

**GREATER
MANCHESTER**
DOING THINGS DIFFERENTLY

**5-YEAR
ENVIRONMENT
PLAN FOR GREATER
MANCHESTER**

2019-2024

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FOREWORD



In this time of national uncertainty, Greater Manchester is taking the initiative and setting out our bold plans to give people, communities and businesses hope and confidence for the future.

As the place at the heart of the industrial revolution, this city-region was a leading contributor to the global increase in greenhouse gases emissions and perhaps experienced the first impacts of major air and water pollution and the unsustainable use of natural resources. Now it is time for us to lead a new revolution. This plan sets out how we can do that

together and create a place which is fit for the future.

We all need to act now and act together to tackle the environment threats we face. Above all, this means taking the lead in tackling climate change and environmental degradation, which threaten to undermine the public health gains of the last 50 years, our prosperity and our efforts to reduce health inequalities.

If we don't act now, it is our children and grandchildren's generations and beyond who will be left with the consequences of climate change – consequences that may be long-lasting, or even irreversible and which they will have inherited from us. Their homes will be at greater risk of flooding, heat stress will be a greater risk to their health, water shortages will be more common and their natural environment – green spaces, soils, and species – will be at greater threat. Beyond our city-region, their world will be a less safe place in which to live – coastal areas will flood, food supply will be less secure, more species will become extinct and people could be driven into migration and conflict. This will have a cost that they, not us, will have to bear – if we don't act now. The impacts of climate change could cost us 10 times more by 2100 than if we manage to limit global temperature rises in line with international commitments.

This plan sets out our aim to be a carbon neutral city-region by 2038 – a science-based target, aligned with international commitments – and what we all need to do now and over the next 5 years to put us on that pathway. Urgent action is needed, together with innovation that will accelerate future change. Acting now makes sense for our health and prosperity, as well as for our environment. If we take the actions in this plan, we could all save up to £1000 per household per year on our energy bills. We could have the cleanest air in any major British city. We could see a tree planted for every person in Greater Manchester. Most importantly, it will enable us to secure the health and economic benefits of a cleaner environment and more active/healthier lifestyles, sustainable economies and decreased pressures on our health system. As well as reducing our energy bills, we can secure first mover advantage from accelerating the transition to a low carbon economy, creating jobs in the future economy. We already have a diverse and thriving Low Carbon Environmental Goods and Services sector, which has the potential to grow further if we achieve the aims set out in our plan. It currently employs over 45,000 people, has annual sales of £6.7bn and growth of 6.3%, outperforming the UK average to be ranked 3rd in the UK.

It is within our gift to start now, using the tools and technologies already available to us. But to achieve our challenging ambitions, we also need to stimulate innovation – in new technologies and processes, in new business models and in how we all engaged, educated and upskilled. That involves all of us working together in different ways and is why we want to launch the UK's first regional Clean Growth Mission for Greater Manchester, mobilising everyone around our mission for a carbon neutral city-region and breaking down the barriers between traditional sectors and groups.

Everyone needs to act to deliver on this plan – individuals, communities, businesses, the public sector and voluntary, community and social enterprise organisations. The plan sets out what each of these groups needs to do to lead the way. But we cannot do it all in Greater Manchester. Government has some of the most powerful levers – fiscal and legislative – to drive the transformational change we need. Our Local Industrial Strategy will set out how we will work with government to implement our clean growth ambitions.

Only through acting now and innovating for our future can we deliver this plan. When future generations look back at this moment in time, we want them to see that we understood the threats and we did everything we could. We cannot afford to do anything else.

A handwritten signature in black ink that reads "Andy Burnham". The signature is written in a cursive, flowing style.

Andy Burnham,

Mayor of Greater Manchester

INTRODUCTION

The importance of our environment

Our environment in Greater Manchester underpins all aspects of our daily lives, from the air we breathe, to the water we drink and the green spaces in which we spend time. We cannot afford to see our environment in isolation: it is fundamental to our health and wellbeing, is the foundation of a productive economy, goes hand in hand with better connectivity and provides us with attractive neighbourhoods and access to green spaces we can enjoy.

We face urgent and significant environmental challenges in Greater Manchester – the global impacts of climate change and environmental degradation have been widely acknowledged as among the greatest economic¹ and public health² threats of this century. But, we also know that immediate environmental leadership and action will enable us to secure the health and economic benefits from a cleaner environment, more active/healthier lifestyles, sustainable economies and decreased pressures on our health system. It will also allow us to address health inequalities and do our part to promote intergenerational equity. This plan sets out what we all need to do to tackle these challenges together and capitalise on the opportunities and benefits that will come from taking action.

Greater Manchester – doing things differently and doing things first

Greater Manchester is taking the initiative and setting out bold plans to give people, communities and businesses the confidence and aspiration to create a city region which is fit for the future. Our People, Our Place – the Greater Manchester Strategy sets a clear vision for Greater Manchester to be one of the best places in the world to grow up, get on in life and grow old. This plan is a key part of achieving that for our current and future generations.

This plan is about our meeting environmental responsibilities, alongside securing our economic future and wellbeing. Greater Manchester has a history of industrial and social innovation and we need to harness this to make sure everyone here can grow up and live in a clean and green city region, with good quality housing and secure jobs in the future economy. This plan is part of a set of bold plans for our city region, taking the urgent action needed to meet our ambitions:

- The Greater Manchester Local Industrial Strategy will highlight the need to improve productivity, with more efficient use of resources an important part of this. It will also set out the opportunities for our people, communities and economy of acting first to reduce our carbon dioxide (CO₂) emissions promoting a Clean Growth Mission approach, and confirm the need for innovative finance to support delivery.
- The Transport Strategy 2040 Draft Delivery Plan (2020-2025) sets out a wide range of actions that will contribute to reducing CO₂ emissions whilst also delivering air quality improvements (see below).

¹ <https://unfccc.int/news/climate-change-is-biggest-threat-to-global-economy>

²

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/371103/Health_Effects_of_Climate_Change_in_the_UK_2012_V13_with_cover_accessible.pdf

- The Greater Manchester Spatial Framework sets out plans for new development to be zero carbon by 2028 and sets out our proposals to give greater protection to our green and blue infrastructure in new development.
- Our Housing Vision recognises the challenge of retrofitting existing buildings to reduce the amount of heat they use. This will be developed into a Housing Strategy for Greater Manchester.
- The Greater Manchester Infrastructure Framework recognises that growth in local renewable generation, rapid electric vehicle charging and the electrification of heat could pose challenges to our current infrastructure and highlights the challenge of protecting and enhancing our existing natural assets.
- The Clean Air Plan will aim to tackle poor air quality in the near term, safeguarding all our residents from high levels of Nitrogen Dioxide (NO₂) whilst protecting the poorest in our communities from any financial penalties.
- The city region's first holistic Resilience Strategy, currently being developed, will set out our approach to providing infrastructure that maintains and/or reduces flood risk, tackling these and other shocks and stresses, including those to our key infrastructure set out in the Greater Manchester Infrastructure Framework.

This plan brings together key policies and actions from across these wider strategies and plans, as set out in Figure 1 below.

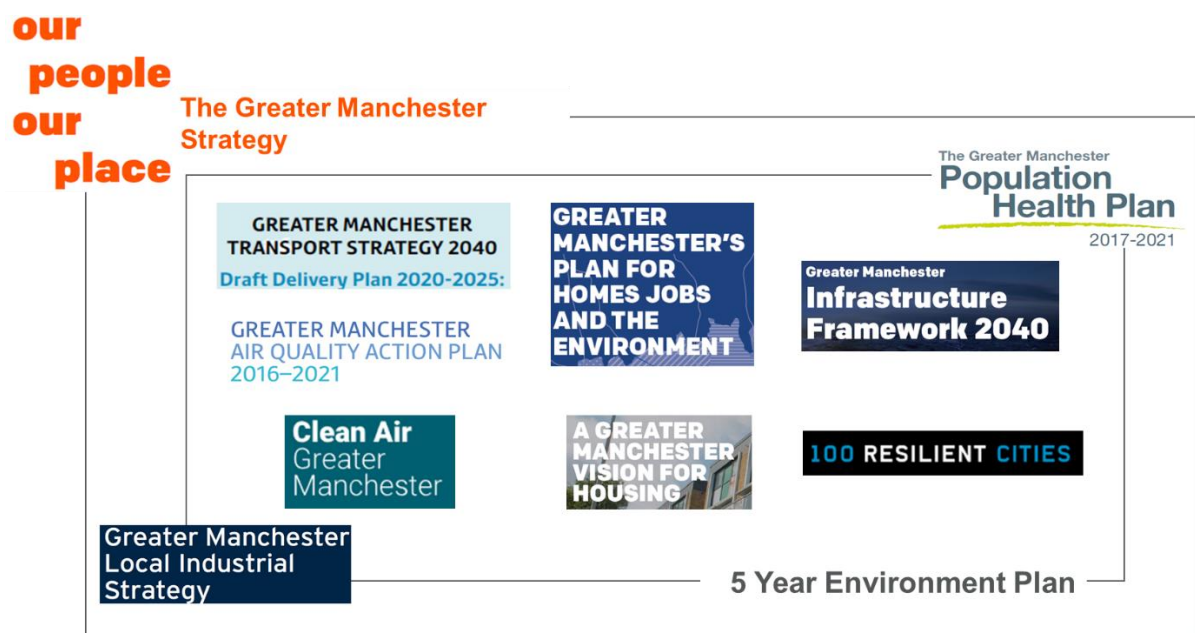


Figure 1 – The 5 Year Environment Plan and other Greater Manchester strategies and plans (including those currently in development)

Principles of our plan

The challenges and opportunities we face require us all to take urgent, collective action across Greater Manchester. To reflect this, the approach taken in our plan is underpinned by 5 key principles:

A plan that is...

1. **For all of us** – this is a plan for all of us in Greater Manchester and requires urgent action from all of us to deliver it. This includes actions we all need to take as individuals, as residents, as members of communities and as employees as well as what we need from our organisations to lead the way. We will only achieve the aims set out in this plan if everyone agrees to act. We also need to ensure that the impacts of this plan are equitable, fair and provide access to all, so that everyone benefits from the actions it sets out. This includes supporting people out of fuel and food poverty and enabling fair access to jobs, greenspace and clean, safe transport.
2. **Focussed on urgent action** – this plan sets out the urgent actions needed now and over the next 5 years to put us on the path towards our ambition. The plan cannot capture everything, so it focusses on those actions which will have the greatest impact over the next 5 years.
3. **Visionary** – this plan sets out a long-term vision for our environment to show what our immediate action will lead to achieving in the future.
4. **Ambitious** – this plan reflects the scale of the challenges we face. It is aspirational, setting out is what we all need to do rather than just focussing on actions that are already planned. There will be areas where we do not yet know whether all our planned actions will be sufficient to meet the challenges we face.
5. **Reported on** – this plan should drive widespread actions over the next 5 years. The Greater Manchester Combined Authority (GMCA) will update and report on progress on an annual basis on behalf of the city region as a whole, against a set of key performance indicators and the actions set out in this plan.

Development of our plan

The plan has been developed with input from countless representatives from across the city-region and the country, who have given their time, knowledge, expertise and skills to inform its content through a series of workshops from October 2018 to February 2019. This form of engagement, along with the public's vision, were key foundations of the 2018 Springboard Report³, published after the 2018 Green Summit. We need to continue this collaborative approach as we implement the actions in this plan.

³ <https://www.greatermanchester-ca.gov.uk/media/1317/springboard-report.pdf>

Purpose and structure of our plan

The plan sets out:

- The current state of our environment and the urgent challenges we face (Section 1).
- A long-term vision and aims for our future environment (Section 2).
- The urgent actions we all need to take over the next 5 years to put us on the right path to realising our long-term vision and aims (Section 3).
- How we should measure progress in implementing the plan (Section 4).
- The overall approach we should take to achieving our vision and aims (Section 5)

1. WHAT URGENT CHALLENGES ARE WE FACING?

1.1 The environmental challenges we face

We face several major environmental challenges that threaten the future health and prosperity of our city-region.

Challenge 1: Our contribution to mitigating climate change

Climate change is the single biggest threat the world faces. In Greater Manchester, we generate significant CO₂ emissions, which equate to about 3.6% of total UK annual CO₂ emissions and contribute to global climate change. Although our CO₂ emissions have declined over the last 30 years (a 39% reduction on 1990 levels by 2015), this has been largely due to action at the national level, through changes in the way the electricity we use is produced across the UK (namely the shift from coal to gas and offshore wind power). Achieving the significant and rapid reductions needed for us to make a fair and equitable contribution to meeting UK and global targets to tackle climate change will require us to take more radical local action, alongside national-level action, to accelerate the level of reduction we have achieved to date. [Further detail on the work commissioned by GMCA to understand potential CO₂ emission reduction pathways and actions for Greater Manchester is set out in section 1.3.](#)

Challenge 2: Our air quality

Local air pollution causes significant harm to our health and environment and, as a result, has an adverse impact on us and our economy. The most dangerous pollutants are NO₂ and Particulate Matter (PM, small particles which are harmful even in low concentrations), with transport the major source of both these types of emissions. There is strong evidence associating air pollution with increased mortality and ill health, including exacerbation of asthma, effects on lung function and increases in respiratory and cardiovascular hospital admissions.

NO₂ levels in Greater Manchester are in breach of legal limits. As the main source of NO₂ is road vehicles, the 10 Greater Manchester local authorities (LAs) are working with the GMCA and Transport for Greater Manchester (TfGM) to produce a single Clean Air Plan, on which there has been close collaboration with Public Health England and Government's Joint Air Quality Unit. Local modelling has identified 152 stretches of road where concentrations of NO₂ are forecast to exceed the legal limit value beyond 2020. [Further detail on the proposals to tackle NO₂ can be found at <http://www.CleanAirGM.com> and our *Air Quality Action Plan \(2016-2021\)*⁴ sets out more detail on the challenge we face in this area.](#)

4

http://www.gmcameetings.co.uk/download/downloads/id/228/greater_manchester_air_quality_action_plan_2016-21.pdf

Challenge 3: Our production and consumption of resources

The products and goods we consume and the waste produced after their use has a significant impact on our local environment and on CO₂ emissions produced inside and outside of the city region. We need to increase action to reduce the energy and resource that goes into making goods and services. Many products are designed to be thrown away after use, rather than us seeing them as a resource to be re-used or recycled. We currently recycle 47% of the domestic waste produced each year.

Waste plastics create significant environmental problems in the city-region – particularly in our streets and green spaces. If plastic finds its way into our watercourses, it causes pollution in local rivers and seas and oceans beyond. Food waste is also a serious problem – we waste too much food at a significant cost to households, businesses, the public sector and our environment.

Challenge 4: Our natural environment

The quantity and quality of habitats and spaces provided by our air, land and water, and the biodiversity they support, are key components of our natural environment. Greater Manchester's natural environment provides us with multiple benefits – improving air quality, reducing flood risk, conserving biodiversity and in taking up and storing CO₂. Accessing and connecting with the natural environment also plays an important role in improving our physical and mental health and the environment contributes to our prosperity. It has been estimated that these "Natural Capital" benefits can be valued at £1bn per year. However, more action and investment is needed to protect, maintain and enhance our natural environment, so that we see a "net gain" rather than a "net loss" in the services it provides. [Our Natural Capital Investment Plan⁵](#) and [Natural Capital Accounts⁶](#) set out more detail on the challenges and opportunities we face in this area.

Challenge 5: Our resilience and adaptation to the impacts of climate change

We need to increase our city's resilience and adapt to the impacts that unavoidable climate change will increasingly have on us. We will be at greater and greater risk from more frequent and intense extreme weather events (particularly periods of high-level rainfall, strong winds and storms) and heat stress over the coming decades. The most critical issue in Greater Manchester is flood risk. Like many cities, we are seeing this hazard intensify as both climate and urban areas have changed. The combined impact of climate change and patterns of development has meant surface water flooding is now more frequent. Managing the impacts of heat stress will also be important in the future, as the need for cooling of our buildings and shading in our public spaces will increase.

1.2 The broader challenges we face – our environment, economy, people and places

⁵ <https://naturegreatermanchester.co.uk/project/greater-manchester-natural-capital-investment-plan/>

⁶ <https://naturegreatermanchester.co.uk/wp-content/uploads/2018/06/NCA-for-GM-Final-Report-270618.pdf>

As well as challenges to our environment, we also face a set of broader challenges to our economy, society and places. In tackling our environmental challenges, we must harness to potential for delivering economic, social and environmental benefits together in the places that make up our city region.

Our city region – its places, economy and people

The Greater Manchester Strategy, Local Industrial Strategy (once published) and Population Health Plan⁷ set out the wider opportunities and challenges for our city region's prosperity and health. These include:

- Places – the need to create vibrant and sustainable places in our city region, with a particular focus on the provision of infrastructure (including transport, energy and green infrastructure) and good quality homes.
- Economy – the need to increase productivity through tackling longstanding income inequalities, issues in our education, training and skills system, inadequacies in our infrastructure, and low levels of innovation adoption and diffusion.
- People – the need to improve the health of and reduce health inequalities among residents, to improve their quality of life and their ability to contribute to increasing productivity.

1.3 Reducing our CO₂ emissions

1.3.1 Global and local action

Responding to the threat of climate change requires coordinated action across the world to reduce CO₂ emissions. The Paris Agreement, adopted in 2015, has the goal of keeping a global temperature rise this century well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase even further to 1.5°C.

Given the CO₂ emissions we produce, we need to make our fair contribution to these global commitments by reducing our own emissions. In 2018, the Tyndall Centre for Climate Research calculated a carbon budget for Greater Manchester that is compatible with the Paris Agreement. This research⁸ concluded that, for us to make its 'fair' contribution towards this commitment, we need to:

- Take prompt action to put Greater Manchester on a path to 'carbon neutrality' by 2038, initiating an immediate programme of mitigation delivering an annual average of 15% cuts in emissions (range of 10-20%).
- Through this action, hold cumulative carbon dioxide emissions at under 71 million tonnes (MtCO₂) up to 2100, and under 67 MtCO₂ for the period 2018-2038.
- Have greater engagement with other global cities to share knowledge in this area.

In the Tyndall Centre's proposed budget, aviation emissions are treated as a national issue. In looking at a Paris compliant carbon budget, there is an assumption that

⁷ <http://www.gmhsc.org.uk/wp-content/uploads/2018/04/GM-Population-Health-Plan-Full-Plan.pdf>

⁸

https://www.research.manchester.ac.uk/portal/files/83000155/Tyndall_Quantifying_Paris_for_Manchester_Report_FINAL_PUBLISHED_rev1.pdf

emissions nationally from all flights (including those by Greater Manchester residents) should hold steady to 2030 and then reduce to zero by 2075 and that such emissions are monitored.

1.3.2 Models of potential emission reduction pathways

GMCA commissioned research, Setting City Area Targets and Trajectories for Emissions Reductions (SCATTER)⁹ to understand potential carbon reduction pathways for Greater Manchester. SCATTER is a model – it provides different emission reduction pathways depending on local decisions taken across over 40 different interventions, which can each be implemented to 4 different extents. This allows the tool to be adapted to reflect local circumstances and provide a modelled pathway based on decisions across these interventions. It also takes into account our ambitions for growth in the city-region and the impact of national policy.

The graph below sets out potential carbon reduction pathways for Greater Manchester, against the budget recommended by the Tyndall Centre’s research. This shows that:

- Under “SCATTER Level 4” pathway (each of the 40+ interventions pulled to the maximum extent), carbon neutrality is possible to achieve but even under this scenario emissions of nearly 20% above the Tyndall Centre’s recommended budget¹⁰ are produced in Greater Manchester by 2050.
- Under the “SCATTER GM” pathway (an estimate of what is currently planned and what might be achievable in the future in Greater Manchester) emissions of over double the Tyndall’s recommended budget are produced by 2050.

