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Introduction

Transport for Greater Manchester (TfGM), working alongside the Greater Manchester Combined Authority (GMCA), has committed to ambitious targets to reduce regional CO₂ emissions by 48% by 2020 (from a 1990 baseline). TfGM are taking the lead role in delivering solutions to lower transport emissions to achieve the GM Mayor's carbon neutral plans by 2040.

In addition, the UK Government has committed to take action against climate change having agreed to the international Paris agreement. This commits the UK to keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels; and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

Taking sustainability and carbon emissions seriously is an integral part of a high-quality transport network and meeting our 2040 Transport Strategy's environmental responsibilities.

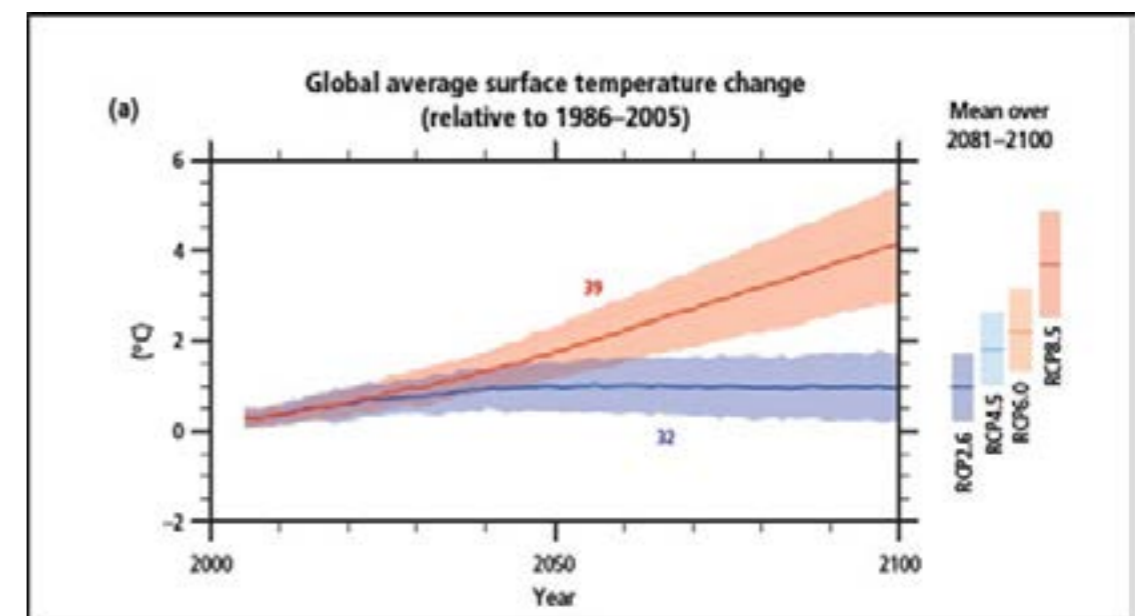
TfGM has committed to reducing 3.8% carbon emissions from its infrastructure and property portfolio by 2021 through innovative retrofit and renewable energy technologies.



Drivers for change

Current scientific consensus that rapid change caused by emissions from industrialisation shows that there has been an 0.8°C rise in surface temperatures that this is likely to reach 2°C by 2050 (IPCC, 5th report).

- **Costs:** Future scenarios predict rising energy costs by potentially 50% by 2021. TfGM will therefore implement projects that aggressively target a reduction in CO₂ emissions to allow TfGM to negate risk and reduce its exposure to future energy price increases.
- **Climate Change Adaptation:** In Greater Manchester, projections show that average surface temperatures and precipitation levels will rise along with the number of extreme weather events such as flooding and heatwaves. The complexity of the current transport system has an amplifying effect on these impacts and therefore it is critical to prepare for future risks and build resilience.
- **Air Quality:** Air quality and climate change are interlinked concepts, for example, climatic effects such as increasing summer temperatures will affect the frequency and severity of high level occurrences of air pollutants. Linked strategies including the GM Climate Change Strategy, the Low Emissions Strategy and the Air Quality Action plan have brought together these concepts to identify cost effective solutions and prevent competing agendas.
- **Legislation:** Greater Manchester has demonstrated clear commitment alongside global cities by becoming a signatory to three international commitments: The Integrated Covenant of Mayors, the Compact of Mayors, and Under 2 MOU. These commitments have emissions targets that are either in line with or greater than national targets.



