GOLD STANDARD VERIFICATION REPORT

- 8th Periodic –

DELHI METRO RAIL CORPORATION (DMRC)

INSTALLATION OF LOW GREEN HOUSE GASES (GHG) EMITTING ROLLING STOCK CARS IN METRO

GS REF. NO.: 4597

Monitoring Period : 2016-01-19 to 2017-12-28
(incl. both days)

Report No: 8000471461 – 17/078

Date: 31/07/2019

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Verification Report:	***Report No.***	***Rev. No.***	***Date of issue:***	***Date of this rev.***
	8000471461 – 17/078	1	2019-07-31	2019-07-31
Project:	*Title:*		*Gold Standard Registration date:*	*Gold Standard No:*
	Installation of low Green House Gases (GHG) emitting rolling stock cars in Metro		2016-01-19	GS 4597
Project Participant(s):	***Host party:***		***Other involved parties:***	
	India		-	
	PP Non Annex 1 Country		***PP Annex 1 Country***	
	Delhi Metro Rail Corporation (DMRC)		-	
Applied methodology/ies:	***Title:***		***Version No.:***	***Scope:***
	AMS III.C. "Emission reduction by low greenhouse gas emitting vehicles"		10	7
Monitoring:	***Monitoring period (MP):***		***No. of days:***	***MP No.***
	2016-01-19 to 2017-12-28 (incl. both days)		710	01
Monitoring Report:	***Title:***		***Draft version:***	***Final version:***
	Installation of low Green House Gases (GHG) emitting rolling stock cars in Metro		2018-07-19	2019-07-29
Verification team / Technical Review and Final Approval	***Verification Team:***		***Technical review:***	***Final approval::***
	Kunal Rami (TL), Swapnil Thanekar (TM)		Stefan Winter, Eric Krupp	Stefan Winter
Emission reductions: [t CO_{2e}]	***Verified amount***		***As per draft MR:***	
	92,805 tCO_2e		**92,805 tCO_2e**	

Summary of Verification Opinion:

Delhi Metro Rail Corporation (DMRC) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Gold Standard verification of the project: "Installation of low Green House Gases (GHG) emitting rolling stock cars in Metro", with regard to the relevant Gold Standard (GS) requirements for VER project activities. The project activity comprises of operation of low GHG emitting rolling stocks which have regenerative braking system. Thus, the project activity replaces conventional electro-dynamic rheostatic braking technology, with regenerative braking technology. The regenerated electrical energy by the project activity reduces the consumption of equivalent grid electrical energy required by the powering trains, and conserves equivalent electrical energy which leads to reduced GHG emissions. This verification covers the monitoring period from 2016-01-19 to 2017-12-28 (including both days). In the course of the verification one (4) Correction Action Request (CAR), (1) Clarification Requests (CL) were raised and successfully closed. Besides during this verification no Forward Action Request (FAR) has been raised. The verifications based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD and GS-passport, and supporting documents made available to the TÜV NORD JI/CDM CP by the project participants.

As a result of this verification, the verifier confirms that:

☒ all operations of the project are implemented and installed as planned and described in the validated project design document and Gold Standard additional Annexes to the project design document,

☒ the monitoring plan is in accordance with the applied approved GS methodology,

☒ the monitoring plan as set out in the validated project design document and the validated additional Annexes has been followed,

☒ the project contributes to sustainability development

☒ the monitoring system is in place and functional. The project has generated GHG emission reductions, and

☒ the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

	TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows: 2016 45,967 tCO2e 2017 46,838 tCO2e	
Emission reductions: [t CO_{2e}]	***Verified amount***	***As per PDD:***
	92,805 tCO_2e	**96,681 tCO_2**
Document information:	*Filename:*	*Num. of pages:*
	2019_07_31_GS FVR_TR_edited	91

Abbreviations:

CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CER	**Certified Emission Reduction**
CDM	**Clean Development Mechanism**
CO_2	**Carbon dioxide**
CO_{2eq}	**Carbon dioxide equivalent**
CL	**Clarification Request**
ER	**Emission Reduction**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
GS	**The Gold Standard**
MP	**Monitoring Plan**
MR	**Monitoring Report**
NIS	**National Interconnected System**
PDD	**Project Design Document**
PP	**Project Participant**
QA/QC	**Quality Assurance / Quality Control**
UNFCCC	**United Nations Framework Convention on Climate Change**
VVS	**Validation and Verification Standard**
XLS	**Emission Reduction Calculation Spread Sheet**
GS	**Gold Standard**
TN CERT	**TÜV NORD Certification GmbH**
GST	**Gold Standard Toolkit (GSv1.0)**

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1. INTRODUCTION

Delhi Metro Rail Corporation (DMRC) has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the CDM Gold Standard (GS) verification of the project

"Installation of low Green House Gases (GHG) emitting rolling stock cars in Metro"

with regard to the relevant requirements for Gold Standard CDM project activities. The project was registered on 2016-01-19 as per guidelines on the Gold Standard Requirements version 2.2. The verification covers the monitoring period 2016-01-19 to 2017-12-28. The verifiers have reviewed the implementation of the monitoring plan (MP) in the Approved PDD (Version 05)/PDD/ and GS Passport (Version 02)/GSP/.

The project GHG emissions reductions and sustainable development contribution are both included in the same Monitoring Report/MR/.

GHG data as well as sustainability aspects for the monitoring period were verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Standard/VVS/ of the UNFCCC and additional Gold Standard requirements/GSR/.

This report summarizes the findings and conclusions of this 8th periodic verification of the above-mentioned GS registered project activity.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions and the contribution to sustainable development. It includes the verification of the:

- Implementation and operation of the project activity as given in the PDD/PDD/.
- compliance of the actual monitoring systems and procedures with the provisions of the monitoring plan as a part of approved PDD, the GS monitoring matrix and the applied approved monitoring methodology;
- data given in the monitoring reports by checking the monitoring records, the emissions reduction calculation and supporting evidence
- accuracy of the monitoring systems
- quality of evidence
- Significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this project is based on the Approved PDD (Version 05)/PDD/ and GS Passport (Version 02)/GSP/, the monitoring report version 1/MR/, the registered GS validation report version 01/VAL/, last issued Verification reports/VER/ supporting documents made available to the verifier and information collected through performing

interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 12 of the Kyoto Protocol/KP/,
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 17/CP.7 /MA/, and subsequent decisions made by the Executive Board and COP/MOP,
- Gold Standard Version 1.0/GSv1.0/
- Gold Standard Requirements version 2.2
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Standard /VVS/,
- monitoring plan as given in the Approved PDD /PDD/,
- Approved CDM / GS methodology.

2. GHG PROJECT DESCRIPTION

2.1. Project Characteristics

Essential data of the project is presented in the following Table 2-1.

Table 2-1: Project Characteristics

Item	Data		
Project title	Installation of low Green House Gases (GHG) emitting rolling stock cars in Metro		
Project size	☐Large Scale ☒Small Scale		
Project Scope *(according to UNFCCC sectoral scope numbers for CDM)*	☐	1	Energy Industries (renewable- /non-renewable sources)
	☐	2	Energy distribution
	☐	3	Energy demand
	☐	4	Manufacturing industries
	☐	5	Chemical industry
	☐	6	Construction
	☒	7	Transport
	☐	8	Mining/Mineral production
	☐	9	Metal production
	☐	10	Fugitive emissions from fuels (solid, oil and gas)
	☐	11	Fugitive emissions from production and consumption of halocarbons and hexafluoride
	☐	12	Solvents use
	☐	13	Waste handling and disposal
	☐	14	Afforestation and Reforestation
	☐	15	Agriculture
Applied Methodology	AMS-III.C ver. 10: Emission reductions by low-greenhouse gas emitting vehicles AMS-III.BC. version 2.0- Emission reductions through improved efficiency of vehicle fleets[1]		
Technical Area(s)	Scope: 7/ Technical Area: 7.1		
GS registration No.	GS 4597		
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (10 y)		

2.2. Project Verification History

Essential events since the registration of the project are presented in the following Table 2-2.

Table 2-2: Project verification history

#	Item	Time	Status
1	Date of GS registration	2016-01-19	-
2	Start of crediting period for GS	2016-01-19	-

[1] At the time of GS validation of Passport, the methodology AMS-III.C ver. 10 was already expired and not valid, thus as per GS rules the relevant active and applicable methodology AMS-III.BC. ver 2.0 was adopted. However, the emission reductions are evaluated following the monitoring plan under approved PDD(version 05). Please also refer para 5.1.7, 5.2, 5.4 of GS validation report.

#	Item	Time	Status
3	1st Monitoring period under CDM	2007-12-29 to 2008-01-31	Issued
4	2nd Monitoring period under CDM	2008-02-01 to 2008-12-31	Issued
5	3rd Monitoring period under CDM	2009-01-01 to 2009-12-31	Issued
6	4th Monitoring period under CDM	2010-01-01 to 2010-12-31	Issued
7	5th Monitoring period under CDM	2011-01-01 to 2011-12-31	Issued
8	6th Monitoring period under CDM	2012-01-01 to 2012-12-31	Issued
9	7th Monitoring period under CDM	2013-01-01 to 2017-12-28.	Requesting issuance
10	8th Monitoring period under GS	2016-01-19 to 2017-12-28.	Requesting issuance

2.3. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-3).

Table 2-3: Project Parties and project participants

Characteristic	Party	Project Participant
Host Party	India	Delhi Metro Rail Corporation (DMRC)
Other involved party/ies	-	-

2.4. Project Location

The details of the project location are given in table 2-4:

Table 2-4: Project Location

No.	Project Location
Host Country	India
Region:	Delhi
Project location address:	Delhi Metro Rail Corporation (DMRC) Bhishma Pitamah Marg Pragati Vihar IIIrd NBCC Place New Delhi Delhi – 110003
Latitude:	28.61° N
Longitude:	77.23°E

2.5. Technical Project Description

The project activity involves operation of low GHG emitting rolling stocks which have regenerative braking system. Thus, the project activity replaces conventional electro-dynamic rheostatic braking technology, with regenerative braking technology. The regenerated electrical energy by the project activity reduces the consumption of equivalent grid electrical energy required by the powering trains, and conserves equivalent electrical energy which leads to reduced GHG emissions.

The project activity aims to reduce GHG emissions reducing approximately 47,053 tCO_{2e} per year over the fixed crediting period of 10 years, (ref. Approved PDD Version 05)/PDD/

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract Review
- Appointment of team members and technical reviewers
- A desk review of the draft monitoring report including the claimed emission reductions and the sustainability monitoring report submitted by the client and additional supporting documents
- Verification planning
- On-Site assessment
- Background investigation and follow-up interviews with personnel of the project proponent and its contractors
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 3.1 below:

Table 3.1: Verification sequence

Topic	Time
Assignment of verification	2015-10-26
On-site visit	2018-12-18
Draft reporting finalised	2018-12-24
Final reporting finalised	2019-07-06
Technical review finalised	2019-07-31

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the CDM and GS accreditation requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consistent of one team leader, was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table (3-2) below.

Table 3-2: Involved Personnel

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence [3]	Technical competence [4]	Verification competence [5]	Host country Competence	On-site visit
☒ Mr. ☐ Ms.	Kunal Rami	TN CERT GmbH	TL	SA	☒	7.1	☒	☒	☒
☒ Mr. ☐ Ms.	Swapnil Thanekar	-	TM	LA	☒	-	☒	☒	☒
☒ Mr. ☐ Ms.	Eric Krupp	TN CERT GmbH	TR[B)]	TE	☐	7.1	☐	☐	-
☒ Mr. ☐ Ms.	Stefan Winter	TN CERT GmbH	TR/FA[B)]	SA	☒		☒	☐	-

1) TL: Team Leader; TM: Team Member[A)], TR: Technical review[B)]; OT: Observer-Team[B)], OR: Observer-TR[B)]; FA: Final approval[B)]
   A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE
   B) No team member: OT, TR, OR, FA
2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert
3) GHG auditor status (at least Assessor)
4) Technical Area / TR Subcategory as per S01-VA000-F02 or S01-VA070-F01 (such as 1.1, 1.2, …)
5) In case of verification projects

All team members contributed to the review of documents, the assessment of the project activity and to the preparation of this report under the leadership of the team leader.

Statements of competence for the above mentioned team members are enclosed in annex 2 of this report.

3.4. Publication of the Monitoring Report

The draft Gold Standard MR/MR/and other evidence as received from the project participants, have additionally been made publicly available in the Gold Standard website prior to the onsite visit to enhance transparency of the verification process.

3.5. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in table 3-3 below.

Table 3-3: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *FARs*)**
The following potential risks were identified and divided and structured according to the possible areas of occurrence.	*The potential risks of raw data generation have been identified in the course of the monitoring system implementation. The following measures were taken in order to minimize the corresponding risks.* *The following measures are implemented:*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.*	*The additional verification testing performed is described. Testing may include:* - *Sample cross checking of manual transfers of data* - *Recalculation* - *Spreadsheet 'walk throughs' to check links and equations* - *Inspection of calibration and maintenance records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

The completed table A-1 is enclosed in the annex 1 (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific GS verification protocol is developed. The protocol shows, in a

transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a GS project is expected to meet for verification
- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the GS verification is described in table 3-4.

Table 3-4: Structure of the project specific GS verification checklist

Table A-2: Periodic verification checklist				
Checklist Item	***Reference***	***Verification Team Comments***	***Draft Conclusion***	***Final Conclusion***
The checklist items in Table A-2 are linked to the various requirements the monitoring of the project should meet. The checklist is organised in various sections as per the requirements of the topic and the individual project activity. It further includes guidance for the verification team.	*Gives reference to the information source on which the assessment is based on.*	*The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the verification team and how the assessment was carried out. The reporting requirements of the GS shall be covered in this section.*	*Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft clarification stage.*	*In case of a corrective action or a clarification the final assessment at the final verification stage is given.*

The GS verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in the annex (table A-2) to this report.

3.6. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- The approved version of the PDD/PDD/ and attached documents, including the monitoring plan/PDD/, the additional annexes to the PDD GS including the GS monitoring matrix.
- The registered GS validation report/VAL/.

- The draft monitoring report/MR/, including the claimed emission reductions for the project.
- The emission reduction calculation spreadsheet/XLS/.

Other supporting documents, such as publicly available information on the Gold standard website, the UNFCCC website and background information were also reviewed.

3.7. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on-site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore, the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. Changes to the key sustainable development indicators and the achievement and implementation of mitigation / compensation measures are other integral parts of the on-site assessment.

Keeping in mind the principles of materiality and quality of evidence, typical activities on-site include but are not limited to:

- An investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- Required calibration of all measuring equipment.
- The monitoring processes, routines and documentations to check their proper application.
- Checking the monitoring data and monitoring/usage survey data.
- The data aggregation trails were checked via spot sample down to each level.
- Checking for possibility of double counting and/or leakage.

During the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of Delhi Metro Rail Corporation (DMRC) and the consultant were interviewed. The main topics of the interviews are summarised in Table 3-5.

