



5 YEAR ENVIRONMENT PLAN FOR GREATER MANCHESTER

EXECUTIVE SUMMARY

2019-2024



INTRODUCTION

Our environment in Greater Manchester underpins all aspects of our daily lives. We face urgent and significant environmental challenges in Greater Manchester. They require us all to take action now.

Greater Manchester has a history of industrial and social innovation that we need to harness. 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 environment plan brings together, and is a key part of, a set of bold plans for achieving that for our current and future generations, setting out what we all need to do to tackle those challenges and

capitalise on the opportunities and benefits that will come from taking action.

The approach taken in our plan is underpinned by 5 key principles. It is a plan that is:

1. For all of us
2. Focussed on urgent action
3. Visionary
4. Ambitious
5. To be reported on

The plan has been developed with input from countless representatives from across the city-region and the country. This form of engagement, along with the public's vision, were key foundations of the 2018

Springboard Report¹, published after the 2018 Green Summit. We need to continue this collaborative approach as we implement the actions in this plan.

¹<https://www.greatermanchester-ca.gov.uk/media/1317/springboard-report.pdf>

WHAT CHALLENGES ARE WE FACING?

The challenges we face

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

- **Challenge 1:**
Mitigating climate change
- **Challenge 2:**
Air quality
- **Challenge 3:**
Production and consumption of resources
- **Challenge 4:**
Natural environment
- **Challenge 5:**
Resilience and adaptation to the impacts of climate change

As set out in the Greater Manchester Strategy, Local Industrial Strategy and Population Health Plan², we also face a set of broader challenges to our:

- **Places** – the need to create vibrant and sustainable places in our city region.
- **Economy** – the need to increase productivity.
- **People** – the need to improve the health and quality of life of our residents.

In tackling our environmental challenges, we must harness the potential for delivering economic, social and environmental benefits together.

The threat of climate change – reducing our carbon dioxide (CO₂) emissions

Mitigating climate change is the most significant of our environmental challenges. We need to make our fair contribution to global commitments aimed at limiting global temperature rise.

Research was carried out in 2018 by the Tyndall Centre for Climate Research³ to calculate what a fair contribution looks like for Greater Manchester. It concluded that urgent action was needed 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.

²<http://www.gmhsc.org.uk/wp-content/uploads/2018/04/GM-Population-Health-Plan-Full-Plan.pdf>

³https://www.research.manchester.ac.uk/portal/files/83000155/Tyndall_Quantifying_Paris_for_Manchester_Report_FINAL_PUBLISHED_rev1.pdf

Models of potential emission reduction pathways

Greater Manchester Combined Authority (GMCA) commissioned research to understand potential carbon reduction pathways to implement these recommendations using a model called SCATTER (Setting City Area Targets and Trajectories for Emissions Reductions)³. This provides different pathways depending on local decisions taken across over 40 different interventions, which can each be implemented to 4 different extents.

Figure 1 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 emissions of nearly 20% above the Tyndall Centre's recommended budget are produced by 2050.

- Under the "SCATTER GM" pathway (an estimate of what is currently planned and what might be achievable in the future) emissions of over double the Tyndall's recommended budget are produced by 2050.

This means that there is a gap between what we know we need to achieve, and what we believe is immediately possible. The plan therefore sets out actions that everyone can take now, whilst accepting that future innovation will be required to accelerate carbon reduction

