DMRC's CARBON REDUCTION PLAN

Supplier name: M/s Delhi Metro Rail Corporation Limited

Publication date: Sept'25

Commitment to achieving Net Zero

M/s Delhi Metro Rail Corporation Limited is committed to achieving Net Zero emissions by 2050.

Baseline Emissions Footprint

Baseline emissions are a record of the greenhouse gases that have been produced in the past and were produced prior to the introduction of any strategies to reduce emissions. Baseline emissions are the reference point against which emissions reduction can be measured.

Baseline Year: 2023-24

Baseline year emissions:	
Emissions	**Total (tCO_2e)**
Scope 1	15,592
Scope 2	575,784
Scope 3* **(included sources)**	118,997 (comprising of Category 3 and Category 7)
Total emissions	**710,373 tCO_2e**

*Other applicable categories are under calculation

Current Emissions Reporting

Reporting Year: 2024-25	
Emissions	**Total (tCO_2e)**
Scope 1	15,653
Scope 2	601,956
Scope 3* **(included sources)**	124,556 (comprising of Category 3 and Category 7)
Total emissions	**742,165 tCO_2e**

*Other applicable categories are under calculation

The Increase in Scope-1, 2 and 3 emissions w.r.t Baseline year can be attributed to fleet expansion and network expansion.

Emissions Reduction Targets:

In order to continue our progress to achieving Net Zero, we have adopted the carbon reduction targets. DMRC has bifurcated its emission reduction targets in three phases:

1. Near Term Target (2025-2030)
2. Mid-term Target (2030-2040)
3. Long Term Target (2040-2050)

1. Near Term Target (2025–2030)

The objective of Near-Term Target is to focus on benefits through Energy efficiency and transition to Renewable energy.

The activities intended to be undertaken in the Near-Term Target are as follows:

1.1. Scope 1:

The activities to be undertaken to reduce the Scope-1 emissions in the near term are as follows, but not limited to:

1. Efforts to transition the diesel gensets to green fuel gensets or replace with battery backup, if deemed possible.
2. Efforts to minimise the gasoline-based vehicles (maintenance vans, staff transport) by transitioning to EVs/CNG hybrids.
3. Efforts to transition to low-GWP refrigerants and phase-down the high-GWP refrigerants.

1.2. Scope 2:

The activities to be undertaken to reduce the Scope-2 emissions in the near term are as follows, but not limited to:

1. Efforts to sign more green PPA contracts (solar/wind) to increase the share of renewable energy.
2. Efforts to identify and install Solar Plants at the more locations to generate green energy in-house.
3. Implement smart energy management at stations (LEDs, HVAC optimisation).

1.3. Scope 3:

The activities to be undertaken to reduce the Scope-3 emissions in the near term are as follows, but not limited to:

1. Develop an embodied carbon procurement policy to focus on EPDs – Environmental Product Declarations.
2. Efforts to seek GHG emissions disclosures with the major suppliers.

2. Mid Term Target (2030–2040)

The objective of Mid-Term Target is to intensify the decarbonisation Target and embed the Net-Zero culture.

2.1. Scope 1:

The activities to be undertaken to reduce the Scope-1 emissions in the mid - term are as follows, but not limited to:

1. Efforts to obtain 100% electrification of the fleet by 2040.
2. Efforts to phase out 80% of the fossil-fuel backup systems with clean fuel systems.

2.2. Scope 2:

The activities to be undertaken to reduce the Scope-2 emissions in the mid - term are as follows, but not limited to:

1. Efforts to obtain 80% of electricity from **renewables via PPAs** and grid decarbonisation.

2.3. Scope 3:

The activities to be undertaken to reduce the Scope-3 emissions in the mid - term are as follows, but not limited to:

1. Implement embodied carbon procurement policy to focus on EPDs – Environmental Product Declarations.
2. Efforts to seek GHG emissions disclosures with the all suppliers.

3. Long Term Target (2040–2050)

The objective of Long Term Target is to obtain Net-Zero for DMRC Operations and maintenance activities.

3.1. Scope 1:

The activities to be undertaken to reduce the Scope-1 emissions in the long - term are as follows, but not limited to:

1. Ensure Zero fossil fuel use in operations.
2. All refrigerants with ultra-low GWP or natural refrigerants.

3.2. Scope 2:

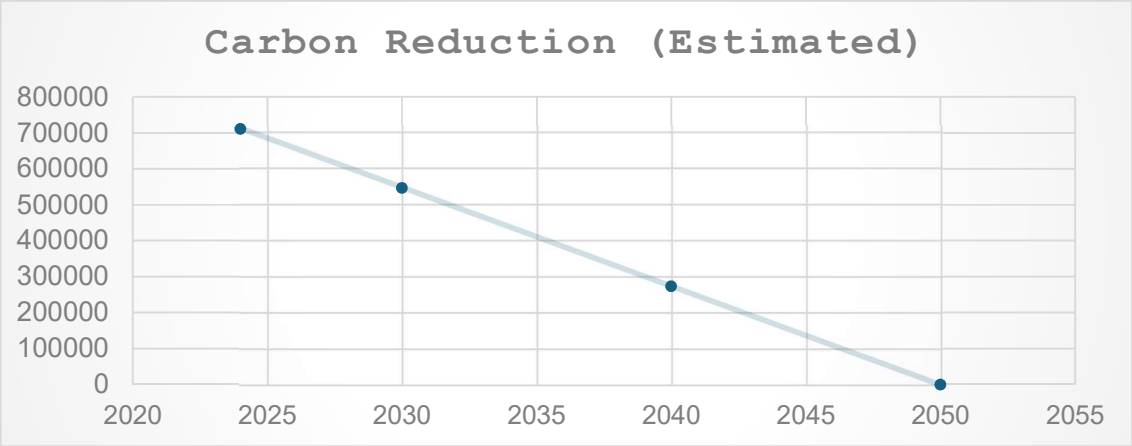
The activities to be undertaken to reduce the Scope-2 emissions in the long - term are as follows, but not limited to:

1. All the energy used in DMRC Operations and maintenance is renewable energy based.

3.3. Scope 3:

The activities to be undertaken to reduce the Scope-3 emissions in the long - term are as follows, but not limited to:

1. Embodied carbon in new infrastructure offset by verified low-carbon materials and high-quality carbon removals.
2. All suppliers under SBTi Net-Zero or equivalent.



We project that carbon emissions will decrease to 546,441 tCO_2e by 2030. This is a reduction of 23%.

Carbon Reduction Projects

The carbon reduction projects are as follows:

A. Energy Efficiency Initiatives

Guided by Energy Management Policy and aligned with ISO 50001 standards, DMRC has embedded energy efficiency into every layer of operations. The teams across Energy and Maintenance, Traction, and Environment work collaboratively to identify opportunities, implement solutions, and monitor performance.

DMRC have undertaken several energy-saving initiatives that have significantly contributed to reducing our overall electricity consumption and improving system efficiency, few of which are mentioned below:

1. **Regenerative Braking System:** In rolling stock, DMRC introduced regenerative braking technology that captures kinetic energy during train deceleration and converts it into electrical energy. This recovered energy is fed back into the traction system and used to power other trains or station operations, reducing the net electricity demand from the grid. The system not only improves energy efficiency but also contributes to smoother train operations and reduced wear on mechanical braking components.

Together, these efforts underscore the belief that energy efficiency is not a standalone goal but a continuous journey embedded in operations, planning, and innovation. Over the past year, our targeted initiatives—ranging from HVAC upgrades and LED lighting to regenerative braking and intelligent controls—have collectively resulted in a **total energy savings of 40%** across our network. DMRC remain committed to refining systems, adopting emerging technologies, and aligning with global best practices to ensure that every unit of energy is used purposefully.

2. **Replacement of VRV/VRF Units**

   The conventional VRV/VRF air-conditioning units has been replaced with advanced inverter-based systems that offer superior energy efficiency and adaptive load modulation. These systems are particularly effective in maintaining stable temperatures in critical areas such as signaling and telecom equipment rooms, where uninterrupted cooling is essential for equipment reliability. The new units also feature smart controls that optimize performance based on occupancy and ambient conditions.

3. **Replacement of Conventional Lights with LED Lights**

   DMRC has transitioned from traditional fluorescent and incandescent fixtures to LED lighting across stations, depots, and administrative buildings. LEDs consume significantly less power, offer better illumination, and have a longer operational life, which reduces both energy costs and maintenance frequency. This initiative has also contributed to improved passenger experience and workplace lighting quality.

4. **RF-Based Wireless Control of Fire Pumps**

   To enhance operational efficiency in fire safety systems, DMRC deployed RF-based wireless control mechanisms for fire pumps. These systems allow for remote monitoring and control, ensuring pumps operate only when necessary—especially during off-hours. This not only reduces energy consumption but also prevents water wastage and mechanical wear, extending the lifespan of the equipment and improving overall system reliability.

5. Replacement of Water-Cooled Chillers with Air-Cooled Chillers

DMRC replaced water-cooled chillers with air-cooled chillers to simplify our cooling infrastructure and reduce auxiliary energy loads. Water-cooled systems require additional components such as cooling towers, water pumps, and chemical treatment units, which increase energy and resource consumption. Air-cooled chillers operate independently and are easier to maintain, eliminating the need for continuous water supply and complex treatment processes. This transition has led to significant operational savings and improved environmental performance.

B. Renewable Energy:

DMRC is committed to advancing sustainable urban mobility by integrating clean energy solutions across our operations. As the network expands and energy demands grow, transitioning to renewable energy has become essential—not only to reduce our carbon footprint but also to contribute meaningfully to India's national climate goals. Renewable energy enables us to lower emissions, improve air quality, and enhance energy security, while aligning with India's target of achieving 500 GW of non-fossil fuel capacity by 2030. For us, this transition is a strategic pathway to long-term resilience and environmental stewardship.

Guided by the principles of DMRC's Solar Policy, which emphasizes reducing dependence on fossil-fuel-based energy sources, DMRC is working toward a forward-looking goal of reaching **60 MW of solar capacity by 2029**.

