,649	1,089,806	425,113	429,017	71,196	72,459
TS# 313	1,109,448	1,132,942	465,853	462,090	76,629	76,216
TS# 314	1,112,437	1,122,885	430,544	424,516	75,480	73,590
TS# 315	1,063,802	1,107,509	448,209	454,232	73,269	73,960
TS# 316	965,015	1,149,083	413,869	483,077	65,237	75,191
TS# 317	1,067,933	1,070,497	425,840	419,461	73,272	71,491
TS# 318	1,067,743	1,124,429	440,118	451,449	73,119	74,443
TS# 319	952,496	1,163,735	373,949	450,772	64,026	76,028
TS# 320	993,210	1,105,827	410,511	445,282	68,211	74,422
TS# 321	1,113,942	1,030,786	389,555	398,567	70,184	68,311
TS# 322	1,032,517	1,039,318	410,671	403,874	69,543	68,391
TS# 323	949,650	1,105,266	392,578	461,065	63,996	73,956
TS# 324	1,077,648	1,068,092	438,568	414,688	73,394	70,794
TS# 325	976,108	952,859	407,764	390,839	66,552	63,718
TS# 326	891,210	849,934	352,388	331,268	58,732	54,331
TS# 327	835,292	718,013	332,495	277,836	54,307	45,811
TS# 328	883,295	933,273	362,661	378,944	57,172	59,793
TS# 329	880,907	824,030	355,506	317,922	58,745	51,890
TS# 330	908,378	1,000,861	349,633	387,023	60,198	64,903
TS# 331	854,957	898,222	343,392	360,596	56,325	58,068
Sub-total	31,263,190	33,345,700	12,469,603	13,060,715	20,89,498	2,171,354

Service Line-3 & 4	Electrical Energy Consumed (kWh)		Energy Regenerated (kWh)		Distance covered (km)	
	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016	01/01/2016 to 30/06/2016	01/07/2016 to 31/12/2016
TS# 301	1,176,335	1,290,385	466,987	509,707	75,096	80,387
TS#302	1,209,878	1,307,563	453,188	491,645	76,479	80,964
TS# 303	1,245,489	1,324,154	473,359	506,901	79,777	82,947

CDM-MR-FORM

TS# 304	1,201,777	1,238,724	466,252	477,504	77,375	78,877
TS# 305	1,198,275	1,311,721	462,146	505,650	77,633	82,851
TS# 306	1,262,626	1,279,966	495,615	502,916	80,706	79,934
TS# 307	1,237,240	1,326,335	493,883	526,139	81,729	85,985
TS# 308	1,250,328	1,311,651	498,693	527,410	80,823	83,164
TS# 309	1,228,325	1,268,468	466,562	476,154	79,519	79,339
TS# 310	1,291,875	1,342,166	472,730	513,314	81,621	83,270
TS# 311	1,156,566	1,155,449	460,300	454,483	76,565	74,691
TS# 312	1,163,232	1,201,417	467,584	475,658	77,797	77,830
TS# 313	1,159,275	1,208,440	467,007	480,731	77,255	78,507
TS# 314	1,128,755	1,261,362	431,186	483,565	75,368	80,699
TS# 315	1,122,281	1,166,591	465,480	480,188	75,262	75,825
TS# 316	1,158,087	1,220,468	488,410	517,653	75,819	78,953
TS# 317	1,107,575	1,195,726	439,324	466,183	74,096	78,220
TS# 318	1,162,529	1,195,354	471,576	487,869	76,676	78,092
TS# 319	1,162,256	1,230,547	463,370	496,992	76,794	80,505
TS# 320	1,130,724	1,241,944	463,640	513,278	75,615	81,909
TS# 321	1,150,002	1,211,894	447,072	474,106	76,203	78,535
TS# 322	1,152,763	1,248,907	454,321	504,213	75,878	80,114
TS# 323	1,158,935	1,216,948	488,231	511,505	78,097	80,416
TS# 324	1,177,281	1,242,148	456,199	487,245	77,455	80,709
TS# 325	1,092,123	1,217,199	448,512	509,676	72,049	80,416
TS# 326	986,410	987,021	397,862	406,950	64,151	63,387
TS# 327	979,478	942,681	394,559	394,161	65,558	61,712
TS# 328	932,280	1,014,611	377,987	409,279	59,907	64,985
TS# 329	984,862	1,067,029	390,733	423,797	63,252	67,551
TS# 330	824,306	1,051,132	307,201	419,160	52,188	67,768
TS# 331	1,038,921	1,019,428	423,726	424,275	67,062	65,272
Sub-total	35,230,789	37,297,429	13,953,695	14,858,307	2,303,805	2,393,814