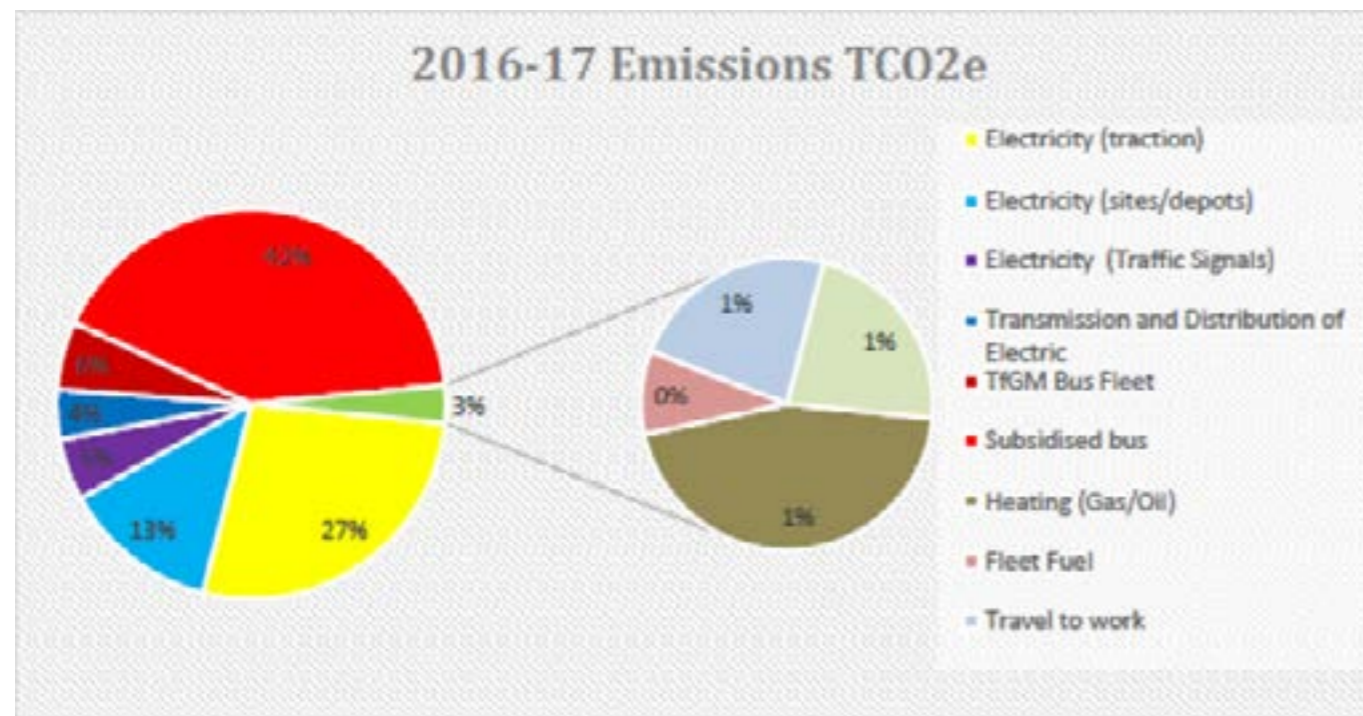
TfGM's Carbon Footprint

TfGM had a carbon footprint of 41,000t of CO₂e per year in 2017. Analysis shows that approximately 90% of TfGM's emissions reside in three specific areas:

- Subsidised bus service fuel: 42%,
- Metrolink traction electricity: 27%; and
- Property portfolio including bus stations and interchanges and offices, Metrolink sites & external lighting electricity: 20%.

