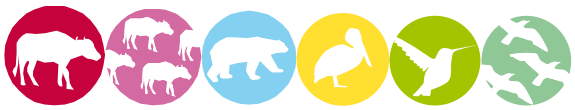
ANNEX R – PASSPORT TEMPLATE

CONTENTS



A. Project title

B. Project description

C. Proof of project eligibility

D. Unique Project Identification

E. Outcome stakeholder consultation process

F. Outcome sustainability assessment

G. Sustainability monitoring plan

H. Additionality and conservativeness deviations

Annex 1 ODA declarations

SECTION A.	**Project Title**

[See Toolkit 1.6]

Title: Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system

Date: 28/03/2018

Version no.: 3

SECTION B. Project description

[See Toolkit 1.6]

Estimated project start date: 02/05/2001 (As per registered PDD under UNFCCC[1])

The purpose of the project activity is to attain energy efficiency in mass rapid transport system through conservation of electrical energy by the deployment of regenerative braking technology in Delhi Metro Rail Corporation (DMRC), thereby making the rolling stocks less GHG intensive than it would have been in absence of the project activity.

The project activity replaces the conventional electro-dynamic rheostatic braking technology, with regenerative braking technology fitted rolling stocks. The regenerated electrical energy reduces the consumption of equivalent grid electrical energy required by the powering trains, thereby conserving electrical energy and subsequently leading to GHG emission reduction.

The project contributes to the sustainable development objectives of the host country by means of improving Social, economic, environmental and technological wellbeing of the region as described in the sustainable development assessment matrix. There is overall improvement in Air quality, Energy Conservation, Employment Generation.

The project activity is a registered Clean Development Mechanism project under the UNFCCC bearing registration number 1351 and has successfully reduced emissions to the tune of 225,093 tCO_2 during six monitoring/verification periods from the year 2007 to 2012. The project participant now aims to add Gold Standard rating to the existing registered CDM project

SECTION C. Proof of project eligibility

C.1. Scale of the Project

[See Toolkit 1.2.a]

Please tick where applicable:

Project Type	Large	Small
	☐	☑

[1] https://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view

	☐	☐
	☐	☐
	☐	☐
	☐	☐

	☐

C.2. Host Country

[See Toolkit 1.2.b]

India

C.3. Project Type

[See Toolkit 1.2.c and Annex C]

Please tick where applicable:

Project type	Yes	No
Does your project activity classify as a Renewable Energy project?	☐	☑
Does your project activity classify as an End-use Energy Efficiency Improvement project?	☑	☐
Does your project activity classify as waste handling and disposal project?	☐	☑

Please justify the eligibility of your project activity:

The purpose of the project activity is to attain energy efficiency in mass rapid transport system through conservation of electrical energy by the deployment of regenerative braking technology in Rolling Stock of Delhi Metro Rail Corporation (DMRC). The project activity replaces the conventional electro-dynamic rheostatic braking technology, with regenerative braking technology fitted rolling stocks. The regenerated electrical energy reduces the consumption of equivalent grid electrical energy required by the trains, thereby conserving electrical energy and subsequently leading to GHG emission reduction.

The Delhi Metro System is designed for rolling stock where coaches are equipped with 3 phase AC traction motors with regenerative braking system. The regenerative braking technology employed in DMRC is different from the prevalent system adopted by metro system in the country which uses conventional electro-dynamic rheostatic braking system. The electro-dynamic rheostatic braking system converts the kinetic energy of decelerating Rolling stock into the thermal energy of rheostats which is dissipated as heat while decelerating. Hence, the choice made by DMRC for using regenerative braking technology displays the environmental consciousness of the management. The regenerated electrical energy reduces the consumption of equivalent grid electrical energy required by the powering trains, thereby conserving electrical energy and subsequently leading to GHG emission reduction. By providing this technology intervention, the level & quality of service will not be affected.

Pre Announcement	Yes	No
Was your project previously announced?	☐	☑
Explain your statement on pre announcement -		

C.4. Greenhouse gas

[See Toolkit 1.2.d]

Greenhouse Gas	
Carbon dioxide	☑
Methane	☐

Nitrous oxide	☐

C.5. Project Registration Type

[See Toolkit 1.2.f]

Project Registration Type	
Regular	☐

Pre-feasibility assessment	Retroactive projects (T.2.5.1)	Preliminary evaluation (eg: Large Hydro or palm oil-related project) (T.2.5.2)	Rejected by UNFCCC (T2.5.3)
	☑	☐	☐

If Retroactive, please indicate Start Date of project activity dd/mm/yyyy: 02/05/2001[2]

SECTION D. Unique project identification

D.1. GPS-coordinates of project location

[See Toolkit 1.6]

	Coordinates
Latitude	28.610 N
Longitude	77.230E

Explain given coordinates

D.2. Map

[See Toolkit 1.6]

[2] https://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view

SECTION E. Outcome stakeholder consultation process

E.1. Assessment of stakeholder comments

[See Annex J]

[**See Local Stakeholder Consultation Report B.5** and insert table from "C.3.iii Assessment of all comments". Insert a summary of alterations based on comments]

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
How much credits can be earned due to the project?	Yes	As the project is already registered at UNFCCC platform, the expected number of CER as mentioned in registered PDD is approx. 47,000.
Is the regenerative braking system applied to all trains of DMRC.	Yes	The regenerative braking system is applied to all the trains in DMRC. These include the rolling stock mentioned in registered PDD also.

E.2. Stakeholder Feedback Round

Please describe report how the feedback round was organized, what the outcomes were and how you followed up on the feedback.

