

# MANCHESTER CLIMATE CHANGE FRAMEWORK 2020-25

Our strategy towards making Manchester a thriving, zero carbon, climate resilient city.

Version 1.0  
February 2020

MANCHESTER  
CLIMATE CHANGE PARTNERSHIP

MANCHESTER  
CLIMATE CHANGE AGENCY



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# EXECUTIVE SUMMARY

Our aim:

***“Manchester will play its full part in limiting the impacts of climate change and create a healthy, green, socially just city where everyone can thrive.”***

To help us get there, we have four objectives we need to meet by 2025.

### **Objective 1 – Staying within our carbon budgets**

This involves taking action in three areas:

- Direct CO<sub>2</sub> emissions: staying within our 15 million tonne carbon budget for 2018-2100, including reducing the CO<sub>2</sub> emitted from our homes, workplaces and ground transport by at least 50% during 2020-25
- Aviation CO<sub>2</sub> emissions: working with UK Government to ensure that all flights from Manchester Airport are in line with the Paris Agreement and a limited carbon budget for UK aviation emissions
- Indirect CO<sub>2</sub> emissions: understanding and taking action on the things that we consume and which generate greenhouse gases through their production, transportation and disposal.

### **Objective 2 – Climate adaptation and resilience**

Adapting the city's buildings, infrastructure and natural environment to the changing climate and increasing the climate resilience of our residents and organisations.

### **Objective 3 – Health and wellbeing**

Improving the health and wellbeing of everyone in Manchester through actions that also contribute to our objectives for CO<sub>2</sub> reduction and adaptation and resilience, with particular focus on those most in need.

### **Objective 4 – Inclusive, zero carbon and climate resilient economy**

Ensuring that Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit from playing an active role in decarbonising and adapting the city to the changing climate.

### **Six priority areas for action**

To meet our objectives we need everyone in the city to take action on our six priority areas:

1. Buildings (existing and new)
2. Renewable energy
3. Transport and flying
4. Food
5. The things we buy and throw away
6. Green infrastructure and nature-based solutions

To enable this to happen we have established a devolved, partnership-based approach to climate action. It is built on two key components:

- Engaging and empowering Manchester residents and organisations to take action, using the Manchester Climate Change Partnership and its networks as our key engagement mechanism, and
- Joint working between Manchester City Council, Manchester's strategic partners, Greater Manchester Combined Authority, UK Government, and their agencies to provide the support, incentives, standards and infrastructure Manchester's residents and organisations need

Manchester Climate Change Partnership is made up of 60 members, across ten sectors, with responsibility for 20% of Manchester's direct CO<sub>2</sub> emissions. Its members also have reach into the remaining 80% through their staff, students, customers, tenants, football fans, theatre-goers, worshippers, and others.

Manchester City Council is a member of the Partnership. This enables the Council to understand the areas where it can use its existing powers and funding to provide the support, incentives, standards and infrastructure that are needed to enable action. Where these powers or funding don't exist at the local level, the City Council will work with the Greater Manchester Combined Authority and Government to secure them, extending our partnership-based approach beyond the city's boundaries.

To ensure we are on-track to meet our objectives we will establish independent groups to monitor progress and will publish our performance in our annual report.

This Framework is our high-level strategy for meeting our commitment to 'play our full part' on climate change. It will need to develop over the next five years, in line with changes in policy, climate science, our rate of progress and other factors. We will do this in collaboration with other cities, to ensure that we can replicate tried-and-tested solutions here, at the same time as sharing our experience from working to become one of the first zero carbon, climate resilient cities in the world.

# 1. INTRODUCTION FROM THE MANCHESTER CLIMATE CHANGE PARTNERSHIP

A green city with walkable neighbourhoods, clean air, good jobs in successful businesses, warm homes and affordable energy, safe cycling routes and a public transport system that works for everyone. This is the city we are working to create. As a Partnership, we've been part of this work since 2018. As a city we've been doing it for well over 10 years. Working together to create the green and healthy city that we all want.

Our work is partly about ensuring Manchester plays its full part in limiting the impacts of climate change, ensuring that we help to keep global heating to well below 2°C. But it's also about ensuring our communities can thrive, our businesses can prosper, and we continue to draw people and businesses to the city to share in our success.

Since 2018 the members of the Manchester Climate Change Partnership have been forging ahead to make this vision a reality. Our work builds on the progress the city has been making since the launch of Manchester's first ever climate change strategy, in 2009. At the time Manchester committed to contributing towards the UK Climate Change Act, by reducing our CO<sub>2</sub> emissions by 41% by 2020. We're on track to achieve that goal. However, the goalposts have shifted significantly over the last decade.

We know that a traditional approach to growth and development won't create the city – or the world – we all want. We know that success in the 21st century won't be defined by our traditional economic metrics alone. We know that we need to urgently wean ourselves off our reliance on fossil fuels and our unsustainable consumption habits. We need to help tackle the global climate and ecological emergency.

As we look forward to this new decade we know that we need to part of something bigger, more exciting and more challenging than anything we've achieved globally for many years, if ever. We need to be part of a journey to an environmentally, socially and economically sustainable future. A future that is defined by the United Nations and their 17 Sustainable Development Goals.

So, what is Manchester's role on this journey? What role for the city where carbon-fuelled growth and development was born? A city that still contributes 2.1 million tonnes of CO<sub>2</sub> to the global mix every year, 5,700 tonnes every day, 4 tonnes since you started reading this.

In some ways we are about to take on a radically different role to our current one. However, in many ways it is also a role we have been playing for many decades – a role focused on continually improving the city for the benefit of our residents and businesses, built on solutions that we will share with cities around the world.

As with our past transformations, our zero carbon journey will be powered by the passion and ingenuity of Manchester people and organisations. It will lead us to an exciting future where our politicians, universities, businesses, communities and citizens create solutions that work for us here and which can be adopted by cities across the UK and around the globe. It's a future where Manchester and our commitment to create a better world means that we will break the mould and set the standard for other cities to follow.

## **How do we know that? We know that because it's already happening.**

Manchester was one of the first cities in the world to set climate change targets in line with the Paris Agreement, in November 2018. We are now working to influence the biggest climate change network of cities in the world, the Covenant of Mayors, to roll out this approach globally, through the Manchester-led Zero Carbon Cities project.

Our universities are undertaking pioneering research to create batteries from Graphene, to enable renewable energy to be stored and used on demand.

We are delivering the GrowGreen and IGNITION projects to find new ways to increase urban green infrastructure by 10% by 2038, innovation projects funded by the EU so that solutions we find here can be shared across Europe.

We are moving in the right direction. But not yet fast enough to meet the commitments we've set. Getting on track will require us to begin with the solutions we already know work: helping our residents, schools and organisations to install solar panels, to travel sustainably, to buy less and buy better, to improve diets, all at the same time as saving money over the long run, improving health and wellbeing, and creating good jobs.

However, to get on track we also need to bring about fundamental changes in the way that our economy and society work. Working as part of a global economic system means that we are currently pulling in two directions, one towards emitting less carbon, the other towards emitting more. Manchester is not alone, we are, after-all, playing by the same economic, consumption-based rules that, in all cities, are driving climate change. However, we need to have the bravery to be honest about this and to work with other cities, businesses, international organisations, Greater Manchester Combined Authority and UK Government to address the systemic and structural barriers that are currently holding back Manchester's and the world's journey to zero carbon. Otherwise, we will not meet our targets.