TfGM's ambition is therefore to reduce its CO₂ emissions from those areas over which it has direct control. This strategy aims to reduce emissions by 1,596 tonnes of CO₂e by 2021 which equates to approximately 3.8% reduction of the entire footprint through major capital investment in energy efficiency projects and renewable energy schemes.

It should be noted that increased Metrolink and bus patronage are key priorities in the GM climate change implementation plans, so while emissions are increasing as the network grows, they are conversely decreasing regional emissions through modal shift.



TfGM Carbon Priorities

1. Carbon and Energy Management

TfGM are responsible for carbon management in relation to Metrolink, bus stations and interchanges, traffic signals, and bus stops across Greater Manchester, and are also responsible for the operation of 145 buses for the Metroshuttle and Yellow School Bus services (grown from the 34 buses operated in 2007).

Over the last 10 years a number of carbon reduction projects have been completed including a hydroelectric power plant at Rochdale Interchange, a wind Turbine at Horwich Parkway, replacement of a total of 52,000 traditional traffic signal bulbs with low energy LED and LED lighting upgrade at bus stations. Our fleet utilises diesel-electric hybrids, retrofitted EURO VI diesels and we also operate three fully electric buses.

The majority of Metrolink emissions are indirect and result from traction electricity. The cost of the Metrolink electricity is nearly ten times the value of our property portfolio energy consumption.

COMMITMENTS

We will look to install where possible a number of carbon reduction projects within our portfolio:

- Retrofit LED lighting for all external lighting applications including Metrolink facilities.
- Renewable energy and battery storage.
- Remote monitoring of upgrading building controls across the existing estate.
- Solar and store technology.
- Explore the feasibility of the introduction of a fleet of low CO₂ emission traction engines on Metrolink.
- Seek funding approvals for 'spend to save budget' for the proposed carbon reduction projects.

TARGET

- 3.8% reduction in carbon emissions.



2. Low carbon travel, transport and access

TfGM recognises it has a significant and complex role in transport emissions in the region. TfGM directly controls some infrastructure and services, and can influence some in other areas.

TfGM has published its 2040 Transport Strategy and has prioritised actions in the GM Climate Change Implementation Plan which outlines how TfGM will drive forward a reduction in Greater Manchester's transport emissions.

TfGM will prioritise low carbon transport modes, and seek to encourage behavioural change, increasing the share of walking and cycling. TfGM will also seek to bring external funding for low carbon transport improvements to Greater Manchester.

In 2017 TfGM completed a successful trial with a key supplier to test a new electric bus and opportunity charging system.

COMMITMENTS

- TfGM will apply for national funding for low emission buses and make a strong case to the government for air quality funding to transform Greater Manchester's bus fleet.
- TfGM will investigate testing of electric buses and other low carbon vehicle options.
- Work collaboratively to ensure key franchise operators fulfil their commitments to reduce energy consumption and associated carbon emissions.

TARGET

- All new fleet vehicles to meet low emission standards by 2021.



3. Staff Travel

Transport for Greater Manchester have in the past developed a number of Travel Plans which have had a positive impact on cost savings, carbon reduction and enabling staff to make informed decisions about their travel choices. The most recent in 2016 highlighted the trends in increased sustainable travel options. The plan includes a wide range of incentives to encourage TfGM staff to reduce their travel demand and choose more sustainable modes both for commuting, and for business mileage.

TfGM's Travel Choices team have engaged with over 650 businesses in Greater Manchester and produced nearly 300 Action Plans in the process, helping businesses reduce congestion, improve efficiency and resilience, demonstrating best practice and therefore becoming an employer of choice and improving health and wellbeing.

We are mindful that whilst we encourage and support businesses to make these changes, we must be able to show that we ourselves at TfGM are leading the way and developing our own best practice.

TfGM has conducted travel surveys with staff to track progress towards this goal, with 2016 survey results indicating a continued downward trend in single occupancy car use mileage (9%) and an uptake in public transport, particularly rail (42%) and tram (19%).