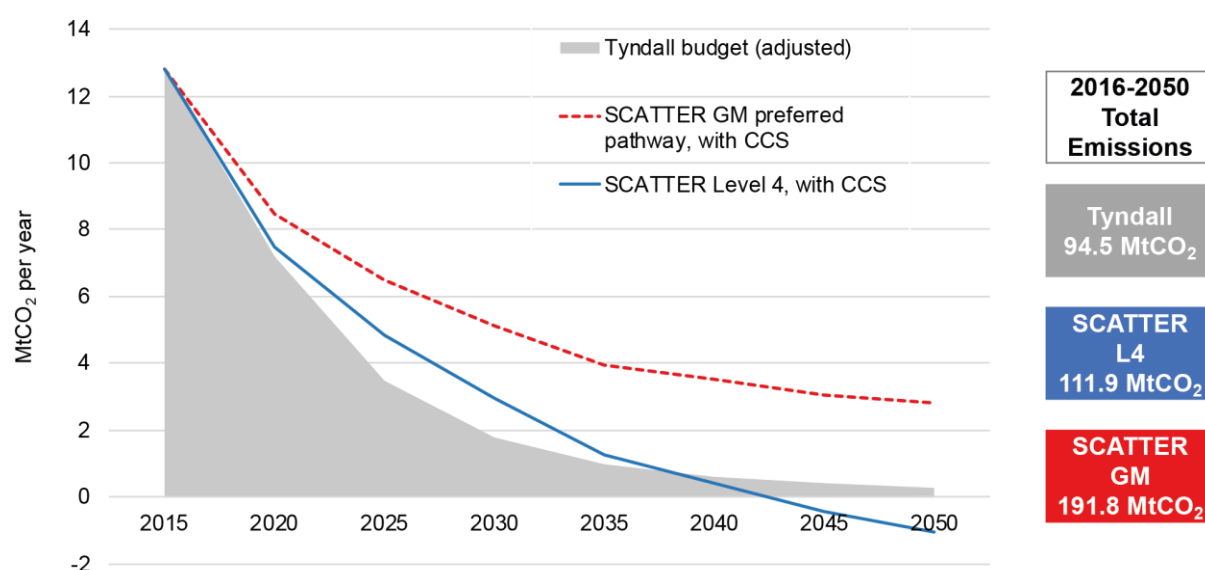


Figure 2 – Potential Carbon Reduction Pathways for Greater Manchester.

Source: Anthesis

⁹ <https://www.anthesisgroup.com/scatter-carbon-footprint-reduction-tool>

¹⁰ Extrapolated to cover 2015-2050 from 2018-2050 in the Tyndall Centre’s original report

The graph below shows the scale of reductions needed over the next 8 years alone (the period of the current and next UK carbon budget periods), during which time:

- We would need to reduce our current annual emissions by more than half to put ourselves on the “SCATTER Level 4” pathway.
- We would need to reduce our current annual emissions by more than two thirds to meet the Tyndall Centre’s recommended budget.

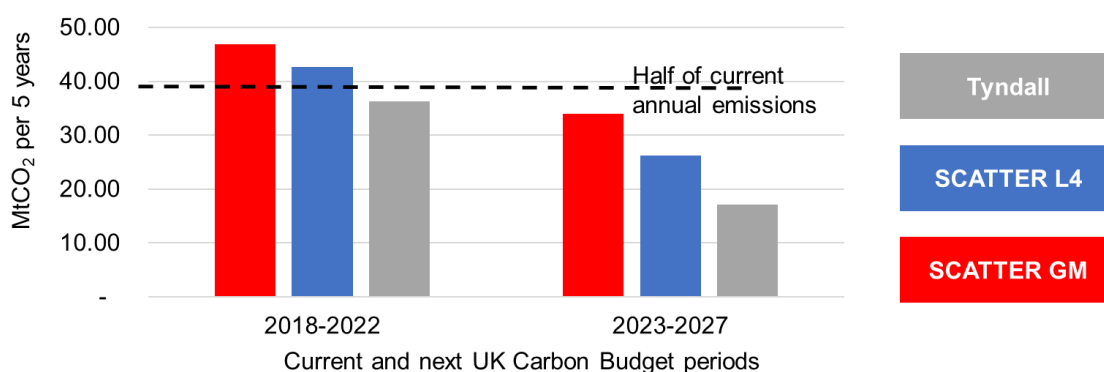


Figure 3 – Potential Carbon Budgets for Greater Manchester; Source: Anthesis

GMCA also commissioned work using another modelling tool, the Energy System Modelling Environment (ESME). It considers the whole UK energy system and models the most cost effective way of Greater Manchester both becoming carbon neutral by 2040 and attempting to minimise emissions prior to then. The model results in emissions of 191 MTCO₂ over the period 2016-2050, virtually the same as the “SCATTER GM” pathway, but the initial reductions are slower. This is partly as it avoids replacing existing technologies (such as domestic heating systems) until they reach end of life, as it sees these as the most cost effective options.

1.3.3 Using the models to inform our plans

As models, both SCATTER and ESME have their limitations. They are only theoretical models of possible carbon reduction pathways and cannot account for all the practical and commercial constraints and the local context in which policy interventions are applied and technology is deployed. The level of change on which they are based may not be practical or possible to implement or achieve in the timescales modelled.

The principle value of the models to us is therefore in the scale of change they show is required and possible pathways of achieving emissions reductions, as follows:

- **Informing the scale of the challenge we face** – both ESME and SCATTER model reductions that will be extremely challenging to achieve, requiring unprecedented transformational change and financial investment. Turning these scenarios into reality requires immediate, radical actions over the next 5 years and beyond. Despite the challenge of achieving reductions, it is important for us to maintain that level of ambition as that is what we need to do if we are to make our fair contribution to tackling climate change. However, at the same time, we need to be

conscious of this challenge and use it to inform our actions.

- **Informing our overall approach** – the models result in different futures for Greater Manchester. ESME sees us more reliant on decarbonisation of the national grid rather than local renewable generation. The ESME model also places less reliance on local energy efficiency. It models this approach as the most cost-effective way to reduce emissions, but does not account for the wider benefits to Greater Manchester of greater local renewable energy generation and local energy efficiency.
- **Informing our priorities** – both models indicate and are in agreement on the sectors where the most significant reductions in our CO₂ emissions will come from (see Figure 4 below).
- **Informing our actions** – the models are in agreement in the types of actions we need to take in each of these sectors to reduce emissions.
- **Informing our goals and monitoring progress** – the models are also in agreement on what these actions need to achieve and therefore what we should monitor to track progress, although they differ in terms of the size of the goal for our actions.

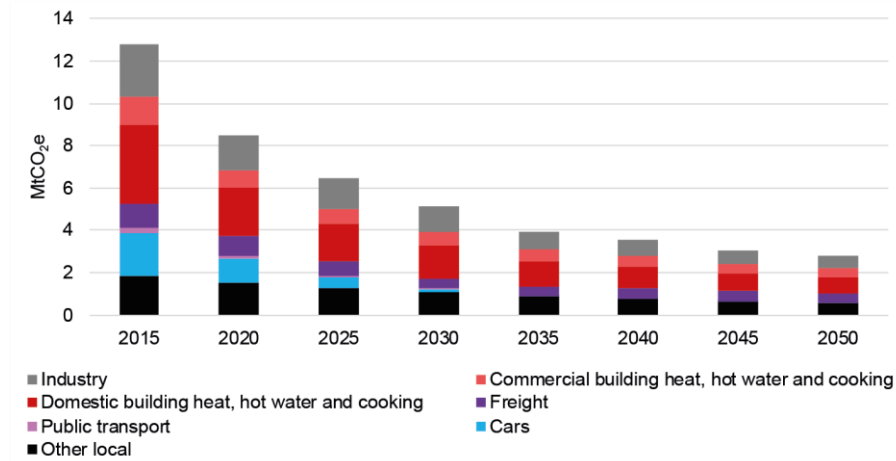


Figure 4 – Sectors where emission reductions come from (“SCATTER GM” pathway)
Source: Anethesis

1.3.4 Going further and closing the gap

The models are used in the way set out above to inform this plan. In particular, for each priority area where we need to take action, a “SCATTER GM Challenge” box indicates the scale of the challenge and change we need to achieve to meet the “SCATTER GM” pathway. Going beyond that and towards the “SCATTER L4 Pathway” would require even more radical action, some of which are not feasible (e.g. the need for every private vehicle on Greater Manchester’s roads being zero emissions by 2025).

Going beyond SCATTER L4 would require innovation in technology, delivery or financing/funding which could include:

- An increase in the efficiency of renewable energy generation technology – such as in solar photovoltaic panels or onshore wind turbines.

- A more significant scale up in delivery of deep retrofit homes, reaching a higher standard (e.g. Passivhaus standard¹¹).
- Greater reduction for heating demand in commercial buildings, beyond that currently supported by evidence.

Our approach for encouraging innovation in new technology, finance and delivery to support this is set out in section 5.

2. WHERE DO WE NEED TO GET TO?

2.1 A long-term vision for our environment

Given the importance of our environment and the challenges facing our city region, we need a long-term vision to help guide and support our action to protect and improve it.

A long-term vision for our environment:

We want Greater Manchester to be a clean, carbon neutral, climate resilient city-region with a thriving natural environment and circular, zero-waste economy where:

- Our infrastructure will be smart and fit for the future: we will have an integrated, clean and affordable public transport system, resource efficient buildings, greater local community renewable energy, cleaner air, water and greenspace for all.
- All citizens will have access to green space in every community, more trees including in urban areas, active travel networks, environmental education and healthy and locally-produced food.
- Citizens and businesses will adopt sustainable living and businesses practices, focusing on local solutions to deliver a prosperous economy.

¹¹ <http://www.passivhaustrust.org.uk/>

2.2 Aims for our environment

To deliver this vision and make sure we focus on the challenges we face, this plan establishes a set of key aims for our environment. In meeting these aims, we need to maximise the positive impacts on our health and prosperity that these actions will bring.

1. **Aim for our mitigation of climate change:** For our city-region to be carbon neutral by 2038 and meet carbon budgets that comply with international commitments.
2. **Aim for air quality:** To improve our air quality, meeting World Health Organisation guidelines on air quality by 2030 and supporting the UK Government in meeting and maintaining all thresholds for key air pollutants at the earliest date.
3. **Aim for sustainable consumption and production:** To put us on a path to being a circular economy, recycling 65% of our municipal waste by 2035 and reducing the amount of waste we produce.
4. **Aim for our natural environment:** To protect, maintain and enhance our natural environment for all our benefit, taking steps to implement and achieve environmental net gain.
5. **Aim for resilience and adaptation to climate change:** To be prepared for the impacts of climate change and already be adapting to the future changes from any increase in climate shocks and stresses.

3. WHAT DO WE NEED TO DO OVER THE NEXT 5 YEARS?

3.1 The approach taken in this plan

The following section is the most important part of this plan. It sets out the urgent actions all of us need to take over the next 5 years to put us on the right path to meeting our aims and achieving our environmental vision for Greater Manchester. Our aims, in particular our aim for a carbon neutral city-region by 2038, can only be achieved by everyone committing to taking the actions outlined in this plan.

The plan focusses on the key parts of our daily lives where action is required and a small set of key priorities within each of those areas, where we need to take action over the next 5 years and beyond to achieve our aims. These action areas and priorities are underpinned by evidence and more detailed individual reports which have been developed with stakeholders.



Our energy supply – the source of the power and heat to our buildings and transport.

Increasing local renewable electricity generation	Decarbonising how we heat our buildings
Increasing the diversity and flexibility of our supply	



Our travel and transport – how we move and how our goods are transported within the city region.

Increasing use of public transport and active travel modes	Phasing out of fossil-fuelled private vehicles and replacing them with zero emission (tailpipe) alternatives
Tackling the most polluting vehicles on our roads	Establishing a zero emissions bus fleet
Decarbonising freight transport and shifting freight to rail and water transport	



Our homes, workplaces and public buildings – the demand for energy to heat the places we live and work.

Reducing the heat demand from existing homes	Reducing the heat demand from existing commercial and public buildings
Reducing the heat demand in new buildings	



Our consumption and production of resources – how sustainably we produce goods and services and what we do with them after we have used them.

Producing goods and services more sustainably, moving to a circular economy	Becoming more responsible consumers
Managing our waste as sustainably as possible	Reducing unnecessary food waste



Our natural environment – increasing the wide range of benefits provided by our air, land, water and biodiversity.

Managing our land sustainably	Managing our water and its environment sustainably
Achieving a net gain in biodiversity for new development	Increasing investment into our natural environment
Increasing engagement with our natural environment	



Our resilience and adaptation to climate change – how resilient we are to climate change and how well we adapt to its impacts.

Embedding climate change resilience and adaptation in all policies	Increasing the resilience of and investment in our critical infrastructure
Implementing a prioritised programme of nature-based climate adaptation action	Improving monitoring and reporting

Figure 5 sets out where these priorities map onto the reductions in CO₂ emissions modelled in the SCATTER GM Pathway

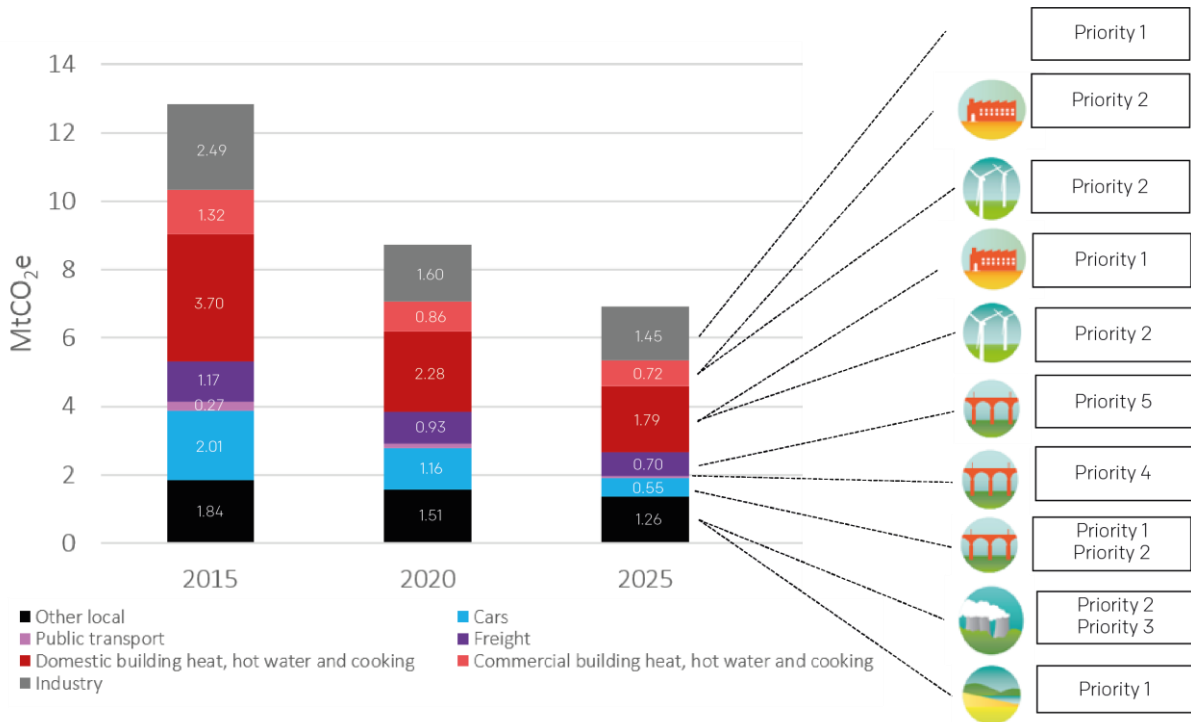


Figure 5 – Mapping of priorities in the plan against emissions reductions in the SCATTER GM Pathway. Source: Anthesis.

3.2 A Mission-Oriented Approach

These areas and priorities are linked and need tackling as part of a single, coherent approach rather than in isolation. These links include, but are not limited to, the following:

- The installation of low carbon heating and renewable energy generation/storage as part of retrofitting a building to reduce its energy demand or adding green infrastructure (e.g. green walls) to it.
- The potential for active travel networks (walking and cycling routes) to also provide green infrastructure.
- The resilience of our energy infrastructure, homes and buildings to climate change.
- The role of our natural environment in mitigating and adapting to climate change.
- The use of waste for energy generation.

In delivering this plan, we need to adopt an approach that reflects the links, complexities and the role of individuals and numerous organisations in delivering the aims set out in this plan. To do this, we want to establish a mission-oriented approach to tackling our environmental challenges. Rather than focussing on particular sectors, this approach focuses on problem-specific challenges facing society, which requires many different sectors involvement to solve. Further detail on this approach is set out in section 5.

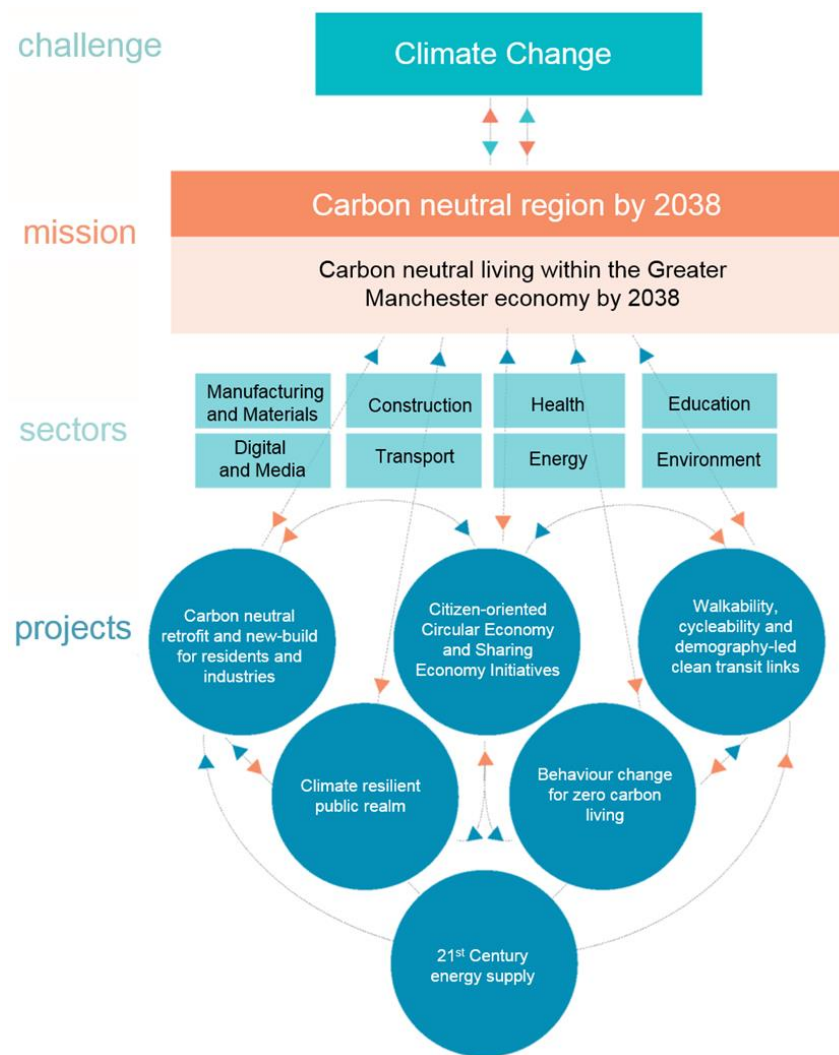


Figure 6 – The potential components of a mission-oriented approach.

Source: University College London Institute for Innovation and Public Purpose (IIPP)

3.3 Structure of the plan

Each section of the plan answers the following questions across a set of priorities for each area: Where do we need to get to? Where we are now? What do we need to do over the next 5 years?

3.3.1 Our energy supply

Summary of the challenges and opportunities

We need to reduce CO₂ emissions that are produced by the energy we use, shifting away from fossil fuels to renewable sources. The Greater Manchester Infrastructure Framework sets out the challenges for our electricity infrastructure associated with this shift to renewable electricity generation, low carbon heating and electric vehicles (EVs). Through the *Greater Manchester Spatial Framework*, standards for new buildings and developments will be set, but we still need to increase renewable energy generation and low carbon heating in existing homes and buildings. To do this, residents will need support to help make the right decisions, making sure everyone can benefit from these changes.