The long-term context for this work is to 2100, ensuring that Manchester plays its full part in limiting the global temperature rise to well below 2°C and pursuing efforts to limit the temperature increase even further to 1.5°C. To do this we know we need to focus on urgent action in the next five years. The science tells us this the period where we need to see the most profound changes: deep and unprecedented carbon reduction during 2020-25, at the same time as planning for further cuts from 2026, down to zero CO<sub>2</sub> emissions by 2038, at the latest.

This document sets out our approach to making it happen, ensuring that in every household, every community, every classroom, every boardroom, every town hall meeting room we are all playing our full part to take urgent action on climate change. Our challenge is great, but so is the opportunity, to make Manchester one of the first zero carbon, climate resilient cities in the world.

***Manchester Climate Change Partnership***  
***February 2020***

# 2. APPROACH TO DEVELOPING THIS FRAMEWORK

This Framework is Manchester's high-level strategy for meeting the commitment in the Our Manchester Strategy 2016-25<sup>1</sup> to *'play our full part in limiting the impacts of climate change'*.

For readers familiar with the EU Covenant of Mayors<sup>2</sup>, this is also our *'Sustainable Energy and Climate Action Plan'*.

## Manchester Climate Change Partnership and Agency

This Framework has been produced by the Manchester Climate Change Agency (the Agency), on behalf of the Manchester Climate Change Partnership (the Partnership). The Partnership and Agency have been working together since February 2018 to champion climate change action in the city.

In Manchester we achieve more by working together. By bringing together our public, private, community, faith and education partners, the city has built itself a reputation as the place that makes things happen, that raises the bar, and that others want to follow. The Partnership has been established in this same mould.

The Partnership is currently made up of 60 organisations from across 10 sectors, with shared responsibility for 20% of Manchester's direct CO<sub>2</sub> emissions. It is a forum where our partners constructively challenge and support each other, built on the principle that our collective impact is more than the sum of our parts.

Our partners all have something positive to bring to the table: past successes for others to replicate, new ideas and opportunities, and a passion for making Manchester the city we all want it to be. The Partnership and the Agency have helped Manchester partners to secure over £10m for the city and the city-region, to make things happen on the ground and to bring even more people and organisations into the city's climate journey.

As well as challenging and supporting each other, the Partnership is also able to challenge and support the city to do even more. Thanks to the Partnership, our wider partners, and Manchester City Council's open, devolved approach to policy-making, Manchester agreed some of the most ambitious climate change targets in the world, in 2018. This Framework includes an even more challenging set still, well-beyond those being made in most other cities.

At the time of writing the Partnership is two years old. In this time, we have been able to help the city to achieve things that otherwise may not have been possible. It's an approach that works for Manchester and which we believe can work for other cities who are also committed to ambitious climate action (see Section 10 for more information on our work with other cities).

We have made a good start since 2018 but we know the real work starts now. It's a challenge we're passionate about, a passion we see right across the city, to make Manchester one of the most exciting places in the world for action on climate change.

## Building on the Draft Manchester Zero Carbon Framework 2020-38

This Framework builds on the *Draft Manchester Zero Carbon Framework 2020-38*<sup>3</sup>, which was published in February 2019 and Manchester City Council's declaration of a climate emergency in July 2019<sup>4</sup>. The document has been shaped by experts in climate change to ensure it is in line with the latest science and the Paris Agreement (including a review of targets in late 2019/early-2020; see Section 5.1). It has also been informed by Greater Manchester and national commitments, to ensure that Manchester contributes to and can benefit from working as part of wider city-region and national programmes.

It's important to note that this document sets out what the science tells us we need to achieve to make our full contribution to the Paris Agreement and our high-level strategy for getting there. There are many areas where further details and support from Government are required. However, we've chosen not to wait until we have all the details or the support we need to get started. Rather we want to use this Framework as an urgent call for action based on what we already know we need to do, with further details to follow in a future version.

1 [www.manchester.gov.uk/mcrstrategy](http://www.manchester.gov.uk/mcrstrategy)

2 [www.covenantofmayors.eu](http://www.covenantofmayors.eu)

3 <http://www.manchesterclimate.com/framework-2020-2038>

4 [https://secure.manchester.gov.uk/news/article/8194/manchester\\_city\\_council\\_debate\\_climate\\_emergency\\_motion](https://secure.manchester.gov.uk/news/article/8194/manchester_city_council_debate_climate_emergency_motion)

A key difference between this final version of the Framework and the earlier draft is the shift from 2020-38 to a focus on 2020-25, but still set within the context of limited carbon budgets for 2018-2100. The Partnership and Agency have made this change in response to evidence from the scientific community, including the recommendations from the Tyndall Centre for Climate Change Research, which has set out the need for immediate and deep cuts in emissions, beyond those being achieved on our current trajectory.

This version also differs from the earlier draft in terms of the action plans that accompany it. At the time of publishing the draft Framework it was envisaged that a single citywide action plan for 2020-22 would sit alongside the final Framework. The Partnership and Agency have chosen to alter this approach and instead believe that a suite of bespoke commitments and plans for every household, community, school and organisation will be the most effective way to build a citywide movement of climate action. As part of this approach, the Framework is accompanied by action plans from members of the Partnership (*Appendix 2*).

Finally, this document also takes on board comments from CDP<sup>5</sup> and their recommendation to include a new adaptation and resilience objective, to be in line with international best practice (see Section 5.2).

## Why a framework?

This document is Manchester's high-level strategy for meeting our climate change commitments.

It is different to the approach that most other cities have adopted, typically in the form of a Council-led strategy and a single implementation plan.

We have established a devolved, partnership-based approach to climate change action in Manchester, one which requires every single resident, school and organisation to be actively involved – the 'Our Manchester approach'.

It has been designed to enable more and more people and organisations to join our efforts on climate change, with a view to ultimately having everyone with us on this exciting journey.

On that basis the Framework is intended to provide the overarching structure for everyone to 'plug-in' their own bespoke plans, guided by the 15 actions in Section 6.2. And for the delivery of those plans to be enabled by support, incentives, standards and infrastructure provided by Manchester City Council, Manchester's strategic partners, the Greater Manchester Combined Authority, UK Government and their agencies. The governance structure for making this approach work is set out in Section 7.

## Key Principles

This Framework is built on eight key principles. You will see them embedded throughout this document.

1. Setting our objectives and targets in line with the latest science and the Paris Agreement
2. Contributing to Manchester's social, environmental and economic goals
3. Ensuring that social justice is at the heart of our approach
4. The need for urgent action by everyone who lives, works and studies in Manchester, from our young people to our older people
5. Everyone who lives, works and studies in Manchester enabled to act through support, incentives, standards and infrastructure provided by Manchester City Council, Manchester's strategic partners, Greater Manchester Combined Authority, UK Government and their agencies
6. Advice, guidance and progress monitoring from independent experts
7. Contributing to Greater Manchester, UK and international commitments
8. The need for Manchester's growth and development to be zero carbon and resilient to the changing climate

<sup>5</sup> CDP work with investors, companies and cities to help them take action to build a truly sustainable economy by measuring and understanding their environmental impact; [www.cdp.net](http://www.cdp.net)

### 3. OUR AIM

***“Manchester will play its full part in limiting the impacts of climate change and create a healthy, green, socially just city where everyone can thrive.”***

# 4. OUR VISION FOR 2025

**By 2025 Manchester will be playing its full part in limiting the impacts of climate change, with everyone who lives, works and studies here benefiting from the health, wellbeing and economic benefits that will come as a result.**

By 2025 Manchester will be on track to stay within our 15 million tonne carbon budget for 2018-2100, for the emissions from our homes, workplaces and ground transport. During 2020-25 we will reduce our direct CO<sub>2</sub> emissions by at least 50%.