COMMITMENTS

- TfGM will continue to implement and develop its Travel Plan, monitored through a staff travel survey, that will continue to provide insight into staff business travel and commuting.
- TfGM is committed to supporting flexible working opportunities. This enables some staff to alter work travel times to avoid peaks in congestion. TfGM will continue to explore dynamic working options to reduce business travel.
- Some TfGM staff currently use their own vehicles for work purposes. We will investigate opportunities to improve the carbon and financial efficiency of the fleet including review of low emissions car club vehicles for casual users and support for essential users to purchase ultra-low emissions vehicles (ULEVs).

TARGETS

- Increase in staff travelling by sustainable / low transport methods and a reduction in car use.



4. Fleet Vehicles

TfGM has committed £17m to low carbon buses, after being awarded £5m funding from DFT. This resulted in the purchase of 104 low carbon buses, which have been operating as part of Metroshuttle services, Yellow School Buses and general service fleets. Savings resulting from improved engines are estimated to be 5440 tCO₂e. In recent observations across the wider fleet, 15% were diesel-electric hybrids and 3% were running EURO VI diesel engines.

TfGM was also previously successful in a bid to the Clean Bus Fund which provided £161,000 to retrofit the seven remaining Yellow School Buses to EURO VI standard.

TfGM aims to continue to lead the field in developing the use of low carbon fleet and will join our existing fleet of ULEVs that includes two electric vans, a hybrid Toyota Prius and an electric Nissan Leaf.

COMMITMENTS

- TfGM aims to reduce emissions from its fleet of vehicles, by encouraging efficient driving and reviewing the least efficient vehicles.
- All future leases will be required to be EURO VI and exceed government buying standards in terms of carbon performance.
- Drive cycles for ancillary vehicles used for maintenance will be analysed and where possible hybrid, electric or alternatively fuelled vehicles will replace conventionally fuelled vehicles.
- TfGM will look to continue to increase the efficiency of its Metroshuttle and Yellow School Bus fleet. The fitting of selective catalytic reduction systems have led to air quality improvements. Carbon reductions will be achieved through continued optimisation including engine idle controls, software to improve throttle control, regenerative braking and on-bus telematics to improve driver performance on electric and hybrid buses.

TARGETS

- All new fleet vehicles to meet low emission standards by 2021.
- 50% of ancillary vehicles to be zero emission by 2021.



5. Designing the built environment

TfGM is responsible for investment in transport infrastructure in Greater Manchester, bringing economic benefits to the region. TfGM also recognises that developments including new interchanges and infrastructure can have an impact on GHG emissions both through construction activity and ongoing operations.

To meet long-term target for emissions reduction for new design and build projects, design should, subject to available funding resources, be innovative in raising energy efficiency standards. For example, inclusion of greater levels of on-site energy generation such as solar PV and battery storage on new bus station and interchange projects.

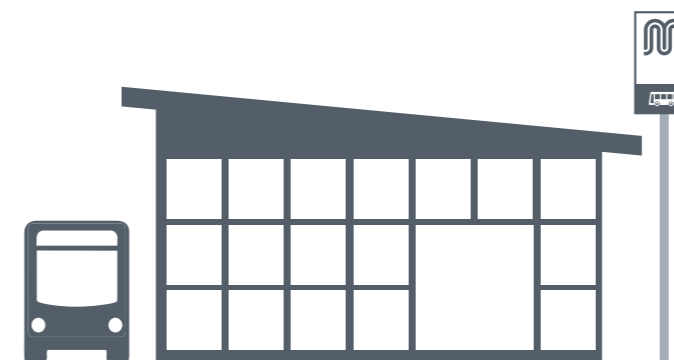
To achieve more ambitious carbon emissions reductions require design intervention at early building design stages. TfGM have developed a sustainable assessment toolkit (SAT) that enables designers to create developments that meet rigorous sustainability criteria and scoring through option selection and whole life costing.