[See Toolkit 2.11]

A stakeholder consultation was conducted on 15th September 2015. The opening of consultation round was done by Senior AGM, Delhi Metro and a power point presentation was given by consultant representative.
In the stakeholder meeting, the stakeholders were briefly introduced about the project and the regenerative braking technology and how it helps in conserving consumed electricity and thus reduce carbon emissions.
A detailed power point presentation was given about the project and its impact on local stakeholders by Consultant representative. The presentation consisted of an introduction to Delhi Metro, detailed description of the project and regenerative braking technology, contribution of the project to sustainable development, a brief introduction to Gold standard and emission reduction calculation. The presentation was made in such a manner that it can be easily understood by all. The clarifications to stakeholders were provided at the conclusion of meeting and at that time there were no pending feedback/observations. The closure of the meeting was done by DMRC Officials and Consultant representative by thanking the stakeholders for their valuable time successively in both the stakeholder consultation rounds. During the Stakeholder Consultation, following documents were made available- non-technical summary of the project, Project Design Document (as available in UNFCCC website) and Passport. During the meeting, the local stakeholders were informed that the stakeholders consultation report (LSC report) would be available at DMRC's Office (the venue where stakeholders consultation was organized) after a week for their feedback. They were also informed that all the project related documents (passport and LSC report) would be webhosted in gold standard website. The LSC report was prepared within a week of the consultation and was made publicly available at the DMRC office so that the stakeholders could give their feedback.

The stakeholder feedback round for those who attended live stakeholder consultation was initiated immediately on conclusion of stakeholder consultation. These stakeholders were provided with the email ids and phone numbers of DMRC to give their feedback. Link to publicly available PDD at UNFCCC website was also shared with stakeholders. The SFR for all stakeholders (including those who did not attend live stakeholder consultation) was conducted by publishing the Project documents on the GS Website. As per GS procedure, SFR was opened via publishing the GS passport and LSC report on GS website for a period of two months i.e. 8th August to 8th October 2016. Thus the Stakeholder feedback round was open for more than a year after conclusion of stakeholder consultation and all the stakeholders were encouraged to comment during this period by consulting documents available at DMRC 's office and GS website.

No further comments or suggestions were received during this period.

E. 3. Discussion on continuous input / grievance mechanism

[See Annex W]

Discuss the Continuous input / grievance mechanism expression method and details, as discussed with local stakeholders.

	Method Chosen (include all known details e.g. location of book, phone, number, identity of mediator)	Justification
Continuous Input / Grievance Expression Process Book	DMRC provides multiple windows to its esteemed commuters to register complaint, feedback and suggestions. The available windows are on site at each customer care of every stations, through emails, website, 24x7 IVRS based helpline etc. DMRC also trains its official to provide instant solution to aggrieved commuter as far as possible. DMRC has nurtured a culture a culture wherein each and every complaint is responded by its officials. This responsiveness encourages patrons to register their grievances, feedbacks and suggestions. Thus, it is seen that total number of complaints received through various windows has increased. This increase in	The sources mentioned for the purpose of grievance redressal are the easiest, fastest and transparent way to inform DMRC on stakeholder feedback and comments. It delivers the feedback directly to the nodal person within DMRC for taking up requisite action.

	number of complaints may also be attributed to the increasing ridership. However, it is noteworthy that percentage increases in total complaints have gone down over the years. Apart from the above-mentioned sources, some complaints are also received from Public Grievances Commission (PGC), Public Grievances Monitoring System.	
Telephone access	24 hour helpline: 155370/011-22561231 Gold Standard Telephone No.- +41 (0) 22 788 7080	
Internet/email access	helpline@dmrc.org; Gold Standard Email: info@goldstandard.org	
Nominated Independent Mediator (optional)	No independent mediator nominated	This step is optional

All issues identified during the crediting period through any of the Methods shall have a mitigation measure in place. The identified issue should be discussed in the revised Passport and the corresponding mitigation measure should be added to sustainability monitoring plan in section G.

SECTION F. Outcome Sustainability assessment

F.1. 'Do no harm' Assessment

[See Toolkit 2.4.1 and Annex H]

Safeguarding principles	Description of relevance to my project	Assessment of my project risks breaching it (low, medium, high)	Mitigation measure
The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicit in Human Rights abuses.	Yes, the project activity abides by human rights. It contributes towards conserving electricity which is a scare commodity in the nation. It thereby not only contributes towards reducing the gap between supply and demand of energy but also supports the principle of respecting life and security by having positive impact	There is low project risk against this safeguarding principle	Since the project activity is not causing human rights abuse in any form, there is no need for any mitigation measure.

	on quality of air, water, soil and energy. The project participant is not a land mine or arms producer and distributor. The cultural property is protected by means of safeguarding the environment, by proper planning of routes in a way that does not interfere with any cultural or heritage property in the city of Delhi where the project is being implemented. The govt. of host nation has signed various Human rights treaties and has its legislation to consider violation of rights.		
The project does not involve and is not complicit in involuntary resettlement.	Though the host nation has not signed ILO 169 convention but the project activity does not involve any resettlement. In case of projects that involve resettlement, social impact analysis needs to be carried out by the project proponent. This is as per "National Rehabilitation and Resettlement policy 2007" by Ministry of Rural Development. Only those projects with proper rehabilitation and resettlement are provided clearance by the host country government.	There is low project risk against this safeguarding principle	Since the project activity does not involve any resettlement, there is no need for mitigation measure.
The project does not involve and is not complicit in the alteration, damage or removal of any critical cultural heritage	There is no damage caused by the project activity to the traditional culture, archaeological structures. Proper planning of routes and lines are carried out and strictly implemented in a way that does not interfere with any cultural or heritage property in the city of Delhi where the project is being implemented. Moreover, the host nation is highly sensitive to issues relating to cultural and religious heritage and principles concerned are effectively complied with. The host country has proper acts and regulations which prevent implementation of project activities that complicit in alteration or degradation of critical	There is low project risk against this safeguarding principle	The project activity is not causing any harm to cultural and religious heritage. So there is no need of any mitigation measure.