By 2025 Manchester will be working with Government to ensure that all flights from Manchester Airport are part of a UK aviation strategy that is fully aligned with the Paris Agreement.

By 2025 Manchester will have a good understanding of our indirect CO<sub>2</sub> emissions and be taking action to reduce them.

By 2025 we will be adapting the city to the changing climate and increasing the climate resilience of our residents and businesses to cope with increases in extreme weather events such as floods and heat waves. We will have increased the quality and quantity of our existing green spaces, on track to achieve a 10% increase in urban green space by 2038, from 2018 levels.

By 2025 Manchester residents will have cleaner air, be walking and cycling more, be living in more energy efficient homes, have access to high quality green spaces in their neighbourhoods, and be securing good, well-paid jobs in socially and environmentally responsible Manchester businesses.

By 2025 Manchester will be a key player in the global zero carbon economy, recognised as one of the best places in the world to innovate, invest and roll-out new solutions to climate change. Manchester businesses will be rewarded for their commitment to climate action by saving money, attracting talented workers and exporting their products and expertise across the UK and internationally.

By 2025 Manchester will be a carbon literate city, with our schools, colleges, universities and organisations embedding learning on climate change throughout their teaching and training, equipping all our students and workers with the skills and knowledge they need to drive positive change.

Using COP26 in November 2020 as our springboard, by 2025 Manchester will be working in even closer partnership with Greater Manchester, UK Government and other UK cities to establish the UK as a leading nation for our action on climate change.

By 2025 the Manchester Climate Change Partnership will have helped the city to achieve the objectives in this Framework. We will have grown our membership to reach an even greater proportion of the city's CO<sub>2</sub> emissions and be taking action to reduce them to zero. And we'll be standing on the international stage, telling the story of how the world's first industrial city is now playing a leading role in the new zero carbon revolution.

# 5. OUR OBJECTIVES

To realise our vision we have committed to achieve four headline objectives. We recognise that they are interlinked but we've separated them here to make it clear what we're aiming to achieve and to enable clear reporting on our progress.

- Staying within our carbon budgets
- Climate adaptation and resilience
- Health and wellbeing
- Inclusive, zero carbon and climate resilient economy

Each objective is set out on the following pages.

## 5.1 Staying Within Our Carbon Budgets

Our carbon budgets objective and its sub-objectives are based on recommendations by the Tyndall Centre for Climate Change Research at the University of Manchester, developed with support from the Manchester Zero Carbon Advisory Group<sup>6</sup>. The Tyndall Centre's full analysis and recommendations are available in *Appendix 1*.

### Headline objective:

***To ensure that Manchester plays its full part in helping to meet the Paris Agreement objectives by keeping our direct CO<sub>2</sub> emissions within a limited carbon budget, taking commensurate action on aviation CO<sub>2</sub> emissions and addressing our indirect / consumption-based carbon emissions.***

### Why is this important?

In order to meet the Paris Agreement objective to keep global temperature increases to well below 2°C, pursuing efforts for 1.5°C, there is a limited amount of CO<sub>2</sub> we can emit globally. Climate change scientists refer to this as the global 'carbon budget'.

A carbon budget can be thought of like a financial budget, it tells us how much we're allowed to 'spend'. For example, the budget for Manchester's direct CO<sub>2</sub> emissions during 2018-2100 is 15 million tonnes CO<sub>2</sub>. Given we currently 'spend' approximately 2.1 million tonnes every year, we are projected to run out in 2025, rather than making our budget last until 2100.

This carbon budget-based approach to setting targets is the one recommended by the Tyndall Centre for Climate Change Research and we believe is the right one to ensure we set clear commitments in line with the Paris Agreement.

<sup>6</sup> <http://www.manchesterclimate.com/zero-carbon-advisory-group>

## Where do our emissions come from?

There are three main sources of CO<sub>2</sub> emissions that Manchester is responsible for or which we have influence over:

- **Direct (energy-related)<sup>7</sup> CO<sub>2</sub> emissions:** from homes, workplaces and ground transport activities inside the city.
- **Aviation CO<sub>2</sub> emissions:** from flights taken by Manchester residents and organisations, from Manchester and other UK airports. Also recognising that we have a responsibility to work with UK Government, UK airports and others to ensure that emissions from all flights from Manchester Airport are in line with the Paris Agreement.

- **Indirect / consumption-based CO<sub>2</sub> emissions:** from the things that we buy and ultimately dispose of, for example, food, clothes, phones, electrical equipment, furniture, construction materials, many of which are produced outside of the city.

The following graph and table provide a high-level summary of the annual emissions from each of these three areas, plus the emissions from flights from Manchester Airport that are taken by non-Manchester residents and organisations. It's important to note that the figures are calculated in different ways for each emissions source so can't be directly compared.

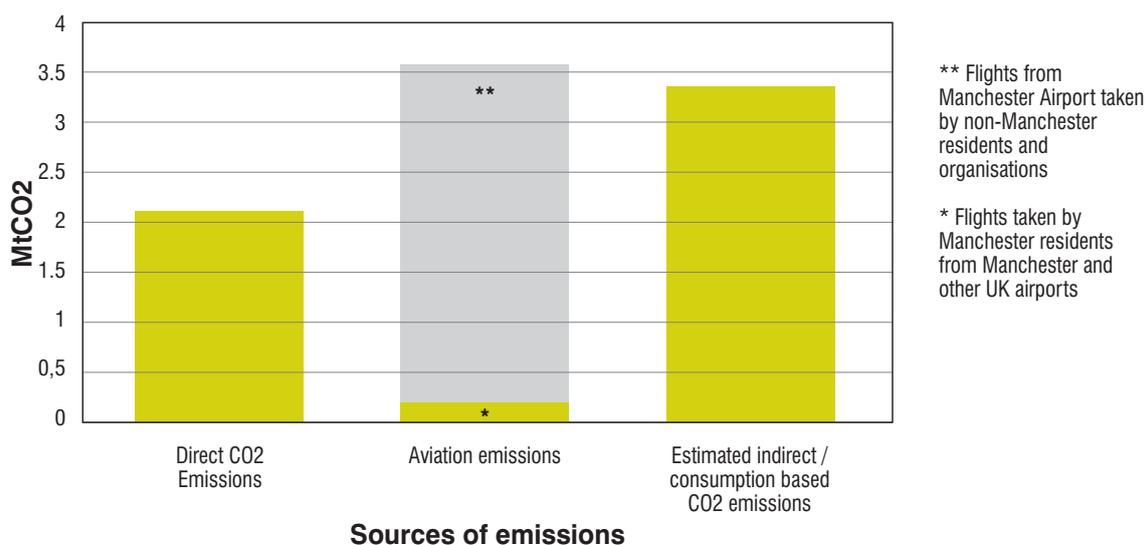


Figure 1: Manchester CO<sub>2</sub> emissions in 2017

Source of Emissions	Emissions in 2017 (Mt CO <sub>2</sub> )	
Direct CO <sub>2</sub> <sup>8</sup>	2.1	
Aviation CO <sub>2</sub> <sup>9</sup>	Flights taken by Manchester residents from Manchester and other UK airports	0.2
	Flights from Manchester Airport by non-Manchester residents and organisations	3.4
Estimated CO <sub>2</sub> on a consumption basis <sup>10</sup>	3.4	

Table 1: Manchester CO<sub>2</sub> emissions in 2017

Sub-objectives for each of these areas are set out on the following pages.