COMMITMENTS

- TfGM to incorporate ambitious targets for sustainability in all major infrastructure schemes for future projects to be rated as 'good' or above within minimum 60% SAT score.
- All new buildings and transport infrastructure projects to be commissioned to target exceeding the Part L2A targets for carbon emissions by 35%.
- To update the selection list of technologies used within SAT as required where there is technological advancements.
- To further consider the environmental impact at the building concept design stage using SAT to meet emissions targets.
- Develop a whole life cost model a NPV (Net Present Value), to produce investment grade business cases eg. installation of solar and battery store systems at the larger suitable facilities management sites.

TARGET

- Future development projects to achieve minimum 60% SAT score.
- All new buildings and transport infrastructure projects to be commissioned to target exceeding the Part L2A targets for carbon emissions by 35%.



6. Biodiversity

TfGM recognises the importance of contributing to improving the natural environment in Greater Manchester. Biological diversity, or biodiversity, is the variety of life on earth. It describes the variability among living organisms from all sources including terrestrial, marine and freshwater ecosystems, and the ecological complexes of which they are part. This also includes diversity within species, between species and of ecosystems.

TfGM have a 'duty' under Section 40 the Natural Environment and Rural Communities (NERC) Act 2006 'to have regard to the purpose of conserving biodiversity in the exercise of its functions'. A key purpose of this 'duty' is to embed consideration of biodiversity as an integral part of policy and decision making throughout the organisation.

There is a significant opportunity to enhance blue-green infrastructure and consequently, biodiversity. Urban greenspace is particularly valuable in reducing the atmospheric concentration of CO₂ by sequestering (absorbing) it through trees and other biomass. In addition, trees can help filter particulates, intercept rainfall and provide shade and cooling, therefore reducing the demand for heating and air conditioning.

Green spaces also provide aesthetically pleasing environments. Paths and cycle lanes through green space are usually very attractive and can support behavioural shifts from cars to more sustainable and active means of transport.

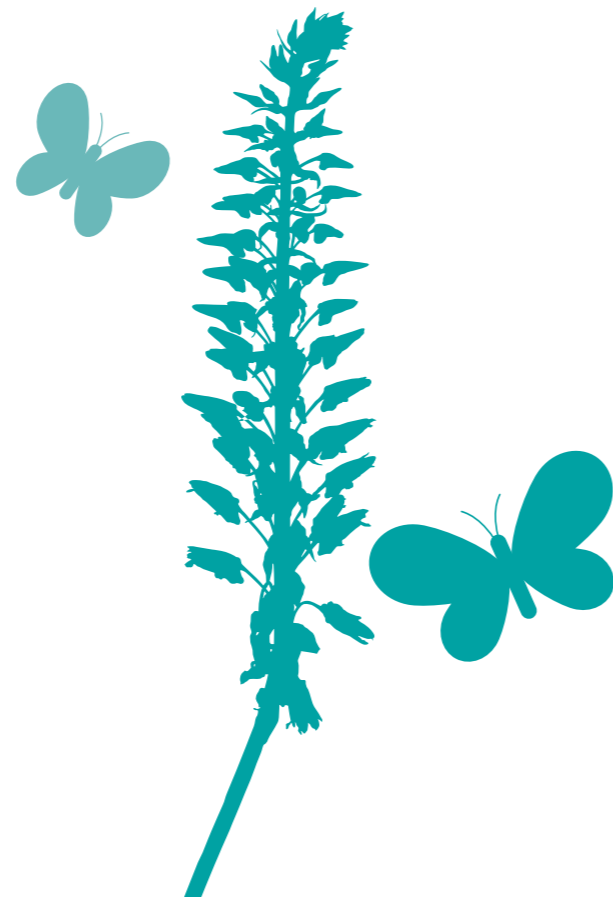
COMMITMENTS

TfGM's biodiversity management commitments aim to improve the quality of life for transport users and non-transport users alike; and to promote a healthy natural environment through:

- Habitat conservation and enhancement;
- Management of invasive non-native species;
- Community engagement and partnership working;
- Control the use of environmentally damaging substances and materials and processes; and
- Improving and sharing information.

TARGET

- Meet the requirements of the Biodiversity Duty.