Service Line - 3 & 4	Electrical Energy Consumed (kWh)		Energy Regenerated (kWh)		Distance covered (km)	
	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017	01/01/2017 to 30/06/2017	01/07/2017 to 31/12/2017
TS# 301	557,971	1,221,031	202,389	478,752	33,024	79,592
TS# 302	1,072,142	1,234,663	409,290	490,161	67,792	81,937
TS# 303	1,128,423	1,255,964	414,658	489,500	72,048	83,489
TS# 304	1,206,981	999,087	473,266	392,949	78,377	66,079
TS# 305	1,133,426	1,269,379	438,449	498,529	71,701	83,952
TS# 306	1,102,308	1,235,273	430,835	487,239	69,702	81,856

TS# 307	1,114,218	1,166,316	439,591	457,650	72,370	79,730
TS# 308	1,161,550	1,129,124	470,973	464,288	75,038	76,197
TS# 309	1,216,458	1,110,151	457,113	442,659	77,152	73,019
TS# 310	1,178,539	1,327,124	474,996	532,141	74,235	83,739
TS# 311	1,179,554	1,151,873	461,088	457,681	77,454	77,132
TS# 312	1,195,401	1,116,271	478,699	445,748	78,186	74,132
TS# 313	1,173,619	1,111,185	463,347	427,814	76,908	73,327
TS# 314	1,228,111	1,102,616	464,321	419,977	79,605	72,697
TS# 315	1,148,349	1,069,599	473,724	438,204	75,881	71,527
TS# 316	1,122,558	1,111,383	474,966	467,276	73,621	73,287
TS# 317	1,153,006	1,056,124	445,163	413,862	75,536	71,231
TS# 318	1,187,367	1,148,263	481,149	453,994	78,073	75,932
TS# 319	1,154,338	1,097,908	465,462	432,929	75,441	71,707
TS# 320	1,185,949	1,083,196	489,526	434,327	78,789	71,640
TS# 321	1,154,889	1,165,937	455,062	439,875	76,487	76,029
TS# 322	1,206,679	1,135,334	498,809	434,090	79,250	74,310
TS# 323	1,177,493	1,122,492	481,062	437,231	77,037	73,308
TS# 324	1,174,492	1,116,107	460,937	422,577	77,157	73,294
TS# 325	1,171,473	1,134,946	489,771	462,150	77,524	75,256
TS# 326	1,171,406	954,050	468,378	382,155	73,477	63,523
TS# 327	1,067,332	968,718	434,791	372,079	70,723	63,622
TS# 328	1,114,694	1,093,975	450,590	428,404	71,939	70,021
TS# 329	1,098,292	1,125,648	434,621	446,637	70,505	72,169
TS# 330	1,111,467	1,186,218	441,777	467,017	72,144	76,559
TS# 331	1,081,419	1,169,179	460,449	485,324	71,488	76,271
Sub-total	35,129,904	35,169,134	13,985,252	13,903,219	2,278,664	2,316,564

Summary sheet for three lines:

Service Lines	Total Energy Consumed (kWh)	Total Energy Regenerated (kWh)	Total Distance covered (km)
01/012013 to 31/12/2013			
Line 1	57,696,479	22,692,710	3,981,976
Line 2	20,390,960	6,850,166	1,243,975
Line 3&4	65,543,366	26,049,952	4,207,924
Total	143,630,805	55,592,828	9,433,875
01/012014 to 31/12/2014			
Line 1	58,387,443	22,383,503	3,928,949
Line 2	18,769,578	5,981,204	1,138,081
Line 3&4	63,809,338	25,162,993	4,215,817
Total	140,966,359	53,527,700	9,282,847
01/01/2015 to 31/12/2015			
Line 1	60,631,266	23,518,912	4,039,768
Line 2	19,104,477	5,990,053	1,155,462
Line 3&4	64,608,890	25,530,318	4,260,852
Total	144,344,633	55,039,283	9,456,082

01/01/2016 to 31/12/2016			
Line 1	65,683,134	25,500,148	4,336,488
Line 2	19,871,512	6,127,103	1,133,665
Line 3&4	72,528,218	28,812,002	4,697,619
Total	158,082,864	60,439,253	10,167,772
01/01/2017 to 28/12/2017			
Line 1	64,166,520	24,619,124	4,267,058
Line 2	20,249,421	6,269,386	1,190,678
Line 3&4	69,721,238	27,659,251	4,557,459
Total	154,137,179	58,547,761	10,015,194

Appendix 1.

AC-	Alternating Current
Aircon-	Air conditioner
C/I-	Converter/Inverter
CT-	Current Transformer
DC-	Direct Current
DT Car-	Driver trailer Car
M-Car-	Motoring Car
NABL	National Accreditation Board For Testing and Calibration Laboratories
OHE-	Over Head Equipment
PT-	Potential Transformer
SIV-	Static Inverter
TIMS-	Train Integrated Management System
VVVF-	Variable Voltage Variable Frequency

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
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.
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.

<i>Version</i>	<i>Date</i>	<i>Description</i>
----------------	-------------	--------------------

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: monitoring report