	cultural or national heritage.		
The project respects the employees' freedom of association and their right to collectivebargaining and is not complicit in restrictions of these freedoms and rights	The project activity complies with the principle. There may be bond period and penalty in some projects, however, the same is transparent and the employee is informed at the onset of any such conditional requirement. DMRC has a staff council. Membership of this council is open to the staff. The Staff Council representatives of employees have regular meetings with the management. Further, through the Staff Welfare Trust Fund assistance/ facilities have been provided to employees and their family members, resulting in sense of belonging to the company. Various measures have been taken for the welfare of female employees in various Staff quarters, provision of working women hostel at Shastri Park, female visiting doctor and only female excursion trips, etc. Apart from this, workers are not a part of any other association.	There is low project risk against this safeguarding principle	Since it has low risk, hence this principle does not call for mitigation in the project scenario
The project does not involve and is not complicit in any form of forced or compulsory labour	The host nation has signed ILO convention 29 and 105 for abolition of forced labour[3]. There is no forced labour involved in the project.	There is low project risk against this safeguarding principle	Since there is no forced labour involved in project activity, no need of mitigation measure.
The project does not employ and is not complicit in any form of child labour	The nation has not signed the child labour conventions. However the host nation has following laws: "**The Child Labour (Prohibition and Regulation) Act of 1986".** This prohibits the employment of children below the age of 14 years in hazardous occupations identified in a list by the law. "**The Juvenile Justice (Care and**	There is low project risk against this safeguarding principle	The project is free from child labour. So there is no need of mitigation measure.

[3] http://www.ilo.org/dyn/normlex/en/f?p=1000:11110:0::NO:11110:P11110_COUNTRY_ID:102691

	Protection) of Children Act of 2000" This law made it a crime, punishable with a prison term, for anyone to procure or employ a child in any hazardous employment or in bondage. DMRC Safety, Health and Environment (SHE) Manual specifically mention about works to be undertaken in accordance with all applicable legislation and Indian statutory requirements including Child Labour (Prohibitions & Regulations) Act, 1986 and Rules 1950		
The project does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis.	The host nation has ratified the conventions 100 and 111 to prevent any discrimination at work. The nation also has legislation to prohibit discrimination at workplaces. The project does not discriminate among people in terms of gender, race, religion, sexual orientation, etc. DMRC is an equal opportunity provider to aspirants who meet the relevant criteria (technical/administrative/managerial) to be involved in projects.	There is low project risk against this safeguarding principle	The project activity does not discriminate among people so mitigation measures are not required.
The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	The project activity complies with OHSAS standard which ensures safety and healthy environment at the workplace.	There is medium risk in train operations and low risk in case of the project activity in particular since the application of regenerative braking system being an automated system does not involve any additional workforce participation.	DMRC ensures compliance to all OHSAS[4] rules and regulation along with regular audit as per requirement of OHSAS.
The project takes a precautionary approach in r	The project activity complies with the principle. Moreover, green	There is low project risk against this safeguarding	There is low risk involved in it. So

[4] OHSAS- Occupational Health & Safety Assessment Series

egard to environmental challenges and is not co mplicit in practices contr ary to the precautionary principle.	chemicals are being used during the cleaning of the rolling stock.	principle	there is no need of mitigation measure.
The project does not inv olve and is not complicit in significant conversio n or degradation of criti cal natural habitats, incl uding those that are (a) l egally protected, (b) offi cially proposed for prote ction, (c) identified by a uthoritative sources for their high conservation value, or (d) recognized as protected by traditio nal local communities.	The project involves installation of Regenerative Braking System (RBS) in rolling stocks. There is no additional land required for the project activity. The project activity does not increase any stress on the site, rather this project is an effort to conserve electricity which is a scarce commodity in the host nation. Moreover, electricity generation is mainly fossil fuel based in and hence such energy efficient initiatives pave the way forward for further technological innovations in the country which lead not only to conservation of resources but also mitigation of climate change and its impacts on ecosystem.	There is low project risk against this safeguarding principle	The project activity does not degrade any critical natural habitat. And project also does not require additional land. So there is no need of any mitigation measure to be taken.
The project does not inv olve and is not complicit in corruption.	DMRC has strict rules for maintaining anti-corruption within the organization and in its dealing with other parties. There is a Vigilance Unit, which works in close coordination with the Vigilance Unit of the Ministry of Urban Development and the Central Vigilance Commission. Vigilance Unit of DMRC arranges vigilance awareness programme from time to time. These programmes are arranged for the benefit of all concerned. During such programmes, all officers /staffs are invited to create vigilance awareness in the organization. All exercises, operations and project activities, including the said project obliges to the principle of anti-corruption in DMRC.	There is low project risk against this safeguarding principle	Since it has low risk, hence this principle does not call for mitigation in the project scenario.

F.2. Sustainable Development matrix

[See Toolkit 2.4.2 and Annex I]

Insert table as in section D3 from your Stakeholder Consultation report (Sustainable Development matrix).

Indicator	**Mitigation measure**	**Relevance to achieving MDG**	**Chosen parameter and explanation**	**Preliminary score**
Gold Standard indicators of sustainable development	If relevant, copy mitigation measure from 'Do No Harm' assessment, and include mitigation measure used to neutralise a score of '-'	Check www.undp.org/mdg and www.mdgmonitor.org Describe how your indicator is related to local MDG goals	Defined by project developer	Negative impact: score '-' in case negative impact is not fully mitigated, score '0' in case impact is planned to be fully mitigated No change in impact: score '0' Positive impact: score '+'

Air quality	The project activity reduces air pollution. The major pollutant prevented by the project activity are the criteria pollutants due to the electricity generated from fossil fuels.	MDG affected: 7.A Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources[5]	Amount of electricity regenerated from regenerative braking system. 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 neither the Project nor the baseline activity has any impact on the local air quality since neither the Regenerative braking nor the Rheostatic braking generates any air emission. Hence the parameter has been considered as neutral.	0
Water quality and quantity	DMRC has effluent treatment plants at its depot. No water from the depots is released into environment without prior treatment. Water quality monitoring has	MDG affected: 7.A Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources[6]	DMRC in their depots uses green chemicals (chemicals with eco labels) for cleaning purposes of rolling stock. However, wherever water is being used by DMRC for cleaning uses are treated by in-house ETP.	0