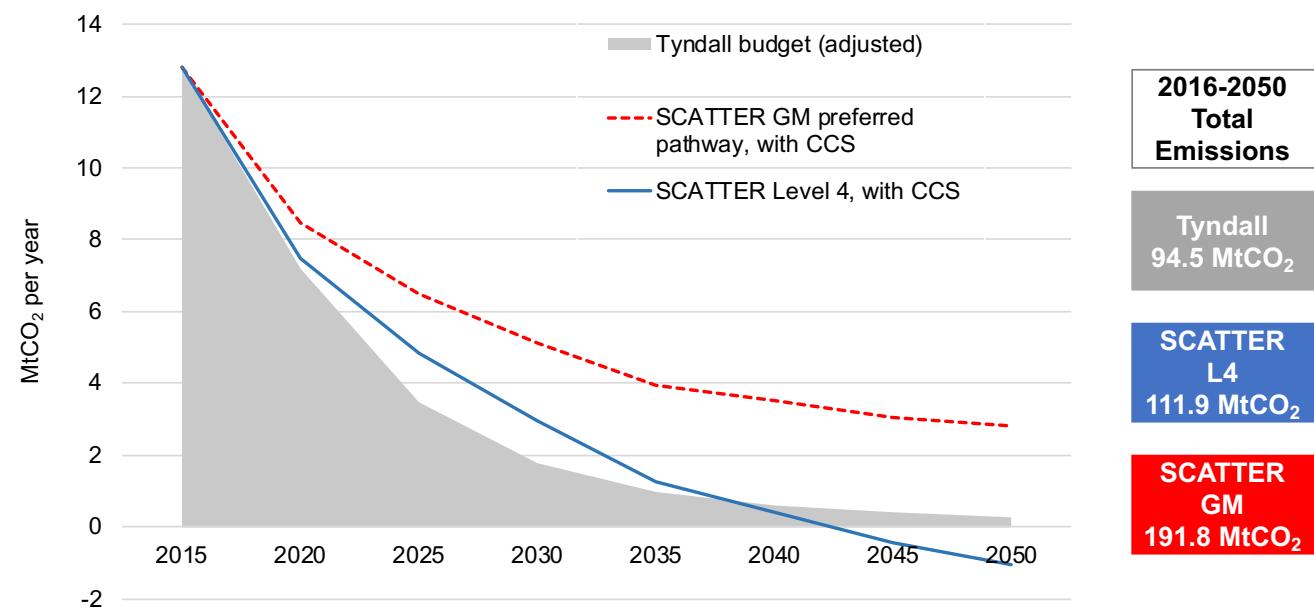


Figure 1 – Potential Carbon Reduction Pathways for Greater Manchester; Source: Anthesis

³<https://www.anthesisgroup.com/scatter-carbon-footprint-reduction-tool>



Figure 2 shows the scale of reductions needed over the next 8 years alone, 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.

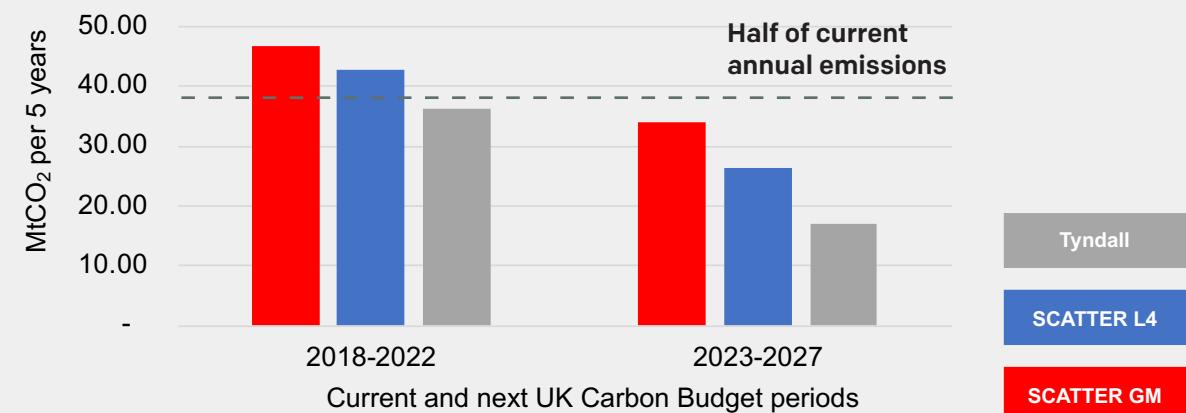


Figure 2 – Potential Carbon Budgets for Greater Manchester; Source: Anthesis

Using the models to inform our plans

Models have their limitations. The principle value of the models to us is:

- Informing the scale of the challenge we face – reductions on this scale will be extremely challenging to achieve, requiring unprecedented transformational change and financial investment.
- Informing our overall approach – models indicate the choices we have in relying on national level action (e.g. decarbonisation of the national grid) versus taking local level action (e.g. local renewable energy generation).
- Informing our priorities – the sectors where the most significant reductions in our CO₂ emissions will come from (see Figure 3).
- Informing our actions – the types of actions we need to take in each of these sectors to reduce emissions.

- Informing our goals and monitoring progress – what these actions need to achieve and therefore what we should monitor to track progress.

Going further and closing the gap

The plan sets out an indication of the scale of change assumed in the SCATTER GM model to show the challenge we face. Going beyond that and towards the “SCATTER L4 Pathway” would require even more radical action, some of which are not thought feasible (e.g. the need for every private vehicle on Greater Manchester’s roads being zero emissions by 2025). We need to establish a platform for innovation to occur.

This innovation is partly technical (e.g. increasing the efficiency or effectiveness of existing solutions, regulatory changes), partly financial (e.g. devising innovative finance mechanisms to increase the rate of deployment) and partly social innovation (e.g. encouraging the need for fair and equitable transition, behavior change plus policy and regulatory nudge mechanisms).

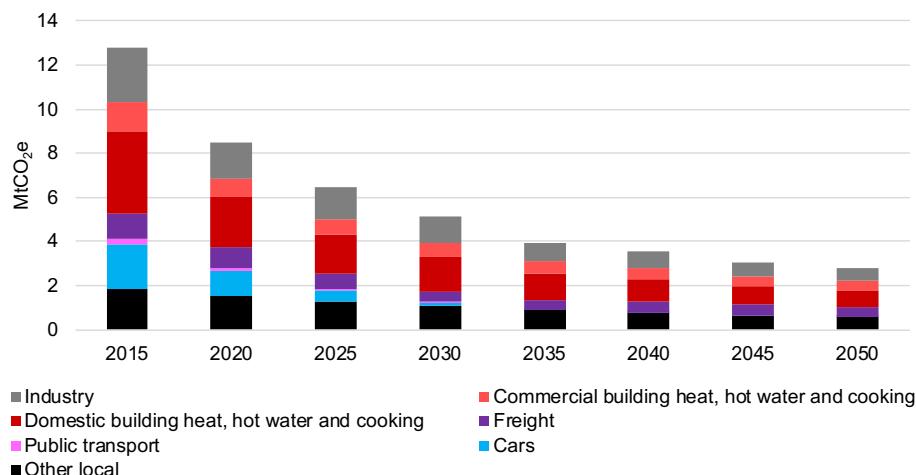


Figure 3 – Sectors where emission reductions come from (“SCATTER GM” pathway) Source: Anthesis

WHERE DO WE NEED TO GET TO?

Our vision

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.

Our aims

1. Mitigating climate change: For our city region to be carbon neutral by 2038 and meet carbon budgets that comply with international commitments.
2. 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. 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. Natural environment: To protect, maintain and enhance our natural environment for all our benefit, taking steps to implement and achieve environmental net gain.
5. 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.

In meeting these aims, we need to maximise the positive impacts on our health and prosperity that these actions will bring.



WHAT DO WE NEED TO DO OVER THE NEXT FIVE YEARS?

Our plan sets out the urgent actions all of us need to take over the next 5 years.

Our aims 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 areas and priorities are linked and need tackling as part of a single, coherent approach rather than in isolation. 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.