Table 3-5 Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Project proponent 2. Project & Operations Personnel	- General aspects of the project - Changes since validation - Monitoring and measurement

Interviewed Persons / Entities	Interview topics
3. Stakeholders	- Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - Procedural aspects of the verification - Maintenance - Environmental aspects - Sustainability indicators - Data management - Traceability and integrity of data - ER calculations

3.8. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings form the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

3.9. Resolution of CARs, CLs and FARs

Non-conformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation or previous verifications requiring actions by the project participants to be verified during verification have not been resolved.

The verification team uses the term Clarification Request (CL), which is be issued if:

- information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. Refer to chapter 4.

3.10. Final reporting

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.11. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.12. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the verification team will submit the verification report including the verification opinion to the client via e-mail and to Gold Standard via the GS registry.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the carbon and sustainability monitoring report/MR/, the PDD/PDD/ and additional annexes for GS registration, the GS validation report/VAL/ and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

Verification topic	No. of CAR	No. of CL	No. of FAR
A – Description of project activity	1	0	0
B – Implementation of project activity	0	2	0
C – Description of monitoring system	2	1	0
D – Data and parameters	0	0	0
E - Calculation of Emission Reductions	1	0	0
SUM	**4**	**3**	**0**

Table 4-1: Summary of CAR, CL and FAR issued during this verification period

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex 1).

Table 1. Clarification Requests from this verification

CL ID	1	**Section no.**	B.1	**Date:**18/12/2018

Description of CL

- Clarification is requested under the section B.1 of MR as to how the numbers of rolling stocks vary for applied monitoring period even though the year of commissioning of service lines does not change (cp 6th periodic verification).
- In addition clarification is also requested pertaining to the name and number of metro depot with respect to the section A.1 of the approved PDD (version 05) and reason for its variation with the information reported during 6th periodic verification.

Project participant response (1st round) **Date:** 07/03/2019

- Clarification w.r.t. number of rolling stocks is as follows:

At the start of 6th crediting period, the distribution of rolling stock is as follows:

S. No.	Service Line	Number of Rolling Stock
1.	1	27
2.	2	12
3.	3 & 4	31

However, MC#11 and MC#12, earlier under line 2, were shifted from line 2 to line 1 in the month of November 2012. No. of rolling stocks have remained same i.e. 70. All the 70 Rolling Stock were under operation during the monitoring period i.e. 01/01/2012 to 31/12/2012.

The revised distribution of rolling stock in each service line is mentioned in the MR and the same is given in the table below:

S. No.	Service Line	Number of Rolling Stock
1.	1	29
2.	2	10
3.	3 & 4	31

The above distribution is same at the start of 8th crediting period viz. 19/01/2016.

- The details of name and number of metro depot has been removed from Section A.1 of the MR and same has been clarified in Section B.1 of the MR.

Documentation provided by project participant (1st round)

☒	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		

DOE assessment (1st round) **Date:** 11/03/2019

Documents to support the stated changes are requested. Year wise status is requested for transparent representation. CL has been kept OPEN

Project participant response (2ndround) **Date:** 13/05/2019

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 02were 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 (TS#30) 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 (TS#32) 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

A sample document of shifting of rolling stock from one depot to another is attached as Appendix-1.

DOE assessment (2nd round)	**Date:** 18/05/2019

Appendix 1 does not provide the date of allotment of the rolling stocks. Authenticated copy clearly mentioning the date of allotment is requested to confirm the date of allotment within the line 1, 2, 3 and 4. Finding is KEPT OPEN.

Project participant response (3rd round)	**Date:** 25/06/2019

Authenticated copy of the date of commissioning of 70 Rolling stock and their conversion from 4 cars to 6/8 cars are mentioned in "Appendix-A Details on commissioning date and conversion of Rolling Stock."
DOE assessment (3rd round) **Date:** 30/06/2019
Authenticated copy the records are provided. The pending issue is CLOSED out.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	02	**Section no.**	A.1 of MR, Onsite observations	**Date:**08/04/2019

Description of CL

The PDD (Section A.1) and MR (Section A.1) states that the project activity involves 4 cars for each rolling stock however; the rolling stocks employ 8 or 6 cars for each rolling stock.

In addition, it needs to be justified how the project is in line with the registered PDD (Version: 05, dated 2013-10-20).

Project participant response (1st round) **Date:**13/05/2019

Section A.1 of the MR has been revised accordingly and details of conversion of cars from 4 to 6/8 has been attached as Appendix-2.

The project proponent viz Delhi Metro Rail Corporation has increased four cars to six/eight cars in each rolling stock. The cars have been increased considering the increase in passenger ridership.

Consequently, the number of cars in rolling stock has changed. For instance in the train set No.12. which is an 8 car rolling stock, the previous car number and new car number including additional cars are as follows:

Train Set No.	Old Car Number	New Car Number	Remarks
TS 12	M323	M3A12	Data monitored as required in Registered PDD
	M324	M3B12	
	-	M3C12	Data not monitored.
		M3D12	

It is further submitted that only those cars which are part of registered PDD has been considered in calculation of Emission Reduction. The same is also evident from the Emission Reduction sheets submitted along with Monitoring Report for year 2016-2017. Rest Rolling Stock cars which are not in registered PDD have not been considered in ER calculation.

Hence, from above it can be concluded that the project is in line with the registered PDD.

Documentation provided by project participant (1st round)

☐ Changes in the PDD	Section(s):	New version No.:
☐ Changes in MR	Section(s):	New version No.:
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment (1st round) **Date:** 18/05/2019

Further, response in line with the para 242 of the Project Standard (PS) Version 02.0 is requested. The impact on the below particulars are not addressed (a) The applicability and application of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents with which the project activity has been registered; (b) The compliance of the monitoring plan with the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents; (c) The level of accuracy and completeness in the monitoring of the project activity compared with the requirements contained in the registered monitoring plan; (d) The additionality of the project activity; (e) The scale of the project activity. Finding has been kept OPEN.

Project participant response (2nd round)	**Date:** 25/06/2019

Point wise reply of particulars are mentioned below:

(a) As per the provisions of appendix B of simplified modalities and procedures for small scale CDM project activities, Type III C category:
1. "Comprises low-greenhouse gas emitting vehicles".
2. "Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually".
   - The project boundary covers the low-greenhouse gas emitting rolling stock in all the service lines that are part of the project activity.
   - The emission reductions from the project activity are 47,053 tCO_2e annually which is below the specified limit of 60,000 tCO_2e per year through-out the crediting period.

Hence, the project activity meets both the applicability criterion of the AMS III.C. methodology.

The baseline and emission reduction calculations for the project are based on paragraph 4, 5, 6 under Type III.C. of Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

The project is applicable for four coaches of 70 Rolling Stock only. The conversion of four car to six/eight car are not part of project boundary and is therefore not considered under applicability and application of applied methodologies.

(b) The monitoring plan of the project activity is based on guidance provided in the paragraph 8 and 9 under Type III.C. of Appendix B of the simplified modalities and procedures for small scale CDM project activities.
The Baseline, Project and other parameters for the monitoring period has been monitored as per Section B.6 of PDD.
Hence, the monitoring plan remains unaffected due to the conversion of four car to six/eight cars in a rolling stock.

(c) 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 monitoring of the all electrical energy data required for estimation of baseline and project emissions for the project activity is carried out through state of the art electronic equipment's like Train Integration Management system (TIMS). This is an electronic device of very high accuracy used for measurement and recording. The projects activity represents four cars of all 70 rolling stock trains of all the service lines for which electrical energy data is monitored through TIMS during the project activity.
All the parameters during the monitoring period have been monitored as per the Monitoring plan mentioned in Section B.7 of the PDD.
Hence, the completeness and accuracy of monitoring parameters remains unaffected due to the conversion of four car to six/eight cars in a rolling stock.

(d) Four car Rolling stock has been converted to six/eight cars Rolling stock. However, the additional coaches in each rolling stock are not the part of project activity and therefore have not been considered for monitoring. Therefore the conversion of 4 cars to 6/8 cars of 70 rolling stocks has not changed the additionality of the project and the additionality is in accordance with paragraph 28 of the simplified modalities and procedures for small-scale CDM project activities.

(e) The four car rolling stock has been converted to Six/Eight car rolling stock. However, as per the registered PDD, only four car of rolling stock are considered and Emission Reduction from the registered cars have been considered. This is also evident from the ER worksheets considered for calculation of CERs. Hence, the scale of the project activity remains unaffected by conversion of four to six/eight cars and project remains as a small scale project.

DOE assessment (3rd round)	**Date:** 30/06/2019

The Verification visited the site and accordingly raised above CL based on the onsite observations. During the interviews, the PP updated that the ridership is continuously increasing and thus, it is a natural phenomenon to add CARS to match the ridership requirement. Each CAR is having independent monitoring system and the monitoring plan has provision to capture monitoring parameter dedicated to each CAR by the TIMS. Please also refer additional assessment as given below: • During the site visit, the Verification Team observed that the monitoring process is exactly in line with the registered monitoring plan and the monitoring of the 70 CARS as stated in the PDD is undertaken and reported into the emission reduction worksheet. The verification team is thus convinced that the conversion from 4 CAR to 6 or 8 is not affecting the project design as still the provisions of monitoring are intact. • The emission reduction accrued from the 70 CARS is well within the threshold of the small-scale type III i.e. 60 kT CO_2. Thus, it is also accepted that the limit of small-scale activity is not affected. • Only the 70 CARS are getting monitored, and the details of the transfer of CAR from one yard to other is also appropriately updated under the section B.2 of MR Based on the above assessments it is confirmed by the Verification team that, the project activity is in line with the registered PDD. CL has been CLOSED.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	3	**Section no.**	C	**Date:** 18/03/2019
Description of CL				
The para “Calibration Procedure” states that DMRC undertakes “PP does the calibration of CT/PT from accredited lab, with a frequency of once in a three year”. During onsite verification, the PP however argued that calibration is not applicable and supported argument with registered monitoring plan. Inconsistency statements needs to be clarified.				
Project participant response (1st round)				
The Project Proponent carries out calibration of CT/PT from accredited lab on sampling basis for few equipments. Since, this said calibration is not required under the registered monitoring plan, hence the calibration procedure has been modified in Section C of the Monitoring Report. In addition, the calibration details of few equipments are mentioned in Section D.2 of the monitoring report.				
Documentation provided by project participant (1st round)				**Date:**13/05/2019
☐ Changes in the PDD		Section(s):		New version No.:
☐ Changes in MR		Section(s):		New version No.:
☐ Changes in XLS		Worksheet(s):		New version No.:
☐ Other:				
DOE assessment (2nd round)				**Date:** 18/05/2019
Accepted. TIMS is totally software-based system with high level of accuracy and hence does not require calibration. The Verification Team confirms that the registered monitoring plan also does not mandate for calibration requirements. The CT/ PT are however calibrated on sample basis as additional measure to maintain accuracy. Finding has been CLOSED.				

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 2. Corrective Action Requests from this verification

CAR ID	01	**Section no.**	Front page, Section A, B and E	**Date:**18/12/2018
Description of CAR				

Front page

- Clarification is requested how applied monitoring period number is 7th monitoring period.
- The duration of monitoring period does not follows DD/MM/YYYY Format.
- The name of project participant is in consistent with the MoC.
- The Front page of MR Reports "Amount Achieved before 1 January 2013 However the applied the start date of applied monitoring period is 19/01/2016 appropriate correction are requested.
- The front page of MR States estimated Ex ante emission reduction for year 2016 and 2017 however the adjustment to calculate ER is missing.

Section A.4

Section A.4 lacks reference to applied tools and UNFCCC CDM websites references.

Section B.2.2, B.2.5, B.2.6.

- List of all the corrections since the registration of project activity, approved by the board as applicable from period prior to the applied monitoring period, approval date, reference numbers of the post registration changes is missing. Same finding applies to section B.2.4 and B.2.6 of MR.

Section B.2.3

- The stated start date of crediting period is incorrect

Section E.4

Section E.4 doesn't follow the tabular representation as prescribe by CDM-MR-FORM

Project participant response (1st round)	**Date:** 07/03/2018

Front page

- Monitoring period number has been changed to 8th in the MR. The 7th Monitoring report is from 01/01/2013 to 28/12/2017. The 8th monitoring report is from 19/01/2016 to 28/12/2017.
- Changes in duration of monitoring period have been followed as per DD/MM/YYYY Format.
- Name of project participant is now consistent with the MoC.
- As there is no value which is to be mentioned in the column of "Amount Achieved before 1 January 2013", therefore, '-' has been accepted.
- As per approved PDD, ex-ante emission reduction for year 2016 and 2017 are 47,890 and 51,577 tCO_2 respectively. Now, the adjusted value for year 2016 and 2017 are 45,528 and 51,153 tCO_2 respectively.
  This adjustment has been made as the number of days considered are from 19/01/2016 to 31/12/2016 and 01/01/2017 to 28/12/2017 as against 01/01/2016 to 31/12/2016 and 01/01/2017 to 31/12/2017.

Section A.4

Methodology link has been provided in Section A.4 in the MR.

Section B.2.2, B.2.5, B.2.6.

- Details related to corrections, permanent changes and changes to project design has been incorporated in their respective sections.

Section B.2.3

- Start date of crediting period has been corrected and incorporated in DD/MM/YYYY format.

Section E.4

- Table in Section E.4 has been corrected as per by CDM-MR-FORM

Documentation provided by project participant (1st round)		
☒ Changes in MR	Section(s): Front page, Section A, B and E	New version No.: 02

☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment (1st round)	**Date:** 08/04/2019

Front page

- The project activity has already applied for issuance to UNFCCC for 07 times, hence the applied monitoring period number has been changed to 8th in the MR. The 7th Monitoring report has been uploaded on the project page Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system to claim the CERs for monitoring period of 01/01/2013 to 28/12/2017. Thus, the stated monitoring period under the MR i.e. 8th monitoring report (for period 19/01/2016[2] to 28/12/2017[3]) is deemed as appropriate. Finding has been CLOSED.
- It is checked and confirmed that DD/MM/YYYY format has been followed appropriately.
- It is checked and confirmed that name of project participant is now consistent with the MoC (MoC Annex 2 (Change/update authorized signatory, name or contact details valid as of 07/03/2012).Finding has been CLOSED.
- Update is in line with the MR filling guidelines. Finding has been CLOSED.
- Mention of multiple values is not accepted. As per the MR filling guidelines, the final applicable value (with adjustment for the comparable period, as appropriate) for the applied monitoring period is missing. Finding has been KEPT OPEN.

Section A.4

- Appropriate reference to the methodology has been provided in Section A.4 in the MR. Finding has been CLOSED.

Section B.2.2, B.2.5, B.2.6.

- **Section B.2.2:** All the corrections are not covered. Finding has been KEPT OPEN.
- **B.2.5:** Appropriately updated. Finding has been CLOSED.

Section B.2.6

- Updates on the changes to project design are appropriately updated. Finding has been CLOSED.

Section E.4

Table in Section E.4 has been corrected as per by CDM-MR-FORM, finding has been CLOSED.