[5] http://www.un.org/millenniumgoals/environ.shtml
[6] http://www.un.org/millenniumgoals/environ.shtml

	been done at regular intervals.			
Soil condition	The project activity has no impact on soil pollution.	n/a	There is no impact on soil condition as the regenerative braking technology are installed in trains running on already built tracks. It does not impact the quality of soil.	0
Other pollutants	The regenerative braking does not generate any additional noise and indirectly reduces thermal pollution.	MDG 7 Ensure Environmental Sustainability	The regenerative braking systems installed in existing rolling stocks do not lead any noise production. Moreover, as due to the system, less grid electricity is drawn, which comes majorly from coal powered thermal power plants associated generation of local pollutants are reduced[7].	0
Biodiversity	There is no impact on biodiversity	n/a	There is no impact on biodiversity as the regenerative braking technology are installed in trains running on already built tracks which does not have any endangered species nor comes under ecologically protected areas.	0
Quality of employment	The project activity ensures good quality of employment by training the staff, providing medical benefits and insurance. National norms for jobs will be maintained.	MDG affected: 1.5 Employment-to-population ratio	Training of Staff, medical benefits and insurance The staff recruited undergoes a training where they are informed about the working and site requirements.	+

[7] http://www.climatetechwiki.org/technology/regenerative_braking_in_trains

Livelihood of the poor	The project activity will have impact on the improving the livelihood. The measures involve providing homes, schools for homeless and poor, etc.	MDG affected: 1Achieve full and productive employment and decent work for all, including women and young people	CSR activities of DMRC related to enhancing livelihood of the poor DMRC has been carrying out various sustainable development activities in Delhi NCR. DMRC under the name of "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. The quarterly report for the same has been attached as "Quarterly Report_DMRC Children Home". DMRC under their CSR programme has been sponsoring the Winter Shelter for elderly persons under the name of "HelpAge India" wherein DMRC bears the expenditure of a maximum of 40 people. The financial support provided by DMRC to HelpAge India is governed by an agreement which is attached herewith as "HelpAge India_DMRC_Agreement". Delhi Metro Museum at Patel Chowk engages very closely with the children and organizes a number of programmes and events for them. The main objective of the museum is knowledge sharing coordinated visits, workshops, competitions, storytelling sessions etc. About 10,000 children visit the Delhi Metro Museum every year from schools across the country. A document explaining the objectives and activities	+

			undertaken by Delhi Metro Museum has been attached as "Museum for Children". Revenue from the project activity will be used for betterment of livelihood of the poor and needy.	
Access to affordable and clean energy services	Access to affordable and clean energy services refer to changes compared to the baseline in: • Stakeholders have access to better transportation services at affordable price. Reduction in units of energy consumed will contribute towards the improvement in the power scenario of Delhi i.e. the region where GS project is implemented. • Reducing dependency of fuel/ energy imports that may lead to more sustainable and affordable energy services in a country.	MDG affected: 7.2 CO2 emissions, total, per capita and per $1 GDP (PPP)	Energy Consumption for all the Rolling Stock included in project activity The project activity entails higher investment and results in improved energy services. These services are available to the stakeholders at affordable prices. Moreover, reduction in electrical units consumed due to project activity has an overall positive impact on the power situation of the city. Due to the implementation of the project, power regenerated is now available to other sectors. The project will contribute to bridge the gap of power shortage[8,9].	+
Human and institutional capacity	DMRC will develop human and institutional	n/a	Training and development of human and institutional capacity through CSR	+

[8] http://greencleanguide.com/electricity-scenario-of-national-capital-territory-of-delhi/

[9] http://www.climatetechwiki.org/technology/regenerative_braking_in_trains

	capacity of users / workers / etc. The mitigation measures includes workshop / ICT material to enhance awareness on environment , safety, health and other social issue.		activities. The revenue obtained from the project activity will be utilized for enhancing human and institutional capacity in dealing with sustainability issues. The following programs will be taken up: • Awareness film on facilities for commuters in Metro. • Workshops for Travelling of Physically challenged person in Metro • organizing a series of street plays (nukkad natak) at all its major construction sites to spread awareness about the preservation of the environment among the workers and officials	
Quantitative employment and income generation	Ensures employment generation during the operation and maintenance of the project activity	MDG affected: 1.5 Employment-to-population ratio	Employment was generated during the installations. Moreover, operation and maintenance will also lead to further employment generation. All the employees of DMRC are governed by minimum wage rate as per govt. of India regulation. Payscale of each type of employee has been defined in the recruitment notice of DMRC and the HR Department of DMRC is in custodian of the same. DMRC strictly adheres to the rates of wages. DMRC ensures that the wages paid	+

			are not less favorable than those established for the industry. Section 6 of the General Conditions of the Contract for DMRC illustrates the same and has been attached herewith as "Section-VI General Conditions of Contract"- Refer point 6.2 of the contract.	
Balance of payments and investment		MDG 1 Eradicate extreme poverty and hunger MDG 8 Global Partnership for Development	The Project activity is partially financed by the Government of Japan through JICA. Once carbon revenues are issued, the investment for the project activity will be alleviated.	0
Technology transfer and technological self-reliance	The successful implementation of the project activity will result in the use of similar technologies in upcoming metros in India.	MDG affected: 8: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications	The project activity is through cooperation from JICA. The energy efficient technologies of the project activity have been utilized for the first time in DMRC The project activity demonstrates the viability of the regenerative braking technology and will help in technology transfer to future phases of DMRC as well as other MRTS in India. There is no experience of such projects in the state as the technological advancements are first of its kind. Hence it is an intra-country technology transfer.	+

Justification choices, data source and provision of references

A justification paragraph and reference source is required for each indicator, regardless of score