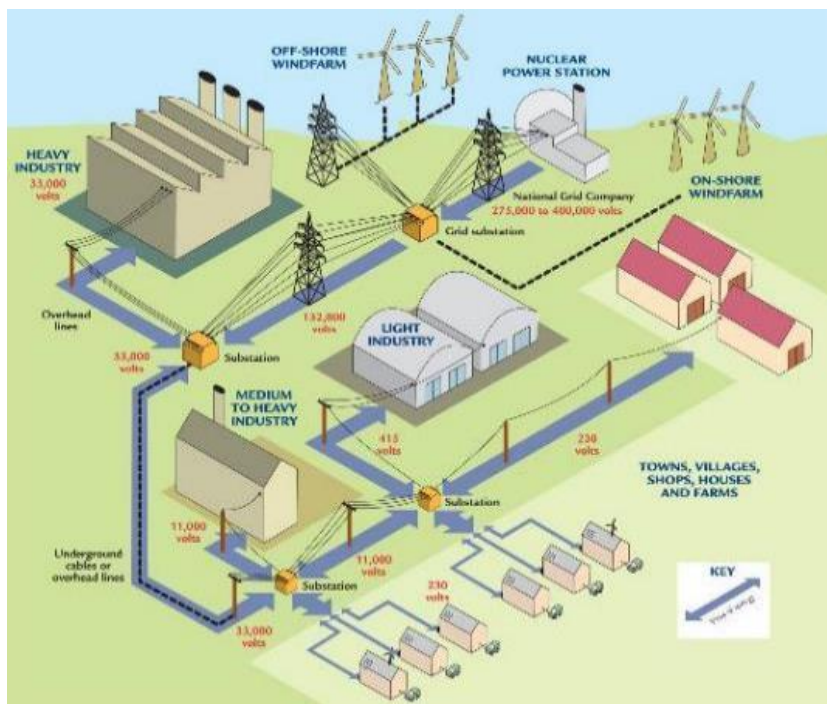


Figure 7 – Smart Energy System

Source: Greater Manchester Combined Authority, 2018

Summary of our priorities – energy supply

Priority 1
Increasing local renewable electricity generation

Priority 2
Decarbonising how we heat our buildings

Priority 3
Increasing the diversity and flexibility of our electricity supply

SUMMARY OF OUR ACTIONS – ENERGY SUPPLY

Residents

- Install renewable energy at your home
- Switch to a renewable energy supplier
- Plan now for when you next need to replace your current heating system

Greater Manchester Health and Social Care Partnership

- Explore options to purchase green energy
- Encourage innovation and support new technologies
- Work with GM partners to assess opportunities for generating onsite renewable or ultra-low carbon energy

Local Authorities

- Will procure renewable energy tariffs (from GM sources if possible) when they are next procured
- Will complete a full assessment of the potential of our assets for renewable energy and develop these assets (where financially viable) by the end of 2021
- When replacing heating systems in buildings, will install low carbon alternatives where viable, seeking to avoid carbon intensive technologies (gas, coal, oil)

Businesses and other organisations

- Install renewable energy generation at your premises and partner with community energy groups
- Switch to a renewable energy supplier
- Access energy related business support from the Growth Company
- Plan now for when you are next due to replace your heating system

What we need from government policy

- Work with us to develop the Energy Transition Region concept to support innovation
- Accelerate and deepen grid decarbonisation
- Stable and long-term policy landscape
- Decision on long-term decarbonisation of heat

Local policy

- Establish an investment vehicle to develop assets for renewable energy and deliver renewable energy generation on estate.
- Require 20% renewable energy generation at new developments
- Examine the potential to establish a GM collective solar PV/battery purchase to drive up residential uptake
- Seek funding to roll out Local Area Energy Planning across GM to identify which heating solutions are best suited to which areas of the city-region
- Identify "Heat and Energy Network Opportunity Areas" and require an assessment of the viability of connecting new developments to a heat network within these areas
- Convene key partners (industry, academia and utility providers) with a view to them leading the development of a hydrogen strategy for Greater Manchester

Other key partners

- Electricity North West – lead the transition to a "Smart Grid" to help optimise both the generation and use of electricity and facilitate the local trading of electricity

Priority 1: Increasing local renewable energy generation, adding at least a further 45MW¹² by 2024

Scale of the challenge – “SCATTER GM” pathway 2040:

- 50% of all households have the equivalent of a 16m² solar photovoltaic (PV) system, with an additional 5.5km² on commercial rooftops or in ground-mounted installations
- 550 on-shore wind turbines delivering around 3.4TWh/year (by 2050)
- x4.5 increase in current biomass capacity delivering around 4TWh/year

Where do we need to get to?

We need an urgent and significant increase in the proportion of electricity we use and generate coming from renewable sources. The reductions in CO₂ emissions in the modelling, which supports this plan, are based on a reduction of between a 58-76% of emissions from generating grid electricity by 2025, increasing to 80% by 2030 and to over 95% by 2035. This could come from decarbonising the national electricity grid; however, to increase energy security, protect against uncertainty and energy price rises, maximise the economic opportunities and increase the rate of emissions reductions, our ambition for is to maximise the contribution from local renewable electricity generation within the city region. This needs to take place alongside accelerated decarbonisation of the national electricity grid. There are risks to meeting our aims if the national grid does not carbonise quickly enough.

Where are we now?

Currently, of the total electricity used within Greater Manchester, only 2.5% comes from renewable sources located within the city region’s boundary. When translated to a per household measure, this equates to nearly half of the national average. Uptake rates remain low and current generation is also only around a quarter of the estimated technical potential of the city region, to which PV in particular has the greatest potential to contribute (over 80%). Nationally, under the National Grid’s latest future energy scenarios¹³, two of its four scenarios achieve a 62% reduction in grid emissions by 2026, with a maximum of 92% reduction achieved by 2050 (against a 2017 baseline).

What we need to do over the next 5 years?

Residents – what we can do now:

Generate your own energy by installing renewable generation technologies (e.g. solar PV) at your home. (Visit: https://www.simpleenergyadvice.org.uk/measures/meta_solar_photovoltaic_panels).

Switch to a renewable energy supplier – you can do this through the Big Clean Switch and save on average £270 per year (Visit: <http://www.gmgreen.energy>).

¹³ <http://fes.nationalgrid.com/media/1357/fes-2018-in-5-minutes-web-version.pdf>

Organisations and Businesses – what we can do now:

Install renewable electricity generation (e.g. solar PV) at your premises and consider partnering with community energy groups (e.g. [Power Paired](#)) to do so

Switch to a renewable energy supplier. Nine out of ten businesses can either save money or have their existing energy deal matched by switching to renewable energy. Big Clean Switch can help your business or organisation switch today. (Visit: <http://www.gmgreen.energy>).

Access energy related business support through The Growth Company. Visit: <https://www.businessgrowthhub.com/services/support/operational-efficiency>)

Voluntary, Community and Social Enterprise Organisations:

We need to continue to realise and support the contribution and power of community energy groups to contribute to local electricity generation, including [Generation Oldham](#) and [Greater Manchester Community Renewables](#). Community-led action can often tackle challenging issues around energy, with community groups well placed to understand their local areas and to bring people together with common purpose. Community groups have come together to develop a Community Energy Action Plan they will implement to support this.

Local Authorities:

When procuring contracts for electricity supply in the future, GMCA and LAs will procure renewable energy tariffs (from Greater Manchester sources if possible).

By June 2019, GMCA and LAs will have completed a full assessment of the potential of their assets for renewable energy. By the end of 2021, GMCA and LAs will have developed these assets (where financially viable) either themselves or in partnership with local communities.

Greater Manchester Health and Social Care Partnership (GMHSCP)

GMHSCP will explore options to purchase green energy. GMHSCP will encourage innovation and support new technologies that help improve their usage and carbon performance related to energy and water usage. GMHSCP will work with partners to assess opportunities for generating onsite renewable or ultra-low carbon energy (e.g. solar PV, solar heating, heat pumps or biomass/biogas/fuel cell combined heat and power

Local policy:

GMCA and LA will develop proposals for an investment vehicle, potentially via an Energy Innovation Company, to deliver renewable energy generation on their estate.

As part of proposals in the Greater Manchester Spatial Framework, GMCA and LA are consulting on a minimum 20% reduction in CO₂ emissions in new buildings/dwellings through the use of on-site or nearby renewables and/or low carbon technologies.

With partners, GMCA and LA will examine the potential to establish a collective solar PV/battery purchase to drive up residential uptake of these technologies.

Priority 2: Decarbonising how we heat our buildings, adding at least a further 10TWh of low carbon heating by 2024

Scale of the challenge – “SCATTER GM” pathway 2040:

- Phasing out gas boilers so that they account for less than 35% of home heating, with 60% of all heating (domestic and commercial) supplied by low carbon heating.

Where do we need to get to?

We need an urgent and significant increase in the use of low carbon heating, through a mixture of heat networks in heavily urbanised areas and the use of other low carbon heating (e.g. heat pumps) elsewhere. At the same time, we need to remain open to changes at the national scale of how heat might be provided in the future, including the future of the mains gas grid and the potential role of hydrogen. The reductions in CO₂ emissions modelled in SCATTER and ESME are based on between 51,000 and 69,000 homes per year being connected to low carbon heating between now and 2040, equating to installs in around 4.5-6% of Greater Manchester’s current number of homes each year.

Where are we now?

Gas is widely used for heating across Greater Manchester, with 95% of postcodes connected to the gas grid. Currently we have a limited number of microscale heat networks and around 1,000 installed heat pumps across the region. At present, the annual national take-up of heat pumps is low – around 30,000 per year – compared to around 1.5m annual gas boilers installations. Gas network operators are investigating whether hydrogen can be introduced to the gas grid to reduce its carbon intensity. However, there are technical and cost implications of this which need to be overcome for it to be a viable proposition.

What do we need to do over the next 5 years?

Residents – what we can do now:

Think now about what you will do when you next need to replace your gas boiler or heating system and look at low carbon alternatives, such as a heat pump or solar thermal. (Visit: <https://www.simpleenergyadvice.org.uk/pages/low-carbon-heating-options.>)

Organisations and Businesses – what we can do now:

Develop a plan now for what you will do when you next replace your heating system, including the option of low carbon heating.

GM Housing Providers:

In support of this plan, GMHPs have committed to planning for a post-gas economy in terms of new and replacement heating systems.

Local Authorities:

When replacing heating systems in their buildings, GMCA and LAs will install low carbon alternatives where viable, rather than replacing with carbon intensive technologies.

Local policy:

GMCA and LAs will seek funding to roll out Local Area Energy Planning across the city region to identify which heating solutions are best suited to which areas. This will build on the work in the Greater Manchester Spatial Framework to identify Heat and Energy Network Opportunity Areas.

As part of proposals in the Greater Manchester Spatial Framework, GMCA and LAs are consulting on proposals to identify “Heat and Energy Network Opportunity Areas” and require an assessment of the viability of connecting new developments to a heat network within them

GMCA and Manchester Metropolitan University will convene key partners (industry, academia and utility providers) with a view to developing a hydrogen strategy for Greater Manchester so that we can understand and maximise the opportunities over the next 5 years and beyond.

Priority 3: Increasing the diversity and flexibility of our electricity supply, adding at least a further 45MW¹⁴ of diverse and flexible load by 2024

Where do we need to get to?

Our local energy system will need to adapt in order to accommodate these shifts and the increase in EVs (see section 3.3.2), which will mean that an increasing proportion of our energy needs will be met by electricity. They will also bring with them a more complex pattern of supply (including from local generation) and demand (from EV charging and electrified heating systems) than at present. We need to increase the use of smart technologies and local storage to spread the increase in peak loads these changes may bring across the day and also to accommodate anticipated increases in our population (forecast to increase by a quarter of a million by 2037), number of homes (forecast to increase by 250,000 by 2037) and office, industrial and warehousing floorspace (forecast to increase by 6.7 million m² by 2037)¹⁵.

Where are we now?

The current infrastructure provided, both in Greater Manchester and across the country, is predominantly configured to supply electricity from power stations into homes and other buildings. At present, Greater Manchester has around 750kW of storage, 500kW of which is used for research purposes.

What do we need to do over the next 5 years?

Electricity North West (ENWL)

Providing a local electricity network that supports this shift is the responsibility of ENWL, working in partnership with local stakeholders. ENWL is the distribution network operator (DNO) in Greater Manchester, operating and maintaining the regional grid that takes power from the national grid and local generators to homes and industrial/commercial buildings and users. Over the coming years, ENWL will change to a Distribution 'System' Operator (DSO) model. The understanding of the roles and responsibilities of the DSO is still evolving, so ENWL will continue to work with local stakeholders and national bodies to develop the technical and regulatory framework to transition to this new model. The product of this transition will be a "Smart Grid", which will help optimise both the generation and usage of electricity in the region and facilitate the local trading of electricity.

¹⁵ <https://www.greatermanchester-ca.gov.uk/gmsf>

What do we need from national government policy across these 3 priorities?

- To work with us to establish an Energy Transition Region (or Energy Innovation Zone) in Greater Manchester to test innovative approaches, policy and finance mechanisms to accelerate local renewable energy generation, storage and efficiency at scale.
- Accelerated and deeper decarbonisation of the national electricity grid beyond that in the scenarios set out by the National Grid.
- A more stable and longer term policy landscape for local renewable electricity generation and low carbon heat to build confidence, demand and supply in a sustainable way.
- A decision, during the lifetime of this plan, on the long-term decarbonisation of heat, including the future of the gas grid.

3.3.2 Our transport and travel

Summary

We need to improve our air quality and reduce CO₂ emissions that are produced by the way we, and the goods we use, travel within the city region. To do this, we need to reduce the amount we travel in fossil-fuel powered vehicles, by using sustainable modes and shifting to zero emissions (tailpipe) or cleaner alternatives.

In January 2019, TfGM gave members of the public the opportunity to have a say on its Transport Strategy 2040: Draft Delivery Plan (2020-2025)¹⁶. The 5 Year Environment Plan has been developed in conjunction with that Delivery Plan. Reporting on the progress of this 5 Year Environment Plan will also be aligned with the final Delivery Plan and subsequent Delivery Plan Progress Reports, as well as with the Clean Air Plan for Greater Manchester.

A large number of the actions set out in the Delivery Plan (2020-2025) will directly contribute to or enable the delivery of improvements in air quality and reductions in CO₂ emissions. The graph below sets out our Vision for 2040.

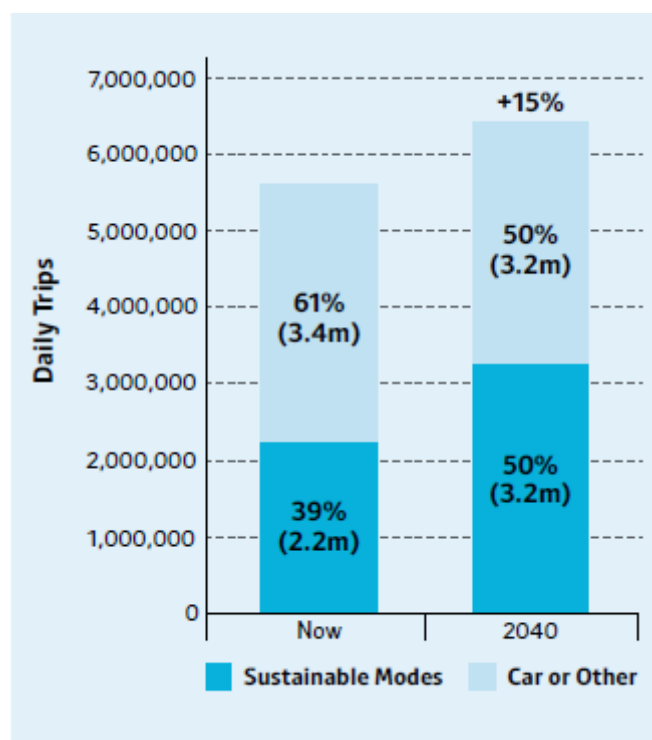
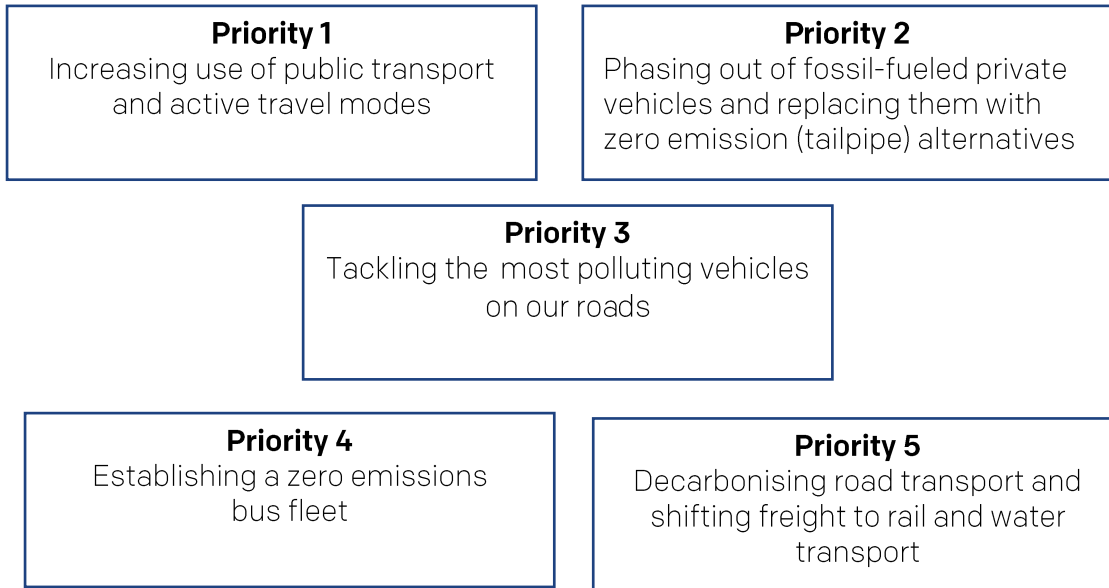


Figure 8 – Our Vision for 2040: 50% of journeys in Greater Manchester to be made on foot, by bike or using public transport. Source: TfGM Transport Delivery Plan

¹⁶ <https://tfgm.com/2040/delivery-plan-2020-2025>

Summary of our priorities – travel and transport

The 5 priority areas set out below summarise a smaller set of key actions that will contribute most significantly to our aims.



SUMMARY OF OUR ACTIONS – TRANSPORT AND TRAVEL

Residents

- Walk and cycle for short journeys
- Use public transport for longer journeys
- Cut costs, congestion, parking problems and pollution by sharing a car with a colleague or friend.
- Switch off your engine when at a standstill.
- Buy an electric car – if you do, make sure you are on the right electricity tariff

Businesses and other organisations

- Support your employees in doing the right thing, encouraging flexible working and use of public transport, cycling/ walking and car-sharing
- Switch your car/van fleet to Electric Vehicles and consider charging infrastructure
- When replacing other vehicles, purchase the least polluting and most efficient model
- Maintain your fleet to minimise emissions

What we need from government policy

- Long-term sustainable funding, including a fully devolved, long-term infrastructure budget
- Greater powers, including over rail franchising stations and support decisions around reform of the bus market.
- Test Mobility as a Service approaches
- Radically improve connectivity with other UK cities .
- Invest in rail electrification or in piloting low carbon alternatives (such as hydrogen)

Greater Manchester Health and Social Care Partnership

- Collaborate closely with stakeholders to support local area improvement of travel services and infrastructure
- Work with partners and stakeholders to assist with improvement of local air quality
- Monitor the environmental impacts associated with suppliers' transport and logistics and work with them to find ways to minimise their traffic burden

Local Authorities

- Procure zero emission (tailpipe) cars/ vans where suitable and cost effective when we come to replace existing fleet and keep under review the options for other types of vehicles

Local policy

- Implement the 2040 Transport Strategy Delivery Plan, including in the next 5 years:
- Implementing the Mayor's Challenge Fund for walking and cycling
- Implementing a "Streets for All" approach to street design and management.
- Expanding and promoting the city region's Electric Vehicle charging network and aim to complete the businesses case for further expansion.
- Continue to develop a Full Business Case of proposals to reduce NO₂ exceedances to submit to government by the end of 2019. Subject to approval and sufficient government funding being received as a result, measures will then be implemented as set out in the Full Business Case.
- Implementing a programme to retrofit existing buses to reduce emissions (subject to funding).
- Assessing and developing a roadmap to deliver a zero emission bus fleet
- Assessing and developing a roadmap to reduce freight emissions and support modal shift.