DMRC's renewable energy journey began in 2012 with a strategic partnership to explore solar photovoltaic (PV) technology. Since then, we have steadily expanded our solar portfolio through a combination of onsite installations and strategic procurement. As of FY 2025, approximately **33% of our total energy requirements** are met through renewable sources, with solar energy forming the backbone of this transition.

In alignment with our policy's emphasis on scalability and innovation, we are expanding rooftop solar installations across stations, depots, and staff quarters, partnering with REWA Ultra Mega Solar Limited (RUMSL) for large-scale solar procurement, and enhancing operational efficiency through regular cleaning and maintenance of solar panels—especially in high-traffic depot areas. Our total onsite solar installed capacity stands at **51.4 MWp**.

DMRC is also procuring renewable energy (354 Million Units of Solar Energy in FY 24-25) from Rewa, Madhya Pradesh, India. This uptake of solar energy meet approximately DMRC's 33% of energy requirement and thus increase our share towards renewable energy in DMRC's total energy mix, hence, reducing DMRC's carbon footprint.

C. Climate Change Projects:

DMRC's journey toward low-carbon operations began with participation in international climate mechanisms.

DMRC has been instrumental in reducing its carbon footprint and in contributing to mitigating climate change. Not only that, it also a forerunner in quantifying climate change benefits from its operations. In 2008, DMRC become the first Metro or Railway project in the world to be registered by the United Nations under the Clean Development Mechanism (CDM) which has enabled it to claim carbon credits for its Regenerative Braking Project.

The 2nd CDM project, registered by DMRC in year 2011 is based on the principle of Modal Shift. The essence of this project is that the carbon footprint of people travelling by metro is much lesser than that of the same journeys performed by other modes of transport i.e. private vehicles. The non-metro modes of transport are not only less efficient in terms of fuel economy but also are more polluting. In the project situation the metro complements other modes of transport and replaces partially trips made by conventional or traditional means of transit by metro. Metro, being a more efficient, faster, safer and more reliable transport means Emission reductions are achieved through reducing GHG emissions per passenger-kilometre, comparing conventional modes of transport with metro.

The **Program of Activities (PoA)project** makes Delhi Metro the managing entity for all other metros of India for fast tracking the Clean Development Mechanism (CDM) registration of all the upcoming rail-based metro systems in the country in future. These credits can be used by entities in developed nations to offset their GHG emissions. Apart from the above, Delhi Metro has also become the **first ever Metro and Railway system in the world** to be registered with the prestigious '**Gold Standard Foundation'**, Switzerland, which is a globally accepted certification standard for carbon mitigation projects

Building on this foundation, we expanded our carbon credit portfolio to include projects under Voluntary Carbon Units (VCUs), Gold Standard (GS CERs and VERs), and Carbon Offset Units (CoUs). Collectively, these efforts have earned us over 9.3 million carbon credits, reinforcing our leadership in climate action within the public transport sector.

S. No.	Project Name	Platform
1.	Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system (PC – 1351)	UNFCCC
2.	Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system (ID No. 469)	VERRA
3.	Metro Delhi, India (PC – 4463)	UNFCCC
4.	The MRTS PoA (PC – 9863)	UNFCCC
5.	DMRC Solar PV Project (CPA 6161-P1-0002-CP1)	UNFCCC
6.	Energy Efficiency Measures in DMRC Phase II Stations (GS1246)	Gold Standard
7.	Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system (GS4597)	Gold Standard
8.	Energy Efficiency in DMRC Phase-III Elevated Stations (GS4634)	Gold Standard
9.	Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system (ID No. 370)	UCR
10.	Delhi Metro, India (ID No. 373)	UCR

D. Carbon Neutrality:

As global climate frameworks evolved, we aligned our sustainability strategy with the Paris Agreement, aiming for deeper decarbonisation and long-term impact.

In line with this commitment, Metro Bhawan and Line 4 of the metro network were certified carbon neutral for FY 2024–25 under the globally recognized PAS 2060 standard.

Certificate of Carbon Neutrality

Certificate Number: EARTHOOD_ESG.24.033.CN_DMRC

This is to certify that DMRC's Corporate Office - Metro Bhawan, Barakhamba Road, New Delhi is CARBON NEUTRAL as per PAS 2060.

Date of issue: June 5, 2024,

Dr. Kaviraj Singh
Managing Director

Earthood

Certificate of Carbon Neutrality

Certificate Number: ESG.24.47. GHGV_DMRC

This is to certify that DMRC's Line 4 (Laxmi Nagar to Vaishali), New Delhi is CARBON NEUTRAL as per PAS 2060:2014.

Date of issue: Sep 30, 2024,

Dr. Kaviraj Singh
Managing Director

Earthood

By integrating global climate frameworks with local action, we are redefining what sustainable public transport can look like in India. As we continue to expand our network and deepen our environmental initiatives, we remain focused on creating a metro system that not only moves people efficiently but also moves the nation closer to its climate goals. For us, every journey is a step toward a cleaner, more resilient future.

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