Air quality	Neither the Project nor the baseline activity has any impact on the local air quality since neither the Regenerative braking nor the Rheostatic braking generates any air emission. Hence the parameter has been considered as neutral.
Water quality and quantity	DMRC has taken significant steps to prevent water pollution. DMRC in their depots uses green chemicals (chemicals with eco labels) for cleaning purposes of rolling stock. Thus ETP & STP have been installed at depots to treat and reuse the wastewater generated and prevent water & land pollution[10].
Soil condition	The project activity will not impact the soil quality of the region.
Other pollutants	The project does not have any effect on noise increment during operation and reduces thermal pollution indirectly. The regenerative braking systems installed in existing rolling stocks do not lead to any noise production. Moreover, due to the system, less grid electricity is drawn, which comes majorly from coal powered thermal power plants associated generation of local pollutants are reduced [11]. The implementation of regenerative braking technology at some places have reduced the vibration levels along with greater riding comfort[12].
Biodiversity	Since the project activity i.e. installation of regenerative braking technology in metro trains is operating on existing metro routes thus it is not impacting the biodiversity of the region.
Quality of employment	Project activity will have significant change on the quality of employment as people will be trained by experienced staff for operation and maintenance of the project activity.
Livelihood of the poor	The project activity has impact on improving the livelihood. The measures involve providing homes, schools for homeless and poor, etc. DMRC has been carrying out various sustainable development activities in Delhi NCR. DMRC under the name of "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. DMRC under their CSR programme has been sponsoring the Winter Shelter for elderly persons under the name of "HelpAge India" wherein DMRC bears the expenditure of a maximum of 40 people. Delhi Metro Museum at Patel Chowk engages very closely with the children and organizes a number of programmes and events for them. The main objective of the museum is knowledge sharing coordinated visits, workshops, competitions, storytelling sessions etc. About 10,000 children visit the Delhi Metro Museum every year from schools across the country. A document explaining the objectives and activities undertaken by Delhi Metro Museum has been attached as "Museum for Children".

[10] http://www.delhimetrorail.com/otherdocuments/ssmotion.pdf
[11] http://www.climatetechwiki.org/technology/regenerative_braking_in_trains
[12] http://www.globalmasstransit.net/archive.php?id=2946

Access to affordable and clean energy services	Clean energy will be generated and supplied to the gird there by replacing the electricity generated by fossil fuels[13].
Human and institutional capacity	DMRC will develop human and institutional capacity of users / workers / etc. The mitigation measures includes workshop / ICT material to enhance awareness on environment, safety, health and other social issue.
Quantitative employment and income generation	Project activity will lead to improved local employment in the operation and maintenance of the trains[14]. Payscale of each type of employee has been defined in the recruitment notice of DMRC and the HR Department of DMRC is in custodian of the same. DMRC strictly adheres to the rates of wages. DMRC ensures that the wages paid are not less favorable than those established for the industry.
Balance of payments and investment	The Project activity is partially financed by the Government of Japan through JICA. Once carbon revenues are issued, the investment for the project activity will be alleviated.
Technology transfer and technological self-reliance	Company will provide technical training to their staff for continuous operation and maintenance of the project activity. The successful implementation of the project activity has resulted in the use of similar technologies in upcoming metros in India.

SECTION G. Sustainability Monitoring Plan

[See Toolkit 2.4.3 and Annex I]

According to GS toolkit, the sustainability monitoring plan is required for each non-neutral indicator according to GS Annex I. The indicators directly impacting sustainability are positive in nature and hence do not require mitigation measures. However the main parameter for the project activity which is energy conservation will be monitored during the entire crediting period. The energy conservation will be calculated on the basis of energy consumption data by each rolling stock. This parameter will be monitored throughout the crediting period. Since it is a neutral parameter, hence a mitigation measure is not applicable to this parameter.
Monitoring Plan for project activity and to ensure sustainability in each step, the project proponent (DMRC) will monitor the electricity consumed by all rolling stocks forming the part of project activity. The data will be archived electronically and be stored for 2 years after the end of the crediting period. To ensure that the data is reliable and transparent, the project entity will also establish Quality Assurance and Quality Control (QA&QC) measures to effectively control and manage data reading, recording, auditing as well as archiving data and all relevant documents. The data will be monitored on a monthly basis and will be submitted to Quality Assurance team of project proponent.

No.	SI8
Indicator	Access to affordable and clean energy services
Mitigation measure	Access to affordable and clean energy services refer to changes compared to the baseline in:

[13] http://www.delhimetrorail.com/cleandevelopment.html
[14] http://www.climatetechwiki.org/technology/regenerative_braking_in_trains

		• Stakeholders have access to better transportation services at affordable price. Reduction in units of energy consumed will contribute towards the improvement in the power scenario of Delhi i.e. the region where GS project is implemented. • Reducing dependency of fuel/ energy imports that may lead to more sustainable and affordable energy services in a country.
Chosen parameter		Energy Consumption for all the Rolling Stock included in project activity
Current situation of parameter		In absence of project activity (installation of regenerative braking), equivalent amount of electricity would have been consumed by rolling stocks, from the grid. Thus, 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.
Estimation of baseline situation of parameter		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.
Future target for parameter		100 % monitoring of the data will be done. Data shall be archived for 2 years following the end of the crediting period
Way of monitoring	How	*The data will be measured through Train Integration and Management System (TIMS) reading. The readings are cumulative. These readings are noted daily and downloaded monthly using a maintenance terminal.*
	When	Monthly
	By who	Project proponent