Priority 1 – Increasing use of public transport and active travel modes

Scale of the challenge – “SCATTER GM” pathway:

- Increasing the proportion of trips by sustainable modes.
- Reducing the overall amount we travel.

Where do we need to get to?

Greater Manchester’s overall ‘vision for 2040’ is to improve our transport system to support a reduction in car use to no more than 50% of daily trips made by Greater Manchester residents with the remaining 50% made by public transport, walking and cycling. This will mean a million more trips each day using sustainable transport modes in Greater Manchester by 2040. This is equivalent to 35% of passenger miles being made by sustainable modes and broadly aligns with the mode split outputs from SCATTER. Analysis by SCATTER suggests that we also need to focus attention on reducing the overall amount we travel in order to meet carbon targets.

Where are we now?

At present, 39% of daily trips in Greater Manchester (made by the city-region’s residents) are made by sustainable modes (including walking, cycling and bus, train and Metrolink) with the remaining 61% of trips made by car (or in other private vehicles). By 2040, GM’s vision is to improve our transport system so that we can reduce car use to no more than 50% of daily trips made by GM residents, with the remaining 50% made by public transport, walking and cycling.

What do we need to do over the next 5 years?

Residents – what we can do now:

Walk and cycle more for short journeys – half of trips within Greater Manchester are of 2km or less and 40% of these are made by car. Visit: <https://my.tfgm.com/#/getactive/>.

Use public transport for longer journeys. Visit: <https://my.tfgm.com/#/planner/>.

Businesses and organisations – what we can do now:

Support your employees in doing the right thing – provide suitable work from home arrangements which mean that fewer journeys are necessary; offer flexible working hours which mean that people can travel at less congested times and which enable easier public transport journeys; promote public transport options; provide good facilities (e.g. showering and storage) to encourage people to cycle and walk to work; and coordinate car sharing schemes for staff.

[Greater Manchester Health and Social Care Partnership \(GMHSCP\):](#)

GMHSCP will collaborate closely with stakeholders to support local area improvement of travel services and infrastructure.

We will monitor the environmental impacts (CO₂e and air pollution) associated with our suppliers' transport and logistics and are actively working with our suppliers to find ways to minimise their traffic burden (e.g. more efficiently planned deliveries, less polluting vehicles etc.).

[Local policy:](#)

GMCA, LA and TfGM will implement the 2040 Transport Strategy Delivery Plan.

In the next five years this will include delivering the Mayor's Challenge Fund for walking and cycling, transforming cycling and walking infrastructure to encourage people to make walking and cycling their natural choice for short journeys. £160m will be invested between 2018/19 and 2021/22 over two tranches. To complement this, the GM Health and Social Care Partnership has invested further £2m over 3 years (to March 2021) to support population scale behaviour change to create a cultural norm for walking.

The Delivery Plan also includes implementing a "Streets for All" approach to street design and management, creating streets where the movement needs of all modes of transport are balanced with the need for safer walking and cycling facilities, better public transport and a more attractive and less polluted environment.

Priority 2 – Phasing out of fossil-fuelled private vehicles and replacing them with zero emission (tailpipe) alternatives, with charging infrastructure supporting at least 200,000 vehicles by 2024

Scale of the challenge – "SCATTER GM" pathway:

- 100% of all cars are zero emissions (tailpipe) by 2035

[Where do we need to get to?](#)

We need a significant and urgent shift from fossil-fuelled private vehicles to zero emissions (tailpipe) alternatives, supported by an expansion in the EV charging network. This will require a significant increase in the charging infrastructure to support the increased use EVs in and around the city region.

[Where are we now?](#)

There are currently 3,400 licensed plug-in vehicles in Greater Manchester, making up about 0.25% of the total number of licensed vehicles in the city region. The total number of these vehicles in Greater Manchester has increased by a steady rate of around 500 per year each year since 2014, or 3.3% of new cars registered in Greater Manchester annually. A significant increase is expected in the number of cars registered in the coming years driven by the market, as the up-front cost of these vehicles, relative to their petrol and diesel equivalents, continues to reduce.

Greater Manchester has a relatively small but increasing EV charging infrastructure, consisting of 320 7kW individual points and 4 rapid chargers.

What do we need to do over the next 5 years?

Residents – what we can do now:

If you buy a new car or replace your current car, buy an Electric Vehicle. Visit: <http://www.energysavingtrust.org.uk/transport/electric-vehicles>.

If you already have or buy an Electric Vehicle and charge it at home, make sure you are on the right electricity tariff: <http://www.energysavingtrust.org.uk/transport/electricity-tariffs-electric-vehicles>.

Businesses and organisations – what we can do now:

When you replace cars or vans in your fleet, switch to Electric Vehicles.

Plan for what charging infrastructure you might need for Electric Vehicles – in your own fleet and those of your staff.

GM Housing Providers:

In support of this plan, GMHPs have committed to developing a shared procurement framework for Electric Vehicles.

Local Authorities:

GMCA, LAs and TfGM will procure zero emission (tailpipe) cars/vans where suitable and cost effective when they come to replace existing fleet and will keep under review the options for other types of vehicles.

Local policy:

GMCA, LA and TfGM will expand and promote the city region's EV charging network and aim to complete the businesses case for further expansion over the next 5 years. 48 new rapid charge points will be installed in addition to the city region's existing public charging points.

Priority 3: Tackling the most polluting vehicles on our roads

Where do we need to get to?

We need to address NO₂ exceedances at the roadside. NO₂, along with PM and other oxides of nitrogen, are a serious concern in Greater Manchester given their risk to the public's health. In July 2017 Government served a Direction on Greater Manchester LAs requiring them to produce a feasibility study, in which they must identify the option which will deliver compliance with legal limits for NO₂ in the "shortest possible time". Local modelling identified 152 stretches of road (road links) where concentrations of NO₂ are forecast to exceed the legal limit value beyond 2020.

Where are we now?

Whilst air quality has been generally improving over time, poor air quality is the largest environmental risk to the public's health. LAs are required to submit to government an outline business case by the end of March 2019, setting out proposals reduce NO₂ exceedances in the shortest possible time. The *Clean Air Plan – Outline Business Case*¹⁷ sets out the preferred option of delivering compliance in the shortest possible time through a Greater Manchester wide penalty for buses, taxis and commercial vehicles in phase 1, expanding to light goods vehicles in phase 2. This is predicted to deliver compliance in 2024. Subject to government's review of this, it is anticipated that the government will direct LAs to continue to develop a Full Business Case (submitting it by the end of 2019). Implementing the plan would be subject receiving significant financial support from government.

What do we need to do over the next 5 years?

Residents – what we can do now:

Switch off your engine when at a standstill and make sure your tyres are correctly inflated.

Where you need to use your car, consider car sharing options. Visit:

<https://www.carsharegm.com/register.aspx>

Businesses and organisations – what we can do now:

Ensure your fleet is maintained and those travelling for work are supported in reducing their impact on air quality.

When you come to replace vehicles (that are not cars or vans, see above), purchase the least polluting and most efficient model possible.

¹⁷ https://www.gmcmeetings.co.uk/meetings/meeting/659/greater_manchester_combined_authority

Greater Manchester Health and Social Care Partnership (GMHSCP):

GMHSCP will work with partners and stakeholders to assist with improvement of local air quality.

GMCA, LAs and TfGM – policy:

GMCA, LAs and TfGM will continue to develop a Full Business Case of proposals to reduce NO₂ exceedances, in conversation and consultation with stakeholders, affected businesses and the public. This will be submitted to government by the end of 2019. Subject to approval and sufficient government funding being received as a result, measures will then be implemented as set out in the Full Business Case.

Priority 4 – Establishing a zero emissions bus fleet

Scale of the challenge – “SCATTER GM” pathway:

- 100% of all buses are zero emissions (tailpipe) by 2035

Where do we need to get to?

We need to reduce the emissions produced by our bus fleet, moving from fossil fuelled vehicles to zero emissions (tailpipe) alternatives.

Where are we now?

TfGM is working with private operators to seek to develop a roadmap to achieving an emissions-free bus fleet. There have been 3 fully electric buses operating on TfGM's free bus service in Manchester city centre that have provided valuable insight into operational challenges and opportunities. A recent funding award could see up to 70 fully electric buses (3.5% of the Greater Manchester fleet) deployed in Greater Manchester by 2023. TfGM is currently supporting operators with government funding to retrofit 170 buses to the cleanest current air quality standard (EURO 6)

What do we need to do over the next 5 years?

Local policy:

As part of the development of its plan to tackle NO₂ exceedances, GMCA, LAs and TfGM are asking the government for a financial package of support to retrofit/renew existing buses by 2021, upgrading them to cleaner EURO 6 engines, reducing emissions.

TfGM will assess and develop a roadmap to deliver a zero emission bus fleet, concluding this by 2025.

Priority 5 – Decarbonising freight transport and shifting freight to rail and water transport

Scale of the challenge – “SCATTER GM” pathway:

- Decarbonising freight transport, delivering a shift away from road freight and enabling more efficient freight practices

Where are we now?

The movement of freight is a national and international issue, and the growth of the sector will have implications across the city region’s boundaries.

The majority of goods are moved by road (87% of goods lifted) in diesel powered HGVs and LGVs (vans). The complex and diverse nature of this industry makes decarbonisation a challenge but emerging technologies and solutions such as natural gas, electric and hydrogen vehicles, light weighting and autonomy provide opportunities to reduce emissions. A significant barrier to uptake is access to infrastructure. Key organisations led by TfGM will develop a roadmap to facilitate a joined up approach with other UK regions.

Rail freight currently moves around 7% of all goods lifted across the north. Rail, despite being diesel powered is significantly more energy efficient than other modes (with the exception of shipping). It produces 76% less CO₂ emissions than the equivalent HGV journey¹⁸. There is scope to work with other bodies, such as Transport for the North, to adopt a pan-Northern approach to freight and to explore opportunities to move more freight by rail.

What do we need to do over the next 5 years?

[Greater Manchester Health and Social Care Partnership](#)

GMHSCP will monitor the environmental impacts associated with its suppliers' transport and logistics and are actively working with its suppliers to find ways to minimise their traffic burden.

[GMCA, LAs and TfGM – policy](#)

GMCA, LAs and TfGM will assess and develop a roadmap to reduce freight emissions and support modal shift, increased efficiency and alternative fuels for HGVs

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/552492/rail-freight-strategy.pdf

What do we need from government policy across these 4 priorities?

- Further powers and long-term sustainable funding, through devolution, to deal effectively with the pressing challenges we face – including air quality, congestion and improving public transport. This includes a fully devolved, long-term infrastructure budget for Greater Manchester, as recommended in the National Infrastructure Commission’s recent National Infrastructure Assessment.
- Greater powers over rail franchising stations, support for decisions around reform of the bus market, facilitate the trialling of tram-trains to enable substantial expansion of the rapid transit network and enable regulatory reforms to complement the shift to cycling and walking.
- Test Mobility as a Service approaches to enable the transition to a future-proofed fully integrated, shared, inclusive and sustainable transport system across the city-region, thereby supporting the Future of Mobility and Clean Growth Grand Challenges.
- Radically improve connectivity with other UK cities through Northern Powerhouse Rail and High Speed 2.
- Investment in rail electrification or in piloting low carbon alternatives (such as hydrogen) so that low carbon rail can make the contribution needed for us to meet our ambitions.

3.3.3 Our homes, workplaces and public buildings

Summary

We need to reduce CO₂ emissions produced by the excessive use of energy, particularly in heating our homes and commercial and public buildings. Achieving this will require owners of existing homes and buildings to make improvements to current levels of insulation to reduce heat loss through the building fabric well beyond the basic measures they might already have in place (e.g. loft insulation, draught proofing).

The Greater Manchester Infrastructure Framework agrees that a step change in the energy efficiency performance of existing domestic and non-domestic property will have to be achieved. In the Greater Manchester Spatial Framework, the GMCA and LAs are consulting on higher standards for new builds, requiring all new development to be net zero carbon by 2028. Retrofitting of existing buildings will however be crucial to reducing energy demand and to our wider ambitions of having affordable homes for our residents, as set out in the Greater Manchester Vision for Housing. Affordability includes the cost of keeping homes warm – quality, modern, properly insulated and energy efficient homes are cheaper to run and healthier to live in, as well as helping reduce CO₂ emissions. This is a vital part of our efforts to reduce fuel poverty in our city region (see the map below). Given that overall electricity demand may still increase due to the use of electric heating and vehicles, it is crucial to take opportunities to reduce energy demand where possible in order to mitigate the risk of the national grid not decarbonising quickly enough for us to meet our aims for CO₂ emissions reductions and to realise these wider benefits.

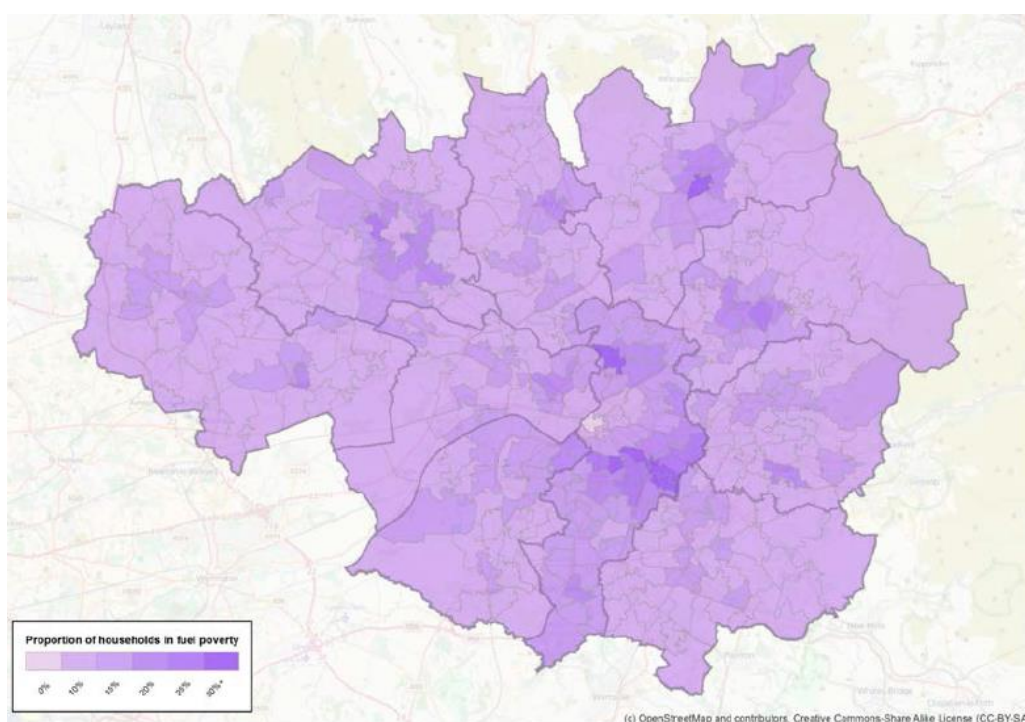


Figure 9 – Proportion of households in fuel poverty.

Source: Greater Manchester Spatial Energy Plan

Summary of our priorities – homes, workplaces and public buildings

Priority 1:

Reducing the heat demand from existing homes, focussing on initiating a fundamental shift to whole house retrofit

Priority 2:

Reducing the heat demand from existing commercial and public buildings

Priority 3:

Reducing the heat demand in new buildings

SUMMARY OF OUR ACTIONS – HOMES, WORKPLACES AND PUBLIC BUILDINGS

Residents

- Get the basics right – including LED lighting and draught-proofing
- Upgrade your home insulation – loft, cavity wall and draught
- Think about whole-house retrofit, particularly if carrying out renovations

Local Authorities

- Standardise measurement and reporting of the operational efficiency of their buildings.
- GMCA and LAs will aim to obtain an average DEC of rating D or better by 2024 and C or better by 2030 for their public buildings where economically viable.

Greater Manchester Health and Social Care Partnership:

- Work with partners to include sustainability indicators in their review of buildings

Businesses and other organisations

- Sign up to the Net Zero Carbon Buildings commitment
- Measure, report on and improve the operational energy efficiency of premises, coming together within sectors to do so.
- Consider greener, more energy efficient premises when current or future contracts require renewal.
- Engage with landlords/tenants landowners and tenants over key issues – e.g. data sharing, energy efficiency measures, green energy.

Other key partners

- Social Housing Providers – commitments to the efficiency of existing homes and to building new homes to net zero carbon in advance of 2028
- Voluntary, Community and Social Enterprise Organisations – continue to work with partners as we develop a GM retrofit partnership focussed on helping people and communities

Local policy

- Develop a GM retrofit partnership/ accelerator to tackle sector development/skills and access to finance/capacity
- Launch a major new drive to raise standards in the private rented sector, including the development of a GM Good Landlord standard.
- Investigate encouraging greater energy efficiency through council tax and business rates and other financial vehicles.
- Implement a business support programme for energy efficiency
- Require zero carbon development by 2028

Other key partners

- Working with us to develop new technology and financial models to make domestic and commercial retrofit at scale a possibility.
- Meeting commitments on smart meter roll-out.
- Changing the Energy Company Obligation (ECO) funding to ensure it is more effective at meeting GM's needs.

Priority 1: Reducing the heat demand from existing homes, focussing on initiating a fundamental shift in whole house retrofit by retrofitting homes by 2024

Scale of the challenge – “SCATTER GM” pathway 2040:

- Retrofit measures installed at 61,000 homes per year.

Where do we need to get to?

Retrofit of existing residential properties is the most significant issue in achieving our aims for carbon neutrality. The reductions modelled in SCATTER and ESME are based on moderately retrofitting 23,500 (EMSE) homes to more extensive retrofit of 61,000 (SCATTER) homes per year between now and 2040.

There are wider benefits of reducing demand, including reducing energy bill costs, increasing our security to fluctuations in energy prices, contributing to lifting people out of fuel poverty and further improving health by improving the quality of people’s homes. Given that, our ambition is to see basic measures installed at all homes and, at the same time, to maximise the extent of whole house retrofit, whilst recognising this will require us to develop approaches to tackle the greater up-front capital cost, sector and skills challenges this approach entails.

Where are we now?

It is estimated that around over half a million properties in Greater Manchester may still have not had basic insulation measures (such as loft or cavity wall insulation) installed¹⁹. The market for these measures is well-established, with the main issue being the take-up of these measures by able-to-pay home owners.

Whole-house retrofit has been carried out successfully on a small number of properties in Greater Manchester to date. However, the scale of this activity here and elsewhere has been limited due to the invasiveness of the measures needed, the difficulties of engaging with homeowners and making deep retrofit financially attractive to them given the high initial capital costs. As well as overcoming these barriers, the capacity and capability of the supply chain is not yet sufficiently developed in order to deliver the scale of change that we need.

¹⁹ http://media.onthepatform.org.uk/sites/default/files/retrofit_spreads.pdf

What do we need to do over the next 5 years?

Residents – what we can do now:

Get the basics right – fit LED and low energy lighting, turn off appliances when not in use and draught proof your windows and doors (Visit: <http://www.energysavingtrust.org.uk/home-energy-efficiency/energy-saving-quick-wins>). You might be Check if you eligible for a visit by a trained Home Energy Adviser to help do this. (Visit: <https://applyforleap.org.uk/apply/>)

Upgrade your home insulation – check your loft insulation, replace any single glazed windows with double or triple glazing and fill cavity walls (if your property has them)

If you're a home owner, think about whole home retrofit and the more advanced energy efficiency measures you can install, such as solid wall and floor insulation, particularly if you carry out building works. (Visit: <http://www.energysavingtrust.org.uk/home-insulation>)

GM Housing Providers:

In support of this plan, GMHPs have committed to achieving minimum C SAP (Standard Assessment Procedure) Rating by 2025 for all existing homes.

