



CARBON EMISSIONS



WHY WE CARE

Climate change is among the biggest obstacles to TM's nation building aspirations affecting social progress, inclusiveness and prosperity. Governments, businesses and individuals alike need to drastically reduce carbon emissions to avoid the most catastrophic effects of climate change. This includes extreme social challenges such as physical health effects, food, water and livelihood security, forced displacement and other risks.

From a business perspective, climate change also brings great socio-economic risks to the communications sector. These include physical risks such as damages to network infrastructure, disruptions to operations and supply chains and employee health and safety. There are also risks related to the global transition towards a low-carbon economy, such as tighter consumption regulations and investors' expectations. As a company that is committed to sustainability, we must take progressive action, align with the global climate agenda and protect our stakeholders and business sustainability from the worst effects of climate change.

What Our Stakeholders Expect

- Carbon reduction efforts
- Energy efficient processes

TM's ESG Commitments

- 30% carbon emissions reduction by 2024
- 45% carbon emissions reduction by 2030
- Net Zero emissions by 2050

WHAT IS OUR APPROACH

TM addresses climate change by continuously minimising our operational emissions. We look to improve our process efficiencies, investing in low-carbon technologies, embarking on renewable energy and adopting carbon offset initiatives. All levels of the Group play an active role in carbon emissions reduction, from the leadership team driving TM's Value Programmes that focuses on energy savings across TM, to the continuous support of all employees in executing programmes. As part of our continuous improvements, we strive to expand our scope of carbon tracking and reporting so that it is more representative of our impact.

Deployed Capitals:
Met Strategic Aspirations:
Stakeholders Affected:
Sustainability Impact:

WHAT IS OUR APPROACH

SCOPE 1: DIRECT EMISSIONS FROM FUEL CONSUMPTION

This year, we added the emissions from our gensets to our Scope 1 boundary, in addition to the fuel consumed by our vehicle fleet.

We calculated the carbon emissions from fuel consumption using the IPCC Guidelines for National Greenhouse Gas Inventories, 2006.

SCOPE 2: INDIRECT EMISSIONS FROM ELECTRICITY CONSUMPTION

We have significantly expanded our Scope 2 boundary from eight (8) sites to 100% of TM assets in Peninsular Malaysia, with plans to cover all sites across Malaysia next year.

We calculated the carbon emissions equivalent of the electricity used according to the Fourth Biennial Update Report Under the United Nations Framework Convention on Climate Change by The Ministry of Natural Resources, Environment and Climate Change Malaysia.

SCOPE 3: INDIRECT EMISSIONS FROM OTHER ACTIVITIES

We cover two (2) key dimensions for Scope 3:

- Air Travel:** The flights taken by TM employees for business-related matters, which is calculated using The Civil Aviation Organisation (ICAO) Carbon Emissions Calculator.
- Waste Production:** Solid waste data collected from our operations are converted into carbon emissions following the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National GHG Inventories, 2006.

As part of our continuous improvement, we aim to expand our Scope 3 boundary to include employee commuting by 2023

We have a climate change risk management strategy to manage the risks posed by climate change to our business. This includes protecting our network infrastructure from climate-related damage so we can continue providing uninterrupted service to our customers while transitioning to a low-carbon economy.

We are also working to align our business with the TCFD reporting framework. This will help us to understand and evaluate the risks and opportunities associated with climate change. By disclosing information on climate-related risks, opportunities and governance, we aim to increase transparency and help stakeholders make informed decisions, while demonstrating our commitment to climate action. We plan to publish our TCFD report by mid-2023, two (2) years ahead of Bursa Malaysia's requirements.

HOW WE CREATED VALUE IN 2022

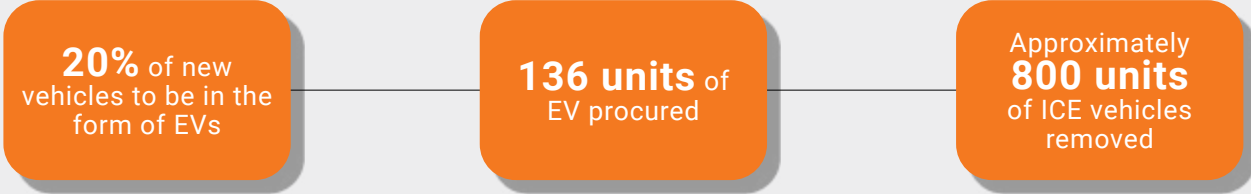
1 Scope 1: Fuel Consumption

Our main source of Scope 1 emissions is fuel used for our vehicle fleet. Therefore, throughout 2022, we continued to minimise our fleet's carbon footprint through various fuel-saving initiatives:

What We Did

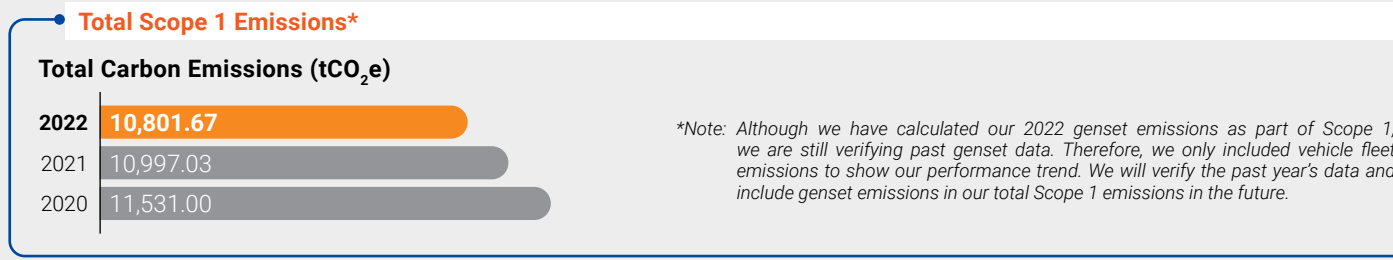
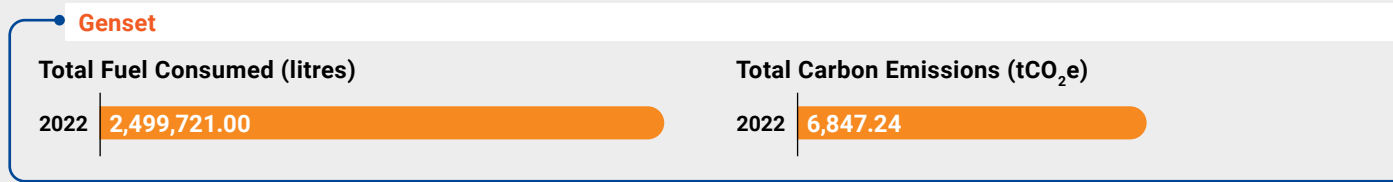
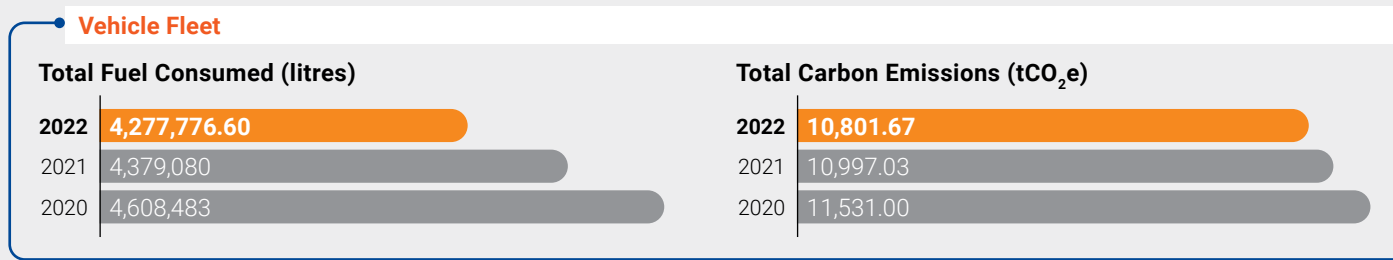
Vehicle Optimisation Programme	<p>Reduced the number of vehicles used by our LOBs and subsidiaries based on their business requirements</p> <p>Impact & Achievements:</p> <p>Number of vehicles</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Number of vehicles</th> </tr> </thead> <tbody> <tr> <td>2022</td> <td>3,462</td> </tr> <tr> <td>2021</td> <td>3,779</td> </tr> <tr> <td>2020</td> <td>3,917</td> </tr> </tbody> </table>	Year	Number of vehicles	2022	3,462	2021	3,779	2020	3,917
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2022	3,462								
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Smart Fleet Monitoring System (TM CONVES BIZ)	Deployed TM R&D's smart solution for vehicle management to monitor usage, efficiency and status of vehicles								
TM EZFleet (Car Sharing)	Enabled vehicle sharing among employees via a digital platform, TM EZFleet								

We are also in the process of converting our vehicle fleet into electric vehicles (EV) to further minimise emissions from internal combustion engines (ICE). This will be guided by our newly-established TM Fleet Electrification & EV Infrastructure (TMEEVI) Blueprint 2022-2025, which includes the following targets:



Through this blueprint, we project to reduce emissions by 3,000 tCO₂e annually by the end of 2025 (approximately 36% of current emissions). As of 2022, we have already received delivery of our first three (3) EVs in the form of light-utility van.

Through our efforts, we managed to reduce our total Scope 1 Emissions by 1.77%.