No.		SI6
Indicator		Quality of employment
Mitigation measure		The project activity ensures good quality of employment by training the staff, providing medical benefits and insurance. National norms for jobs will be maintained.
Chosen parameter		Training of Staff, medical benefits and insurance.
Current situation of parameter		The staff recruited undergoes a training where they are informed about the working and site requirements. Refresher training is provided as in when required Medical benefit and insurance are provided to staff.
Estimation of baseline situation of parameter		In absence of project activity the staff would not have been trained on regenerative braking and skills would not have been enhanced.
Future target for parameter		Continue to provide quality employment in all operation and maintenance activity for the project by imparting training and refresher training.
Way of monitoring	How	Number of staff trained / training records
	When	Annual
	By who	Project proponent

No.	SI7
Indicator	Livelihood of the poor
Mitigation measure	The project activity will have impact on the improving the livelihood. The mitigation measures involve providing homes, schools for homeless and poor, etc.
Chosen parameter	CSR activities of DMRC related to enhancing livelihood of the poor
Current situation of	DMRC works proactively towards enhancing livelihood of the poor and needy in Delhi NCR. DMRC has been carrying out various CSR activities

parameter		focused on enhancing livelihood of poor like supporting Help age India , salam balak trust (NGO working with poor senior citizens, homeless orphans and street children).DMRC has been carrying out various sustainable development activities in Delhi NCR. DMRC under the name of "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. DMRC under their CSR programme has been sponsoring the Winter Shelter for elderly persons under the name of "HelpAge India" wherein DMRC bears the expenditure of a maximum of 40 people. Delhi Metro Museum at Patel Chowk engages very closely with the children and organizes a number of programmes and events for them. The main objective of the museum is knowledge sharing coordinated visits, workshops, competitions, storytelling sessions etc. About 10,000 children visit the Delhi Metro Museum every year from schools across the country.
Estimation of baseline situation of parameter		Start date of project activity is 2001. Activities towards enhancing livelihood of poor started in 2009. Hence under baseline scenario, such activities are not undertaken.
Future target for parameter		Shelter for helpless, poor street children equipped with all necessary facilities for their overall growth. Children dormitory, classroom and playground for homeless children Old age home for helpless, homeless elders
Way of monitoring	How	Progress Report
	When	Annual
	By who	Project proponent

No.	SI9
Indicator	Human and institutional capacity
Mitigation measure	DMRC will develop human and institutional capacity of users / workers / etc. The mitigation measures includes workshop / ICT material to

		enhance awareness on environment, safety, health and other social issue.
Chosen parameter		Training and development of human and institutional capacity through CSR activities.
Current situation of parameter		The revenue obtained from the project activity is being utilized for enhancing human and institutional capacity in dealing with sustainability issues. The following programs will be taken up: • Awareness film on facilities for commuters in Metro. • Workshops for Travelling of Physically challenged person in Metro • organizing a series of street plays (nukkad natak) at all its major construction sites to spread awareness about the preservation of the environment among the workers and officials • Organizing workshops / street plays to enhance awareness on aids and other communicable diseases.
Estimation of baseline situation of parameter		Such initiatives have been initiated since 2012[15] hence under baseline situation ie prior to 2001 such initiatives were not taken.
Future target for parameter		• Continued development of human and institutional capacity by awareness programmes .
Way of monitoring	How	Annual reports, Newsletters of DMRC
	When	Annual
	By who	Project proponent

No.	SI10
Indicator	Quantitative employment and income generation
Mitigation measure	Ensures employment generation during the

[15] http://delhimetrorail.com/press_reldetails.aspx?id=BzM0uJW3rr8lld

		operation and maintenance.
Chosen parameter		Employment generation each year.
Current situation of parameter		Employment was generated during the installations. Moreover, operation and maintenance also leads to further employment generation.
Estimation of baseline situation of parameter		Number of employees in DMRC is growing pursuant to baseline situation. Number of employees with DMRC has grown from 2,400 employees in 2004 to about 8,000 currently.[16] Thus there is a growth of Quantitative employment and income generation.
Future target for parameter		Continue generation of employment.
Way of monitoring	How	All the employees of DMRC are governed by minimum wage rate as per govt. of India regulation. Payscale of each type of employee has been defined in the recruitment notice of DMRC and the HR Department of DMRC is in custodian of the same.
	When	Annual
	By who	Project proponent

No.	SI12
Indicator	Technology transfer and technological self-reliance
Mitigation measure	The successful implementation of the project activity has resulted in the use of similar technologies in upcoming metros in India.
Chosen parameter	Similar technology (regenerative braking) being used in other metros in India planned after this project activity.
Current situation of parameter	The energy efficient technologies of the project activity have been utilized for the first time by DMRC The project activity demonstrates the viability of the regenerative braking technology and will help in technology transfer to future phases of DMRC as well as other MRTS in India.

[16] http://www.businesstoday.in/magazine/cover-story/best-companies-to-work-for-delhi-metro-rail-corporation/story/196688.html

		There is no experience of such projects in the state as the technological advancements are first of its kind. Hence it is an intra-country technology transfer. After success of this technology other upcoming metro like Ahmedabad Metro is also considering Regenerative Braking .
Estimation of baseline situation of parameter		Being first of it's kind in India baseline situation is installation of Rheostatic Braking system without technology transfer similar to Kolkata metro.
Future target for parameter		The success of the project would lead to implementation of similar technology in upcoming metro systems as well.
Way of monitoring	How	Similar technologies being used in upcoming metros. (Refer to the DPR).
	When	As and when new metros are planned and DPR is available.
	By who	Project proponent

Quality Assurance and Quality Control

QA&QC procedures for recording, maintaining and archiving data shall be implemented as part of this Gold Standard project activity. The project proponent will implement QA&QC measures to ensure the accuracy of metering and safety aspects of the project operation. The energy metering devices will be inspected properly and periodically, according to state electricity board's specifications and requirements to ensure accuracy in the readings.
Training and maintenance procedures: Carbon credit Quality Advisor would ensure training to on-site staff with respect to adherence to the Monitoring Plan of the project activity. Records of the training would be kept. Internal audit of all the records of the plant will be carried out twice a year. During these audits all the data and parameters that need to be monitored as per the monitoring plan would be checked and shortcomings if any will be reported and addresses.