7. Waste & Water

WASTE

TfGM manages a large amount of public waste generated at bus stations and interchanges which accounts for over 70% of all waste recovered. TfGM's environmental management system sets targets for recycled material and reduction in waste and monitors the performance of waste reduction across all sites. TfGM works to reduce waste to landfill according to the waste hierarchy.

Greenhouse Gas (GHG) emissions result from the collection and transportation of waste and from fugitive emissions arising from landfill. The gas from landfill waste includes methane, which is a potent greenhouse gas 23 times more damaging than CO₂.

WATER

The management, distribution and disposal of water contributes to the overall carbon footprint of TfGM. Water should be considered and managed as a precious resource. In 2016-17, TfGM consumed over 19,000 cubic metres.

TfGM will improve water efficiency measures at existing sites and install monitoring and low water technologies at new development sites.

COMMITMENTS

- TfGM will reduce the amount of waste it creates and divert waste away from landfill and increase waste segregation and recycling of materials at all sites.
- TfGM will seek to improve waste performance by considering the life cycle and disposal costs in purchasing.
- Water cost and consumption will be measured, monitored and reported annually and data will be analysed to target inefficiencies and leaks.
- Carry out internal water audits to identify sites for grey water facilities (older sites) and water efficiency recommendations.
- Efficient use of water integrated into building developments at the design stage.

TARGET

- Increase recycling of business waste by 50% by 2021.
- Reduce water usage by 5% by 2021.



8. Procurement

TfGM aims to engage with its key suppliers and their supply chains, looking to include high standards for sustainability in all purchasing decisions. Responsible procurement is a key part of an ethical, environmentally-conscious organisation. We want to work with suppliers who support this approach and take Social Value considerations into account as part of any procurement and contract management activities. Sustainable procurement has an important role in reducing GHG emissions. For example, when TfGM purchases equipment or enters into contracts with external providers to build new infrastructure, there are opportunities to address environmental and social concerns and set higher standards for environmental performance over the life of the asset. There is also an economical benefit to be realised in so far as addressing whole life costs. Sustainable procurement will affect our carbon emissions scopes and targets in the following ways:

- Scope 1 & 2 emissions – Actively reduce the usage of energy from TfGM owned buildings, appliances and vehicles by procuring the most energy efficient products where possible.
- Scope 3 emissions – Ensure that suppliers have adequate measures in place to report on the supply chain and life cycle emissions from the goods and services supplied. TfGM will engage with key suppliers to assist where possible in reducing their organisational and product carbon footprint.

COMMITMENTS

- Embedding sustainability into internal procurement processes and gateways. Procurement will promote the use of a Sustainable Procurement Toolkit and Government Buying Standards to its suppliers to ensure that the goods, services and works that they deliver to TfGM are at least compliant with the applicable DEFRA or International standards in order to reduce the environmental impact of our operations.
- Work with key suppliers to ensure plans are in place and delivered in line with this Strategy.

TARGET

- Embed sustainability in all purchasing activities.
- Reduce the impact of embedded resources and emissions, along with direct impacts of items and services.



9. Communication and behavioural change

TfGM recognises that significant inefficiency can be avoided by changing people's behaviour. Raising staff awareness and encouraging people to change their habits is an extremely cost effective investment, requiring minimal funding for a significant return.

TfGM's aim is that consideration of carbon implications becomes a business as usual activity.

TfGM will consider its role in becoming an exemplar employer in disseminating responsibilities to senior leaders.