Project participant response (2nd round)	**Date:**13/05/2019

Front Page:
Only applicable value has been mentioned in the Monitoring Report.

Section B 2.2 :
All the corrections have been mentioned in the monitoring Report.

DOE assessment (2ndround)	**Date:** 18/05/2019

Reflection of apportioning logic for calculation of ex-ante emissions is missing for independent reader. Finding is KEPT OPEN.

All corrections are covered appropriately. Finding has been CLOSED.

Project participant response (3rd round)	**Date:** 25/06/2019

Apportionment logic for calculation of ex-ante emission has been mentioned in the monitoring report.

DOE assessment (3rd round)	**Date:** 15/05/2019

The monitoring report is now appropriately updated to transparently include the logic of calculation of estimated emission reductions. The CL has been CLOSED.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	02	**Section no.**	C	**Date:** 18/12/2018

[2]Considering the start date of the monitoring period as start date of the crediting period under GS
[3]Considering the end date of monitoring period as end date of crediting period of project activity

Description of CAR		
The section C of MR states that there are 3 service lines whereas Annexure 1 data states information for 4 service lines.		
Project participant response (1st round)		**Date:** 07/03/2019
Section C of MR has been revised to four (4) service lines.		
Documentation provided by project participant (1st round)		
☒ Changes in MR	Section(s): C	New version No.: 02
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		
DOE assessment (1st round)		**Date:** 08/04/2019
Appropriate corrections are included. The number of lines is stated as 04.		
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	03	**Section no.**	ER worksheet	**Date:**18/12/2018

Description of CAR

Below findings are raised on submitted separate ER worksheets for year 2016 and 2017

2016:

- Linkage between the worksheets is missing for the ER calculation worksheet associated to year 2016. Example value of the worksheet "NFD-JAN16-1" are aggregated into "NFD-JAN16-2" however the same are not linked. This finding follows for the all the stations Depot data for months under the applied monitoring period.
- Clarification is requested pertaining to the terms "Calculated data" and "Final data" and its relation with the monitoring plan as well as its implications on the emission reduction calculations. Please refer tab "NFD-JAN16-2", "SPD-JAN16-2" etc
- DMRC is further requested to clarify the reason behind the variation in the kWh/km between “NFD”, “SPD”, “KPD”, “YBD” and “SLPD”.
- The data for the January 2016 is not exactly consistent with the records. The application of adjust to consider the pro-rata basis is not defined transparently in the MR.
- Data inconsistency is identified as below:

Tab	Parameter	Description
SPD	Total distance covered by rolling stick ‘i’	km at the end of month for September is inconsistent with km at the start of October for TS25
YBD	Electrical energy regenerated by operational rolling stock ‘i’	kWh at the end of month for November is inconsistent with kWh at the start of December for TS# 27
SLPD	Electrical energy consumed by the operational rolling stock ‘i’	kWh at the end of month for September is inconsistent with kWh at the start of October for MC # 01
SLPD	Electrical energy regenerated by operational rolling stock ‘i’	kWh at the end of month for January is inconsistent with kWh at the start of February for MC # 01

2017:

- Clarification is requested pertaining to the terms "Calculated data" and "Final data" and its relation with the monitoring plan as well as its implications on the emission reduction calculations. Please refer tab "NFD-JAN16-2", "SPD-JAN16-2" etc
- DMRC is further requested to clarify the reason behind the variation in the kWh/km between “NFD”, “SPD”, “KPD”, “YBD” and “SLPD”.
- During the verification of the submitted ER worksheet for Line-02, it is identified that the distance covered is recalculated and restricted to Jahangirpuri station. Clarification is requested how this approach is in line with the Approved PDD version 05.
- Data inconsistency is identified as below:

Tab	Parameter	Description
YBD	Electrical energy consumed by the operational rolling stock ‘i’	kWh at the end of month for February is inconsistent with kWh at the start of March for TS# 26

	SLPD	Electrical energy regenerated by operational rolling stock 'i'	kWh at the end of month for June is inconsistent with kWh at the start of July for MC # 01
	SLPD	Total distance covered by rolling stick 'i'	km at the end of month for June is inconsistent with km at the start of July for MC # 01
	SLPD	Electrical energy regenerated by operational rolling stock 'i'	kWh at the end of month for July is inconsistent with kWh at the start of August for MC # 01
	SLPD	Total distance covered by rolling stick 'i'	km at the end of month for July is inconsistent with km at the start of August for MC # 01
	SPD	Total distance covered by the rolling stock 'i'	km reading while transferring from SLPD to SPD TS30(MC#01) are inconsistent
	NFD	Electrical energy consumed by the operational rolling stock 'i'	kWh at the end of month for May is inconsistent with kWh at the start of JuneforTS#10
	NFD	Total distance covered by the rolling stock 'i'	km at the end of month for May is inconsistent with km at the start of June forTS#10
	SPD	Total distance covered by the rolling stock 'i'	km readings inconsistently reported for all the train sets during the months September, October & November.
	SPD	Electrical energy regenerated by operational rolling stock 'i'	kWh at the end of month for January is inconsistent with kWh at the start of February for TS27.
Project participant response (1st round)			**Date: 07/03/2019**

2016

- Linkage between the worksheets has been provided in the ER calculation worksheet.
- Calculated data and Final data have been removed from the ER calculation worksheet. Only the actual tables have been kept in the ER calculation worksheet. Adjustment for the number of days in the month of Jan'16 has been done by taking 13 number of days in the month of January'2016 instead of 31 days since the project was registered with GS on 19th January, 2018
- The distribution of metro depots on various service lines along with Energy consumption and Energy regeneration are as follows:

S.No	Service Line	Metro Depot	Energy consumption (CI+SIV) in Jan 2016 (Kwh/KM)	Energy Regenerated in Jan 2016 (Kwh/KM)
1	1	Shastri Park Depot (SPD)	13.57	5.92
2	2	Khyber Pass Depot (KPD)	15.89	5.34
3	2	Sultanpur Depot (SLPD)	15.55	5.02
4	3	Yamuna Bank Depot (YBD)	13.96	6.21
5	3	Najafgarh Depot (NFD)	13.59	6.01

As observed from above, the Energy consumption and Energy regeneration on Khyber Pass depot (service line-2) and Sultanpur depot (service line-2) are quite similar. Further, energy consumption and energy regeneration on Yamuna Bank Depot (service line-3) and Najafgarh depot (service line-3) are also similar.

Based on this, it can be inferred that the amount of energy consumption and energy regeneration (in term of Kwh/KM) is almost similar on depots lying on same line.

Further, the details of stations and network length on each service line is as follows:

S.No.	Service Line	Service line length (Km)	Number of Stations (No.)	Average distance between stations (Km)
1.	1	25.15	21	1.19
2	2	49.15	37	1.33
3	3	58.67	50	1.17

It is evident from above table that average distance between two stations on service line-2 is 1.33 Km as against 1.19 Km on Line-1 and 1.17 Km on Line-3. The average distance between two stations on service Line-02 is more as compare to line-1 and line-3, so it can be said that while accounting on Km basis, train travels more distance on service line-2,which results in increase in energy consumption and simultaneously reduction in energy regeneration.

- Data for January 2016 has been taken on pro-rata basis and the same has been incorporated transparently in respective columns of the ER calculation worksheet. Further, adjustment for the number of days in the month of Jan'16 has been done by taking 13 number of days in the month of January'2016 instead of 31 days since the project was registered with GS on 19th January, 2018
- Consistency maintained in the whole ER calculation worksheet.

2017

- Calculated data and Final data have been removed from the ER calculation worksheet. Only the actual tables have been kept in the ER calculation worksheet. Adjustment for the number of days in the month of Dec'17 has been done by taking 28 number of days in the month of Dec'17 instead of 31 days since the project was registered with GS on 19th January, 2018

- The distribution of metro depots on various service lines along with Energy consumption and Energy regeneration are as follows:

S.No.	Service Line	Metro Depot	Energy consumption (CI+SIV) in Jan 2017 (Kwh/KM)	Energy Regenerated in Jan 2017 (Kwh/KM)
1	1	Shastri Park Depot (SPD)	13.81	6.0
2	2	Khyber Pass Depot (KPD)	16.16	5.47
3	2	Sultanpur Depot (SLPD)	16.12	5.64
4	3	Yamuna Bank Depot (YBD)	14.06	6.30
5	3	Najafgarh Depot (NFD)	13.87	6.14

As observed from above, the Energy consumption and Energy regeneration on Khyber Pass depot (service line-2) and Sultanpur depot (service line-2) are quite similar. Further, energy consumption and energy regeneration on Yamuna Bank Depot (service line-3) and Najafgarh depot (service line-3) are also similar.

Based on this, it can be inferred that the amount of energy consumption and energy regeneration (in term of Kwh/KM) is almost similar on depots lying on same line.

Further, the details of stations and network length on each service line is as follows:

S.No	Service Line	Service line length (Km)	Number of Stations (No.)	Average distance between stations (Km)
1.	1	25.15	21	1.19
2	2	49.15	37	1.33
3	3	58.67	50	1.17

It is evident from above table that average distance between two stations on service line-2 is 1.33 Km as against 1.19 Km on Line-1 and 1.17 Km on Line-3. The average distance between two stations on service Line-02 is more as compare to line-1 and line-3, so it can be said that while accounting on Km basis, train travels more distance on service line-2, which results in increase in energy consumption and simultaneously reduction in energy regeneration.

- ER worksheet has been modified and covered the distance till Badli as mentioned in the approved PDD, Version 05.
- Consistency maintained in the whole ER calculation worksheet.

Documentation provided by project participant (1st round)		
☐ Changes in MR	Section(s):	New version No.:
☒ Changes in XLS	Worksheet(s): Various tabs	New version No.: 02
☐ Other:		

DOE assessment (1st round)	**Date:** 08/04/2019

The Assessment Team identified inconsistency between the CAR number stated in the ER worksheet and the rolling stock cars (one example)

Nomenclature followed in the ER sheet	Nomenclature followed in the rolling car
TS #17 – M301	TS #17 – M3A01

Finding has been KEPT OPEN

Project participant response (2nd round)	**Date:**13/05/2019

Inconsistency between the CAR numbers has been rectified in the ER worksheets. In the ER worksheet, both the old car number and new car number has been mentioned.

The same has been attached as Emission Reduction Calculation MP-2016 and Emission Reduction Calculation MP-2017.
DOE assessment (2nd round) **Date:** 18/05/2019
Appropriate corrections are undertaken in the ER worksheet. Finding has been CLOSED. Redundant Data is still apparent in the ER worksheets. Finding has been raised in this regards. The MR still refers to the old CAR numbers. Finding is KEPT OPEN.
Project participant response (3rd round) **Date:** 25/06/2019
Redundant data has been addressed in all ER worksheets. The same has been attached as Emission Reduction Calculation MP-2016 and Emission Reduction Calculation MP-2017. The train set number of 70 Rolling Stock which are part of project activity are mentioned in the PDD. Further, the monitoring report has been prepared in accordance with these train set number only.
DOE assessment (3rd round) **Date:** 30/06/2019
The ER worksheet is no more having any redundant data. Thus, the finding is CLOSED. The nomenclature of the rolling stocks is appropriately addressed in line with the actual status. Thus, the finding is CLOSED.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	04	**Section no.**	GS Indicators	**Date:**18/12/2018
Description of CAR				
DMRC needs to follow below requirements: **Parameter SI6:** Documentary evidences are pending for the Medical and insurance benefits **Parameter SI7:** Documentary evidences are requested for the performance against the indicator “Livelihood of the poor”. Data from the recent references is stated; however the data reporting encompassing the entire reporting period is missing. In addition the claim of visit of 10,000 students of Metro Museum is not satisfactorily backed by methodological monitoring. **Parameter SI9:** The MR repeats the write-up of GS passport; however the actual data applicable to the monitoring period is missing. **Parameter SI10:** The number of employees for the reporting period is not consistent with credible references (Annual Report). Appropriate corrections requested. **Parameter SI12:** The MR repeats the write-up of GS passport; however the actual data applicable to the monitoring period is missing.				
Project participant response (1st round)				**Date: 0**7/03/2019
Parameter SI6: Documentary evidences for Medical and Insurance benefits are attached as document “Master Circular on Medical Attendance Rules in DMRC” and document mentioning insurance benefits. **Parameter SI7:**				

Actual year wise figures have been provided in the MR and documentary evidences have been attached as

1. Help Age India_2015
2. Help Age India_2016
3. Help Age India_2017
4. Site Visit Information to Metro Museum

Parameter SI9:

Actual data has been provided in the MR and documentary evidence mentioning the same are attached as

1.Nukkad Natak at Construction site
2. Newsletter Jan 2016
3. Newsletter Feb 2016
4. Newsletter May 2016
5. Metro Museum visit details

Parameter SI10:

Actual year wise figures have been provided in the MR and the same has been mentioned in the Annual Reports of Delhi Metro Rail Corporation. The supporting documents are attached as:

1.Annual Report 2015-16
2.Annual Report 2016-17
3. Annual Report 2017-18

Parameter SI12:

Actual data has been mentioned in the MR and documentary evidence mentioning the same are attached as

1. Chapter 7 Hyderabad Metro

Documentation provided by project participant (1st round)		
☐ Changes in MR	Section(s):	New version No.:
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		
DOE assessment (1st round)		**Date:** 08/04/2019

Parameter SI6:

As per the monitoring plan the effectiveness of the indicator is determined by the "Training of Staff, medical benefits and insurance".

Training of Staff: Training records are requested. Further data is requested. Finding has been KEPT OPEN.

Medical Benefits and insurance: DMRC has submitted the Office Order Reference DMRC/PERS/14/2013 with Office Order Number- "PP/1646/2013, dated 07/08/2013, issued with approval of Top Management (Managing Director). The office order was issued with set of rules designed to provide social security and insurance to employees and their family members against various type of illness which may occur them during employment. However, record (statistics) of the benefit taken by employees for applied monitoring period is not transparently stated in the MR. Further data is requested. Finding has been KEPT OPEN.

Parameter SI7:

Providing homes/ Shelters: The cold weather causes fatalities (https://www.rediff.com/news/special/shocking-164-people-have-died-of-cold-in-delhi-so-far/20160125.htm, https://www.dailypioneer.com/2017/delhi/195-people-died-of-cold-this-december-

survey.html). DMRC is providing Winter Shelters to elderly persons. The Verification Team is in receipt of the

- Certificate number: IN-DL-10404346413348O, dated 18-Oct-2016, "Article 5 – General Agreement" signed between HelpAge India (First Party) and DMRC (Second Party) for period of 1st November 2016 to 31st March 2017
- Certificate number: IN-DL57618433388458P, dated 27-Nov-2017, "Article 5 – General Agreement" signed between HelpAge India (First Party) and DMRC (Second Party) for period of 1st November 2017 to 31st March 2018.