<sup>7</sup> Direct energy related emissions in this framework refer to fuel use CO<sub>2</sub> emissions on a direct (Scope 1) basis and electricity use CO<sub>2</sub> on a consumption (Scope 2) basis.

<sup>8</sup> UK Government; <https://data.gov.uk/dataset/723c243d-2f1a-4d27-8b61-cdb93e5b10ff/emissions-of-carbon-dioxide-for-local-authority-areas>

<sup>9</sup> Aviation Sector Emissions and the Manchester Climate Change Framework, Tyndall Centre, February 2020; [www.manchesterclimate.com/targets-2020](http://www.manchesterclimate.com/targets-2020)

<sup>10</sup> Consumption-based Emissions Accounting for Manchester, Tyndall Centre, February 2020; [www.manchesterclimate.com/targets-2020](http://www.manchesterclimate.com/targets-2020)

**Direct CO<sub>2</sub> emissions sub-objective:**

*To emit a maximum of 15 million tonnes CO<sub>2</sub> from our homes, workplaces and ground transport from 2018. We will reduce our direct CO<sub>2</sub> emissions by at least 50% between 2020-25. In line with this budget we will emit:*

- *A maximum of 6.9 million tonnes during 2018-22, and*
- *A maximum of 3.6 million tonnes during 2023-27<sup>11</sup>.*

Manchester's direct CO<sub>2</sub> emissions come from our homes, workplaces and ground transport. In 2017 our direct emissions were 2.1 million tonnes<sup>12</sup>.

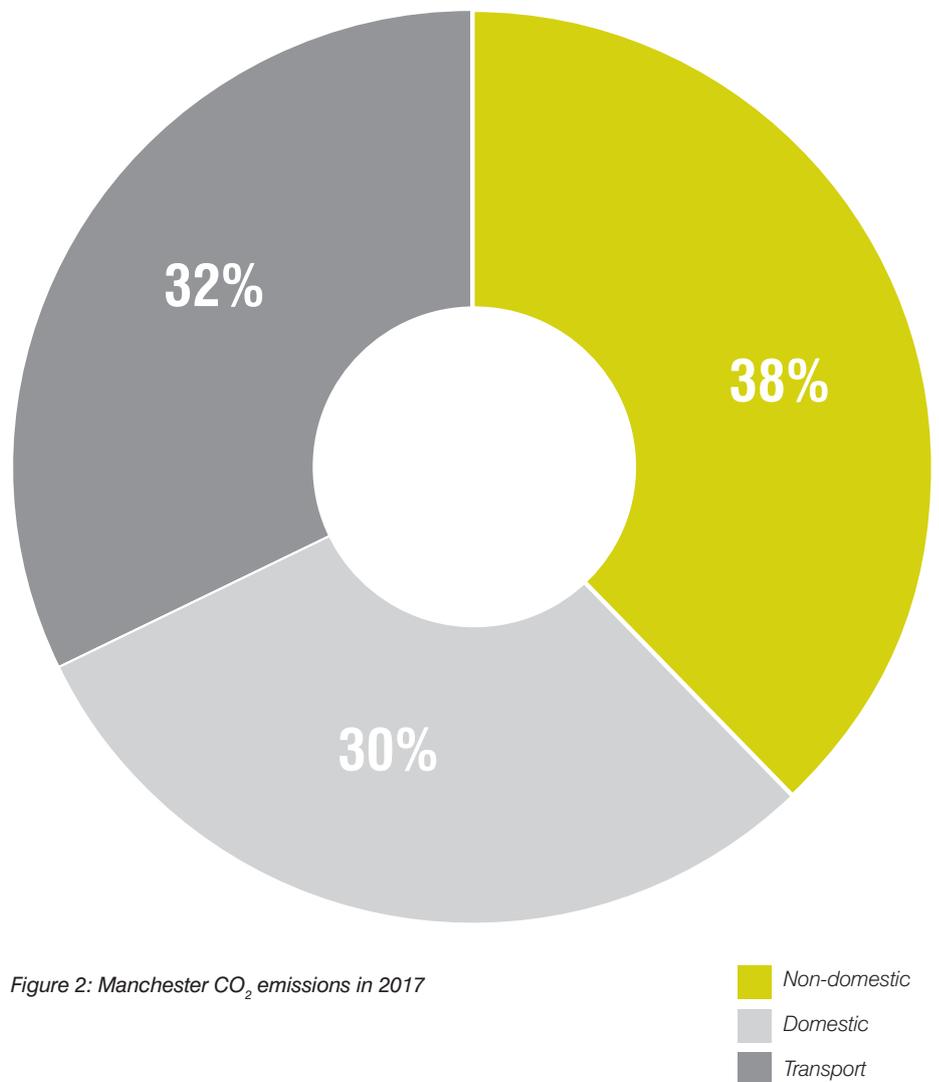


Figure 2: Manchester CO<sub>2</sub> emissions in 2017

<sup>11</sup> The periods 2018-22 and 2023-27 are aligned with the UK carbon budget periods, as set by UK Government.

<sup>12</sup> Manchester's direct CO<sub>2</sub> data is provided by UK Government two years in arrears. Data for 2018 and 2019 will be available in June 2020 and June 2021 respectively. It will be included in the Manchester Climate Change Annual Reports for 2020 and 2021.

The following graph sets out our CO<sub>2</sub> emissions trajectory from 2018 to stay within our 15 million tonne carbon budget, including year-on-year reductions of 13% per annum.

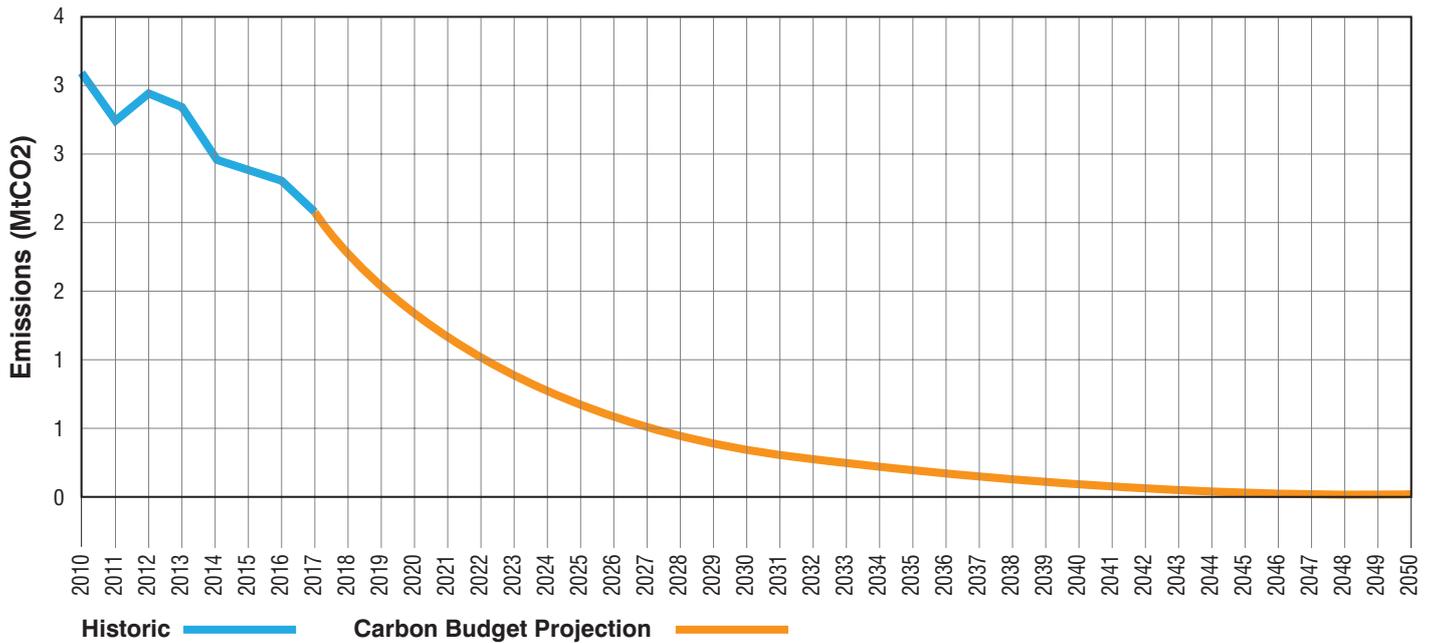


Figure 3: Carbon emissions projection 2018 to 2050 based on the 15 MtCO<sub>2</sub> Manchester carbon budget