Data Storage and Archiving

All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of s for this project activity, whichever occurs later. The data will be maintained in both electronic and paper formats. The data will be stored in following manner:
A copy of data will be maintained in electronic and paper format on-site for anytime reference and validation. The electricity consumption and calibration certificates of all trains with regenerative braking technology will be maintained in the DMRC, Metro Bhawan. The operational area for each station will be stored in the Civil Division of DMRC, Metro Bhawan. A copy of data will be stored in paper format by project operator in their branch office in safe storage.

Additional remarks monitoring

-

SECTION H. Additionality and conservativeness

This section is only applicable if the section on additionality and/or your choice of baseline does not follow Gold Standard guidance

H.1. Additionality

[See Toolkit 2.3]

The project activity is an end use energy efficiency project. Emission reductions are associated with the reduction in electrical energy consumption and do not involve any substitution of non-renewable fuel. The additionality of the project is demonstrated in section B.5 of the CDM registered PDD[17]. The project participant aims to add Gold Standard rating as well to the existing registered CDM project. The Gold Standard accepts the UNFCCC CDM registered projects and additionality need not be demonstrated again. The Gold Standard relies on the UNFCCC's decision on additionality for CDM projects applying for GS registration. This implies that Gold Standard CDM projects will not be required to carry out further demonstration of additionality over and above of what was established during registration with the CDM[18].

H.2. Conservativeness

[See Toolkit 2.2]

- The project participant aims to add Gold Standard rating as well to the existing registered CDM project. The project activity has been already registered with CDM UNFCCC on 29th Dec 2007 using the methodology AMS III.C. "Emission reduction by low greenhouse gas emitting vehicles" Version: 10[19]. Project activity replaces the conventional electro-dynamic rheostatic braking technology, with regenerative braking technology fitted rolling stocks. The regenerated electrical energy reduces the consumption of equivalent grid electrical energy required by the powering trains, thereby conserving electrical energy and subsequently leading to GHG emission reduction. Now the PP would like to register the project as Gold Standard CDM project and avail CERs for rest of the crediting period (2014 – 2017) as Gold Standard CERs.

- The project was registered under version 10 of the methodology; AMS-III.C. However the project activity no longer meets the applicability condition of version 15 of the methodology. There is a new methodology approved by UNFCCC; AMSIII BC "Emission reductions through improved efficiency of vehicle fleets". Project meets applicability criteria as per this methodology as explained below:

Conditions	AMS III BC, Version 2	How the project meets applicability criteria
Applicability	1. This methodology is for project	1. The project involves energy efficiency

[17] https://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view
[18] http://www.goldstandard.org/sites/default/files/v2.2-summary-document.pdf
[19] https://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view

Condition	activities that improve the efficiency of vehicle fleets resulting in reduced fuel usage and greenhouse gas emissions. 2. The project activity shall implement one or more of the following measures: (a) Idling stop device; (b) Eco-drive systems; (c) Tire-rolling resistance improvements; (d) Air-conditioning system improvements; (e) Use of low viscosity oils (f) Aerodynamic drag reduction measures; (g) Transmission improvements; (h) Retrofits that improve engine efficiency 3. More than one energy efficiency measure covered by the methodology may be implemented in the project vehicle fleet(s) and the measures implemented may vary across vehicles in the fleet(s). 4. Vehicle fleets shall be centrally owned and managed by a single entity and driven by contractors or employees of the central entity. 5. The methodology is not applicable to project activities that include: (a) Measures that improve the system efficiency of the fleet, for example a change of operational procedures to improve the occupancy rate of vehicles and modal shift in transportation; (b) Technologies employed to improve combustion efficiency without improvements in engine efficiency; (c) A switch from fossil fuels to biofuels in transportation applications. The usage of a fixed biofuel blend is, however, admissible if project vehicles use the same blend of biofuel as used by baseline vehicles. In the case of using biofuel blends, the biofuel share is accounted for as zero emitting;	of Delhi Metro train fleets through regenerative braking system resulting in reduced fuel usage (electricity consumption) and greenhouse gas emissions. Thus project fulfils this applicability criterion. 2. Project falls under 2 (h) Retrofits that improve engine efficiency which involves direct installation of technologies onto the vehicle/engine that improve the efficiency of engine operation by, for example, **tapping into spare unused kinetic energy**, solar energy or thermo- electric generation and/or generating hydrogen on board to be used as a catalyst, e.g. electro-catalytic efficiency technologies. Thus project fulfils this applicability criterion. 3. Project activity involves only one energy efficiency measure as described above. Thus project fulfils this applicability criterion. 4. Vehicle fleets are centrally owned and managed by Delhi Metro Rail Corporation Ltd. (DMRC) and are driven by employees of DMRC. Thus project fulfils this applicability criterion. 5. Project activity does not include: (a) Measures that improve the system efficiency of the fleet, for example a change of operational procedures to improve the occupancy rate of vehicles and modal shift in transportation; (b) Technologies employed to improve combustion efficiency without improvements in engine efficiency; (c) A switch from fossil fuels to biofuels in transportation applications. The usage of a fixed biofuel blend is, however, admissible if project vehicles use the same blend of biofuel as used by baseline vehicles. In the case of