Evidence against the claim of dinner and breakfast services to 40 persons from 01st November 2016 to 31st March 2017 and 35 person from 1st November 2017 to 31st March 2018 is requested.
Supportive evidences pertaining to the salambalak trust (NGO working with poor senior citizens, homeless orphans and street children) is requested.
Supportive evidences pertaining to the "DMRC Children home", has been carrying out various activities and events focusing on education, health and overall well-being of 136 orphan and street children.
Clarification is requested, how the Site Visit Information is inline with the parameter SI7.Further data is requested. Finding has been KEPT OPEN.

Parameter SI9:

1. Nukkad Natak at Construction site: Photograph is submitted as objective evidence.

2. Newsletter Jan 2016: Safety Awareness week is observed

3. Newsletter Feb 2016: Safety and environmental topics (waste) are discussed through the News Letter

4. Newsletter May 2016: Cultural and environmental topics (waste) are discussed through the News Letter

5. Metro Museum visit details: Site Visit information issued by the Deputy CPRO is furnished.

Finding has been CLOSED.

Parameter SI10:
Actual year wise figures have been Verified from the Annual Report as below:
1.Annual Report 2015-16 (page 16)–Number of employees – 8629 (1832 in project and 6797 in Operation and Maintenance)
2.Annual Report 2016-17 (page 11) - Number of employees – 9684 (1941 in project and 7923 in Operation and Maintenance)
3. Annual Report 2017-18 (page 13)- Number of employees – 12056 (1878 in project and 10178 in Operation and Maintenance)
Based on above trends, it is confirmed that there is increase in the employment at project and operation and maintenance.

Confirmation on the compliance to the Minimum Wages is requested. Further data is requested. Finding has been KEPT OPEN.

Parameter SI12:

Extract of chapter-7 is reviewed; the Verification Team requests contract of consultancy as a corroborative evidence.

Further data is requested. Finding has been KEPT OPEN.

Project participant response (2nd round)	**Date:**13/05/2019

Parameter SI6:

Training of Staff: In the monitoring period 2016 and 2017, a total number of 153 executives have been imparted training at the training institute of DMRC. A office order on sample basis indicating the training of executives is attached as Appendix-3.

In addition, 274 and 489 non executive staff of electrical wing had been trained during the year 2016 and 2017 respectively. A office order on sample basis indicating the training of non executives is attached as Appendix-4.

Medical Benefits and insurance: The medical benefit provided to the Operation & Maintenance employees of DMRC during FY 2016-17 was Rs 1,943 Lakhs. Further, DMRC has provided an insurance amount of Rs 40 Lakh during FY 2016-17.

Parameter SI7:

A. The document submitted provided to the verification team is the contract agreement which DMRC had signed with Help Age India. As per this agreement, DMRC shall pay for the breakfast and dinner services for 40 people. This contract has been successfully completed.
B. A Quarterly report is being prepared by SalaamBalak Trust and is submitted to DMRC. Few reports for the monitoring period of 2016 and 2017 are attached as Appendix-5, Appendix-6, Appendix-7, Appendix-8 and Appendix-9.
C. It is specified in the monitoring report that 2,730 and 2,311 children have visited the metro museum in the year 2016 and 2017. As an evidence of record, site visit record had been provided earlier which mention about the children from various schools visiting the metro museum.
   Further at metro museum, technological features such as the Automatic Train Control System, Automatic Fare Collection system, round-the-clock activities of various departments, features friendly for the physically challenged, actual Metro rails and Over Head Equipment (OHE) to supply power etc. are described. All of this information is provided to the visitors thereby increasing the awareness.
   Additional details pertaining to Metro Museum is also available at DMRC website and link for the same is as follows:

   http://www.delhimetrorail.com/metro-museum.aspx

Parameter SI10:

The employees working in DMRC has a fixed payscale and the pay varies on designation basis. These pay scale has been clearly defined at Page No. 5 of Master Circular No. DMRC/PERS/14/2015 dt 25.03.2015 and same is enclosed as Appendix-10.

Further, it is communicated that all DMRC employees are getting fair wages/salary. The amount of salary is always above than the minimum wages and therefore is in conformance to SI 12 indicator.

Parameter SI12:

As a corroborative evidence, the executive summary of the same report is attached as Appendix-11.

It is clearly specified at Section 0.22.2, Page No.66 of the executive summary, that Hyderabad Metro vide their letter no. HMRL/DMRC/P-2/2016/944, dated 27.7.2016 desired Delhi metro to prepare the feasibility report and in response Delhi Metro has prepared the report for Hyderabad metro.

DOE assessment (2nd round)	**Date:**18/05/2019

Parameter SI6:

Training of Staff: The verification team is in receipt of the

- Office Order: O & M/ Training / JE/ Traction/ 2017/02 dated 10/11/2017
- Office Order: DMRC/ PERS/07/2017 dated 10/03/2017

which confirms that training is imparted to the employees. The Verification Team has reviewed the submitted Office Order and duration of training and the contents of the training and confirm that various technical and safety related topics are covered for the Junior Engineers and Assistant Managers. In addition, the Verification Team interviewed the DMRC Team and enquired about the training schedules and number of trainings imparted. The inputs from the DMRC team are backed by the sample submitted documentary evidences. The Finding has been CLOSED.

Medical Benefits and insurance: Supporting evidence to back the statement is requested. Furthermore, more the reference of the medical benefits is not part of the monitoring plan under parameter SI6. Finding has been KEPT OPEN.

Parameter SI7:

A. Below evidences are requested

- Evidence against the claim of dinner and breakfast services to 40 persons from 01st November 2016 to 31st March 2017 and 35 person from 1st November 2017 to 31st March 2018 is requested.
- Supportive evidences pertaining to the "DMRC Children home", has been carrying out various activities and events focusing on education, health and overall well-being of 136 orphan and street children.

  Finding is KEPT OPEN.

B. A Quarterly report submitted by Salaam Balak Trust are reviewed. It is confirmed that DMRC is implementing initiatives to educate the orphans by majorly focusing on the areas of education, health and overall well-being.

C. DMRC also hosts children in its Metro Museum. Based on the submitted records (site visit record of school children) 2,730 visited in the year 2016 and 2,311 children visited in the year 2017.

Parameter SI10:

The verification Team is in receipt of the Master Circular No. DMRC/PERS/14/2015 dt 25.03.2015, which confirm that salary is always above minimum wages. Furthermore, DMRC has been generating the employment. This fact is verifiable from website: http://www.delhimetrorail.com/career.aspx, which publicly displays the vacancies to eligible applicants. Thus, the requirement is met. Finding has been CLOSED.

Parameter SI12:

Accepted. The letter no. HMRL/DMRC/P-2/2016/944, dated 27.7.2016 is reviewed. The claim that DMRC has contributed to further dissemination of technology is evidenced. Thus, the requirement is met. Finding has been CLOSED.

Project participant response (2nd round)	**Date:** 25/06/2019

Parameter SI6:

Medical Benefits and insurance: During the Financial year 2016-17, DMRC provided medical benefits of Rs 1,943 Lakh to its employees and Rs 40 Lakh was incurred against the insurance of employees. A sample of medical reimbursement provided to DMRC employees during the month of October 2016 is enclosed as "Appendix-B Medical reimbursement in Oct 2016 salary".

Medical and insurance benefits have been included in Parameter SI6 in the monitoring report.

Parameter SI7:

- The contract signed between DMRC and Help Age India to provide winter shelter for elderly people at Govind puri, Delhi. The same is enclosed as "Appendix-C Help Age India_2016".

  As specified on the second page of contract, DMRC had paid for dinner and breakfast services for 40 people during the period 01st November 2016 to 31st March 2017.

  Similarly, the contract signed between DMRC and Help Age India for period 01st November 2017 to 31st March 2018 is enclosed as "Appendix-D Help Age India_2017".

  As specified on second page of contract, DMRC had paid for dinner and breakfast services for 35 people during the period.

- Quarterly reports are prepared by Salaam Balak Trust and submitted to DMRC. Few reports for the monitoring period of 2016 and 2017 are attached as
  Appendix-E Quarterly Report of Salaam Balak Trust_July'16 to Sept'16
  Appendix-F Quarterly Report of Salaam Balak Trust_Oct'16 to Dec'16
  Appendix-G Quarterly Report of Salaam Balak Trust_Jan'17 to Mar'17
  Appendix-H Quarterly Report of Salaam Balak Trust_Apr'17 to June'17
  Appendix-I Quarterly Report of Salaam Balak Trust_July'17 to Dec'17

The numbers of children at the end of the quarter are specified in the report. For instance, In the quarter of July 2016 - September 2016 i.e. Appendix-6 number of children at the beginning of quarter being 157 and at the end of quarter, the number of children being 153. In continuation to it, the quarterly report of October 2016 - December 2016 clearly specified the number of children at the beginning of quarter being 153 numbers.

DOE assessment (3rd round)	**Date:** 30/06/2019
Appropriate evidences in line with the monitoring plan are submitted. The raised finding has been CLOSED.	
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 4. Forward Action Requests from this verification

FAR ID		**Section No.**		**Date:**
Description of FAR				
n.a.				
Project participant response				**Date:**
Documentation provided by project participant				
☐	Changes in the MR		Section(s):	New version No.:
☐	Changes in XLS		Worksheet(s):	New version No.:
☐	Other:			
DOE assessment				**Date:**
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification			

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CLs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Implementation of the project

By means of an in-depth review of the PDD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PDD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment.

Further is has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (rolling stock, cars, regenerative braking system etc.) in PDD, MR and calculation spreadsheet are applied.

Interviews with operational personnel have been carried out, QMS records, maintenance records; instrument specifications were checked in this context.

Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.

Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs.

During the verification, a site visit from 2018-12-18 was carried out. On the basis of this site visit, interview and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipment, as well as the monitoring and metering equipment, the project has been implemented and operated in line with the latest version of the PDD (Version 5).

The Delhi Metro Rail System is implemented in all phases, Phase I, Phase II and Phase III consisting line 1, line 2, line 3 and 4. Please refer section B.1 of MR and closure of CL 01 and CL 02.

5.2. Project history

During the validation, the validating DOE have raised any issues that could not be closed or resolved during the validation stage. No such issues were identified for this project.

There are no open issues from former verifications; this is confirmed by referring to the UNFCCC project page and review of the sixth periodic verification under CDM.

Deviation from the registered monitoring plan was sought and the request for deviation I-DEV0312 entitled "Change of data transfer method of the monitoring parameters from electronic download to manual recording for a period of 46 days." (for the period from 01/02/2008 till 17/03/2008) has been accepted by the UNFCCC secretariat on 25/05/2010. Since the data acquisition practice has been found to be the same as in the monitoring plan of the PDD with effect from 18th March 2008 onwards, there is no need for revision in monitoring plan in this monitoring period

Post registration changes have been identified during the 5th monitoring period. The identified post registration changes are as following:

1	Issue:	PDD had to be updated and transferred to latest template. Accordingly, the PDD version number, date and ERs changed on first page. The changes needed as the Corridor length extended in all the lines (Red Line, Yellow Line and Blue Line) in the Phase II implementations of the project, due to this CERs increases.
2	Issue:	In section B.3 of PDD, the words Phase II & Phase III are added
3	Issue:	The PDD section B.6.3 & B.6.4 have been updated due to the reason that the applied and identified design change has influence to the emission reductions. Therefore, related sections for ex-ante calculation of emission reductions in updated PDD (submitted along with the 5th and 6th Monitoring report) have been adjusted accordingly.
4	Issue	Further the monitoring plan (section B.7.3 of revised PDD) has been updated w.r.t. emergency procedure for monitoring of data in case the data monitoring system fails

A related post registration change has been submitted prior to this issuance request. The approval has been received on 20/12/2013 and 21/12/2013 via approval number PRC-1351-001 and PRC-1351-002. The PP simultaneously applied for both the periodic verifications so the same PRC Assessment Report was submitted for both (5th and 6th periodic verification) the issuance requests and hence not reported separately.

5.3. Special events

No special events with effect on the monitoring of the project have been observed during the monitoring period.

5.4. Compliance with the GS monitoring plan

The SD indicators as per the GS matrix are monitored and reported appropriately and cross-verified by means of desk review of supporting documents, interviews with the PP and selected stakeholders. The monitoring system and all applied procedures are in compliance to the sustainability monitoring plan in the GS matrix, revised PDDs and the Gold Standard principles. Please refer closure of CAR 04 and below assessments as well as checklist in Annex Table A-2.

A summary of interviewed questions and feedback received as presented in the below table for Sustainable Development Indicators:

Sr. No	Parameter	Description	Assessment
1.	SI8	Access to affordable and clean energy services	The parameter essentially refers to "access to affordable and clean energy services" Due to the implementation of metro rail project activity stakeholders have access to better transportation services at affordable price. The regenerative braking technology ensures reduction in units of energy consumed. This in turn has cascading effect to reduce dependency of fuel/energy imports that may lead to more sustainable and affordable energy services in host country India. During Validation it is already established that the baseline scenario for the project activity is rolling stocks without regenerative braking system, the total electricity consumption of which would have been met from northern regional grid (now called as NEWNE grid). The Verification Team confirms the data of energy saved during onsite inspection with TIMS data and hence equivalent emission reduction was verified as part of this verification. Please also refer to closure of CAR 4.
2.	SI1	Air quality	This parameter refers to reduces air pollution. The major pollutants prevented by the project activity are the criteria pollutants due to the electricity generated from fossil fuels. 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. This technology leads to less withdrawal of grid electricity. However, lowering the electricity demand will lower the emission of air pollutants, like NO_x, SO^2 and particulate matter in power generation, if power generation is based on fossil fuels. The situation in shows reduced impact on air quality due to avoidance of generation of SO_X, NO_X, SPM, and RSPM during electricity generation etc. Under baseline situation energy would not have been regenerated, this would have resulted in impact of air quality due to emission of SO_X , NO_X, SPM, RSPM during electricity generation process. The verification team confirms that the data of energy saved and hence equivalent emission reduction was verified as a part of verification.