The following graph and table set out the breakdown of the city's 15 million tonne carbon budget into five-year budgets to 2047, and the remaining budget for 2048-2100.

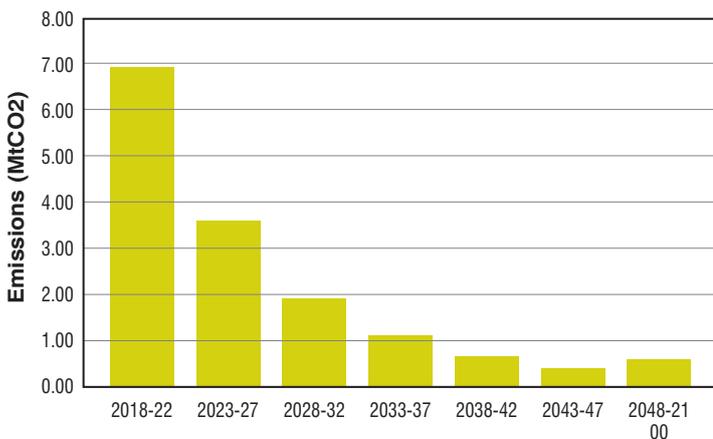


Figure 4: Emissions projections consistent with the 15 MtCO<sub>2</sub> budget – starting from common year (2017)

Time Period	CO <sub>2</sub> budget (MtCO <sub>2</sub> )
2018-22	6.93
2023-27	3.59
2028-32	1.95
2033-37	1.10
2038-42	0.64
2043-47	0.38
2048-2100	0.59
<b>Total</b>	<b>15.17</b>

Table 2: Manchester's 15 MtCO<sub>2</sub> budget by time period

### What happens if we don't achieve this objective during 2020-25?

The key parameter is that the city stays within a 15 million tonne carbon budget from 2018. This total budget is broken down into five-year budgets to help ensure we are on track over the short, medium and long-term.

If we overspend our budget at any point, that means we will have less CO<sub>2</sub> remaining for future years. In order to address this we would need deeper cuts than the 13% year-on-year reductions that are currently required (50% during 2020-25).

The below graph shows the impact of continuing our average rate of carbon reduction (7% during 2010-17), the resulting overspending of our budget, and the deeper reductions that would be needed to ensure we get back on track to stay within our 15 million tonne carbon budget:

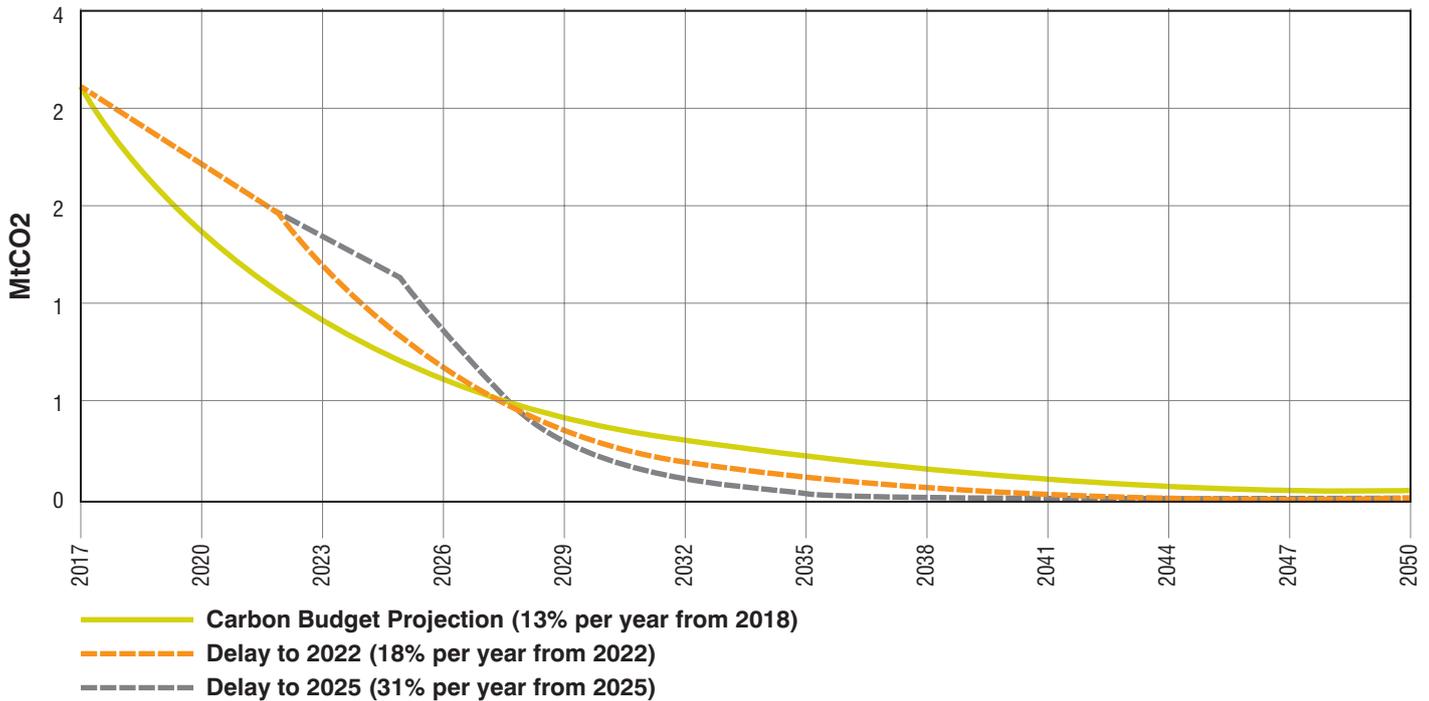


Figure 5: Emissions projections consistent with the 15 MtCO<sub>2</sub> budget – starting from common year (2017)

**Action delayed until 2022:** 18% year-on-year reductions required to stay within the 15 million tonne carbon budget.

**Action delayed until 2025:** 31% year-on-year reductions required to stay within the 15 million tonne carbon budget.

**Aviation sub-objective:**

*We want the emissions from all flights from Manchester Airport to be fully aligned with the Paris Agreement. We believe this means operating within a limited carbon budget for UK aviation, as part of a wider international budget.*

We recognise the UK aviation budget that has been proposed by the Tyndall Centre for Climate Change Research, 1,200 million tonnes CO<sub>2</sub> for the period 2020 to 2100, calculated in line with the methodology for establishing Manchester's carbon budget for our direct emissions. We recognise the interrelationship between these two budgets; if one is exceeded, the other has to reduce to compensate for it.