	(d) A fuel-switch, for example from liquid to gaseous fuels. 6. Project fleets may use various fuel types. The composition of the fleet with regard to fuel types used may also change over time. 7. Only vehicles in which at least one of the ex-ante identified project activity measures has been implemented shall be included in the project fleet. 8. The project design document (PDD) shall include documentation of procedures to eliminate any potential double counting of emission reductions due to, for example, the project vehicles participating in other CDM projects or Programmes of Activities (PoAs). 9. Measures are limited to those that result in emission reductions of less than or equal to 60 ktCO2 equivalent annually.	using biofuel blends, the biofuel share is accounted for as zero emitting; (d) A fuel-switch, for example from liquid to gaseous fuels. Thus project fulfils this applicability criterion. 6. Project fleets use only one type of fuel (electricity). Thus project fulfils this applicability criterion. 7. Retrofit that improves engine efficiency has been identified as the measure implemented in the vehicle fleet. Thus project fulfils this applicability criterion. 8. Project vehicles do not participate in any other CDM project activity so there is no double counting. Thus project fulfils this applicability criterion. 9. Measures are limited to those that result in emission reductions of less than 60 ktCO2 equivalent annually. Average annual CERs are 47,053 tCO2e. Thus project fulfils this applicability criterion.
Project Boundary	The project boundary is the physical, geographical location of the vehicles that are part of the project activity. The spatial extent of the project boundary encompasses the geographical area of the trips of these project vehicles.	There is no change from the registered PDD.
Emission Reduction Calculations	The baseline scenario is the operation of a group of vehicles of the same fleet, in which the project measures are not implemented, for similar transportation services as the project vehicles. Baseline emissions are calculated based on a baseline emissions factor (BEF) derived from the monitored specific fuel consumption of a control group of vehicles and the monitored project activity level.	The analysis shows that basis of baseline emission reduction calculation is same in registered PDD as well as the new methodology.

This has also been communicated and discussed with Mr. Abhishek Goyal, technical Director, Energy of The Gold Standard Foundation. He has agreed to proceed and register the project with AMS III.BC if the emission reductions calculated with AMS III.BC are not more conservative than those calculated with AMS III.C.

The Emission reduction calculated with both the above-mentioned methodologies give the ER as 47,890

tCO_2/year[20]. Thus, there is no overestimation and the project is deemed conservative.

[20] Attached as Annexure 2

ANNEX 1 ODA declaration

The Gold Standard

ANNEX D - OFFICIAL DEVELOPMENT ASSISTANCE DECLARATION

Date: [*Insert Date*] 11/07/17

The Gold Standard Foundation

79 Avenue Louis Casai

Geneva Cointrin, CH-1216

Switzerland

RE: Declaration of Non-Use of Official Development Assistance by Project Owner of GS 4597

[*Project Owner*] DELHI METRO RAIL CORPORATION

As Project Owner of the above-referenced project, and acting on behalf of all Project Participants, I now make the following representations:

[*Project Representative*] SANT ADHAR VERMA

I hereby declare that I am duly and fully authorized by the Project Owner of the above-referenced project to act on behalf of all Project Participants and make the following representations:

I. The Gold Standard Documentation

I am familiar with the provisions of The Gold Standard Documentation relevant to Official Development Assistance (ODA). I understand that the above-referenced project is not eligible for Gold Standard registration if the project receives or benefits from Official Development Assistance with the condition that some, or all, of the carbon credits [CERs, ERUs, or VERs] coming out of the project are transferred to the ODA donor country. I hereby expressly declare that no financing provided in connection with the above-referenced project has come from or will come from ODA that has been or will be provided under the condition, whether express of implied, that any or all of the carbon credits issued as a result of the project's operation will be transferred directly or indirectly to the country of origin of the ODA.

II. Duty to Notify Upon Discovery

If I learn or if I am given any reason to believe at any stage of project design or implementation that ODA has been used to support the development or implementation of the project, or that an entity providing ODA to the host country may at some point in the future benefit directly or indirectly from the carbon credits generated from the project as a condition of investment, I will notify The Gold Standard immediately using the Amended ODA Declaration Form provided below.

The Gold Standard®
Premium quality carbon credits

III. Investigation

The Gold Standard reserves the right to conduct an investigation into any project it reasonably believes may be receiving ODA with the condition that some or all of the carbon credits from the project will be transferred to the ODA donor country.

IV. Sanctions

I am fully aware that the sanctions identified in The Gold Standard Terms and Conditions may be applied to me or the above-referenced project in the event that any of the information provided above is false or I fail to notify The Gold Standard of any changes to ODA in a timely manner.

I swear that all of the statements contained herein are true to the best of my knowledge.

Signed: _____

Name: SANT ADHAR VERMA

Title: GENERAL MANAGER / ENVIRONMENT

On behalf of: DELHI METRO RAIL CORPORATION

Place: DELHI

Influence. Innovate. Inspire.
www.cdmgoldstandard.org

ANNEX 2 ER sheet comparison -AMS IIIC & AMS IIIBC

AMS III-C Monitoring report-6 (Issued (on 21 Dec 13))			
Service line	**Electrical Energy**	**Energy regenerated(kWh)**	**Distance covered (km)**
Line 1	59,562,849	22,166,022	3,887,719
Line 2	26,104,942	8,339,080	1,532,735
Line 3	76,391,598	29,357,103	4,669,171
Total	162,059,389	59,862,205	10,089,625
BEy	129,648		
Ry	47,890		
PEy		81,758	
ER		**47,890**	
Emission factor	800	tCO2/GWh	
	0.0008	tCO2/kWh	

Full form of all abbreviations
BEy: Total baseline emissions in year y
Ry: Total regenerative emissions in year y
PEy: Total project emissions in year y
ER: Emission reductions in year y

AMS IIIBC						
Period 1 Jan-31 Dec 2012	**Service line**	**Electrical Energy Consumed(kWh)**	**Energy regenerated(kWh)**	**Distance covered (km)**	**Emission Factor**	
	Line 1	59562849	22166022	3887719	0.0008	tCO2/kWh
	Line 2	26104942	8339080	1532735		
	Line 3	76391598	29357103	4669171		
	Total	162059389	59862205	10089625		
	BEF Line 1	0.01225662				
	BEF Line 2	0.01362529				
	BEF Line 3	0.01308868				
	BEy	**129647.511**	tCO2			
	REF Line 1	0.00456124				
	REF Line 2	0.00435252				
	REF Line 3	0.00502995				
	Ry	**47889.764**	tCO2			
	PEy	**81757.7472**	tCO2			
	ER	**47890**	tCO2			