			However this is no monitoring parameter as per passport v3.
3.	SI6	Quality of employment	The implementation of project activity generated of employment. The induction to work was associated with pre-requisite of training, medical benefits and insurance which follows the "national norms" for jobs. The Verification Team has verified records pertaining to Training of Staff, medical benefits and insurance/SUS/. **Training** The Verification Team assessed the training records of 153 executives during the monitoring period 2016 and 2017, at the training institute of DMRC. DMRC also imparts trainings to its non-executive staff also. As per submitted records, 274 and 489 non-executive staff of electrical wing had been trained during the year 2016 and 2017 respectively. **Medical Benefits** The Verification Team assessed the submitted master circular on medical attendance rules which clearly states provision of medical benefits to all its employees. /during site visit it was confirmed that the same rules were applicable in the year 2016 and 2017. As per the submitted records, the medical benefits provided to the Operation & Maintenance employees of DMRC were INR 194.3 Million during FY 2016-17. Further, DMRC has provided an insurance amount of INR 4.0 Million during FY 2016-17. It needs to be noted that MR provides values in "lakh" where 1 lakh = 0.1 million.
4.	SI7	Livelihood of the poor	DMRC implemented mitigation measures which involve providing homes, schools for homeless and poor, etc. DMRC has CSR activities related to enhancing livelihood of the poor. The activities include • Enhancing livelihood of poor like supporting Help age India, Salam Balak Trust (NGO working with poor senior citizens, homeless orphans and street children)/SUS/ • "DMRC Children home", focuses on education, health and overall well-being of 136 orphan and street children/SUS/ • DMRC sponsors the Winter Shelter for elderly persons under the name of "Help Age India" and bears the expenditure of these people/SUS/ • 40 person were provided dinner and breakfast services from 01st November 2016 to 31st March 2017/SUS/

			• 35 person were provided dinner and breakfast services from 1st November 2017 to 31st March 2018/SUS/
5.	SI9	Human and institutional capacity	The Verification Team already assessed the trainings above under SI6. DMRC is also involved in workshops / ICT material to enhance awareness on environment, safety, health and other social issue. The Verification Team assessed and confirms that below activities are undertaken by DMRC • Organization of nukkad natak at 12 (during year 2016) and 10 (during year 2017) at various construction sites during the safety week to spread awareness about the safety among the workers and officials/SUS/ • DMRC issued newsletters on monthly basis during the year 2016 and 2017 which focused on various aspects such as safety, vigilance, environment, social initiatives, etc. The news letters were reviewed onsite by the assessment team/SUS/
6.	SI10	Quantitative employment and income generation	The DMRC project generated employment each year. Number of employees with DMRC has grown from 8,629 employees in 2016 to 12,056 by March 2018 clearly registering growth of employment and hence income generation. During site visit it was also confirmed that employees of DMRC are governed by minimum wage rate as per govt. of India regulation. The Verification Team reviewed sample pay scale of employees. The Verification Team also reviewed the recruitment notice of DMRC issued by the HR Department of DMRC/SUS/.
7.	SI12	Technology transfer and technological self-reliance	The successful implementation of the project activity has resulted in the use of similar technologies in upcoming metros in India. DMRC is supporting the intra-country technology transfer. Delhi Metro Rail Corporation has provided consultancy services to Mumbai Metro, Hyderabad Metro, Uttarakhand Metro, etc. during the year 2016 and 2017. Supporting documents were reviewed in form of the Detailed Project Report (DPR) prepared by Delhi Metro for Hyderabad Metro/SUS/

5.5. Compliance with the sustainability monitoring plan

During the verification, the SD indicators were verified with regards to the appropriateness that will contribute to sustainable development.

It was evidenced that the project contributes to sustainable development in host country of India.

For details assessment of SD indicators, refer to section 5.4 above and detailed closure of CAR 04 as well as checklist in Annex Table A-2.

5.6. Compliance with the monitoring methodology

The monitoring system and all applied procedures are completely in compliance to the registered monitoring plan. There was no failure of monitoring system observed during this monitoring period.

Please refer section B.7.1 of Approved PDD and Annex 3 of this report for related PRC has been submitted along with the 5th Verification report, GS Passport (version 2).

5.7. Monitoring of ER parameters

During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the Approved PDD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

5.8. Monitoring report

Prior to onsite visit, the project participants submitted the monitoring report version 01 dated 2018-07-19 to the verification team/MR/.

During the verification, mistakes and needs for clarification were identified. The project participant carried out the requested corrections and adequately responded to clarification requests, so that it can be confirmed that the monitoring report is complete, transparent and in accordance with the registered PDD and other relevant requirements.

During the course of verification, CAR 1 was raised related to some correction in the submitted MR which has been closed successfully.

5.9. Sampling

5.9.1. Implementation of the sampling plan

No sampling was conducted.

5.10. ER Calculation

During the verification, CAR 01, CAR 02, CAR 03 and CAR 04 were raised. The excel sheets submitted during the closure of CAR 01, CAR 02, CAR 03 and CAR 04 was rigorously checked with the archived monitored data and no discrepancies were found. All the formulae have been found to be correctly applied in the emission reduction calculations. Thus it is confirmed that the ER calculation is overall correct. The final emission reductions are calculated by deducting project and leakage emissions from baseline emissions. As per registered PDD and methodology the leakage emissions are set to zero. The baseline emissions are determined by the total electrical energy consumed times the emission factor of the northern grid. The project emissions are determined by the difference between the total electrical energy consumed and regenerated. The difference is multiplied by the grid emission factor of the northern grid. The grid emission factor is fixed ex-ante to 800 tCO_2e/GWh and applied correctly in the emissions reduction calculation. During this monitoring report the project activity consumed electrical energy of the amount of 304,424,176 kWh and regenerated electrical energy of the amount of 116,006,448 kWh. Due to this the baseline emissions are confirmed to be 243,540 tCO_2 as 304.424176 GWh x 800 tCO_2e/GWh and the Project emissions are 150,735 tCO_2 as 188.417728 GWh x 800 tCO_2e/GWh.

Therefore the final amount of emissions reduced is:

ER = BE – PE – LE = 243,540 tCO_2e – 150,735 tCO_2e – 0 = 92,805 tCO_2e

Moreover CAR 01, CAR 02, CAR 03, CAR 04 were raised and closed successfully during the course of verification.

5.11. Quality Management

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, maintenance and training of personnel in the framework of this GS project activity have been defined. The procedures defined can be assessed as appropriate for the purpose. No significant deviations thereof have been observed during this verification cycle.

5.12. Overall Aspects of the Verification

The project participants provided all necessary and requested documentation, so that a complete verification of all relevant issues could be carried out.

Access was granted to all documents requested for review/inspections by the DOE.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are not compliant with the GS requirements, however, CAR were raised which were subsequently close.

5.13. Monitoring of Sustainable Development Indicators

The SD indicators are monitored and appropriately detailed under the MR[/MR/]. CAR 04 was raised as the details of the SD imitators were not transparently mentioned. PP has

responded with requisite corrections and resubmitted the MR along with the supporting documents/SUS/. Detailed assessments are included under 5.4 and 5.5 of this FVR. Checklist assessment is also included under the Annex-1 of the FVR.

5.14. Hints for next periodic Verification

In the course of this GS verification period no FAR has been raised.

6. VERIFICATION OPINION

Delhi Metro Rail Corporation (DMRC) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 8th Gold Standard verification of the project: "Installation of low Green House Gases (GHG) emitting rolling stock cars in Metro", with regard to the relevant requirements for Gold Standard (GS) project activities. The project reduces GHG emissions by operating low GHG emitting rolling stocks having regenerative braking system in Delhi Metro Rail Corporation (DMRC). It replaces the conventional electro-dynamic rheostatic braking technology, with regenerative braking technology fitted rolling stocks. This 1stverification covers the period from 2016-01-19 to 2017-12-28 (including both days).

In the course of the verification one (4) Corrective Action Request (CAR) and (3) Clarification Request (CL) was raised and successfully closed. During this verification no forward action request (FAR) were raised. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the approved PDD, GS-Passport the GS validation report, earlier documents of CDM Verification for this project and supporting documents made available to the TÜV NORD JI/CDM CP by the project participants.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the approved project design document and GS-passport
- the monitoring report is in accordance with the relevant GS requirements.
- the monitoring plans as set out in the validated PDD and the and GS-passport
- the project contributes to sustainability development
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the GS Verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. The verifier confirms the ER of **92,805** tCO_2e achieved in the 8th MP. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions, which could be labelled Gold Standard in the above-mentioned reporting period as follows:

Emission reductions: **92,805** **tCO_{2e}**

Essen, 2019-07-31

Kunal Rami

TÜV NORD JI/CDM Certification Program

Verification Team Leader

Essen, 2019-07-31

Stefan Winter

TÜV NORD JI/CDM Certification Program

Senior Assessor

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
/AR/	Delhi Metro Annual report
/CC/	Commissioning certificates of the total 70 number of Rolling stock car units in the three service lines 1, 2 and 3, 4.
/CON/	The signed contract between TUV NORD and Project Proponent (DMRC) for carrying out verification of certified emission reduction
/DOR/	Sample daily operation reports as proof of increase in ridership demand by the rolling stocks between the stations for the complete monitoring period
/DEPOT/	Details of Depots within project activity boundary
/GRD/	Sample electricity bills as a proof of grid connection for the monitoring period
/LOG/	Monthly summary for monitoring of Energy consumption, energy regeneration and distance travelled for all train sets and all months in the monitoring period Daily check sheets for all train sets for energy consumption, energy regeneration and distance travelled for all days within the monitoring period
/MM/	Records of minutes of the meeting of the internal review meeting
/MR/	GS Monitoring Report Version 01 dated 19/07/2018 GS Monitoring Report Version 02 dated 07/03/2019 GS Monitoring Report Version 03 dated 13/05/2019 GS Monitoring Report version 4 dated 25/06/2019 GS Monitoring Report Version 5 dated 29/07/2019
/PED/	Procedure for electronic download and storage of data for carbon credit project (DMRC/134/08/Carbon Credits/270) dated 18-03-2008.
/QP/	• Quality procedure (PR/RS/PPIO/001) for planning, Maintenance and Monitoring of trains, dated 02-01-2006 • Quality procedure (DMRC/SPD/CDM/001, (“Procedure to address mismatch / discrepancies of energy monitoring for CDM project”) dated 15-02-2008) to address mismatch/discrepancies of energy monitoring and data reporting for CDM Project. • CDM Manual dated 12-04-2008. • Record of internal audit of CDM data conducted on 20-04-2011, 19-04-2012 • Quality procedure for planning, maintenance and monitoring of trains dated 15-04-2008

Reference	Document
/TD/	• Extract of the Energy Measurement scheme in C/I of rolling stock (HCNL5642-70), Mitsubishi Electric Corporation, 27 January 2001. • Extract of Rolling Stock-Training Manual of DMRC, for Technical details for the flow of C/I propulsion system, power and energy management, dated 10-May 2005. • General Schematic for the C/I propulsion system, DMRC Maintenance • Training Manual, dated 23-07-2003 • Data download/upload by TIMS terminal, Train Integrated Management system (TIMS), DMRC Maintenance Training Manual, dated 23-07-2003 • Accuracy of the measurement as 0.01%
/TRN/	Details of the training provided to the personnel in DMRC in data collection, recording, archiving etc.
/SUS/	Supportive documents pertaining to indicators under GS-Passport **Parameter SI6** **Training of Staff** • Office Order: O & M/ Training / JE/ Traction/ 2017/02 dated 10/11/2017 • Office Order: DMRC/ PERS/07/2017 dated 10/03/2017 **Medical Benefits and insurance** A sample of medical reimbursement provided to DMRC employees during the month of October 2016 is enclosed as “Appendix-B Medical reimbursement in Oct 2016 salary”. **Parameter SI7:** • The contract signed between DMRC and Help Age India to provide winter shelter for elderly people at Govind puri, Delhi. Enclosed in “Appendix-C Help Age India_2016” • The contract signed between DMRC and Help Age India for period 01st November 2017 to 31st March 2018 is enclosed as “Appendix-D Help Age India_2017”. • Quarterly reports are prepared by Salaam Balak Trust and submitted to DMRC. Few reports for the monitoring period of 2016 and 2017. o Appendix-E Quarterly Report of Salaam Balak Trust_July'16 to Sept'16 o Appendix-F Quarterly Report of Salaam Balak Trust_Oct'16 to Dec'16 o Appendix-G Quarterly Report of Salaam Balak Trust_Jan'17 to Mar'17 o Appendix-H Quarterly Report of Salaam Balak Trust_Apr'17 to June'17 o Appendix-I Quarterly Report of Salaam Balak Trust_July'17 to Dec'17 **Parameter SI9:**

Reference	Document
	• Nukkad Natak at Construction site: Photograph is submitted as objective evidence. • Newsletter Jan 2016: Safety Awareness week is observed • Newsletter Feb 2016: Safety and environmental topics (waste) are discussed through the News Letter • Newsletter May 2016: Cultural and environmental topics (waste) are discussed through the News Letter • Metro Museum visit details: Site Visit information issued by the Deputy CPRO is furnished. **Parameter SI10:** • Recruitment notice of DMRC issued by the HR Department of DMRC • Master Circular No. DMRC/PERS/14/2015 dt 25.03.2015 for salary above minimum wages • Annual Report 2015-16 • Annual Report 2016-17 • Annual Report 2017-18 **Parameter SI12:** • Letter no. HMRL/DMRC/P-2/2016/944, dated 27-07-2016 confirming DMRC supported in DPR preparation.
/XLS/	• Excel – Calculation sheets provided by the project participant Energy Consumed by each rolling stock in the three services lines. • Emission Reduction calculation MP-2016 • Emission Reduction calculation MP-2017

Table 7-2: Background investigation and assessment documents

Reference	Document
/PDD/	Project Design Document for CDM project: “Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system” Version 05 dated 20/10/2013 approved on date 21 Dec 2013 (http://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view)
/GSP/	Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system version 03 dated 28/03/2018
/VAL/	Validation Report for CDM project “Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system”, dated 27-11-2007 Installation of low Green House Gases (GHG) emitting rolling stock cars in Metro (GS 4597), Gold Standard Validation Report, dated 08/09/2017
/VER/	Verification reports till sixth periodic verification available on the project page (http://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view)

Reference	Document
/PRC/	Validation Opinion related to changes in PDD version 05 (http://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view)
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/GCP/	UNFCCC: Guidelines for completing CDM-PDD and CDM-NM
/GSR/	Gold Standard Requirements (GS 2.2)
/GST/	Gold Standard Toolkit (GSv1.0)
/GS-VVM/	Gold Standard Validation and Verification Manual for voluntary offset projects (June 2007)
/IPCC-GP/	IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000
/IPPC/	1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/IPPC-RM/	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/TEMP/	Guideline: completing the monitoring report form, Version 07.0
/PS/	CDM Project Standard for project activities (Ver02.0)
/VVS/	CDM validation and verification standard for project activities (Ver02.0)
/AMS III.C/	AMS-III.C. ver. 10 - Emission reductions by low-greenhouse gas emitting vehicles

Table 7-3: Websites used

Reference	Link	Organisation
/gsf/	http://www.cdmgoldstandard.org/	Gold Standard Foundation
/gsr/	http://www.cdmgoldstandard.org/our-projects/project-registry	Gold standard Registry System

Reference	Link	Organisation
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/google/	https://www.google.com	Google
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 7-4: Interviewed Persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒Mr. ☐Ms	Sant Adhar Verma	Delhi Metro Rail Corporation (DMRC) / GM/ Environment
/IM01/	V	☒Mr. ☐Ms	Varun Singh	Delhi Metro Rail Corporation (DMRC) / ASE
/IM01/	V	☒Mr. ☐Ms	Gaurav Kumar	Delhi Metro Rail Corporation (DMRC) / ASE
/IM01/	V	☒Mr. ☐Ms	Sanjay Joshi	Delhi Metro Rail Corporation (DMRC) / ASE
/IM01/	V	☒Mr. ☐Ms	Nand Lal	Delhi Metro Rail Corporation (DMRC) / JE
/IM01/	V	☒Mr. ☐Ms	Anil Dhiman	Delhi Metro Rail Corporation (DMRC) / Senior Tech
/IM01/	V	☒Mr. ☐Ms	Pradeep Reddy	Delhi Metro Rail Corporation (DMRC) / JE
/IM01/	V	☒Mr. ☐Ms	Deepak Kumar	Delhi Metro Rail Corporation (DMRC) / ASE