We also recognise that the Tyndall Centre's proposed UK aviation budget is 37% of the total UK carbon budget, a much larger allocation than for other sectors of the economy.

With no global city yet having reconciled its climate change responsibilities with having a major international airport within its boundaries, we believe we have the opportunity to establish Manchester Airport and the city as a national and international leader in sustainable aviation.

As part of playing our full part on climate change we recognise now is the time to tackle this fundamental challenge, whilst also taking into account the significant employment, business, cultural and tourism benefits Manchester Airport provides to the city. To do this we need:

- Manchester Airport Group and Manchester City Council to work UK Government to help develop a UK aviation strategy which is in line with the Paris Agreement and the approach used by the Tyndall Centre for calculating carbon budgets
- Manchester Airport Group and Manchester City Council to work with UK Government and other UK airports to ensure that any proposed development at Manchester Airport is consistent with a Paris Agreement-aligned UK aviation carbon budget, taking into account the 1,200 million tonne carbon budget proposed by the Tyndall Centre, and the city's 15 million tonne carbon budget for direct emissions
- Social justice to be at the heart of Manchester's work with Government on a national aviation strategy, to ensure that everyone in the city has the potential to enjoy their fair share of the benefits of having an international airport in the city
- To establish ways to empower Manchester residents to make informed choices about their travel behaviours, including an understanding of the climate impacts of flying and the options they have to minimise or avoid them entirely. This should take into account the fact that data on the impact of Manchester residents' flights is already available: 0.2 million tonnes CO<sub>2</sub> emitted per year (2017 levels), from all UK airports. And that if the city chose to develop a carbon budget-based approach to help manage these emissions, following the Tyndall Centre's methodology, it would give Manchester residents a carbon budget of 6.6 million tonnes from 2020.
- To establish ways to empower Manchester organisations to make informed choices about their travel behaviours, including an understanding of the climate impacts of flying and the options they have to minimise or avoid them entirely. This should take into account the fact that data on the impact of Manchester organisations' flights is not currently available. And that, if such data was gathered, the city could choose to develop a carbon budget-based approach to help manage these emissions.

**Indirect / consumption-based CO<sub>2</sub> emissions sub-objective:**

*To better understand the broader climate change impact of the city's consumption of goods and services and take action to develop more sustainable consumption practices for the city's residents and organisations.*

Greenhouse gas emissions from goods and services consumed in Manchester from the rest of the country and worldwide also contribute to the city's overall climate impact.

Based on the average for C40 cities (a network of ambitious global cities)<sup>13</sup>, Manchester's emissions on a consumption basis may be 60% greater than they are for our direct CO<sub>2</sub> emissions.

Consumption based emissions are more difficult to assess accurately than our direct CO<sub>2</sub> emissions, particularly at a city scale. This means that target-setting and monitoring is not yet possible in the same way as for the direct emissions carbon budget. A consumption-based account of Manchester's greenhouse gas emissions can however provide an indicative picture of the city's wider contribution to climate change. This in turn can be used to direct action on sustainable consumption practices.

We will develop a more detailed understanding of our consumption-based emissions to enable us to target action and monitor progress. In parallel we will also start to take action based on known key contributors to the city's consumption-based impacts.

## Key Points

### 1. How Manchester's carbon budgets are calculated:

The Tyndall Centre have calculated a carbon budget for the UK that is aligned with the Paris Agreement<sup>14</sup>. This UK budget is then broken down into separate budgets for the UK's three main sources of emissions:

UK direct/ energy only	UK Aviation	UK Shipping
(55%)	(37%)	(8%)

Manchester's direct carbon budget: the UK direct / energy only budget is apportioned to Manchester to give us a figure of 15 million tonnes of CO<sub>2</sub><sup>15</sup>.

### 2. The relationship between the different types of emissions:

If one sector emits more than its budget this needs to be compensated for through reductions in the other sectors. For example, if UK aviation emits more than its 37% of the UK budget, this will need to be compensated for with reductions in the direct and/or shipping sectors.

This is why the Framework covers both direct and aviation emissions.

### 3. Data quality:

It should be noted that the data for Manchester's CO<sub>2</sub> emissions are more robust in some areas (direct CO<sub>2</sub> emissions), estimated in some (indirect CO<sub>2</sub> emissions), and require additional data to give a complete picture in others (data on the flights taken by Manchester residents are currently available but not for organisations' flights).

There is also some overlap between the three types of emissions so it is not possible to add together the three figures to give an accurate figure for Manchester's total CO<sub>2</sub> emissions. However, the data in this section gives us a good sense of the scale of our responsibilities in order to focus our efforts over the next five years.

### 4. Playing our full part – our ambitious scope:

Manchester has chosen to take responsibility for a much wider scope of CO<sub>2</sub> emissions than the majority of other cities. Currently, most cities typically take responsibility and commit to action on their direct CO<sub>2</sub> emissions only. However, in line with our commitment to 'play our full part in limiting the impacts of climate change', we believe it is important to be as ambitious and transparent about our responsibilities as the global climate emergency demands is necessary, including where we need to work with UK Government, and others.

<sup>14</sup> [https://www.research.manchester.ac.uk/portal/files/83000155/Tyndall\\_Quantifying\\_Paris\\_for\\_Manchester\\_Report\\_FINAL\\_PUBLISHED\\_rev1.pdf](https://www.research.manchester.ac.uk/portal/files/83000155/Tyndall_Quantifying_Paris_for_Manchester_Report_FINAL_PUBLISHED_rev1.pdf)

<sup>15</sup> Appendix 2 at <http://www.manchesterclimate.com/targets-2018>

## 5.2 Climate Adaptation and Resilience Objective

This objective has been developed in-part based on the recommendations of CDP<sup>16</sup> who identified this theme as an area missing from the previous draft of this Framework. It has been developed with support from climate change adaptation and resilience experts at the University of Manchester.

### Headline objective:

*To adapt the city's buildings, infrastructure and natural environment to the changing climate and to increase the climate resilience of our residents and organisations.*

### Why is this important?

Manchester's climate is changing<sup>17</sup>. Responses to adapt and build resilience to changing patterns of extreme weather events are required, focusing particularly on hazards such as floods which the evidence shows are a particular threat to Manchester.

Event	1945-1969 Events	1970 – 1993 Events	1994 – 2017 Events
Flood (all forms)	36 (44%)	24 (36%)	109 (52%)
Storm	18 (22%)	24 (36%)	44 (21%)
Cold	17 (21%)	11 (16%)	27 (13%)
Fog	8 (10%)	2 (3%)	15 (7%)
Heat	2 (2%)	4 (6%)	10 (5%)
Drought (water shortages)	1 (1%)	2 (3%)	5 (2%)
<b>TOTAL EVENTS</b>	<b>82</b>	<b>67</b>	<b>210</b>

Table 3: Past occurrence of extreme weather and climate change hazard events across Greater Manchester.

Climate change projections point towards Manchester experiencing warmer and wetter winters, hotter and drier summers, and more periods of extreme heat and heavy rainfall. Winter rainfall could increase by around 30% across Greater Manchester (GM) by 2050, and the warmest summer day could rise by 6°C by this point<sup>18</sup>.

These changes will have a major effect on Manchester's people, environments, buildings and infrastructure. Recent research has identified climate change risks to GM's critical infrastructure, which is central to people's livelihoods and quality of life. Floods and storms account for the highest risks<sup>19</sup>, and these events stand out as priorities for adaptation and resilience planning and action.