GM Voluntary, Community and Social Enterprise Organisations

The VCSE sector in Greater Manchester will be crucial to successfully scaling up domestic retrofit. Co-operatives, such as the Carbon Co-op, play a key role in this area, helping people and communities to make the radical reductions that we need to achieve in home carbon emissions.

Local policy:

GMCA and LAs will convene partners, including those delivering retrofit in Greater Manchester already and others in the construction and finance sectors, to develop a Greater Manchester retrofit partnership/accelerator. This would bring together the range of existing activity to focus collectively on tackling issues of demand, supply, skills and access to finance to develop delivery and business models for whole-house retrofit.

As part of its development of a Housing Strategy, GMCA and LAs will launch a major new drive to raise standards in the private rented sector, including the development of a Greater Manchester Good Landlord standard.

GMCA and LAs will investigate encouraging greater energy efficiency through (nudge) council tax and other financial vehicles.

Priority 2: Reducing the heat demand from existing commercial and public buildings

Scale of the challenge – “SCATTER GM” pathway 2040:

- 22% reduction in heating and cooling demand, with a 10% reduction by 2025.

Where do we need to get to?

We need our businesses and public sector organisations to significantly and urgently reduce their energy demand for heating and cooling. This needs to be underpinned by a better understanding and standardisation of information regarding the in-use or operational efficiency of our commercial and public buildings.

Where are we now?

There is a lack of information available regarding energy efficiency in Greater Manchester's commercial sector. There is evidence showing that the retail, industrial, commercial office and hotel sectors contribute collectively to over 70% of Greater Manchester's non-domestic heat demand (excluding transport). However, there are limited ways of measuring changes in heat demand and efficiency in the commercial sector. Although commercial buildings require an Energy Performance Certificate (EPC) when it is sold or leased, these are not representative of how a building will perform in operation. There are no requirements for the measurement or reporting of the operational efficiency of commercial buildings either nationally or in Greater Manchester at present.

More information on operational efficiency of public buildings is available through Display Energy Certificate (DEC) ratings, which are required for buildings frequently visited by the public and over a certain size. However, these ratings are reflective of the wider efficiency of a building, rather than just its heat demand.

What do we need to do over the next 5 years?

GM Organisations and Businesses – what we can do now:

Sign up to the Net Zero Carbon Buildings commitment, which has set targets for all buildings to be net zero carbon in operation by 2050 – visit:

<https://www.worldgbc.org/thecommitment>.

Measure, report on and improve the operational energy efficiency of your premises. Advice is available from the Business Growth Hub – visit:

<https://www.businessgrowthhub.com/services/resource-efficiency>. An existing way to start this is to obtain a Display Energy Certificate (DEC).

Businesses in key sectors (retail, industrial, commercial office and hotel) should collaborate and come together to report on operational efficiency within their sectors.

If you lease your premises, consider greener, more energy efficient premises when current or future contracts require renewal.

For leased premises, landlords and tenants should engage with each other over issues such as agreements to share data (e.g. on energy consumption), energy efficiency measures and agreement to supply green energy. These could be formalised in green leases.

Local Authorities:

GMCA and LAs will standardise their measurement and reporting of the operational efficiency of their buildings, making use of a standardised schema produced by the Energy Systems Catapult.

GMCA and LAs will aim to obtain an average DEC of rating D or better by 2024 and C or better by 2030 for their public buildings where economically viable and will work with UK Green Building Council to understand how performance in buildings can be better set, measured and monitored.

Greater Manchester Health and Social Care Partnership:

GMHSCP will work with partners to include sustainability indicators in the review of our buildings.

Local policy:

GMCA and LAs will investigate encouraging greater energy efficiency through (nudge) business rates and other financial vehicles.

Priority 3: Reducing the heat demand in new buildings

Where do we need to get to?

As well as retrofitting existing buildings, we need to significantly reduce the heat demand of new buildings. This is especially important given that, by 2037, 201,000 new homes are expected to be built in Greater Manchester.

Where are we now?

The standards for the energy performance of new buildings constructed in Greater Manchester are set out in Part L of the Building Regulations²⁰. The Greater Manchester Spatial Framework sets out additional requirements for new developments in Greater Manchester, specifically a requirement for all new buildings to be net zero carbon by 2028.

What do we need to do over the next 5 years?

GM Housing Providers:

In support of this plan, GMHPs have committed to building all new homes to zero carbon in advance of 2028 target as set out in Greater Manchester Spatial Framework.

²⁰ <https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l>

Local policy:

The Greater Manchester Spatial Framework sets out the proposal to require all new development to be net zero carbon by 2028. The GMCA and LAs will work with the UK Green Building Council (UKGBC) and other building environment professionals in Greater Manchester to test this date, including whether it can be brought forward, and the intervening steps required such as the balance between building efficiency, onsite energy generation and off-setting measures for remaining carbon emissions.

What we need from national government across these 3 priorities

- Develop, with Greater Manchester, innovative finance and delivery mechanisms to retrofit homes and commercial buildings.
- Work with Greater Manchester between now and 2022 to explore options for future delivery of Energy Company Obligation (ECO) funding in Greater Manchester to ensure it most effectively meets our needs in relation to tackling fuel poverty and achieving the scale of CO₂ reductions needed.
- Ensure smart meter roll-out happens in line with commitments made.

3.3.4 Our production and consumption of resources

Summary of the challenges and opportunities

As part of building a thriving and sustainable city region, we need to promote economic and resource productivity, eliminate waste and increase business opportunities through innovation, which in turn will stimulate skills development and jobs. The damage done to our environment caused by waste products can be avoided if more sustainable decisions are made at the production stage. To tackle this problem, we need to change the way that we, as consumers, treat end of life products. At the same time, we also need to work with industry to encourage more circular, sustainable and resource efficient business models; from using more sustainable materials to making sure manufacturing processes maximise resource and energy efficiency.

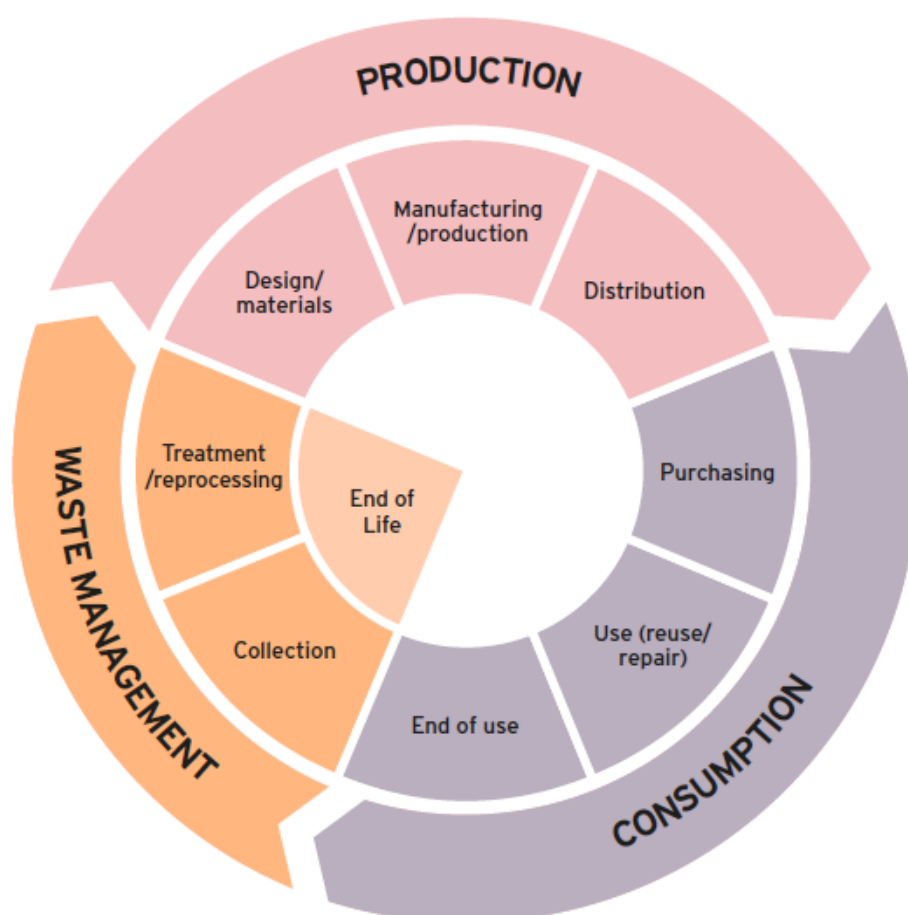


Figure 10 – Components of a circular economy

Source – Defra²¹

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

Summary of our priorities:

Priority 1:

Producing goods and services more sustainably, moving to a circular economy

Priority 2:

Becoming more responsible consumers

Priority 3:

Managing our waste as sustainably as possible

Priority 4:

Reducing unnecessary food waste

SUMMARY OF OUR ACTIONS –SUSTAINABLE CONSUMPTION AND PRODUCTION:

Residents

- Reduce the amount of waste you produce and use reusable products
- Cut down the amount of plastics you use.
- Buy sustainable products
- Look at alternatives to purchasing large items such as lease agreements or take-back schemes.
- Recycle as much as you can
- Reduce the amount of food you waste
- Support local food growing and redistribution initiatives and organisations

Local Authorities

- Voluntary, Community and Social Enterprise Organisations – continue to work with partners across these areas, particularly on the development of our food strategy.

Businesses and other organisations

- Review your processes to look where you can make efficiencies in design and production.
- Make sure sustainability is part of your procurement policy
- Take action to reduce the amount of food your organisation wastes
- Support local food growing and redistribution initiatives and organisations

Local Authorities

- Embed environmental sustainability criteria in social value procurement mechanisms
- Provide Carbon Literacy for all staff involved in procuring activities
- Aim to eradicate avoidable single use plastic on the public estate.

Lead policy

- Collaborate with the GM Sustainable Business Partnership, including a focus on resource efficiency
- Explore ways to support innovation that will help us transition to a circular economy.
- Continue to develop the Plastic Free GM campaign, including launching a roadmap and Plastic Pact for the public sector
- Develop and consult on a Zero Waste Strategy to set out our approach to becoming a zero waste city region.
- Produce a roadmap and future food strategy, which will set out a pathway and priorities for our food system.

What we need from government policy

- Further powers and incentives to increase reuse and recycling for both residents and businesses.

Greater Manchester Health and Social Care Partnership

- Work with partner organisations to support the development of waste management action plans across Trusts
- Take an approach towards a continual reduction in levels of waste, relative to the size of the organisation
- Have a system/process in place that identifies suitable opportunities to convert "waste" into a resource for community groups or charities
- Support staff on how to reduce food wastage to reduce the environmental impact

Priority 1 – Producing goods more sustainably

Scale of the challenge – “SCATTER GM” pathway 2040:

- 50-77% reduction in industrial emissions (38% by 2025).

Where do we need to get to?

There are 3 main areas in how goods are produced on which we need to focus:

- **Sustainable product design** – we need to take action to produce more sustainable products that move us away from a ‘throw away’ society, to one that keeps resources in use for as long as possible. To enable this we need to increase the reusability and recyclability of all components created.
- **Resource efficiency** – we need to maximise resource efficiency by moving away from linear business models to create a more circular approach, reducing waste of all forms at source.
- **Sustainable procurement** – we need to ensure that we are procuring the most environmentally sustainable products by embedding an environment criteria within procurement policy.

Where are we now?

There are approximately 120,000 businesses in Greater Manchester, with the most intensive users located at industrial sites such as Trafford Park. Currently there is little data available to estimate how efficient businesses are in relation to the finite raw materials and energy they consume. A Greater Manchester Sustainable Business Partnership has recently been convened to start to look at collaboration opportunities within Greater Manchester to drive innovation in this and other areas. Benchmarking and measuring progress in this area is also complex, requiring more relevant metrics to do so.

What do we need to do over the next 5 years?

GM Businesses and Organisations – what we can do now:

Review your processes to look where you can make efficiencies in design and production.

Support is available to do this through the Growth Company:

<https://www.businessgrowthhub.com/services/support/sustainability> and WRAP:

<http://www.wrap.org.uk/about-us/about>.

Make sure sustainability is part of your procurement policy, visit:

<https://www.gov.uk/guidance/sustainable-procurement-tools>

Greater Manchester Health and Social Care Partnership

GMHSCP will work with partner organisations to support the development of waste management action plans across their Trusts.

The GMHSCP approach will be towards a continual reduction in levels of waste, relative to the size of the organisation and will have initiatives in place to reduce overall material use in the products we buy and the services we deliver.

GMHSCP will have a system/process in place that identifies suitable opportunities to convert our "waste" into a resource (e.g. furniture re-use schemes and donations of IT and medical supplies etc.) to community groups or charities.

Local policy:

The Greater Manchester Sustainable Business Partnership will collaborate together and in partnership with others and individuals to deliver meaningful change in the city-region over the next 5 years to support our environmental vision, including a focus on innovating for resource efficiency.

GMCA and LA will explore ways to support innovation that will help us transition to a circular economy.

Local Authorities:

GMCA and LAs will embed environmental sustainability criteria in social value procurement mechanisms and all staff involved in procuring activity will receive Carbon Literacy training.

Priority 2 – Becoming more responsible consumers

Scale of the challenge – "SCATTER GM" pathway 2040:

- Limit to 20% any increase of waste currently produced in Greater Manchester.

Where do we need to get to?

All of us need to be conscious of how the choices we make impact on the environment and how small changes can have a positive impact. This can range from the reusing or leasing products to buying more sustainable products, focussing on:

- **Better waste prevention** – work still needs to continue throughout Greater Manchester to continue to raise awareness and change behaviours to stop avoidable waste being produced.
- **Eliminating avoidable single-use plastics** – a key priority in this area is to eradicate avoidable single-use plastics in Greater Manchester and move to more sustainable alternatives, promoting the waste hierarchy to reuse first. We all, as individuals and in organisations, need to move away from using avoidable single

use plastics and move to more sustainable options to protect our natural environment.

Where are we now?

Despite greater awareness of waste, particularly single-use plastics, we still do not do enough to reduce waste in the first place. Across Greater Manchester, we each produce around 400kg of residual waste per year, although this only includes waste created in our homes.

What do we need to do over the next 5 years?

Residents – what we can do now

Reduce the amount of waste you produce and use reusable products wherever possible, rather than single-use products, visit: <https://recycleforgreatermanchester.com/how-do-i-waste-less/>

Cut down the amount of plastics you use. Tips are available online from numerous sources, including: <https://friendsoftheearth.uk/plastics/living-without-plastic>.

Buy sustainable products – such as Fairtrade products or those with higher recyclable content.

Look at alternatives to purchasing large items such as lease agreements or take-back schemes.

Local Authorities:

GMCA and LAs will aim to eradicate avoidable single use plastic on the public estate by 2024.

Local policy

GMCA and LAs will develop and launch a roadmap and Plastic Pact (subject to agreement) for the public sector to increase collaboration across organisations and increase understanding of sustainable alternatives.

Priority 3 – Managing our waste as sustainably as possible

Scale of the challenge – “SCATTER GM” pathway 2040:

- Achieve a recycling rate of 65% by 2035.

Where do we need to get to?

For products that cannot be re-used, we need to maximise recycling and minimise the amount of waste that goes to landfill. This plan does not cover how we dispose of our household waste. This will form part of a subsequent *Zero Waste Strategy*, which we will develop in autumn 2019 (subject to the outcome of government consultations). It does however cover a broader landscape of commercial waste which is produced within Greater Manchester. Our key focus here is to increase the proportion of waste recycled. To do this, we need to maximise the quality and commercial value of recyclable materials, that cannot be reused, and collectively improve our recycling capabilities to ensure as little as possible goes to landfill.

Where are we now?

With over 1.1m households in Greater Manchester, recycling as much as possible is crucial if we cannot reduce potential waste in the first place or re-use products. For household waste collection and disposal, the GMCA is the Waste Disposal Authority (WDA) for 9 of the 10 districts, with Wigan Council having separate arrangements in place. 2017/18 household

Household recycling rates	GMWDA	Wigan
Recycling rate %	47.09%	48.5%
Landfill rate %	11.49%	4.6%
Total waste collected (tonnage)	1,128,823	147,558

Very little commercial waste is collected by any of the 10 District Councils, with this being collected by a range of private operators, meaning that data on commercial waste is limited.

England's Resource and Waste Strategy was published on 18th December 2018 and sets out government's key priorities. Several of these will be subject to a series of consultations from now until the end of 2020. One of these consultations will look at consistency of collection services, which could see government mandating what and how certain waste streams will be required to be collected separately, and will be a focus of a Greater Manchester *Zero Waste Strategy*.

Residents – what we can do now

Recycle as much as you can – visit: <https://recycleforgreatermanchester.com/>.

Local policy:

GMCA and LAs will develop and consult on a Zero Waste Strategy to set out our approach to becoming a zero waste city region.

Priority 4 – Reducing unnecessary food waste

Where we need to get to?

We need to reduce unnecessary food waste, stimulate local markets for food and maximise redistribution to ensure that those who are living in poverty are able to access such services.

Where are we now?

We waste significant amounts of food. Across the UK, this amounts to around 10 million tonnes a year, with a value of over £20 billion a year²² – or £700 per household. As well as this financial cost, the carbon footprint of food and drink consumed equates to 6.4 million tonnes of CO₂ emissions per year²⁰, although most of these will be generated outside of the city-region, where the majority of our food comes from. To address this we need to develop, agree and embed an action plan to address all aspects of the food system. Currently, scoping work is being undertaken to provide an overview of the data, strategies and activities being undertaken in this area to enable a roadmap to be devised with key partners, which will promote, target and measure actions based on the food and drink hierarchy.

What do we need to do over the next 5 years?

GM Residents – what we can do now:

Reduce the amount of food you waste – visit the Love Food Hate Waste website:
<https://recycleforgreatermanchester.com/how-do-i-waste-less/love-food-hate-waste/>

Support local food growing and redistribution initiatives and organisations. The Greater Manchester Poverty Action Group has created a map here:
<http://greatertogethermanchester.org/find-support/food-banks/>

GM Businesses and Organisations – what we can do now:

Take action to reduce the amount of food your organisation wastes. Those in the retail, food manufacturing and supply chain, hospitality and food service and agricultural sectors have a crucial role to play, see: <http://www.wrap.org.uk/food-drink/business-food-waste/courtauld-2025>.

Support local food growing and redistribution initiatives and organisations. The Greater Manchester Poverty Action Group has created a map here:
<http://greatertogethermanchester.org/find-support/food-banks/>

²² <http://www.wrap.org.uk/food-drink>
<http://media.onthepatform.org.uk/sites/default/files/4432%20ENW%20ESTA%20FP%20NW%20Final%20-%20GM%20v3.pdf>

[Greater Manchester Health and Social Care Partnership \(GMHSCP\)](#)

GMHSCP will support staff on how to reduce food wastage to reduce the environmental impact.

[Local policy:](#)

GMCA and LAs will support the Good Food GM Board in producing a roadmap (by 2020) and future food strategy, which will set out a pathway and priorities for Greater Manchester's food system, including food waste.

What we need from national government across these 4 priorities

- Further powers and incentives in increase reuse and recycling for both residents and businesses.

3.3.5 Our natural environment

Summary

The UK Government’s 25 Year Environment Plan²³ sets out what the UK will do to improve the environment, within a generation. By 2040, the ambition is to achieve high quality, accessible, natural spaces with increased biodiversity close to where people live and work; with a focus around the equal distribution of environmental benefits and resources to all.

We need to realise this ambition within Greater Manchester, prioritising action over the next 5 years to protect, maintain and enhance our key natural assets (air, land, water and biodiversity) and the multiple benefits (ecosystem services) they provide. Ultimately, we want to achieve measurable improvements in our natural environment – environmental net gain. A key first step in this will be implementing biodiversity net gain – delivering improvements through habitat creation or enhancement after avoiding or mitigating harm as far as possible. To achieve these ambitions, we need to mobilise existing and new sources of funding into our natural environment, increasing the value we place in it, as well as communicating and engaging about it, so that we are all better connected with nature.