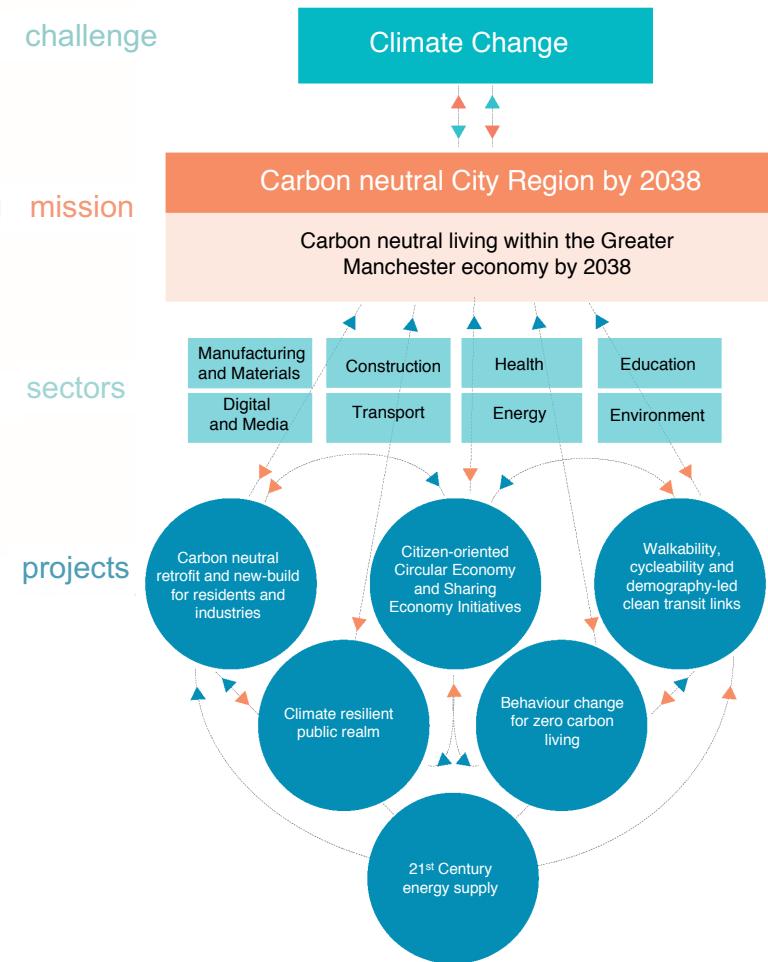


Figure 4 – Potential components of a Greater Manchester Clean Growth Mission

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

Our energy supply

Summary of the challenges and opportunities

We need to reduce CO₂ emissions that are produced by the energy we use to power our transport and heat and power our buildings, shifting away from fossil fuels to renewable sources. There are challenges for our electricity infrastructure associated with this shift to renewable electricity generation, low carbon heating and electric vehicles. 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.

SUMMARY OF OUR PRIORITIES

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

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

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

SUMMARY OF THE SCALE OF THE CHALLENGE

Priority 1: "SCATTER GM" pathway 2040:

- 50% of all households have the equivalent of a 16m² solar 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

Priority 2: "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.

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

Our transport and travel

Summary of the challenges and opportunities

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 away from fossil fuel powered transport to zero emissions (tailpipe) or cleaner alternatives. We also need to address exceedances of Nitrogen Dioxide (NO₂) at the roadside, tackling the most polluting vehicles in a way that delivers compliance with the legal limits for NO₂ in the shortest possible time.

SUMMARY OF OUR PRIORITIES

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

Priority 2: Phasing out of fossil-fuelled private vehicles and replacing them with zero emission (tailpipe) alternatives

Priority 3: Tackling the most polluting vehicles on our roads

Priority 4: Establishing a zero emissions bus fleet

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

SUMMARY OF THE SCALE OF THE CHALLENGE

Priority 1:

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

Priority 2:

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

Priority 4:

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

Priority 5:

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

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.

Our homes, workplaces and public buildings

Summary of the challenges and opportunities

We need to reduce CO₂ emissions produced by the excessive use of energy, particularly in heating our homes and commercial and public buildings. This will also help residents to live in warm homes which are cheaper to run and healthier to live in and contribute to efforts to reduce fuel poverty in the city region. 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).