2 **Scope 2: Electricity Consumption**

We continued the implementation of our value programmes for electricity cost savings, with various energy-efficiency initiatives that aim to reduce our total electricity consumption. Through our energy-efficiency initiatives, we achieved 36.29 million kWh reduction in consumption.

Energy-Efficiency Initiatives

Network Element Shutdown

Implemented network modernisation to ensure only high efficiency network elements remained in operation. This included shutting down any underutilised network elements and migrated the services to more utilised networks.

Impact:

- Reduced electricity consumption with a cost saving amounting to RM4.59 million (9.65 million kWh)



Energy Performance Contracting (EPC)

Enhanced facilities system by outsourcing an energy performance contractor. This included the replacement of an inverter air conditioner to enhance its efficiency and effectiveness in contributing to the facilities' equipment.

Impact:

- Reduced electricity consumption at additional 26 sites with cost savings amounting to RM6.9 million (13.6 million kWh)



Energy Efficiency Optimisation (EEO)

Focused on quick wins and low-cost measures in energy efficiency, which include environment optimisation, lighting optimisation and power factor correction.

Impact:

- Reduced electricity consumption at 233 sites with cost savings amounting to RM0.71 million (1.66 million kWh)



Cooling Unit Upgrading (CUU)

Replaced 564 conventional air-conditioning units with more energy-efficient inverter air-conditioning.

Impact:

- Reduced electricity consumption with cost savings amounting to RM0.66 million (1.3 million kWh)



Purchase of I-REC certificates

Powered our three (3) key data centres, namely KVDC, IPDC and CTDC, with renewable energy through the I-REC scheme by TNBX. This is part of our efforts to reduce our operational carbon footprint by embracing renewable sources.

Subscribed:

- 27 million kWh (21,060 tCO₂e offsets)

We continue to improve energy efficiency at our data centres to reduce our overall Scope 2 emissions. We have equipped our data centres with solutions and technologies to improve their energy performance.



ASHRAE Thermal Guidelines

What We Did:

Maintained a safe operating temperature for ICT equipment while optimising power consumption.



Containment of Energy

What We Did:

Enabled more efficient cooling and prevent mixing of cold air supply aisles and hot air exhaust aisles.



Data Centre Infrastructure Management

What We Did:

Integrated monitoring and real-time system through distributed sensors to monitor power usage, temperature and humidity to ensure an optimum environment.



Energy-Efficient Lighting

What We Did:

Utilised motion control and Light-Emitting Diodes (LEDs) to reduce energy consumption.



ISO 50001:2018 Energy Management System (EnMS)

What We Did:

Upskilled and reskilled our data centre team on EnMS, as well as conduct regular audits to ensure compliance.

In 2022, we expanded our Scope 2 boundary to include all our operations in Peninsular Malaysia and recalculated our emissions for 2019, 2020 and 2021. This helped us better understand our performance over time. Additionally, through renewable energy, we were able to reduce our Scope 2 carbon emissions in 2022 by 4.61%.

TM Electricity Consumption

TM Node (kWh)



Station (kWh)



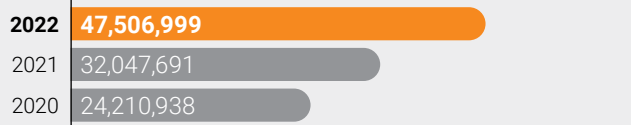
FTTS (kWh)



3RD Parties (kWh)



Data Centre (kWh)



Cabin (kWh)



Note: Increase in energy consumption from the business expansion at our data centres

Commercial (kWh)



Others (kWh)



Total Scope 2 Emissions

Total Carbon Emissions, Overall Electricity Usage (tCO₂e)



3 Scope 3: Emissions from Other Activities

Our climate action extends beyond energy reduction. We also track and report indirect forms of emissions to gain a better understanding of areas to improve. These include:



WASTE GENERATION:

We track our solid waste and carbon emissions at eight (8) sites using our Environmental Management System (EMS).

↳ For more efforts in responsible waste management and disposal, please see pages 108 to 110



AIR TRAVEL:

We continued to reduce employee air travel by using virtual platforms for meetings and engagements. This saves money and reduces our Scope 3 emissions.

Scope 3 Emissions

Waste Generated (tCO₂e)



Air Travel (tCO₂e)



Total (tCO₂e)



4 Overall Performance

We continued to make great progress in reducing our carbon emissions each year, as we remain in progress to achieving our climate targets and becoming net zero carbon company by 2050. In 2022, we managed to reduce our total carbon emissions by 12.45% from our 2019 baseline, on our way to achieving our emissions reduction target of 45% by 2030.

Total Carbon Emissions (Scope 1, 2 & 3 emissions)

Total Carbon Emissions (tCO₂e)



Overall Reduction from 2019 baseline (%)