Greater Manchester is identified as the Urban Pioneer as part of the Government’s 25 Year Environment Plan. This means we are testing new tools and methods for investing in and managing the natural environment, so that we can have cleaner air and water, green roofs and walls, green paths and cycle networks and well managed public parks and other public green and blue spaces and infrastructure. Significant progress has been made in developing a natural capital approach and progressing our priorities.

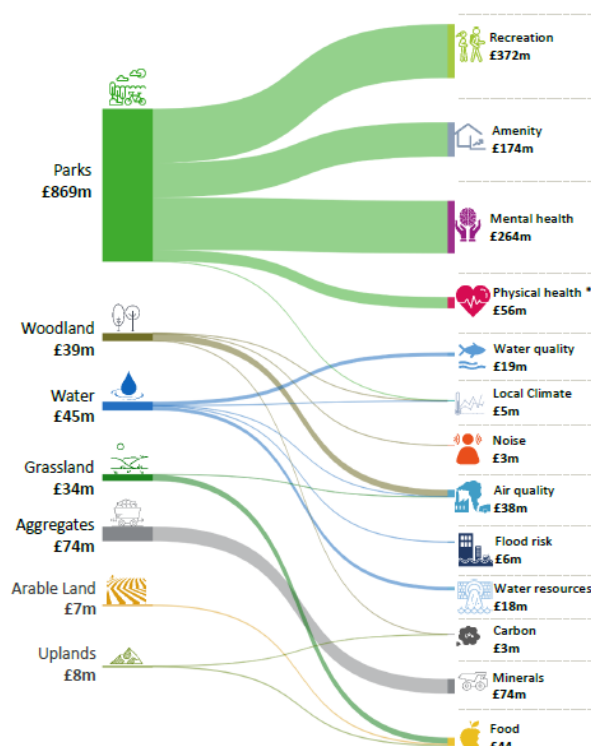
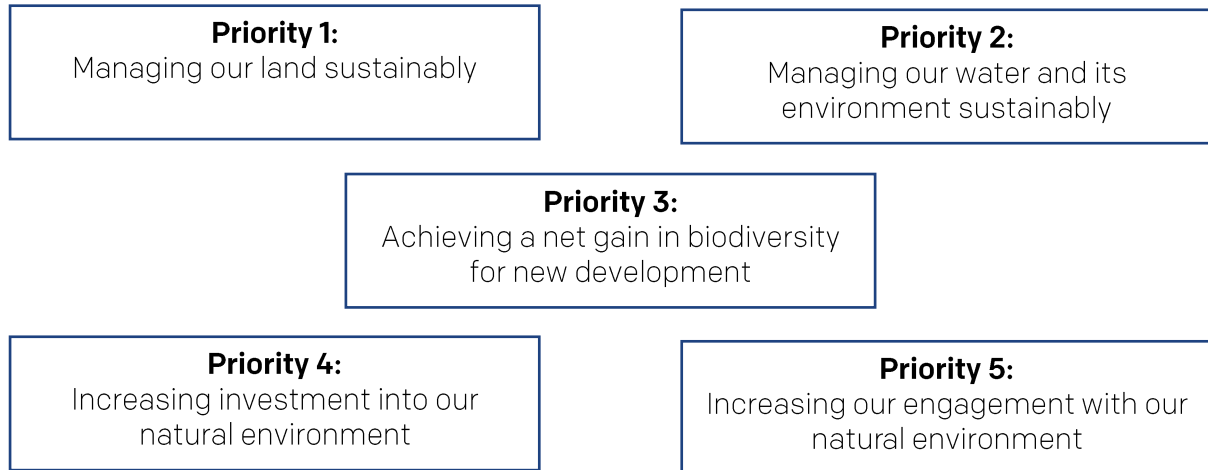


Figure 11 – The benefits from our natural environment. Source – *Urban Pioneer*²⁴

²³ <https://www.gov.uk/government/publications/25-year-environment-plan>

²⁴ <https://naturegreatermanchester.co.uk/resource/gmnaturalcapitalaccounts/>

Summary of our priorities – natural environment



SUMMARY OF OUR ACTIONS – NATURAL ENVIRONMENT:

Residents

- If you have a garden or an allotment, manage this for wildlife.
- Visit, spend time and be active in local green and blue spaces.
- Volunteer for projects that protect or improve the environment in your local area.

Businesses and other organisations

- Manage any gardens or land for wildlife
- Put in place green roofs and/or green walls and/or plant trees.
- Invest in Greater Manchester's natural environment
- Promote environmental volunteering amongst your employees

Landowners and farmers

- Enter into agri-environment agreements to fund environmental improvements on your land
- Access additional funding to create or restore ponds through new District Licensing scheme for great crested newts

Local Authorities

- Build natural capital into projects to maximise the value that the environment brings including on estates and land.

Residents

- City of Trees – develop, embed and support delivery of a Greater Manchester Tree and Woodland Strategy, contribute to 3m tree planting target and increase volunteering and engagement.
- Environment Agency – explore the development of a Natural Capital Plan for Greater Manchester and work with United Utilities to deliver the benefits of its investment across the Irwell and Upper Mersey catchments.
- Greater Manchester Health and Social Care Partnership – ensure that their approach to developing a Greater Manchester Population Health system understands the importance of the natural environment as a key wider determinant of health, and seeks to ensure that action undertaken is reflective of that understanding; promote the health benefits of green space and maximise the opportunities to incorporate this into their programmes.
- Lancashire Wildlife Trust – support delivery of the Greater Manchester Wetlands Nature Improvement Area and increase the number of people engaged with nature.
- Natural England – identify peatland restoration opportunities, new Great Crested Newt licensing scheme, lead developing biodiversity net gain guidance and explore application of green infrastructure standards and establishing of a nature recovery network.
- Royal Horticultural Society – inspire more of Greater Manchester's residents to get involved in gardening and improving their local environments, working in partnership with other community growing projects
- United Utilities – invest £300m at waste water treatment works to improve river quality (2015-2020) and implement further planned improvements in 2020-2025 business plan

Local policy

- Continue the work of the urban pioneer, embedding a natural capital approach into strategy and plan development.
- Support peatland restoration as part of Resilience Strategy.
- Support the delivery of a biodiversity net gain approach in new development.
- Support the development of a Greater Manchester Environment Fund.
- Support the implementation of the Natural Capital Investment Plan (subject to approval) to increase private sources of funding.
- Launch a programme of innovative funding mechanisms to deliver increased investment in nature-based adaptation solutions (subject to approval).

Priority 1 – Managing our land sustainably, including planting 1m trees by 2024

Scale of the challenge – “SCATTER GM” pathway 2040:

- Plant 3m trees by 2035, and a further 1-2m by 2050.
- Restore 50-75% of our peatlands.

What do we need to do?

Whilst the sustainable management of Greater Manchester’s extensive areas of open countryside is enormously important, we also need to make sure that there is an appropriate scale, type, quality and distribution of urban green space that can support a high quality of life and other important environmental and ecosystem services. These make a huge contribution to quality of life, promote good mental and physical health, create liveable places, improve our resilience to climate change and support economic growth. To ensure we continue to receive these benefits now and into the future, we must seek to protect, maintain and enhance our green features.

Our land also plays a critical role in adapting to and mitigating the impacts of climate change. Our trees and peatlands are important in taking up and storing CO₂.

Where are we now?

Outside of urban areas, over 7,000 hectares (or 5.6% of the city region’s total land area) of land is managed under agri-environment agreements, which provide funding for farmers, woodland owners, foresters and land managers to make environmental improvements to land. Alongside this, a number of partnerships and programmes are delivering projects to protect, maintain and enhance our green features across Greater Manchester. For peatland restoration these include the Great Manchester Wetlands Nature Improvement Area, the Carbon Landscape Programme and Moors for the Future. Peatland restoration will also be a key theme within the Greater Manchester Resilience Strategy 2030 and further work is required to identify opportunities for further peatland restoration and their contribution to reducing CO₂ emissions. City of Trees has a target to plant at least 3 million trees in Greater Manchester over the next 25 years as Greater Manchester’s contribution to the Northern Forest. Whilst new planting will be essential, it will also be important to maintain and manage existing trees and woodland which will be reflected as part of the emerging Greater Manchester Tree and Woodland Strategy.

Greater Manchester is also developing its own access to green space (ANGSt) and Green Infrastructure standards to ensure there is sufficient quantity and quality of green features to meet the needs of residents. A number of initiatives are being delivered at a local level within the urban areas, including community food growing projects led by the Royal Horticultural Society, the Kindling Trust and other gardening/community growing organisations.

What do we need to do over the next 5 years?

Residents – what we can do now:

If you have a garden or an allotment, manage this for wildlife. This includes avoiding the use of artificial grass and paving over your garden. Advice on how to make your garden wildlife friendly is available online, including from the Wildlife Trusts (<https://www.wildlifetrusts.org/gardening>), RHS (<https://www.rhs.org.uk/get-involved/wild-about-gardens>) and RSPB (<https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/>) or if you are interested in tree planting from City of Trees (<http://www.cityoftrees.org.uk/about-city-trees>).

Businesses and organisations – what we can do now:

If your premises has a garden or land that you are responsible for managing, manage it for wildlife. Advice on how to make your garden wildlife friendly is available online, including from the Wildlife Trusts (<https://www.wildlifetrusts.org/gardening>), RHS (<https://www.rhs.org.uk/get-involved/wild-about-gardens>) and RSPB (<https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/>) or if you are interested in tree planting, from City of Trees <http://www.cityoftrees.org.uk/about-city-trees>

If your premises has a roof or you lease your premises and can influence your landlord, explore putting in place green roofs and/or green walls and/or plant trees, helping to cool urban areas and create homes for wildlife.

Landowners and farmers:

If you are a farmer, woodland owner, forester or land manager, funding is available to make environmental improvements on your land through the Countryside Stewardship Scheme (<https://www.gov.uk/government/collections/countryside-stewardship-get-paid-for-environmental-land-management/>). Support and advice from conservation charities, such as RSPB and the Wildlife Trusts and from City of Trees on tree planting and woodland management (<http://www.cityoftrees.org.uk/>).

Additional funding will be available to landowners to create or restore ponds through new District Licencing scheme for great crested newts.

[City of Trees \(CoT\):](#)

CoT will continue to develop the Greater Manchester Tree and Woodland Strategy and work with partners to embed it at a local level in policy and to then support its delivery. This includes woodland management and widespread tree planting to contribute to Greater Manchester's initial 3m target as part of the Northern Forest; as well as tree planting in towns and cities to increase the resilience of our urban centres. The growing Citizen Forester programme will greatly increase volunteering and engagement opportunities in the natural environment for individuals, communities and businesses.

[Natural England \(NE\):](#)

NE will work with partners to identify restoration opportunities for our upland and lowland peatlands including on-going support for the Greater Manchester Wetlands Nature Improvement Area and Carbon Landscape Programme. NE will also deliver a new scheme for Great Crested Newt Licencing which will support pond restoration and creation across Greater Manchester.

[Royal Horticultural Society \(RHS\):](#)

The RHS will inspire more residents to get involved in gardening and improving their local environments, including through campaigns like Britain in Bloom and the Campaign for Schools Gardening, and through partnerships with other community growing projects. This will include supporting residents and landowners, highlighting the health and wellbeing benefits of gardening and engaging with nature and making these benefits available to local residents through social prescribing.

[Local Authorities:](#)

GMCA and LA will embed a natural capital approach, including on their estates and land

[Local policy:](#)

GMCA and LAs will embed a natural capital approach into strategy and plan development.

GMCA and LAs will support peatland restoration approaches and provide a clear framework for approach and delivery as part of the development of a Resilience Strategy.

Priority 2 – Managing our water and its environment sustainably

Where do we need to get to?

There are over 2400 km²⁵ of rivers within Greater Manchester, in addition to over 150 km of canals, which provide a unique opportunity to contribute to the quality of the local natural

²⁵ Source: Environment Agency

environment. By 2027, waterbodies within Greater Manchester will be expected to have achieved required environmental targets and support cleaner water, better managed habitats and more naturally functioning and resilient water bodies²⁶. At the same time, population growth, new development and climate change will place increasing pressure on Greater Manchester's drainage and sewerage systems as well as flood defences. There will need to be a shift to more nature-based solutions (e.g. natural flood management) to support traditional flood alleviation schemes and catchment-wide approaches in upland and more rural areas. In the urban areas, we will need to promote combined sustainable drainage solutions which will be essential to improving local water quality, mitigating flood risk and heat stress as well as providing additional benefits such as biodiversity and greenspace.

Where are we now?

Over 70% of waterbodies in Greater Manchester bear little resemblance to their natural state. Since the start of the industrial era they have either been straightened, de-naturalised and, in many cases, buried. In ecological terms, over 90% of waterbodies in Greater Manchester fail to meet their objectives under legislation, with most only reaching 'moderate' status.

United Utilities' on-going programme of 5-year investment plans and enhanced regulation by the Environment Agency are tackling water quality issues whilst 4 catchment partnerships across Greater Manchester are delivering improvements at the local level. This is supported by "Natural Course," an EU Life Integrated Project which includes a focus on the River Irwell Catchment. Further work is required to support organisations to come together and build capacity to deliver more innovative and integrated water management solutions to tackle issues such as diffuse pollution. The EU Urban Innovation Action funded IGNITION project (subject to approval) will look at ways of drawing in private investment to make urban areas more resilient to climate change through interventions such as sustainable urban drainage.

What do we need to do over the next 5 years?

United Utilities (UU)

As the company managing the water and waste water network in Greater Manchester, UU is a key partner in this priority. UU is committed to protecting and enhancing habitats and wildlife across their operations to have a positive impact on the natural environment. They are committed to continue working with partner organisations across Greater Manchester to fundamentally change how they work together to deliver environmental investment. Targeted investment over the most recent five year business plan (2015 -2020) has seen investments of over £300m being spent at waste water treatment works in Greater Manchester to improve river water quality. They have further planned improvements as part of their 2020-2025 business plan, which will be developed with Ofwat by the end of 2019.

²⁶ The EU Water Framework Directive covering water quality aims to ensure that all water bodies reach "good ecological status" by 2027.

[Environment Agency \(EA\)](#)

The EA will work with UU to deliver the benefits of the Water Company Investment Programme across the four catchments within Greater Manchester.

Priority 3 – Achieving a net gain in biodiversity for new development

Where do we need to get to?

In addition to a range of important sites designated for their high nature conservation value, biodiversity is supported by a wider network of green spaces. With better investment and management to improve the quality and quantity of air, land and water, we could also increase biodiversity across Greater Manchester.

If we are to achieve our ambitions, new developments will need to deliver a net gain in biodiversity. We are focused on biodiversity net gain as a first step towards setting a framework for wider environmental net gain, which could include managing flood risk or access to the green space.

We also need a wider strategy for nature recovery, including habitat restoration and creation, and the transformation of broad landscape areas into diverse and interconnected ecological networks. This could be achieved through development of a Greater Manchester Nature Recovery Network.

Where are we now?

The current planning approach is one of no net environmental loss. This needs to shift to an environmental net gain principle for development with an aim to safeguard and enhance our green and blue infrastructure. Natural England is leading on developing an approach for embedding a biodiversity net gain into the planning system, ensuring new developments are having a positive environmental impact and not resulting in net loss of biodiversity (and the ecosystem services they provide). Biodiversity net gain approach is the first step towards embedding an environmental net gain approach for Greater Manchester. Guidance is required to support developers and local planning authorities to implement these requirements.

What do we need to do over the next 5 years?

Natural England (NE)

NE will lead the development of Biodiversity Net Gain Guidance for Greater Manchester supporting the policy set out in the Greater Manchester Spatial Framework. Linking to wider net gain and green infrastructure policies, NE will explore with partners how the national framework of green infrastructure standards being developed can be applied in Greater Manchester. NE will also explore the establishment of a Nature Recovery Network.

Local policy:

GMCA and LA will support the delivery of biodiversity net gain through the Greater Manchester Spatial Framework.

Priority 4 – Increasing investment into our natural environment

Where do we need to get to?

How protection and enhancement of our natural environment is funded needs to change. We need to mobilise existing and new sources of funding to increase investment in our natural environment from private sector and alternative sources that, as well as resulting in a positive impact on the environment, also provide a return to the investor.

Where are we now?

Outside the public sector, investment in natural capital has traditionally drawn upon philanthropic sources such as trusts and foundations, NGOs and lottery funds. To address this, the Greater Manchester Natural Capital Investment Plan aims to broaden the range of potential sources of investment in natural capital, increasing their accessibility to attract potential investors. The plan recommends a number of time-bound actions to deliver the investment plan. This includes setting up an Investment Readiness Fund as well as a Project Delivery Unit to support the delivery of a range of natural capital projects. In the first instance this will focus on nature-based adaptation projects at the larger scale through the European Union Urban Innovation Action funded IGNITION project (subject to approval). GMCA is also supporting the development of a Greater Manchester Environment Fund which would provide the opportunity to invest in projects delivering environmental benefits across Greater Manchester.

What do we need to do over the next 5 years?

Businesses – what we can do now:

Invest in Greater Manchester's natural environment (see: <https://naturegreatermanchester.co.uk/project/greater-manchester-natural-capital-investment-plan/>).

Local policy:

GMCA and LA will support the development of a Greater Manchester Environment Fund to increase other sources of investment in the natural environment.

GMCA and LA will support the implementation of the Natural Capital Investment Plan to increase private sector and alternative sources of funding for a range of natural capital projects.

Subject to formal approval, GMCA and LAs will establish a programme of innovative funding mechanisms to deliver increased investment in nature-based adaptation solutions as part of the IGNITION project (subject to approval) (see section 3.3.6).

Priority 5 – Increasing our engagement with our natural environment

Where do we need to get to?

We need to further develop a natural capital approach in the development of strategies, plans and projects and at the same time widen our engagement to increase the number of us valuing and connecting with the natural environment. This includes building on and using the evidence to understand the wider benefits and value that our natural environment provides to society.

Where are we now?

Further work is required to encourage the use of natural capital as a tool, with a more green and blue infrastructure led design approach, to become common-place in key choices and decision making, to give due regard to the environment as an asset to the overall economy and people's health. With the Urban Pioneer Programme due to draw to a close in March 2020, we need to explore whether we should develop a natural capital plan for Greater Manchester as a continuation, building on the natural capital approach we have developed, including our natural capital accounts²⁷.

There is growing awareness, backed by on-going research, that we are increasingly recognising the social, health, environmental and economic benefits that nature can deliver, particularly in city regions. In addition to the wider range of community led activities in Greater Manchester, key initiatives such as the Natural Capital Groups "connecting people with nature" website, City of Trees' "Citizen Forester" programme and Lancashire Wildlife Trust's "My Wild City" campaign are delivering new engagement approaches with the public and other stakeholders to celebrate and protect nature.

²⁷ <https://naturegreatermanchester.co.uk/resource/gmnaturalcapitalaccounts/>

What do we need to do over the next 5 years?

Residents – what we can do now:

Visit, spend time and be active in our green and blue spaces. There are many parks, green spaces, riversides and canals (see: <https://naturegreatermanchester.co.uk/discover/>), as well as over 90 local nature reserves in Greater Manchester that you could visit (see: <https://designatedsites.naturalengland.org.uk/>)

Volunteer for projects that protect or improve the environment in your local area (see here for a list of organisations you could help: <https://naturegreatermanchester.co.uk/get-involved/>).

Businesses and organisations – what we can do now:

Promote environmental volunteering amongst your employees – a list of potential organisations you could partner with is available here: <https://naturegreatermanchester.co.uk/get-involved/>.

City of Trees (CoT):

CoT's growing "Citizen Forester" programme will greatly increase volunteering and engagement opportunities in the natural environment for individuals, communities and businesses

Environment Agency (EA):

The EA will work with GMCA and other partners to explore the development of a Natural Capital Plan for Greater Manchester to build on the work of the Urban Pioneer.

Greater Manchester Health and Social Care Partnership (GMHSCP)

GMHSCP will ensure that their approach to developing a Greater Manchester Population Health system understands the importance of the natural environment as a key wider determinant of health, and seeks to ensure that action undertaken is reflective of that understanding. They will promote the health benefits of green space to their staff, patients and the wider community and will maximise the opportunities to incorporate this into their programmes such as, but not exclusive to, those relating to Person and Community Centred Approaches (PCCA), Physical Activity, Mental Wellbeing and Clean Air. Where possible, GMHSCP will maximise the availability of green and natural areas on estates.