16 <https://www.cdp.net/en/responses>

17 Carter, J.G., Connelly, A., Handley, J and Ellis, M. 2018. Climate Change Risk Assessment of Greater Manchester's Critical Infrastructure. RESIN Project. Available at: [https://resin-cities.eu/fileadmin/user\\_upload/Resources/City\\_report\\_GM/GMCCRA\\_report\\_final.pdf](https://resin-cities.eu/fileadmin/user_upload/Resources/City_report_GM/GMCCRA_report_final.pdf)

18 Cavan, G. 2011. Climate Change Projections for Greater Manchester. EcoCities Project, University of Manchester.

19 Carter, J.G., Connelly, A., Handley, J and Ellis, M. 2018. Climate Change Risk Assessment of Greater Manchester's Critical Infrastructure. RESIN Project. Available at: [https://resin-cities.eu/fileadmin/user\\_upload/Resources/City\\_report\\_GM/GMCCRA\\_report\\_final.pdf](https://resin-cities.eu/fileadmin/user_upload/Resources/City_report_GM/GMCCRA_report_final.pdf).

**During 2020-25:**

Further work is needed to better understand the level of risk and vulnerability faced by our residents and businesses so that we can more effectively focus our efforts on the key risks and locations most in need. However, alongside this ongoing research and planning work, there is also much we can do to support and undertake practical action.

**Action:**

- 1) Act on the existing evidence and research on climate change impacts and risks to target available adaptation and resilience effort and resources. This means focusing on infrastructure, communities and businesses at risk from flooding in particular.
- 2) Increase the amount of urban green infrastructure cover, aiming for a 10% increase by 2038 from 2018 levels, in line with the Greater Manchester aim<sup>20</sup>.

**Educate and prepare:**

- 3) Educate and prepare our residents, our businesses, and our public sector to encourage changes in their behaviours, operations and services that can support adaptation and resilience to climate change.

**Research and planning:**

- 4) Continue to develop a clear and up-to-date understanding of how the climate is projected to change and the associated risks that we could experience over the short, medium and long-term. To include a developing understanding of our heat stress risks, as well as those for flooding.
- 5) Respond to these risks by incorporating adaptation and resilience within our plans and strategies, and acting to make necessary changes to our buildings, infrastructure and our natural environment.
- 6) Utilise the European Climate Risk Typology<sup>21</sup> to identify and then learn from cities and urban areas that have a similar climate risk profile as Manchester.

<sup>20</sup> This target comes from the IGNITION project, which is creating a green infrastructure baseline that we will use to support activity in Manchester - <https://www.greatermanchester-ca.gov.uk/what-we-do/environment/ignition/>

<sup>21</sup> <http://european-crt.org/index.html>

## 5.3 Health and Wellbeing

This objective has been developed jointly with representatives from the Manchester Health and Wellbeing Board to help ensure that the city's climate action also contributes to the successful delivery of the *Manchester Population Health Plan 2018-27*<sup>22</sup>.

### Headline objective:

**To improve the health and wellbeing of everyone in Manchester through actions that also contribute to our objectives for CO<sub>2</sub> reduction and adaption and resilience, with particular focus on those most in need.**

### Why is this important?

The actions we need to take to reduce CO<sub>2</sub> and adapt the city also have the potential to simultaneously improve our residents' health and wellbeing. Walking and cycling to get residents moving, aiming for 75% to be active or fairly active as part of the Greater Manchester-wide GM Moving programme<sup>23</sup>. Shifting away from petrol and diesel vehicles to help address our air quality crisis, which currently contributes to Manchester having the highest rate of emergency hospital admissions for asthma in the country and is linked to 181 deaths per year in Manchester<sup>24</sup>.

Increased rainfall and flooding, increased heat waves and increased incidences of extreme weather all have the potential to negatively affect the physical and mental wellbeing of Manchester's residents. This is why we need to adapt the city's built and natural environment and prepare our residents to become more resilient to these changes. Increasing the amount and quality of green space to enable residents to benefit from the improved physical and mental health that will come as a result<sup>25</sup>.

Improving the energy efficiency of the city's homes and providing access to affordable, secure supplies of renewable energy are essential help get 38,000 Manchester households out of fuel poverty.

### During 2020-25:

As well as Manchester residents taking action for themselves over the next five years, we will also need new strategic initiatives to help accelerate what people are already doing, and to address any barriers that are preventing or limiting further action.

When these initiatives are developed we need to focus them on the people and communities where climate action has the most potential to improve health and wellbeing, those that are expected to be most impacted by the changing climate, and those who would most benefit from additional support. Often these people will also have made less of a contribution to changing the climate than residents in other parts of the city.

As well as ensuring that climate action has positive health and wellbeing outcomes, this approach will also ensure that our commitment to social justice remains at the heart of what we do.

More information on the approach to developing new strategic initiatives is provided in Section 6.3.

22 [https://secure.manchester.gov.uk/downloads/download/6898/manchester\\_population\\_health\\_plan\\_2018-2027](https://secure.manchester.gov.uk/downloads/download/6898/manchester_population_health_plan_2018-2027)

23 <https://www.greatersport.co.uk/media/2679/gm-moving-v2-july-2018.pdf>

24 <https://cleanairgm.com/air-pollution#your-health>

25 <http://documents.manchester.ac.uk/display.aspx?DocID=33167>

## 5.4 Inclusive, Zero Carbon and Climate Resilient Economy

This objective has been developed jointly with representatives from the Manchester Work and Skills Board to help ensure that the city's climate action also contributes to achieving Manchester's aim to establish a more inclusive economy, as set out in the Our Manchester Industrial Strategy<sup>26</sup>.

### Headline objective:

*To ensure that Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit from playing an active role in decarbonising and adapting the city to the changing climate.*

### Why is this important?

Greater Manchester companies in the low carbon and environmental goods and services sector currently employ over 45,000 people. Based on performance in recent years, these numbers are set to continue to grow, including graduates from our local universities<sup>27</sup>. The Office for National Statistics found that the average gross annual pay for graduates with environmental degrees working in the sector is the 4th highest compared to every other subject, amounting to £38,012, and that the employment rate for graduates in the sector is 87%<sup>28</sup>.

The city's businesses in non-environmental sectors also have an important part to play in our zero carbon transition. Many are already engaged and benefiting from reduced energy bills, improved reputation, increased competitiveness, the ability to attract skilled workers looking for meaningful work with a socially responsible employer, and readiness for new carbon reduction policies and legislation in the coming years.

### During 2020-25:

Our list of strategic actions will develop as we continue to grow our understanding of the city's needs. Section 6.3 sets out our approach to developing and delivering these actions. The following list is a starting point, based on work during 2019-20 with organisations and groups involved in education and training in the city, including Manchester's Work and Skills Board and the Manchester Careers, Education, Information, Advice and Guidance Group.

- 1) Ensure that climate change remains one of the key objectives in the implementation of the Our Manchester Industrial Strategy, with a view to expanding the strategy's aim from the current 'develop a more inclusive economy' to 'develop a more inclusive, zero carbon and climate resilient economy'.
- 2) Embed climate change throughout the city's education and training system to help Manchester become a Carbon Literate city.
- 3) As we invest in infrastructure to become a zero carbon city, we need a proportionate investment in the skills sector to ensure that our education and training providers can respond. In particular, we need to develop the 'green skills' the city needs to deliver the projects and programmes planned for 2020-25 and to prepare for further initiatives from 2026.
- 4) Support existing and new businesses in the low carbon and environmental goods and services sector to provide the expertise and products the city needs to act on climate change.
- 5) Support 'non-environmental' organisations to act on climate change, including those currently in fossil fuel-heavy industries where major changes to business activities will be needed and where workers may need support to transition into new jobs where they can deploy their skills.