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

A1: GS Verification Protocol

A2: Appointment / Authorisation statements

ANNEX 1: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Raw data generation				
• Installation of measuring equipment • Dysfunction of installed equipment • Maloperation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy	• Installation of modern and state of the art equipment • Process control automation • Internal data review • Regular visual inspect-ions of installed equip-ment • Only skilled and trained personnel operates the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment	• Inadequate installation / operation of the monitoring equipment • Inadequate exchange of equipment • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures • Insufficient accuracy	• Site – visit (maintenance dept., gas supplier) • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees • Check of calibration records, if applicable • Check of maintenance records • Counter-checkof raw data and commercial data • Check of CDM management system	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Change of technology • Accuracy of values supplied by Third Parties	• Stand-by duty is organized • Training • Internal audit procedures • Internal check of QA/QC measures of involved Third Parties	• Inappropriate QA/QC measures of Third Parties	• Check of CDM related procedures • Application of CDM management system procedures • Check of trainings • Check of responsibilities • Check of QA/QC documentation / evidence of involved Third Parties	
Raw data collection and data aggregation				
• Wrong data transfer from raw data to daily and monthly aggregated reporting forms • IT Systems • Spread sheet programming • Manual data transmission	• Cross-check of data • Plausibility checks of various parameters. • Appropriate archiving system • Clear allocation of responsibilities • Application of CDM Management system procedures	• Unintended usage of old data that has been revised • Incomplete documentation • Ex-post corrections of records • Ambiguous sources of information • Non-application of management system procedures	• Check of data aggregation steps • Counter-calculation • Data integrity checks by means of graphical data analysis and calculation of specific performance figures • Check of management system certification	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Data protection • Responsibilities	• Usage of standard software solutions (Spreadsheets) • Limited access to IT systems • Data protection procedures	• Manual data transfer mistakes • Unintended change of spread sheet programming or data base entries • Problems caused by updating/upgrading or change of applied software	• Check of data archiving system • Check of application of Management system procedures	
Other calculation parameters				
• Emission factors, oxidation factors, coefficients	• The values and data sources applied are defined in the PDD and monitoring plan	• Unintended or intended Modification of calculation parameters • Wrong application of values • Misinterpretations of the applied methodology and/ or the PDD • Missing update of applicable regulatory framework (e.g. IPCC values)	• Update-check of regulatory framework • Countercheck of the applied MP in the MRagainst the methodology and the PDD	• **See Table A-2**
Calculation Methods				

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Applied formulae • Miscalculation • Mistakes in spread-sheet calculation	• Advanced calculation and reporting tools • A CDM coordinator is in charge of the CDM related calculations • Usage of tested / counterchecked Excel spreadsheets • Involvement of external consultants	• The danger of miscal-culation can only be minimized.	• Countercheck on the basis of own calculation. • Spread sheet walk-trough. • Plausibility checks • Check of plots	• **See Table A-2**
Monitoring reporting				
• Data transfer to the author of the monitoring report • Data transfer to the monitoring report • Unintended use of outdated versions	• An experienced CDM consultant is responsible for monitoring reporting. • CDM QMS procedures are defined	• The danger of data transfer mistakes can only be minimized • Inappropriate application of QMS procedures	• Counter check with evidence provided. • Audit of procedure application	• **See Table A-2**

Table A-2: (Project specific) Periodic Verification Checklist

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
1. Project history				
1.1 Open issues from GS validation *Check (esp. in case of 1st periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?*	/VAL/ /MR/ /VER/ /GSR/	*Description:* This is the 1st periodic verification. *Justification of evidence:* The published project related documentation was checked. *Conclusion: No* pending issues were detected	OK	OK
1.2 Open issues from previous verification *Check in case of further periodic verifications whether there are any open issues indicated in previous verification (FAR)?*	/VAL/ /MR/ /VER/ /GSR/	*Description:* This is the 1st periodic verification. No FAR was raised during 6th periodic verification under CDM as well as GS validation. *Justification of evidence:* The published project related documentation were checked. *Conclusion:* No FAR was raised so no open issues from validation or previous verification	OK	OK
1.3 Requests for Deviations / Revisions of MP *Check if there have been any requests for deviations from the registered CDM monitoring plan or requests for revisions of the CDM monitoring plan. If any, make sure that they are considered during verification?*	/PRC/ /IM01/	*Description:* No request for deviation from the monitoring plan has been identified or reported , however MR doesn't refer to the approved revision to monitoring plan please refer CAR 1 in this regards *Justification of evidence:* The published project related documentation was checked. *Conclusion:* PRC encompassing revision in monitoring plan has been performed in the past.	~~CAR 1~~	OK
1.4 Initial verification	/GSR/ /IM01/	*Description:* No initial verification was conducted.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
In case an initial verification has been carried out, check if all FARs, recommendations etc. have been addressed appropriately.		*Justification of evidence:* The Gold Standard web site and relevant documents were checked. *Conclusion:* There are no pending issues no initial verification was undertaken.		
1.5 Initial project implementation *In case of first GS verification: Assess whether the project has been implemented and operated as per the registered PDD and are all physical features of the project in place?* *In case of further periodic verifications: Go to next chapter.*	/PDD/ /VAL/ /MR/ /GSP/ /IM01/ /PRC/	*Description:* During the previous verification PRC was undertaken and the detailed project implementation has been already verified thus it can be concluded that all physical features of the project are in place. *Justification of evidence:* Interviews were performed during on site visit. All required documentations were reviewed before and after onsite visit *Conclusion: T*he project is implemented as per PDD version 5.	OK	OK
2. Update on Changes and Incidents (during the Monitoring Period)				
2.1 Technical equipment *Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period.* *Check whether any changes occurred that may have impact on the GS qualification of the project, in particular with reference to any potential changes in key parameters leading to an overall impact on sustainable development of the project.* *Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.*	/IM01/ /MR/ /PDD/ /GSP/	*Description:* During the site visit the Assessment Team reviewed the implemented project activity as described in the approved PDD (version 5).the assessment team also under took interviews, examine the data records, the optional lines as well as the number of rolling stocks and the equipment related to project activity it is concluded that all the technical equipment are in place and no changes or incidents took place which impact applicability of the methodology or tools. *Justification of evidence:* Verification team conducted onsite inspection and interview with operating team. No incidents were reported and no changes were noted during onsite visit and interviews.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report, the emission reduction calculation and/or the scoring of the sustainability indicators		*Conclusion:* No change to the project activity is design described in the registered PDD and impacting GS qualification has been observed in the course of verification.		
2.2 Operation modes *Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.* *Check whether any changes occurred that may have impact on the GS qualification of the project, in particular with reference to any potential changes in key parameters leading to an overall impact on sustainable development of the project.* *Consider e.g. interviews with operational personnel, operation log sheets, data management system records.* *In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report, the emission reduction calculation and/or the scoring of the sustainability indicators*	/IM01/ /MR/ /PDD/	*Description:* As per section B.1 of MR, DMRC has been commissioned in 3 corridors. There was variation in the depot wise distribution of rolling stock (total Rolling stocks where 70 in line with Approved PDD). This is clearly stated in the MR. The change in the distribution of rolling stocks is not considered as a change in the operation mode (as the number of rolling stocks remains same). Thus, it is confirmed that there are no changes in operation modes of the project activity. However CL 01 and CL 02 were raised *Justification of evidence:* Assessment Team undertook onsite visit, interviews and document review of monitoring data. *Conclusion:* There has not been any change to the operation modes of the project activity. The project is in line with the Approved PDD. CL 01 and CL 02 are raised.	~~CL 01~~ ~~CL 02~~	OK
2.3 Incidents *Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the equipment?*	/IM01/ /MR/	*Description:* No significant incidents, deviant operation modes and / or downtimes *Justification of evidence:* Interviews with PP and their personnel were performed to confirm that no incidents occurred during the monitoring period.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Consider e.g. interviews with operational personnel, operational log sheets, and analysis of performance data.		*Conclusion:* No incidents occurred during the monitoring period which impacts the applicability of the methodology or published GS requirements.		
2.4 Personnel *Find out, if relevant personnel w.r.t. monitoring has been exchanged?* *In case of changes, assure that the implemented monitoring procedures have not been affected.*	/IM01/ /TRA/	*Description:* This is the 1st GS verification which follows 6th CDM periodic verification. There is no major change in the management structure pertaining to monitoring of project activity. *Justification of evidence:* Interviews were performed with personnel from the project activity. *Conclusion:* Relevant persons have not been exchanged during the monitoring period. The operating personal are already trained.	OK	OK
2.5 Legislation Find out whether relevant legislation with effect on the project activity in the host country has been changed.	/IM01/	*Description:* There has been no change of relevant legislation in the host country that would affect the project. *Justification of evidence:* The verification team interviewed officials with relevant government sources. *Conclusion:* No legislation changes took place during this monitoring period that would affect the project.	OK	OK
3. Monitoring Report – General				
3.1 Monitoring period *Check if the monitoring period is in line with a) the crediting period and/or b) previous monitoring periods?*	/GRS/ /MR/ /PDD/ /GSP/	*Description:* The monitoring period starts on 2016-01-19 and ends on 2017-12-28. The monitoring period is in line with the crediting period of 10 years from the date of registration. *Justification of evidence:* Documents provided and in the GS web site was checked. *Conclusion:* No issues were identified	OK	OK
3.2 References	/MR/	*Description:* All references are given in the monitoring report. CAR 1 was raised.	~~CAR 1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check if the monitoring report and sustainability matrix provides the correct references.		*Justification of evidence:* The monitoring reports version 1 provided by the PP were checked. *Conclusion:* Reference to applied methodology and tools are missing.		
3.3 Completeness *Assess if the monitoring report and sustainability matrix are complete, i.e. have all relevant issues been addressed?* *The MR shall include: (i) The implementation status of the project during the monitoring period (ii) Monitoring systems and procedures incl. QA/QC system employed (iii) all parameters to be monitored and reported at the intervals required by the MP and the Meth (iv) information on calibration of monitoring instruments (v) Emission factors, IPCC default values etc. (vi) reference to any deviation request approved by the EB, (vii) calculation of ER including reference to formulae and methods used (viii) comparison of the actual ER claimed in the MP with the estimate in the registered PDD and explanation in case of significant increase.*	/MR/ /MRT/	Yes all relevant issues are covered; in detail: ☒ (i) Implementation status ☒ (ii) Monitoring systems and procedures (esp. QA/QC) ☒ (iii) All parameters and corresponding intervals ☒ (v) Emission factors, IPCC default values etc. ☒ (vii) Calculation of emission reductions ☒ (viii) Comparison of ER with PDD estimation *Conclusion:* The report and sustainability matrix are complete. Findings are raised on monitoring parameters (emission reduction and SD parameters).	OK	OK
3.4 Comparison of estimated and actual ER *Have differences between the monitored ER and the ex-ante ER been reported and appropriately justified? Please assess potential impacts on baseline and additionality.*	/PDD/ /MR/ /IM01/	*Description:* PDD estimates 96,681 tCO_{2e} over the applied monitoring period. However, as per MR version 1 submitted for verification, 92,523 tCO_{2e} ER were realized. Section E.5 of the MR contains justification and explanation for the difference. *Justification of evidence:* The PDD and MR were checked. Interviews during onsite visit were carried out.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: The emission reduction of this verification period is lower than the estimation.		
3.5 Transparency *Assess if the carbon monitoring report and sustainability monitoring report are transparent, i.e. clear and unequivocal in all respect?*	/MR/	*Description:* The monitoring report is free of unequivocal and unclear issues. *Justification of evidence:* The monitoring report version 1 provided by the PP was checked. *Conclusion:* The monitoring report can be assessed as transparent. No ambiguous statements have been identified	OK	OK
3.6 Misstatements on general issues *Assess whether the carbon monitoring report and sustainability monitoring report are free of material misstatements regarding issues other than the monitoring parameters.* *Discuss the monitoring parameters in detail in chapter "Monitoring Parameters".*	/MR/	*Description:* The monitoring report and sustainability monitoring report are free of material misstatements. *Justification of evidence:* The draft monitoring report provided by the PP was checked. *Conclusion:* The sustainability- and monitoring report are free of material misstatements.	OK	OK
***3.7 Deviations from the validated monitoring plan* and GS monitoring matrix** *Assess whether the carbon monitoring report and sustainability monitoring report are in line with the validated monitoring plan and the GS monitoring matrix?*	/MR/ /PDD/ /METH/ /GSP/ /IM01/	*Description:* The monitoring report is in line with the validated monitoring plan and the GS monitoring matrix. However CL 01, CL 02 and CL03 are raised. *Justification of evidence:* The monitoring report version 1 provided by the PP was crosschecked with the registered monitoring plan and the GS sustainability, monitoring matrix. Interviews were also carried out onsite. *Conclusion:* No deviations from the validated monitoring plan and GS monitoring matrix have been identified. CL 01, CL 02 and CL03 are raised.	~~CL 01, CL 02, CL03~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
3.8 Deviations from the approved methodology *Assess whether the MR in line with the applied monitoring methodology?*	/MR/ /PDD/ /METH/ /IM01/	*Description:* The monitoring report was assessed against the applied methodology. No deviations were identified. *Justification of evidence:* The draft monitoring report provided by the PP was crosschecked with the applied methodology. Verification onsite visit confirmed adherence to the applied methodology. However CAR 02 is raised. *Conclusion:* No deviations from the applied methodology have been identified.	~~CAR 02~~	OK
4. Monitoring Parameters				
4.1. EGi, Wr		***Description*:** *Electrical energy consumed by the operational rolling stock 'I'*		

a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AMS III.C./ /MR/	*Description:* The electrical energy consumed by the operational rolling stocks for motoring and auxiliary electricity is monitored by TIMS. The TIMS has an incremental counter for recording of each energy data (motoring, breaking and auxiliary for each unit of the train). These data are stored in the CPU of the each unit specific TIMS and are also displayed on the VDU located at unit specific DT. The energy data is downloaded from TIMS using maintenance terminals. The Verification Team also interviewed the DMRC engineers if the readings are noted for "Electrical energy consumed by the operational rolling stock 'I", "Electrical energy regenerated by the operational rolling stock 'i', "Total distance covered by the rolling stock 'i'" and other important parameters (not part of monitoring plan) in rolling stock. It was confirmed that the readings are noted (visually inspected) on daily basis as a part of routine check to ensure that all components of Rolling stock are performing as per their respective requirements and hence, the generated data is under continuous data recording mode without fault. The Verification Team confirms (based on the interviews) that monitoring plan has been followed for daily noting and monthly downloading of TIMS data. *Verifier´s action:* The verification checked the measurement procedure during onsite verification audit and subsequent interviews with the personnel. The verification team is convinced that the TIMS have been used throughout the monitoring period since its implementation. The technology for regenerative braking system including TIMS is provided by Mitsubishi Electric Corporation, Japan. No equipment has been exchanged so far No downtime of measuring equipment has occurred during the monitoring period. The measurement method is found to be in line with the registered monitoring plan of the PDD and the applied methodology i.e. AMS III.C./Version 10.	~~CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: The project compiles the as per the registered and revised PDD. However CAR 03 is raised.		