[The Lancashire Wildlife Trust \(LWT\):](#)

LWT will support the delivery of Greater Manchester Wetlands Natural Improvement Area. This essential network of wildlife corridors will provide the stepping stones to link biodiversity across the landscape and allow wetland habitats to thrive and survive. This work also includes the Carbon Landscape Project, delivering £3m of community, skills, education, heritage, access and habitat restoration and connection projects over 5 years and the My Wild City Project, increasing the number of people engaged with nature.

[Royal Horticultural Society \(RHS\):](#)

The RHS will help to inspire and train the next generation of horticulturalists at Bridgewater by hosting up to 7,000 free school visits per year, by creating hundreds of opportunities for volunteering, and up to 20 apprenticeships and traineeships at a time.

[Local policy:](#)

GMCA and LA will, with the support of partners, develop a natural capital stakeholder engagement programme. This will aim to engage more people in the natural environment and increase the understanding and use of natural capital as an approach amongst key stakeholders and in wider plans, programmes and projects.

What do we need from national government across these 5 priorities?

Meeting our ambition and increasing the multiple benefits that come from investment in our natural environment require long-term sustainable funding. We need commitment from government on increasing public funding into the natural environment, as well as catalysing private investment in natural capital at a national scale.

3.3.6 Our resilience and adaptation to climate change

Summary

We are already experiencing impacts from a rapidly changing and increasingly extreme climate. These impacts are projected to increase over time and risk holding back our efforts to deliver our wider ambition to make our city-region one of the best places in the world to grow up, get on and grow old.

We need to continue to enable our citizens, communities, businesses and infrastructure to have the capacity to survive, adapt and grow in the face of these challenges. Resilience is therefore about how our city region can meet its ambitions whilst ensuring it is safe and secure, is addressing its key vulnerabilities and can meet expected or unexpected disruptive challenges. These efforts and investments need to be underpinned by robust action on climate adaptation to protect the most vulnerable communities (who are often the most exposed and least able to deal with climate change impacts), our economy, key infrastructure and our natural environment.

We face challenges in doing this, including in understanding the exact level and location of risk, in embedding resilience across wider policies and the complexity of the landscape of public and private investment and services across numerous organisations. To start to address these challenges, we need to ensure that, as a result of any activities, we do not increase the level of climate risk faced by future generations and work in way which proactively reduces climate risks and increases our resilience. Turning this ambition into a reality will represent a step change in our climate adaptation and resilience approach across a wider range of stakeholders within the city region.

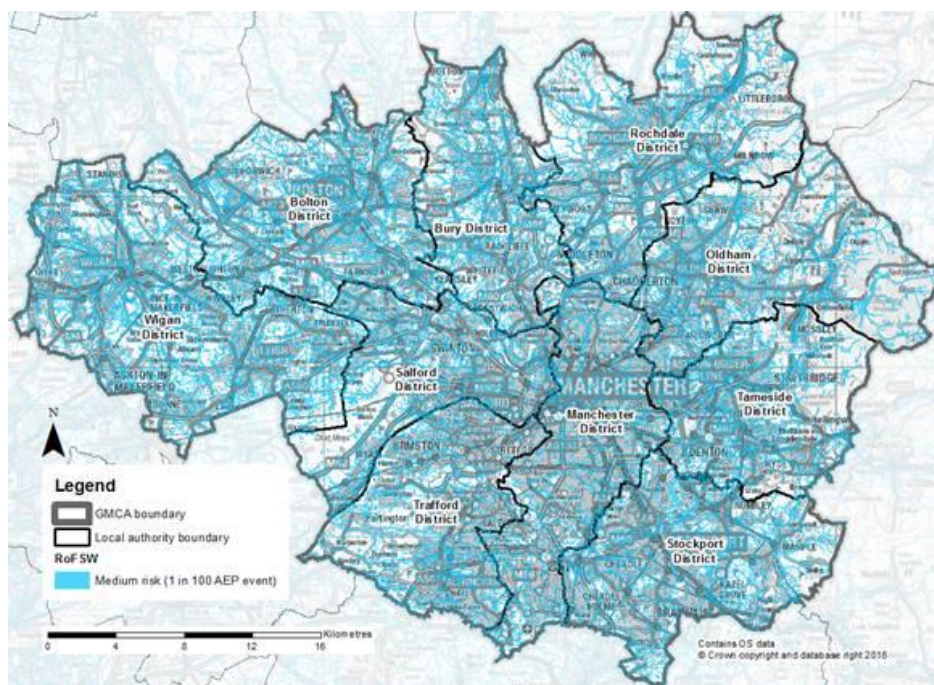


Figure 12 – Surface water flood risk across Greater Manchester (1 in 100 AEP event)

Source: Greater Manchester Strategic Flood Risk Management Framework²⁸

²⁸ <https://www.greatermanchester-ca.gov.uk/media/1726/gmca-final-strategic-sfra-framework-january-2019.pdf>

Summary of our priorities – resilience and adaptation to climate change

Priority 1:

Embedding climate change resilience and adaptation in all policies

Priority 2:

Increasing the resilience of and investment in our critical infrastructure

Priority 3:

Implementing a prioritised programme of nature-based climate adaptation action

Priority 4:

Improving monitoring and reporting

SUMMARY OF OUR ACTIONS – RESILIENCE AND ADAPTATION TO CLIMATE CHANGE

Residents

- Check if you are at risk of flooding and sign up for flood warnings.
- If in a flood risk area, make your home more resilient.
- Check if you have the right level of insurance.
- In extremely hot weather, look after yourself and neighbours/more vulnerable.
- Use water efficiently and install a water meter.

Other key partners

- United Utilities – deliver £100-250m of additional investment for long-term resilience projects (2015-2020) and manage drought (as per 2018 Drought Plan).
- Other infrastructure providers – support the development of the Resilience Strategy
- Environment Agency – manage government investment of £46m by 2021, protecting over 1,300 properties.

Businesses and other organisations

- Check if you are at risk of flooding and sign up for flood warnings.
- If in a flood risk area, make your premises more resilient and link up with neighbouring properties.
- Check if you have the right level of insurance.
- Put in place green roofs and/or green walls and/or plant trees.
- Use water efficiently and install a water meter.

What we need from government policy

- Continued and increased funding to support the flood and coastal risk management programme

Local policy

- Develop a Resilience Strategy, with a roadmap published in 2019.
- Undertake a Strategic Flood Risk Assessment to ensure future growth aspirations consider flood risk.
- Implement proposals to manage flood risk and the water environment in new development.
- Develop an Infrastructure Strategy to address our key infrastructure challenges relating to flood risk and resilience.
- Development by 2021 an investment strategy for future flood risk infrastructure.
- Subject to formal approval, GMCA establish a programme of innovative funding mechanisms to deliver increased investment in nature-based adaptation solutions (INGITION).
- Consider the development of appropriate indicators to monitor and evaluate how prepared we are for the future impacts of climate change.

Priority 1: Embedding climate change resilience and adaptation in all policies

Where do we need to get to?

We need to build on the work already undertaken to develop our experience of adaptation and resilience so that it becomes embedded across all strategy and policies. This will ensure all activities, no matter their aims, result in Greater Manchester becoming more resilient.

Where are we now?

GMCA is partnering with 100 Resilience Cities (pioneered by the Rockefeller Foundation) to develop the city region's first holistic Resilience Strategy. This will support us becoming more resilient to the shocks (catastrophic events like storms, pandemics and floods) and stresses that weaken our capacity of a city-region to deal with the challenges we may face, like skills shortages, population growth, homelessness, and unemployment. A roadmap for addressing the city-region's most pressing and interconnected challenges will be published in 2019.

To understand the challenges of flood risk and future climate change pressures on growth across the city region, a Strategic Flood Risk Assessment is being undertaken to support the Greater Manchester Spatial Framework. This will look to widen our understanding of critical knowledge gaps, new climate change projections and start to identify strategic flood risk management opportunities. The Greater Manchester Spatial Framework also outlines a policy approach for resilience, flood risk (including Sustainable Drainage Systems), urban greening and wider adaptation/mitigation to make sure all future development and planning decisions takes this into consideration.

What do we need to do over the next 5 years?

Local policy:

GMCA will develop a Resilience Strategy, setting out a clear approach to resilience across Greater Manchester. A roadmap will be produced in 2019.

GMCA and LAs will undertake a Strategic Flood Risk Assessment to provide the evidence base to ensure future growth aspirations consider flood risk appropriately. This will be completed in two levels – Level 1 in 2019 and Level 2 in 2019/20.

GMCA and LAs will implement a policy framework to manage flood risk and the water environment in new development through the Greater Manchester Spatial Framework.

Priority 2 – Increasing the resilience of and investment in our critical infrastructure

Where do we need to get to?

Our critical infrastructure (including transport, homes, energy and green infrastructure) needs to withstand future climate change impacts to ensure our growth aspirations are realised and productivity levels are not impeded. We need to improve our understanding of the reliance on our infrastructure networks and deliver improvements in their individual and collective resilience. This will require an understanding of the synergies and links

between different stakeholders and interdependencies of infrastructures, in particular, how we can join up to encourage action on climate change. We also need to ensure that the critical flood risk infrastructure that is required to protect the wider city region and its residents is prioritised as part of wider investment plans and strategies.

Where are we now?

Investment in flood risk infrastructure has provided additional protection to almost 11,000 properties, including from assets built and maintained by the Environment Agency. A large majority of these are from operational work in clearing debris screens to prevent blockage of historic culverts across South Manchester (5800) with the remainder from formal assets such as walls, embankments, control structures and pumping stations at key locations (e.g. Salford and Mersey Flood basins).

However, there is still significant investment required to ensure the standards of protection afforded residents is increased. Remaining capital projects within the Flood Risk and Coastal Management programme (2015-2021) for Greater Manchester will be looking to protect over 1300 homes and Environment Agency projects alone are estimated to be in the region of over £46 million. Beyond this programme, further projects will need to be developed to protect over 10,000 properties at a current estimated cost in the region of £230 million. Funding of these will require partnership contributions to be eligible for government funding and we will need to work collaboratively to identify an investment strategy to facilitate this.

Resilience of other critical infrastructures (e.g. transport, energy and green infrastructure) is essential for Greater Manchester to continue to grow as a successful city region. Physical infrastructure is owned and managed by a wide range of organisations, at local and national levels. The management of these systems, and their interconnections, can make it difficult for infrastructure to respond to change. For these reasons, the GMCA has committed to produce a holistic, cross-sector Infrastructure Strategy. The first step towards this has been the development of an overarching Infrastructure Framework to set the key issues and priorities that need to be addressed.

In terms of water supply, there are no deficits forecast for Greater Manchester and, despite population and economic growth, there is expected to be a reduction in potable water demand over time, which we all need to take action to help realise.

What do we need to do over the next 5 years?

GM Residents – what we can do now:

Check if you are in an area at risk of flooding and sign up for flood warnings

(<https://www.gov.uk/check-flood-risk>)

For properties in flood risk areas, think about measures to make your home more resilient such as installing flood gates, fitting pumps or raising vulnerable electrics

(<https://www.gov.uk/government/publications/prepare-your-property-for-flooding>)

Check if you have the right level of insurance. Further advice can be found on the National Flood Forum: (<https://nationalfloodforum.org.uk/working-together/working-with-professional-partners/flood-information-advice-services/>)

In extremely hot weather think about measures to keep temperatures down and supporting family members/neighbours who are more vulnerable. The NHS has produced a free guide for staying safe:

(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/525358/Beattheheatstaying-safe-in-hot-weather.pdf)

Use water efficiently – United Utilities have produced a free guide to saving water in the home (<https://www.unitedutilities.com/globalassets/documents/pdf/a-guide-to-using-water-wisely-acc17.pdf>).

Consider installing a water meter – it could significantly reduce your water bill

(<https://www.unitedutilities.com/my-account/all-about-water-meters/>)

GM Organisations and Businesses – what we can do now:

Check if you are in an area at risk of flooding and sign up for flood warnings

(<https://www.gov.uk/check-flood-risk>)

For properties in flood risk areas think about resilience measures to protect both the building and stock and write a flood plan. You may wish to invest in flood protection measures by linking up with neighboring properties.

(<https://www.gov.uk/government/publications/prepare-your-property-for-flooding>)

Check if you have the right level of insurance. Further advice can be found on the National Flood Forum: (<https://nationalfloodforum.org.uk/working-together/working-with-professional-partners/flood-information-advice-services/>)

Use water efficiently – United Utilities have produced a free guide to saving water in the home (<https://www.unitedutilities.com/globalassets/documents/pdf/a-guide-to-using-water-wisely-acc17.pdf>).

If you can, consider installing a water meter – it could significantly reduce your water bill

(<https://www.unitedutilities.com/my-account/all-about-water-meters/>)

United Utilities:

As a risk management authority, United Utilities has a major role in managing flood risk to water supply and to their own infrastructure. Specifically:

- United Utilities' business plan commits to delivering additional investment (from £100million to £250million) for long-term resilience projects through Asset Management Period 6 (AMP6) between 2015-2020.
- United Utilities will manage drought (as outlined within the Drought Plan 2018) to ensure the right balance between water supply and environmental protection.

Other Infrastructure Providers:

Through the Greater Manchester Infrastructure Framework, there is a commitment that other infrastructure providers will support the resilience strategy to understand what is required to make sure our 'infrastructures' and the interdependences between them are resilient. Many of these providers are also required under the 2008 Climate Change Act to periodically report on how they are addressing current and future climate risks to Government.

Environment Agency:

The Environment Agency will continue to manage the government's investment programme to reduce flood risk and coastal erosion. This includes project delivery and allocation of funding to lead local flood authorities. The current programme is due to end in 2021 and will seek to deliver schemes to protect just over 1300 properties with Environment Agency led schemes alone costing just over £46 million. Beyond this, a new programme will need to be agreed with the North West Regional Flood and Coastal Committee in collaboration with other Risk Management Authorities.

Local Authorities:

GMCA's and LAs will look to invest in the resilience of their infrastructures and building stock where supported by evidence. In their role as Lead Local Flood Authority, LAs will be responsible for the delivery of projects allocated to them within the flood risk investment programme.

Local Policy:

GMCA and LAs will collaborate with infrastructure providers to develop a Greater Manchester Infrastructure Strategy. This will build on and address the key challenges set out in the Infrastructure Framework published in January 2019, which included infrastructure maintaining and/or reducing flood risk and it being resilient to future shocks and stresses.

GMCA and LAs will develop an investment strategy for future flood risk infrastructure. This will deliver a key aim from the Infrastructure Framework to support future growth and consider standards of protection required for Greater Manchester.

Priority 3: Implementing a prioritised programme of nature-based climate adaptation action

Where do we need to get to?

Underpinned by risk assessment and climate adaptation planning, we need to develop, agree and embed a programme of action based on urban green infrastructure (or nature based solutions) to combat over-heating (provision of shade and evaporative cooling) as well as the flow of excess water caused by extreme weather events. Nature-based solutions have wider benefits, helping to improve air quality, biodiversity, attractiveness of places as well as the health and well-being of citizens.

Where are we now?

Through the IGNITION project (subject to formal approval), part of a European Commission initiative to identify and test new solutions related to sustainable urban development, the GMCA and its partners will seek to establish innovative Nature Based Solutions funding and delivery mechanisms to increase Greater Manchester's urban green infrastructure coverage by 10% by 2038.

What do we need to do over the next 5 years?

GM Organisations and Businesses – what we can do now:

If your premises has a roof or you lease your premises and can influence your landlord, explore putting in place green roofs and/or green walls and/or planting trees, helping to cool urban areas and create homes for wildlife.

Local policy:

Subject to contracting, GMCA and LAs will establish a programme of innovative funding mechanisms to deliver increased investment in nature-based adaptation solutions. The project (IGNITION) would conclude by 2022 and is part of the wider approach to securing greater investment in our natural environment (see section 3.3.5)

Priority 4 – Improving monitoring and reporting

Where do we need to get to?

Monitoring and evaluation is critical, so that we can identify how best to reduce vulnerability and build resilience to climate change. This is complex, so clear indicators need to be developed to understand how Greater Manchester is prepared for future impacts and that this can be monitored over the long term.

Where are we now?

We need to consider further the development of a number of appropriate indicators, continuing in partnership with the Rockefeller 100 Resilient Cities progress. The IGNITION project (subject to formal approval) will also include monitoring and evaluation of the climate resilience impact of the programmes of nature based solutions that are developed.

What do we need to do over the next 5 years?

Local policy:

As part of the development of the Resilience Strategy and IGNITION project, GMCA and LAs will consider the development of appropriate indicators to monitor and evaluate how prepared we are for the future impacts of climate change.

4. HOW WILL WE TRACK PROGRESS?

GMCA will report annually on progress with delivering the plan on behalf of Greater Manchester against a set of key indicators drawn from existing data. This will be aligned to reporting against the priorities set out in the Greater Manchester Strategy. GMCA and LAs will continue to work with partners to explore which existing datasets can allow progress against this plan to be tracked in the most robust and transparent way possible.

For commitments made by GMCA, LAs and others in this plan relating to their operations, governance arrangements will be established to track and report on progress in a coordinated way across organisations.

A list of potential measures is set out below, which will be further developed as set out in the relevant parts of the plan.

Measuring progress against our aims:

Aim	Measure
1	CO ₂ emissions produced within the city region (BEIS data produced 18 months in arrears)
2	Concentrations of NO ₂ and PM

Measuring progress against our priorities:

[Our energy supply:](#)

Priority	Measure
1	Additional renewable capacity created within Greater Manchester (MW)
2	Additional energy from low carbon heat sources (TWh)
3	Number of rapid charge points installed
4	Amount of flexible and diverse load available (MW)

[Our transport and travel:](#)

Priority	Measure
1	Ratio of journeys made by car to those made by sustainable modes of travel
	Proportion of all journeys made by cycling and walking
2	Total number of plug-in vehicles registered licensed in Greater Manchester
	Number of rapid charge points installed
3	Proportion of new buses entering the fleet that are zero emissions
3	Proportion of the total bus fleet that are zero emissions

[Our homes, workplaces and public buildings:](#)

Priority	Measures
1	Number of whole house retrofits carried out
	Energy Performance Certificate ratings of homes
2	Display Energy Certificate ratings of public buildings

[Our production and consumption of resources:](#)

Priority	Measures
1	Increased resource efficiency (GVA) - to be further developed as part of this plan
2	Domestic waste production (kg/head) Avoidable single use plastic waste streams taken out of use on public estate
3	Municipal recycling rates (% of waste recycled)

[Our natural environment:](#)

The Greater Manchester Natural Capital Group will develop and refine how we measure change in our natural environment which will include consideration of the following.

Priority	Measures
1	Peatland restoration and management for carbon sequestration – to be developed further as part of this plan Number of trees planted Tree canopy cover
	People living within the Natural England ANGST Standards ²⁹
2	Kilometres of waterbodies enhanced
3	To be developed further as part of the Greater Manchester Spatial Framework
4	Non-public investment secured in implementing the Natural Capital Investment Plan
5	Engagement of people with the natural environment (MENE survey ³⁰)

[Our resilience and adaptation to climate change:](#)

As part of the development of the actions within this plan, GMCA and LA will consider the development of appropriate indicators to monitor and evaluate how prepared we are for the future impacts of climate change. Sources of information include the following:

Priority	Measures
2	Number of planning permissions granted contrary to EA advice on flood risk
2	Number of households moved to a lower probability flood risk category
3	Uplift in urban green infrastructure – to be developed as part this plan

²⁹

https://webarchive.nationalarchives.gov.uk/20140605111422tf_/http://www.naturalengland.org.uk/regions/ea/st_of_england/ourwork/gi/accessiblenaturalgreenspacestandardangst.aspx

³⁰ <https://www.gov.uk/government/collections/monitor-of-engagement-with-the-natural-environment-survey-purpose-and-results>

5. WHAT SHOULD BE OUR APPROACH?

5.1 Our overall approach

Across the different environmental aims we have set and the actions we all need to take, we need to maximise the positive impacts on our people, economy and places, delivering economic, social and environmental benefits together in a mutually reinforcing way. This will require us all to take new approaches, across areas such as innovation and funding, to tackling the challenges we face.