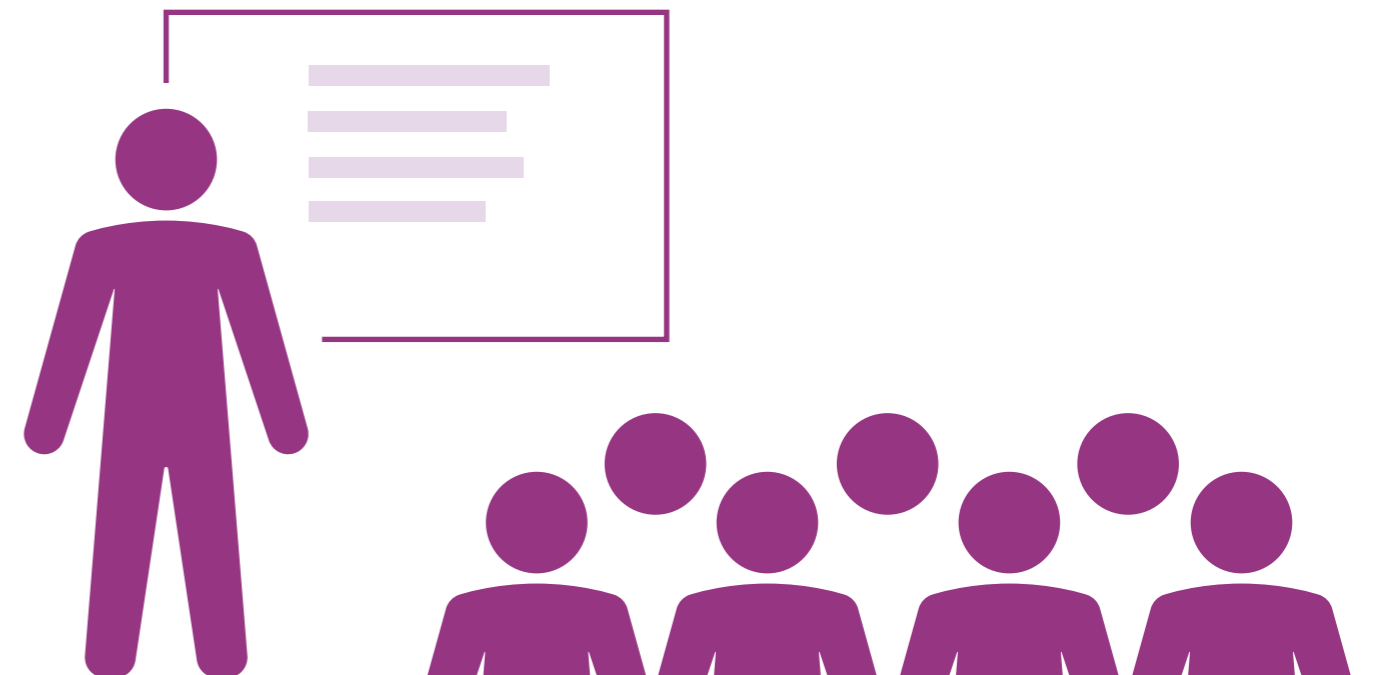
All employees will be made aware of their responsibilities with regard to carbon.

COMMITMENTS

- Create an Environment Delivery Group (EDG) to lead carbon reduction projects, KPIs and their effectiveness in order to report progress to the Performance Board.
- To ensure that the Energy and Carbon Strategy seamlessly fits into and is aligned with the other TfGM business strategies.
- Produce carbon reduction reports and forecasts for the Board.
- Implement an effective carbon communication and awareness campaign as an integral aspect of this carbon strategy.

TARGET

- Deliver an organisational wide carbon awareness programme to promote carbon awareness to all members of TfGM.



Glossary

BAU

Business As Usual scenario in which the estate grows as planned and there is no concerted attempt to reduce CO2 emissions

EMS

Environmental Management System

GHG

Green House Gas Emissions

NVP

Net Present Value, a single figure representing all the future costs and incomes at their equivalent present value.

BIS

Department of Business, Innovation and Skills, a government department that succeeded the Department for Energy and Climate Change.

Carbon Trust

Government body charged with reducing CO2 emissions, funded by Climate Change Levy on bills.

CO2

Carbon dioxide emissions excluding other global warming gases

CO2e

Carbon dioxide emissions equivalent of six global warming gases including carbon dioxide

IPCC

Intergovernmental Panel on Climate Change – the world’s leading international body on climate change. Its function is to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio- economic impacts.

SAT

Sustainable assessment toolkit

UTC

Urban Traffic Control – a service function of TfGM that oversees traffic management