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	*Description:* Inconsistencies are identified in manually transferring data and CAR 03 has been raised. 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 TIMS is totally software based system with high level of accuracy and hence does not require calibration. *Verifier´s action:* Monitoring records are consistently recorded as per approved frequency from TIMS which was cross verified during onsite visit and subsequent interview and found satisfactory by the verification team. The monitoring records generated by the TIMS in form of print outs were verified during the onsite assessment and found satisfactory by the verification team except errors during manual data transfer. In addition, data review meeting reports and calibration certificates were checked during the site visit by the verification team and found that quality assurance and quality control procedures have been applied in accordance with the monitoring plan (except errors during manual data transfer). *Conclusion:* Accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan. All applicable QA/QC procedures are met and the calibration and maintenance of the monitoring equipment have been carried out by competent personnel. Please refer CAR 03 for further correction.	~~CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/XLS/	☐ Correct ☒ Not correct (initial assessment) *Description:* The values given in the MR and Corresponding Excel Sheet cannot be considered as correct and sufficiently justified. Mistakes were detected and CAR 03 was raised. *Verifier´s action:* Values provided in the monitoring report were cross checked with the provided monitoring data excel sheet by the PP. *Conclusion:* The values given in the monitoring report are not correct and sufficiently justified.	~~CAR 03~~	OK
4.2. . EGi, R		*Description: Electrical energy regenerated by the operational rolling stock 'i'*		

a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AMS III.C./ /MR01/ /TIMS record/TIMS data/ /XLS/	*Description:* The electrical energy regenerated by the operational rolling stocks is monitored by TIMS. The TIMS has an incremental counter for recording of each energy data (motoring, breaking and auxiliary for each unit of the train). These data are stored in the CPU of the each unit specific TIMS and are also displayed on the VDU located at unit specific DT. The energy data is downloaded from TIMS using maintenance terminals. The Verification Team also interviewed the DMRC engineers if the readings are noted for "Electrical energy consumed by the operational rolling stock 'I", "Electrical energy regenerated by the operational rolling stock 'i', "Total distance covered by the rolling stock 'i'" and other important parameters (not part of monitoring plan) in rolling stock. It was confirmed that the readings are noted (visually inspected) on daily basis as a part of routine check to ensure that all components of Rolling stock are performing as per their respective requirements and hence, the generated data is under continuous data recording mode without fault. The Verification Team confirms (based on the interviews) that monitoring plan has been followed for daily noting and monthly downloading of TIMS data. However CAR 03 is raised *Verifier´s action:* Verification team checked the measurement procedure during onsite verification audit and subsequent interviews with the personnel. The verification team is satisfied that the TIMS have been used throughout the monitoring period since its implementation. The technology for regenerative braking system including TIMS is provided by Mitsubishi Electric Corporation, Japan. *Conclusion:* No equipment has been exchanged so far. No downtime of measuring equipment has occurred during the	~~CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		monitoring period. The measurement method is found to be in line with the registered monitoring plan of the PDD and the applied methodology i.e. AMS III.C./Version 10.		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	*Description:* 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. Still inconsistencies are identified in manually transferring data and CAR 03 has been raised. TIMS is totally software based system with high level of accuracy and hence does not require calibration. *Verifier´s action:* Monitoring records are consistently recorded as per approved frequency from TIMS which was cross verified during onsite visit and subsequent interview and found satisfactory by the verification team except errors during manual data transfer. The monitoring records generated by the TIMS in form of print outs were verified during the onsite assessment and satisfactory by the verification team (except errors during manual data transfer). *Conclusion:* Accuracy of equipment used for monitoring is controlled and in accordance with the monitoring plan. All applicable QA/QC procedures are met. Please refer CAR 03 for further correction.	~~CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/XLS/	☐ Correct ☒ Not correct (initial assessment) *Description:* values given in the submitted MR and Corresponding Excel Sheet are not deemed as correct and sufficiently justified. *Verifier´s action:* Values provided in the monitoring report were cross checked with the provided monitoring data excel sheet by the PP. *Conclusion:* The values given in the monitoring report are not correct and sufficiently justified. Mistakes were detected and CAR 03 was raised.	~~CAR 03~~	OK
4.3. . Si		*Description: Total distance covered by the rolling stock*		

a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AMS III.C./ /MR01/	*Description:* The distance travelled by each rolling stock is monitored by TIMS. The data regarding the total distance covered by each rolling stock is downloaded from TIMS using a maintenance terminal as per the procedure for electronic download and storage of data for carbon credit project. The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology. The energy data is downloaded from TIMS using maintenance terminals. The Verification Team also interviewed the DMRC engineers if the readings are noted for "Electrical energy consumed by the operational rolling stock 'I", "Electrical energy regenerated by the operational rolling stock 'i', "Total distance covered by the rolling stock 'i'" and other important parameters (not part of monitoring plan) in rolling stock. It was confirmed that the readings are noted (visually inspected) on daily basis as a part of routine check to ensure that all components of Rolling stock are performing as per their respective requirements and hence, the generated data is under continuous data recording mode without fault. The Verification Team confirms (based on the interviews) that monitoring plan has been followed for daily noting and monthly downloading of TIMS data. However, CAR 03 is raised *Verifier´s action:* By means of onsite assessment and cross checking of MR against registered PDD. *Conclusion:* The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology. Pending closure of CAR 03	~~CAR 03~~	OK
b) Accuracy and QA/QC Procedure	/CAL/ /MM/	*Description:* The data is monitored by the operation and maintenance department of DMRC. Maintenance is being carried	~~CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.		out by the trained and skilled personnel of DMRC. Inaccuracies have been identified for this parameter, CAR 03 is raised. *Verifier´s action:* Monitoring records are consistently recorded as per approved frequency from TIMS which was cross verified during onsite visit and subsequent interview and found satisfactory by the verification team (except errors during manual data transfer). *Conclusion:* Accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan. All applicable QA/QC procedures are met and maintenance of the monitoring equipment have been carried out by competent personnel.		
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/XLS01/	☐ Correct ☒ Not correct (initial assessment) *Description:* values given in the web hosted MR and Corresponding Excel Sheet is not correct and sufficiently justified. Mistakes were detected in calculation. *Verifier´s action:* Values provided in the monitoring report were cross checked with the provided monitoring data excel sheet by the PP. *Conclusion:* The values given in the monitoring report is not correct and sufficiently justified, CAR 03 is raised.	~~CAR 03~~	OK
4.4. N		**Description:** Total number of operational Rolling stocks in the three service lines		

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AMS III.C/ /MR/	*Description:* The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology. *Verifier´s action:* The number of all operational rolling stocks is monitored by DMRC in the framework of the normal operation of the metro lines. Unique Identification number of each Rolling stock is identified and verified at the regular monitoring interval by the operation and maintenance department of DMRC. Nevertheless this parameter is not relevant to calculate the Emission reductions of the project as these can be calculated directly by multiplying EGi, R with the ex-ante fixed grid emission factor. There is no measuring equipment involved in the monitoring this parameter. Monitoring procedure found to be in line with the registered monitoring plan of the PDD and the applied methodology. *Conclusion:* The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/ /TRN/ /QP/	*Description:* No any inaccuracies have been identified for this parameter. The data is monitored by the operation and maintenance department of DMRC. Maintenance is being carried out by the trained and skilled personnel of DMRC. *Verifier´s action:* There is no measuring equipment involved in the monitoring this parameter. Monitoring procedure found to be in line with the registered monitoring plan of the PDD and the applied methodology. *Conclusion:* All applicable measures to accurately monitor the parameter are implemented.	OK	OK
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/XLS/	☒ Correct ☐ Not correct (initial assessment) *Description:* values given in the web hosted MR and Corresponding Excel Sheet is correct and sufficiently justified. No mistakes were detected in calculation. *Verifier´s action:* Values provided in the monitoring report were cross checked with the provided monitoring data excel sheet by the PP. *Conclusion:* The values given in the monitoring report is correct and sufficiently justified.	OK	OK
4.5. SI8		**Description:** Access to affordable and clean energy services		

a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /GSP/ /MR/	*Description:* The project activity involves application of regenerative braking to recover the energy. In absence of project activity conventional electro-dynamic rheostatic braking technology would have been utilized. Thus, in absence of project activity (installation of regenerative braking), equivalent amount of electricity would have been consumed by rolling stocks, from the grid. Therefore the project activity displaces equivalent amount of electricity that would have been generated in the fossil fuel based power plant connected to the regional grid. The current situation shows lesser energy consumption due to retrofit of regenerative braking The DMRC enables its users with the better transportation services which is served at an affordable price. The regenerative braking ensures net reduction in units of energy consumed and contributes towards the improvement in the power scenario of host country (where GS project is implemented). The measurements are undertaken with the help of TIMS which cumulates the readings. The readings are downloaded on monthly basis and performance is evaluated accordingly. Since the metro operates on electricity and regenerates the energy it helps to reduce dependency of fuel/ energy imports that may lead to more sustainable and affordable energy services in a country. For additional details please refer the assessment of monitoring plan for parameters ““Electrical energy consumed by the operational rolling stock ‘I”, “Electrical energy regenerated by the operational rolling stock ‘i’, “Total distance covered by the rolling stock ‘i’” However the outcome against the indicator is not transparently stated in the MR, thus CAR 04 has been raised. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		assessed using TIMS Data, the site was inspected and operating staff interviewed. *Conclusion:* The conformance on fulfilment of indicator cannot be established in line with the GS Passport.		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/IM01/ /PDD/ /GSP/ /MR/	*Description:* The monitoring report reproduces the text stated in the GS-Passport. Actual outcome of the monitored data is missing in the monitoring report. Please refer CAR 04. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. *Conclusion:* The value is not presented in the MR version 1 so no confirmation on appropriateness is established. Please refer CAR 04.	~~CAR 04~~	OK
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/IM01/ /PDD/ /GSP/ /MR/	☐ Correct ☒ Not correct *Description:* Actual outcome of the monitored data is missing in the monitoring report. Please refer CAR 04. The correctness of the data will be evaluated once it is updated in line with the reference document and supportive documents are submitted to the verification team. *Justification of evidence:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. *Conclusion:* The QA/QC procedures were followed.	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
4.6. SI6		**Description:** Quality of employment		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /GSP/ /MR/	*Description:* DMRC ensures good quality of employment by making provisions of below requirements • training the staff, • providing medical benefits and • Insurance etc. The DMRC officials undergo training on latest technology which includes the regenerative braking. The employees are trained about the working and site requirements of technology. Refresher training is provided as in when required. In absence of project activity the staff would not have been trained on regenerative braking and skills would not have been enhanced. The MR does not provide details of the activities against the indicator. CAR 04 has been raised. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. In addition the office order for trainings, O & M Trainings and evidences of Medical Benefits and insurance are requested. *Conclusion:* The conformance on fulfilment of indicator cannot be established in line with the GS Passport as the evidences are pending.	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/IM01/ /PDD/ /GSP/ /MR/ /SUS/	*Description:* The accuracy of data is subjected to the submission of evidences, the monitoring report reproduces the text stated in the GS-Passport. Actual outcome of the monitored data is missing in the monitoring report. Please refer CAR 04. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Documentary evidences (the office order for trainings, O & M Trainings and evidences of Medical Benefits and insurance) are requested. *Conclusion:* The substantiation with help of evidences is not presented in the MR version 1 so no confirmation on appropriateness is established. Please refer CAR 04.	~~CAR 04~~	OK
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/IM01/ /PDD/ /GSP/ /MR/ /SUS/	☐ Correct ☒ Not correct *Description:* Actual outcome of the monitored data is missing in the monitoring report. *Justification of evidence:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Documentary evidences (the office order for trainings, O & M Trainings and evidences of Medical Benefits and insurance) are requested. *Conclusion:* Please refer CAR 04. The correctness of the data will be evaluated once it is updated in line with the reference document and supportive documents are submitted to the verification team.	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
4.7. SI7		**Description:** Livelihood of the poor		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /GSP/ /MR/ /SUS/	*Description:* The project activity has impacted the livelihood. The activities include providing homes, schools for homeless and poor, etc. The MR does not provide details of the activities against the indicator. Activities undertaken by DMRC related to enhancing livelihood of the poor are requested along with supportive documents. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Quarterly reports by Salam Balak Trust, Contract between DMRC and Helpage India for Winter Shelter for elderly, Evidences of providing breakfast to 40 people are requested. *Conclusion:* The project compiles the as per the registered and revised PDD. However, CAR 04 has been raised in this context.	~~CAR 04~~	OK
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the*	/IM01/ /PDD/ /GSP/ /MR/ /SUS/	*Description:* The accuracy of data is subjected to the submission of evidences. The monitoring report reproduces the text stated in the GS-Passport. Actual outcome of the monitored data is missing in the monitoring report. Please refer CAR 04. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Quarterly reports by Salam Balak Trust, Contract between DMRC	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
monitoring equipment has been carried out in line with the latest EB guidance.		and Helpage India for Winter Shelter for elderly, Evidences of providing breakfast to 40 people are requested. *Conclusion:* The substantiation with help of evidences is not presented in the MR version 1 so no confirmation on appropriateness is established. Please refer CAR 04.		
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/IM01/ /PDD/ /GSP/ /MR/ /SUS/	☐ Correct ☒ Not correct *Description:* Actual outcome of the monitored data is missing in the monitoring report. *Justification of evidence:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Quarterly reports by Salam Balak Trust, Contract between DMRC and Helpage India for Winter Shelter for elderly, Evidences of providing breakfast to 40 people are requested. *Conclusion:* Please refer CAR 04. The correctness of the data will be evaluated once it is updated in line with the reference document and supportive documents are submitted to the verification team.	~~CAR 04~~	OK
4.8. SI9		**Description:** Human and institutional capacity		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).*	/IM01/ /PDD/ /GSP/ /MR/ /SUS/	*Description:* As per the MR DMRC will develop human and institutional capacity of users / workers / etc. The mitigation measures include workshop / ICT material to enhance awareness on environment, safety, health and other social issue. However, the MR does not provide details of the activities and outcomes against the indicator.	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		*Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Supporting documentation related to workshop / ICT material to enhance awareness on environment, safety, health and other social issue were requested during onsite visit. *Conclusion:* The project compiles the as per the registered and revised PDD. However, CAR 04 has been raised.		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/IM01/ /PDD/ /GSP/ /MR/	*Description:* QA/ QC measures are not involved as no measuring instruments are required for monitoring this parameter. It is identified that the monitoring report reproduces the text stated in the GS-Passport. Actual outcome of the monitored data is missing in the monitoring report. Please refer CAR 04. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Supporting documentation related to workshop / ICT material to enhance awareness on environment, safety, health and other social issue were requested during onsite visit. *Conclusion:* The value is not presented in the MR version 1 so no confirmation on appropriateness is established. Please refer CAR 04.	~~CAR 04~~	OK
c) Correctness	/IM01/ /PDD/ /GSP/	☐ Correct ☒ Not correct *Description:* Actual outcome of the monitored data is missing in the monitoring report.	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Determine whether the value given in the monitoring report is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/	*Justification of evidence:* *Conclusion:* Please refer CAR 04. The correctness of the data will be evaluated once it is updated in line with the reference document and supportive documents are submitted to the verification team.		
4.9. SI10		**Description:** Quantitative employment and income generation		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /GSP/ /MR/	*Description:* For its operation and maintenance requirements DMRC is generating employment. The MR does not provide details of the activities against the indicator. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Supporting documentation related to demonstration of "Quantative employment and income generation" were requested during onsite visit. *Conclusion:* The project compiles the as per the registered and revised PDD. However, CAR 04 has been raised.	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/IM01/ /PDD/ /GSP/ /MR/	*Description: :* QA/ QC measures are not involved as no measuring instruments are required for monitoring this parameter. The monitoring report reproduces the text stated in the GS-Passport. Actual outcome of the monitored data is missing in the monitoring report. Please refer CAR 04. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Supporting documentation related to demonstration of "Quantative employment and income generation" were requested during onsite visit. *Conclusion:* The value is not presented in the MR version 1 so no confirmation on appropriateness is established. Please refer CAR 04.	~~CAR 04~~	OK
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/IM01/ /PDD/ /GSP/ /MR/	☐ Correct ☒ Not correct *Description:* Actual outcome of the monitored data is missing in the monitoring report. *Justification of evidence:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. Supporting documentation related to demonstration of "Quantative employment and income generation" were requested during onsite visit. *Conclusion:* Please refer CAR 04. The correctness of the data will be evaluated once it is updated in line with the reference	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		document and supportive documents are submitted to the verification team.		
4.10. SI12		**Description:** Technology transfer and technological self-reliance		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology*	/IM01/ /PDD/ /GSP/ /MR/	*Description:* The MR does not provide details of the activities against the indicator. CAR 04 has been raised. *Verifier´s action:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. The supportive documents to demonstrate the conformance of the parameter "Technology transfer and technological self-reliance" was requested. *Conclusion:* The project compiles the as per the registered and revised PDD. However, the CAR 4 has been raised as the supporting documents needs to be submitted	~~CAR 04~~	OK
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/IM01/ /PDD/ /GSP/ /MR/	*Description:* The monitoring report reproduces the text stated in the GS-Passport. Actual outcome of the monitored data is missing in the monitoring report. Please refer CAR 04. *Verifier´s action: PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed,* the site was inspected and operating staff interviewed. The supportive documents to demonstrate the conformance of the parameter "Technology transfer and technological self-	~~CAR 04~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.		reliance" was requested, example the DPR for support in the implementation of similar technology in India are requested. *Conclusion:* The documents for the claim were not presented. Please refer CAR 04. The successful implementation of the project activity has resulted in the use of similar technologies in upcoming metros in India, however evidences of involvement of DMRC is requested.		
c) Correctness *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/IM01/ /PDD/ /GSP/ /MR/	☐ Correct ☒ Not correct *Description:* Actual outcome of the monitored data is missing in the monitoring report. *Justification of evidence:* PDD, monitoring plan, Energy Consumption for all the Rolling Stock (which are part of project activity) were assessed, the site was inspected and operating staff interviewed. The supportive documents to demonstrate the conformance of the parameter "Technology transfer and technological self-reliance" was requested, example the DPR for support in the implementation of similar technology in India are requested. *Conclusion:* The QA/QC procedures were followed. Please refer CAR 04. The correctness of the data will be evaluated once it is updated in line with the reference document and supportive documents are submitted to the verification team.	~~CAR 04~~	OK
***5.* ER Calculation**				