SUMMARY OF OUR PRIORITIES

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

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

Priority 3: Reducing the heat demand in new buildings

SUMMARY OF THE SCALE OF THE CHALLENGE

Priority 1:

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

Priority 2:

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

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.

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.

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 THE SCALE OF THE CHALLENGE

Priority 1:

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

Priority 2

- Limit any increase in the quantity of waste produced to 20%.

Priority 3:

- Achieve a recycling rate of 65% by 2035.

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

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

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.

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.

What we need from government policy

- Further powers and incentives in 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

Our natural environment

Summary of the challenges and opportunities

We need to prioritise 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 on 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. Significant progress has been made in developing a natural capital approach and progressing our priorities.

SUMMARY OF OUR PRIORITIES

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

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

Priority 5: Increasing engagement with our natural environment

Priority 2: Managing our water and its environment sustainably

Priority 4: Increasing investment into our natural environment

SUMMARY OF THE SCALE OF THE CHALLENGE

Priority 2:

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

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).

Our resilience and adaptation to climate change

Summary of the challenges and opportunities

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 ambitions. 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.

SUMMARY OF OUR PRIORITIES

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.

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.

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.

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.

What we need from government policy

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

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. For commitments made by GMCA, Local Authorities (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 in the plan – the plan sets out areas where these will be developed further.



WHAT SHOULD BE OUR APPROACH?

In delivering our environmental aims, we need to maximise the positive impacts on our people, economy and places. This will require us all to take new approaches, across areas such as innovation and funding, to tackling the challenges we face. This approach is supported in the findings of the Independent Prosperity Review.

Optimising the economic benefits

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. If we take the actions in this plan, we could all save up to £1000 per household per year on 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 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.

There are also costs of not acting. 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.

Optimising the health and social benefits

We know that environmental actions provide significant health benefits for our population. 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. Low income communities are amongst those groups that are more affected by air pollution, whilst other environmental factors such as access to green space and the quality and warmth of housing also have a significant bearing on health.

There are also costs of not acting. For example, extreme weather (e.g. the 2003 heatwave) had a large impact on health services. 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. 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.

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:

- Supporting innovation in technology
- Taking new approaches to finance and funding
- Building on existing partnerships between the public, private and voluntary, community and social enterprise organisations
- Showing leadership
- Engaging and educating residents, communities and businesses
- Upskilling our workforce

SUPPORTING INNOVATION IN TECHNOLOGY	TAKING NEW APPROACHES TO FUNDING AND FINANCING	BUILDING ON EXISTING PARTNERSHIPS
Innovation ecosystem to support all firms to be innovative, supporting the creation of new products and services (e.g. Energy Transition Region proposals)	Long-term sustainable funding models for infrastructure. Developing business models in unproven areas (whole house retrofit; natural environment)	Continuing the engagement from 2018 Green Summit, with GMCA convening stakeholders around key challenges and through a mission-oriented approach
SHOWING LEADERSHIP	ENGAGING & EDUCATING RESIDENTS, COMMUNITIES AND BUSINESSES	UPSKILLING OUR WORKFORCE
A set of commitments from GMCA/LAs, plus health and social housing providers, showing they are leading by example.	Make a programme of carbon literacy available to young people through the GM Career Portal, in addition to our own commitments on carbon literacy for staff in procurement in GMCA and LAs	Engage the sector in BridgeGM, to better link business leaders into schools and colleges.

Establishing a Clean Growth Mission

This reinforces the need to adopt an approach that mobilises various actors across traditional sector boundaries to come together in new ways. 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. The University College London Institute for Innovation and Public Purpose (UCL-IIPP) has already started worked with GMCA to begin developing this approach, exploring how it can be inspiring and measurable across the city region and want to establish this as the approach we will take to tackling our environmental challenges.



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