5.2 Delivering environmental, economic and social benefits together

This approach is supported in the findings of the Independent Prosperity Review³¹, which recommended that we ensure that, in delivering carbon neutral living within Greater Manchester by 2038, the benefits to the economy and to health and quality of life in the city region are optimised.

5.2.1 Optimising the economic benefits

As set out in the government's Clean Growth Strategy³², in order to deliver environmental, economic and social objectives together, we need to nurture cost effective low carbon technologies, processes and systems. This also applies to our natural environment, where the economic benefits that flow from the natural assets have only recently begun to take greater prominence in policy and to be calculated (as set out in the government's 25 Year Environment Plan³³).

Careful implementation of our approach is needed so that achieving our aims does not act as a constraint on economic growth, particularly as the economy's reliance on carbon is diminished. Taking this approach will minimise costs of services, particularly energy, to our households and businesses.

We can secure first mover advantage from accelerating the transition to a low carbon economy. We already have a diverse and thriving Low Carbon Environmental Goods and Services (LCEGS) sector, which has the potential to grow further if we achieve the aims set out in our plan. It employs over 45,000 people, has annual sales of £6.7bn and growth of 6.3%, outperforming the UK average to be ranked 3rd in the UK³⁴. The sector will be integral to achieving our aims and will need to grow and adapt in order to do this, for example, in supporting the upscaling of renewable energy generation, in delivering extensive retrofit to Greater Manchester's homes and commercial/public buildings and in investing in improving our natural environment.

There are also costs of not acting. For example, extreme weather has a large impact on health services. The 2003 heatwave cost the NHS £41.4m and the economy more widely £399.8m. It is estimated that the health and social care costs of air pollution in England could reach £5.3 billion by 2035 unless action is taken. Increasing number and intensity of

³¹ <https://www.greatermanchester-ca.gov.uk/what-we-do/economy/greater-manchester-independent-prosperity-review/>

³² <https://www.gov.uk/government/publications/clean-growth-strategy>

³³ <https://www.gov.uk/government/publications/25-year-environment-plan>

³⁴ <http://www.neweconomymanchester.com/media/1758/06-lcegs-deep-dive-report-final.pdf>

extreme weather events can damage health facilities and infrastructure putting health systems under intense pressure. Moreover, the main health effects of flooding are often on mental rather than physical health. Failure to act quickly will exacerbate existing national health challenges, place undue financial strain on the NHS, and worsen health inequalities both within the UK and internationally.

5.2.2 Optimising the health and social benefits

We know that environmental actions provide significant health benefits for our population (see Figure 12 below) including cleaner air/water, healthier diets, sustainable economies, social cohesion and decreased pressures on our health system. Implementing this plan will also allow us to address health inequalities and do our part to promote intergenerational equity.

Wherever possible, this plan must interlink with prevention and health improvement efforts across Greater Manchester through LA public health teams, Public Health England and the Greater Manchester Health and Social Care Partnership. Efforts must be focused on addressing health inequalities such as the difference in life expectancy between communities. There is an 18 year gap for men and a 13 year gap for women in healthy life expectancy across Greater Manchester when comparing those areas of highest healthy life expectancy with the lowest³⁵. Low income communities are amongst those groups that are more affected by air pollution³⁶, whilst other environmental factors such as access to green space³⁷ and the quality and warmth³⁸ of housing also have a significant bearing on health.

³⁵

<https://www.research.manchester.ac.uk/portal/files/56630884/LifeandDevoHealthFundingJunePrePub2017.pdf>

³⁶ <https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>

³⁷ <https://naturegreatermanchester.co.uk/resource/gmnaturalcapitalaccounts/>

³⁸

https://webarchive.nationalarchives.gov.uk/20130105021742/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_114012.pdf

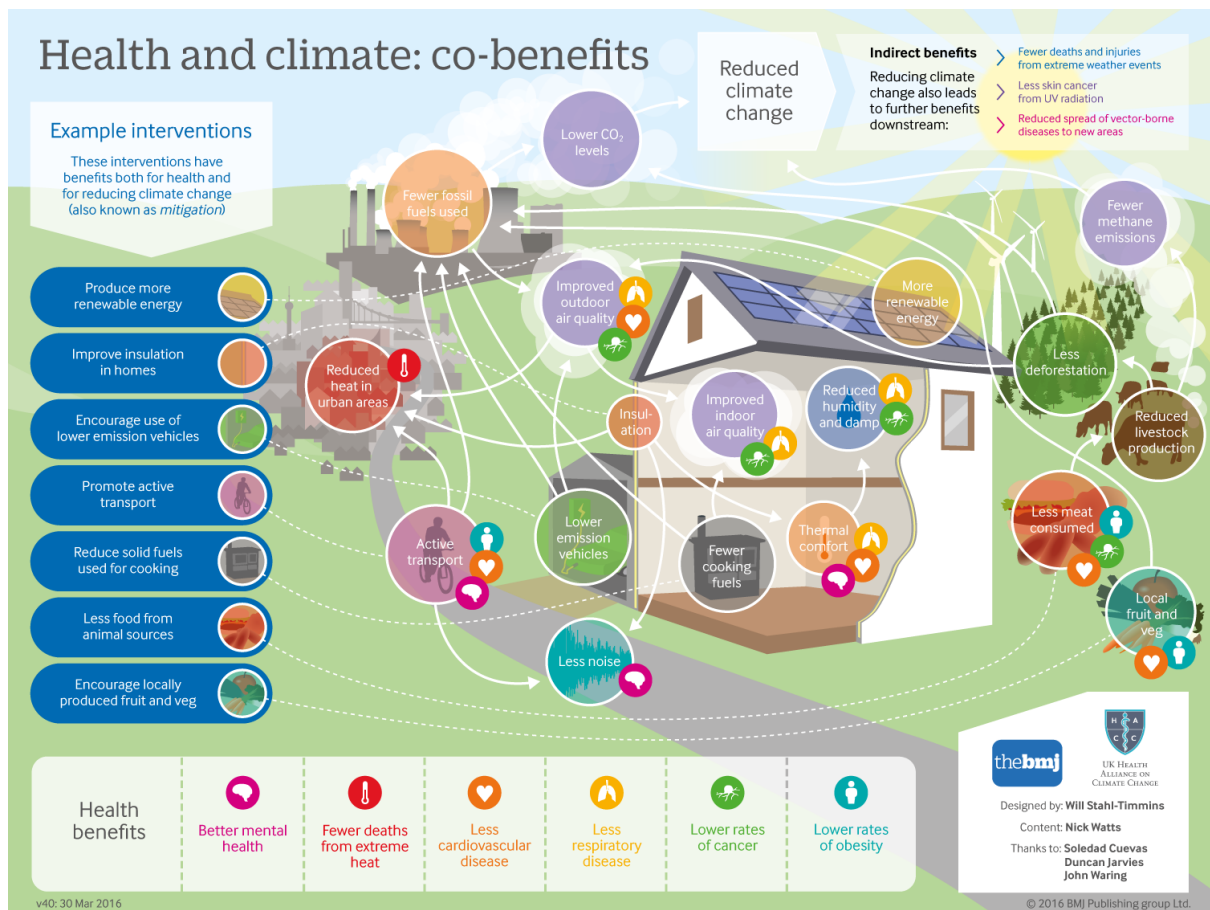


Figure 13 - Health and climate: co-benefits

Source – UK Health Alliance³⁹ ©

5.3 Doing things differently

In order to deliver our environmental vision and aims this plan sets out and to close the gap between what is needed and where we are now, we need to take different approaches to the following.

³⁹ <http://www.ukhealthalliance.org/health-climate-change/>

5.3.1 Supporting innovation

We need to work across Greater Manchester to support innovation in key areas, including the below:

- Technology innovation – providing support for the development and testing of new technologies. We need to use and build on our existing capabilities to develop, test and innovate products and services which can then be piloted at scale.
- Integration innovation – blending different technologies, processes and approaches to demonstrate or pilot.
- Delivery Innovation – testing commercial business models for roll out, marketing, engagement and overcoming non-technological barriers.

In developing the Greater Manchester Local Industrial Strategy, GMCA is working with Government to explore how to create an innovation ecosystem in Greater Manchester which would support all firms to be innovative, supporting the creation of new products and services.

The Greater Manchester Sustainable Business Partnership will collaborate together and in partnership with others and individuals to deliver meaningful change in the city-region over the next 5 years to support our environmental vision. The partnership will demonstrate leadership by focusing on new and innovative actions that support both Greater Manchester's ambitions and their own business plans, which can best be accelerated by working in partnership at the Greater Manchester scale.

5.3.2 Taking new approaches to finance and funding

Sustainable funding and financing is key to delivery. While urban areas in the UK contribute significantly to CO₂ emissions, their resource base remains weak given tax and revenue powers largely reside with national government. This constrains action at the local level and limits the ability of cities to raise and leverage private sources of investment, despite capital being readily available. In Greater Manchester, we therefore need to work across the public and private sector to take more innovative approaches to fund investment (including from private and social investors) in our infrastructure that will deliver our aims, focussing on areas where revenue models for returns on investment are, as yet, unproven.

To support this, Greater Manchester and government will need to identify, develop and implement new long-term sustainable funding models for infrastructure needed to drive inclusive growth and address the problems of long term sustainable infrastructure models.

5.3.3 Building on existing partnerships between the public, private and voluntary, community and social enterprise organisations

Professionals from the wider public continued to participate in shaping this plan during a series of workshops from October 2018 through January 2019. These workshops focused on the thematic areas of Buildings, Energy, and Sustainable Consumption & Production. Practitioners representing universities, public utilities, SMEs, VCSE and others all

contributed their practical insights to help contribute knowledge and experience as we developed the key pillars of this plan. To deliver on this plan, we need to continue this engagement, focussed around the actions set out for the next 5 years.

GMCA, LAs and TfGM will continue the engagement from the 2018 and 2019 Green Summits, taking a mission-based approach to convene key stakeholders around the key environmental challenges we face.

5.3.4 Showing leadership

Delivering the vision set out in this plan will require leadership across all parts of our city region, as individuals in our communities and as employees in our workplaces. It will also require leadership from our private and public sectors.

As **individuals and communities**, this plan summarises the actions we can all take to be leaders in making our environmental vision a reality.

Our **businesses and other organisations** have a leading role to play, both in contributing to the delivery of our aims and, for our larger organisations in particular, showing leadership to others. As well as the actions summarised in this plan, we need our businesses and other organisations to commit to monitoring and reducing, where economically viable, their CO₂ emissions in line with the required reductions set out in this plan.

As well as playing their part as organisations (see above), our **voluntary, community and social enterprise organisations** will remain key to tackling our environment challenges and engaging with a wider group of people to do so. This plan can only highlight a small part of their significant contribution this sector already plays in improving our environment.

Our **public sector** has a leading role to play. This includes national government and, in Greater Manchester, the GMCA, LA, and TfGM, as follows:

- Convening, engaging and educating – see the section below.
- Providing the right policy framework – this includes setting ambition and direction, providing a robust evidence base to inform action and, where the public sector have the policy levers available, setting a policy framework in which others can take action to help meet our aims. Such actions have been outlined throughout this Plan.
- Operations – the public sector should lead by example in putting in place actions to meet our aims. This is most effective in areas the public sector has direct operational and/or financial control over including its assets (e.g. land, buildings, vehicles) procurement and, for LAs, the development it consents. These actions have been outlined throughout this Plan.

Within the public sector, the influence and impact of the **health and social care sector** is vital to the success of this plan, both in providing relevant health messaging/intelligence about environmental impacts and ensuring we continue to build a sustainable health and care system that works within the available environmental and social resources. The devolution of health and care services and creation of the Greater Manchester Health and Social Care Partnership (GMHSCP) represents an opportunity to embed sustainable

development across NHS Trusts and Clinical Commissioning Groups in Greater Manchester and actions for these organisations have been outlined throughout this Plan.

As owners of more than 250,000 of Greater Manchester's homes, our 25 **housing providers** (GMHPs) have a leading role to play in delivering this plan, particularly in reducing CO₂ emissions from Greater Manchester's homes and from their operations.

GMCA and LAs have made a set of commitments relating to the environmental aspects of their operations, as set out in this plan.

The GMHSCP is currently developing its own sustainable development plan based on targets outlined in the NHS Long Term Plan and the NHS England sustainability indicators framework.

GMHPs have committed to act now to accelerate their decarbonisation activities, as set out in this plan.

National government controls some of the most powerful policy levers to influence our environment, including fiscal and legislative measures. This plan sets out where we need further support and action from government to achieve our aims.

5.3.5 Engaging and educating residents, communities and businesses

Who to engage?

Given the need for all of us to take action to achieve the aims in this plan, everyone needs to engage and feel empowered to act and support others to do the same. We need this agenda to become more mainstream, in particular harnessing the potential and enthusiasm of our city region's young people, engaging them in the aims and actions this plan sets out.

Workplaces also provide a way of spreading and embedding a low carbon culture. All employers are encouraged to explore schemes, such as that offered by Manchester-based charity The Carbon Literacy Trust, to engage their staff at scale. Existing Carbon Literate employers, such as those at Media City UK and Greater Manchester's social landlords, are also prepared to advise other employers on how this has worked for them.

To support this, the GMCA will make a programme of Carbon Literacy available to all young people through the Greater Manchester Career Portal by early 2020.

Who engages and how?

We need to inform and empower the leaders who communicate with our citizens to inspire people about the need for action and the ways to contribute. This should take both a top-down and bottom-up approach, recruiting advocates from all backgrounds and ages. Most of all, these advocates must be able to explain why the plan is relevant to the people they are talking to.

A substantial, continuous and relevant engagement process needs to be initiated to achieve this. As well as communication campaigns across the public sector and businesses, this could take the form of the innovative Carbon Literacy Project⁴⁰, already employed at scale by various employers and educators across Greater Manchester. Key to this will be the understanding of leaders and communicators of the aims of this plan and how the agenda applies to other key priorities such as health and the economy.

5.3.6 Upskilling our workforce

The right skills will be essential to delivering this plan. These can generally be split into two areas - 'new green' sectors (e.g. renewable energy) and existing sectors adopting green skills (e.g. construction).

- New green skills – there is a substantial skills shortage for workers in the new green economy sectors [REF!]. In some areas, we face a skills “Catch 22” – the employer demand does not exist for the level of skills delivery required by this plan, and at the same time projects for such employers are hampered by the lack of skills. It is therefore imperative to work with institutional and vocational skills providers to 'pump prime' the provision of skills appropriate to new green sectors
- Greening existing skills – the largest example of the skills gap in relation to this plan's ambitions is in whole house deep retrofit. Courses in sustainable construction exist but are thin on the ground in Greater Manchester – hampered by the situation referred to above. Rapid action to provide relevant training and ensure that the places are filled is a priority for this plan.

In addition, the GMCA will engage the LCEGS sector in BridgeGM, which links business leaders into schools and colleges, driving a gold standard approach to careers and will develop conversion courses linked to digitalisation to allow residents/employees to retrain and progress in an ever changing labour market.

5.4 Establishing a Clean Growth Mission

To support this, we want to establish a mission-oriented approach to tackling our environmental challenges. This approach involves defining a challenge and then uses this to create an ambitious goal and create a long-term policy landscape, setting out tasks that mobilise various actors to come together in new ways.

The *Independent Prosperity Review* highlighted the opportunity we have to use our ambitions to drive mission-based innovation to attract investment and bring direct benefit to residents. We want to establish the UK's first city region Clean Growth Mission for carbon neutral living within the Greater Manchester economy by 2038, driving innovation, the creation of new technologies, and improved resource efficiency. UCL-IIPP have already started worked with GMCA to begin developing this approach, exploring how it can be inspiring and measurable across the city region. Using IIPP's 'mission roadmap' format, key sectors have been identified which are best placed for cross-sector interaction; an understanding of areas of cross-sectoral interest and commonalities has started to

⁴⁰ <http://carbonliteracy.com/>

develop and is set out below. We want to establish this as the approach we will take to tackling our environmental challenges.

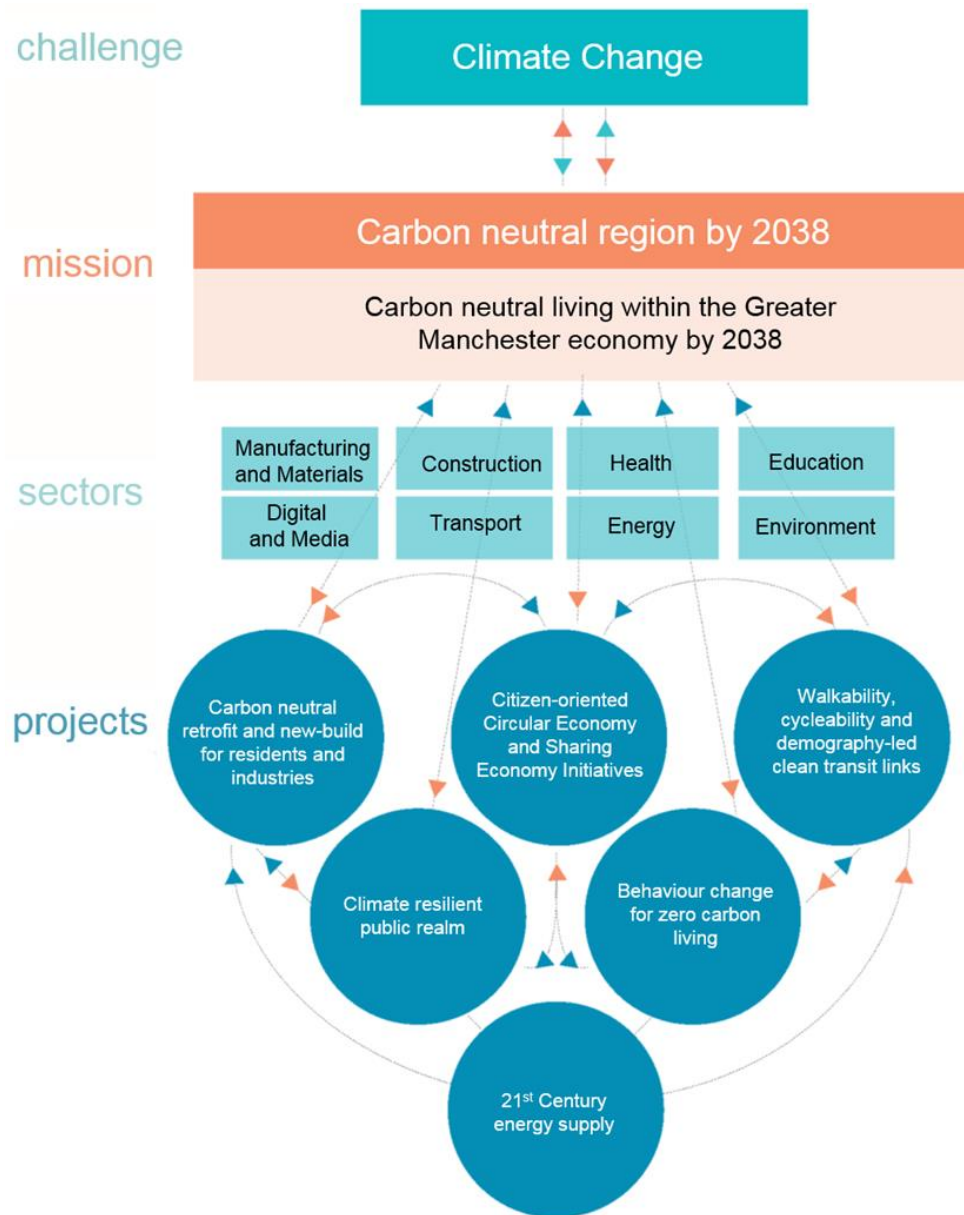


Figure 14 – A clean growth mission for Greater Manchester

Source: UCL Institute for Innovation and Public Purpose, UCL-IIPP