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
5.1 Traceability *Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spreadsheet shall be used. All applied formulae must be visible.*	/XLS/ /MR/	*Description:* An excel sheet has been applied and the formulae are evaluated with the methodology and PDD. The verification team identified missing linkages, mistakes in the manual data transfer in the worksheets and raised CAR 03. *Justification of evidence:* The emission reduction calculation spread sheet was provided by the PP. *Conclusion:* The calculations are not completely traceable. CAR 03 has been raised.	~~CAR 03~~	OK
5.2 Parameter consistency *Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?* *Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). The evaluation of the correctness of the parameter values itself should be discussed in the chapter "Monitoring Parameters".*	/XLS/ /PDD/ /MR/ /LOG/ /TRN/ /TD/	*Description:* The monitored data used in emission reduction calculations have been applied and reported consistently in the MR. *Justification of evidence:* Monitoring report, Excel calculation spread sheet, TIMs logged data, sample calibration reports, internal audits on the TIMS monitored data were checked accordingly. *Conclusion:* Parameters applied have inconsistent. Please refer CAR 03	~~CAR 03~~	OK
5.3 Applied formulae *Check if the applied formulae are in accordance with the monitoring plan and / or the approved methodology.*	/XLS/ /MR/ /PDD/ /METH/	*Description:* The verification team has checked all values included in the MR and excel spread sheet. The formulae are consistent with the validated documents and the applied methodology. *Justification of evidence:* Monitoring report and Excel calculation spread sheet were checked accordingly vs PDD, passport and methodology and related tools..	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: The applied formulae are consistent with the methodology and PDD version 05.		
5.4 Completeness of calculation *Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.* *Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.*	/XLS/ /MR/ /PDD/ /METH/	*Description:* All the calculations are derived as per methodology and in line with the approved PDD version 05 to account for baseline, project emissions[4]. The formula takes into account all components as prescribed by the monitoring plan and the approved methodology. *Justification of evidence:* Monitoring report and Excel calculation spread sheet were checked accordingly and crosschecked with the monitoring plan and the approved methodology. *Conclusion:* All applied formulae are in accordance with the monitoring plan and the approved methodology as well.	OK	OK
***6.* Quality Management; defined organizational structure, responsibilities and competencies Internal QA/QC and document control**				
6.1 Management System *Check if the GHG data monitoring system is embedded in a (certified) company quality management system, if so, check if all CDM monitoring procedures been fully integrated in the project participant's quality management system. If not how the GHG management system has been implemented.*	/IM01/ /MR/ /PDD/ /IM03/	*Description:* The management system employed by the PP enables proper monitoring of GHG. Data is verified at various levels and internal audit is also undertaken. The data management system spells out all aspects of parameter monitoring, frequency, reporting and storage of ER and sustainability data. Data is archived in electronic format as well as in hard copies. These records were accessed and verified during the onsite visit.	OK	OK

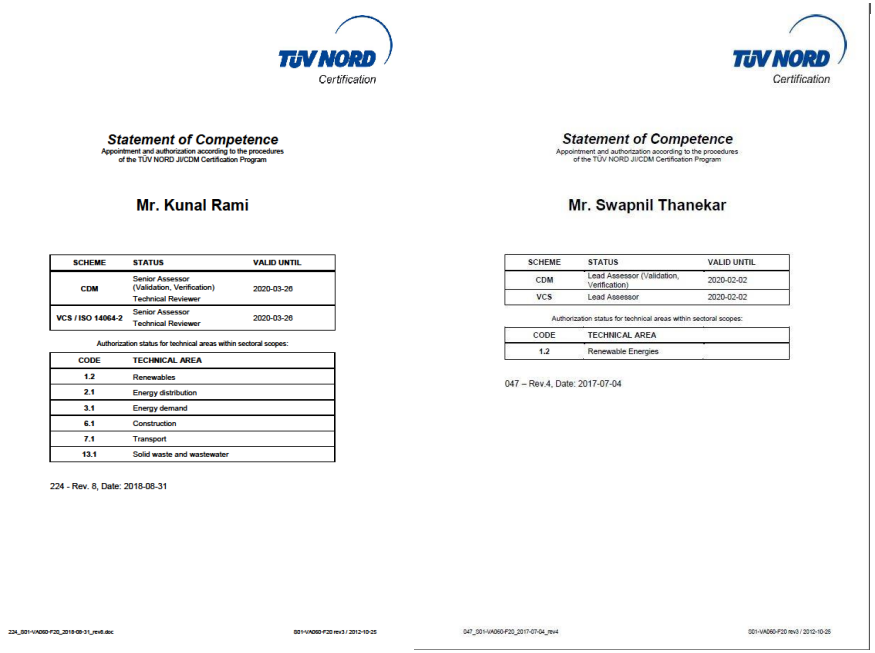
[4] There are no leakage emissions applicable to project activity

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Justification of evidence: The DOE assessed the monitoring procedure and in particular how the records are generated, verified and maintained. The verification team further compared data in the MR against the monitoring provisions stated in the MP. *Conclusion:* Data monitoring and management was checked and confirmed to be reliable and traceable.		
6.2 Roles and Positions *Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented, from raw data generation to submission of the final data.* *Check further if only duly qualified personnel is involved in the monitoring procedures.*	/IM01/ /MR/ /PDD/	*Description:* The operating organogram spells out monitoring responsibilities. The monitoring responsibilities lie with the Operations coordinator, the monitoring coordinator and their assistants. Responsibilities and roles are clearly defined. *Justification of evidence:* Monitoring procedure was checked and interviews among DMRC officials conducted onsite. *Conclusion:* The verifier can confirm the feasibility of the monitoring procedure and that all parameters required for emission reduction calculations and sustainability are incorporated.	OK	OK
6.3 Trainings *Check if initial trainings have been carried out, in case deemed necessary.*	/IM01/ /TRA/	*Description:* Training for operating staff was conducted. *Justification of evidence:* Onsite visits and interviews. The verification team interviewed operating staff. Interviews were also carried out to check data collection and storage. *Conclusion:* No issues that would compromise the integrity of data collected and presented have been identified. Furthermore the staff on the weight bridge was following well established procedure.	OK	OK
6.4 Troubleshooting procedures	/IM01/ /MR/	*Description:* The monitoring procedures for data reporting and entry were well defined.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Assess whether troubleshooting procedures have been implemented.	/PDD/	*Justification of evidence:* Internal audit reports were verified, monitoring staff was interviewed onsite to confirm the procedure. *Conclusion:* Data is well reported and stored.		
6.5 Maintenance procedures Are appropriate maintenance procedures in place?	/IM01/	*Description:* Yes *Justification of evidence:* Various supportive documents were assessed. *Conclusion:* The maintenance procedure and established and followed.	OK	OK
6.6 Internal QA/QC *Assess whether there are any procedures in place on when, where and how checks and reviews of relevant monitoring parameters as well as further processing of the same are to be carried out. Please determine the evidence to be documented. (This might include spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.)*	/MR/ /PDD/ /IM01/	*Description:* The monitoring parameters are audited internally. The internal audit records are checked by verification team. The data is stored safely at DMRC offices and updated on a monthly basis. *Justification of evidence:* Internal QA/QC procedures were checked by desk review and physical inspection of reporting procedures during onsite. . *Conclusion:* No issues were raised.	OK	OK
6.6 Data archive and Data protection Check whether all records of monitoring parameters are archived according to the monitoring plan. Assess further whether appropriate measures have been taken in order to avoid unintended or intended manipulation or loss of the measured data.	/MR/ /IM01/ /PDD/	*Description:* Data records of monitoring parameters are archived according to the monitoring plan in digital and hard copy formats. The management structure developed by the PPs describes the responsibilities and procedures for data collection, calculation, reporting, and storage. *Justification of evidence:* records were checked during on site visit. Interviews were performed to confirm data protection	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		methods including the storage and update of data on a monthly basis. *Conclusion:* All records of monitoring parameters are archived according to the monitoring plan. No discrepancies were identified.		

ANNEX 2: STATEMENTS OF COMPETENCE OF TEAM MEMBERS



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Kunal Rami

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-03-26
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2020-03-26

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
6.1	Construction
7.1	Transport
13.1	Solid waste and wastewater

224 - Rev. 8, Date: 2018-08-31

224_S01-VA060-F20_2018-08-31_rev8.doc S01-VA060-F20 rev3 / 2012-10-25

TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Swapnil Thanekar

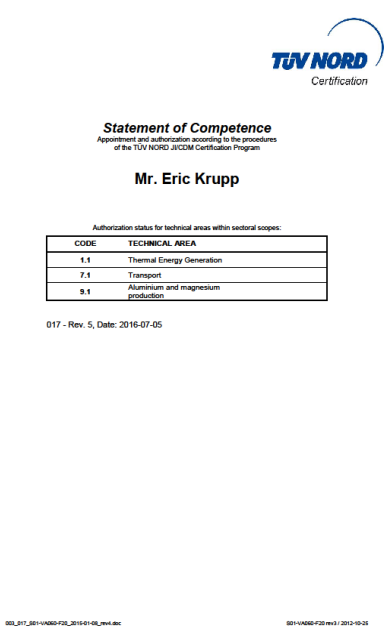
SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2020-02-02
VCS	Lead Assessor	2020-02-02

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

047 – Rev.4, Date: 2017-07-04

047_S01-VA060-F20_2017-07-04_rev4 S01-VA060-F20 rev3 / 2012-10-25



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

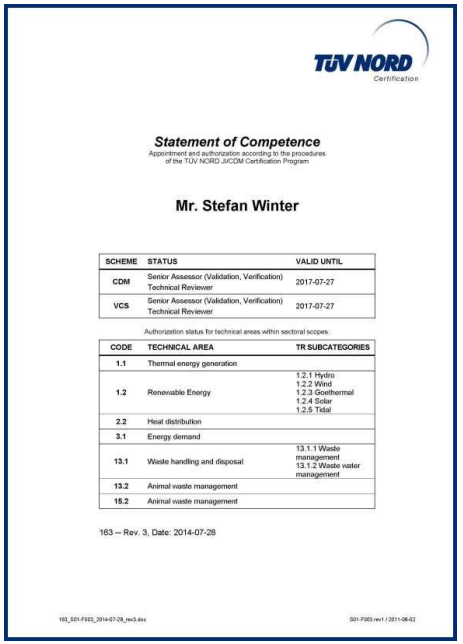
Mr. Eric Krupp

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
7.1	Transport
9.1	Aluminium and magnesium production

017 - Rev. 5, Date: 2016-07-05

003_S17_S01-VA060-F20_2015-01-08_rev4.doc S01-VA060-F20 rev3 / 2012-10-25



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal energy generation	
1.2	Renewable Energy	1.2.1 Hydro 1.2.2 Wind 1.2.3 Goethermal 1.2.4 Solar 1.2.5 Tidal
2.2	Heat distribution	
3.1	Energy demand	
13.1	Waste handling and disposal	13.1.1 Waste management 13.1.2 Waste water management
13.2	Animal waste management	
15.2	Animal waste management	

163 – Rev. 3, Date: 2014-07-28

163_S01-F003_2014-07-29_rev3.doc S01-F003 rev1 / 2011-08-02