<sup>26</sup> [https://www.manchester.gov.uk/downloads/download/7156/our\\_manchester\\_industrial\\_strategy](https://www.manchester.gov.uk/downloads/download/7156/our_manchester_industrial_strategy)

<sup>27</sup> [https://www.businessgrowthhub.com/media/1063153/gm\\_lowcarbon\\_sector\\_report\\_new.pdf](https://www.businessgrowthhub.com/media/1063153/gm_lowcarbon_sector_report_new.pdf)

<sup>28</sup> <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/graduatesintheuklabourmarket/2017>

# 6. URGENT ACTIONS TO MEET OUR COMMITMENTS

## 6.1 Headline Areas for Urgent Action

At a city-level we need to take action in seven key areas to meet our carbon reduction and climate adaptation and resilience objectives:

1. Buildings (existing and new)
2. Renewable energy
3. Transport and flying
4. Food
5. The things we buy and throw away
6. Green infrastructure and nature-based solutions
7. Supporting and enabling residents and organisations to act – see Section 6.3

At this stage we have a good high-level understanding of what needs to be achieved, however, we don't have full details for every area of activity. For example, we know we need 100% of our energy to be from renewable sources as soon as possible, but we don't know what percentage we should reach by 2025.

To start to develop our detailed understanding we have taken some of the headlines from the Greater Manchester Environment Plan for 2019-24 and applied them to Manchester. We will develop further details as part of a future refresh of this Framework.

However, we don't need to wait for further research and planning work before we start our next phase of urgent citywide action. We already have a good enough understanding of what we need to do. The priority over the next five years is to focus our efforts on urgently reducing CO<sub>2</sub> emissions and adapting the city, and planning for further progress from 2026.

### 1) Buildings

#### *Existing buildings*

An estimated 80% of the buildings that will exist in the UK in 2050 have already been built. They were built at a time when climate change and energy considerations were much less of a priority than today, including the 226,640 homes we already have in Manchester. The current levels of energy performance of our homes, schools and workplaces are much lower than we need in order to meet our targets.

There are currently extremely low levels of domestic and non-domestic retrofitting taking place in the city, the exceptions being registered housing providers and a handful of proactive private homeowners. This is a result of lack of knowledge and demand for retrofitting, very low access to funding (including low-cost loans), lack of skills and local supply chain, and a lack of financial incentives and business models to make investment in retrofit stack up for homeowners, public and private landlords.

Addressing this requires significant new interventions. This challenge is faced by all UK local authorities and lends itself particularly to a national programme where Manchester could work in partnership with UK Government. The aim being to get our existing buildings as close to zero carbon as possible by significantly increasing their energy efficiency and generating renewable energy on-site.

Based on the *GM Environment Plan 2019-24*: over 11,500 of Manchester's 226,640 homes retrofitted per year.<sup>29/30</sup>

#### *New buildings*

We need to ensure that new developments in the city don't eat into our limited carbon budgets and add to the already significant retrofit challenge. This means that we need them to be built and operated to zero carbon standards as soon as possible.

The ideal way to do this is through UK Government establishing a national zero carbon definition and methodology for its implementation, and for Manchester City Council to implement this standard as quickly as possible through the local planning system.

This should include applying zero carbon standards to all developments where the Council has additional influence, for example as a client / end-user, landowner or development partner, with a view to all new development needing to be zero carbon from 2023 at the latest, when the new Manchester Local Plan is expected to become operational<sup>31</sup>.

29 18.9% of the 61,000 that need to be retrofitted across Greater Manchester; Manchester homes make up 226,640 (18.9%) of the 1.2 million homes in Greater Manchester

30 [https://secure.manchester.gov.uk/info/200088/statistics\\_and\\_intelligence/2024/housing](https://secure.manchester.gov.uk/info/200088/statistics_and_intelligence/2024/housing)

31 [www.manchester.gov.uk/localplan](http://www.manchester.gov.uk/localplan)

## 2) Renewable Energy

### **100% Renewable Electricity**

We need a combination of two, possibly three, sources of renewable electricity:

- Our own renewable energy generated inside the city: this includes significant increases in the amount generated from solar photovoltaic (PV) panels. In 2019, only 1% of Manchester's electricity demand was met by local renewable generation.
- Decarbonised National Grid: driven by UK Government, the National Grid has been decarbonising in recent years; we need this to continue but at an accelerated rate, with a view to being fully decarbonised as soon as possible.
- Our own renewable energy generated outside the city: this could include through 'power purchase agreements' with renewable energy generators, and/or investing in our own renewable energy generation through, for example, wind farms, solar farms, and others. This option is particularly important if the National Grid doesn't decarbonise at the rate we need it to.

We will also become more compatible with intermittent generation by developing smart grids and dynamic demand within Manchester.

Based on the *GM Environment Plan 2019-24*: at least 50% of all homes should have the equivalent of 16m<sup>2</sup> of solar PV panels by 2024.

## **Gas**

The UK has two main options for natural gas use in the UK: stop using it (except in a small number of instances where viable alternatives don't exist, such as in some industrial processes) and move to electric heating, heat pumps and zero carbon district heating instead, or; replace it with biogas and/or hydrogen.

At the time of writing UK Government are in the early stages of developing a national strategy. However, we can't wait for this to emerge before we start to take action. There are four things we need to do:

- Improve the energy efficiency of our buildings as far as possible to reduce our demand for gas (as in the above 'buildings' section).
- Replace our natural gas-based heating systems with renewable energy-based heating technologies as soon as possible.
- Work with Government to ensure that moving to electricity-based heating systems is affordable and doesn't push even more people into fuel poverty (electricity is currently more expensive than natural gas).
- Work with Greater Manchester Combined Authority and Government to help establish a clear UK strategy for gas (the Netherlands, for example, have committed to be natural gas-free by 2030).

Based on the *GM Environment Plan 2019-24*: over 13,600 (6%) of Manchester's 226,640 homes connected to a low carbon heating source every year.

### 3) Transport and flying

Many of these actions will need to be taken as part of wider Greater Manchester programmes, including work with Transport for Greater Manchester and Manchester Airport.

There are five headline actions we need to take:

**Increase walking and cycling:** through a combination of significantly more safe, well-designed routes and changes in travel behaviours

**Increase public transport use:** again, this is partly about changes in behaviours, but will only work if enabled by significant improvements in the capacity, frequency, reliability, affordability and accessibility of our buses, trams and trains. Our current system falls well short of these essential characteristics.

Based on the *GM Environment Plan 2019-24*: significant increases in sustainable modes of transport.

**Private vehicles:** where travel by private vehicle is necessary, we need these to be electric vehicles, supported by easily accessible charging points, and with the right incentives to accelerate their uptake. Simple 13 amp outdoor plugs will meet most drivers' needs, with more expensive super-fast chargers only required for a minority of vehicle-users. However, we need to keep in mind that the shift to electric vehicles won't address our problems with congestion. The manufacturing of vehicles (in cities outside of Manchester) also generates significant CO<sub>2</sub> emissions, contributing to our consumption-based CO<sub>2</sub> emissions.

Based on the *GM Environment Plan 2019-24*: 100% of Manchester's cars and buses need to be zero emissions (tailpipe) by 2035.

**Rail connections to other cities within the UK and Europe (and beyond):** we need to shift our travel to other cities away from the use of private cars and planes and onto trains, as far as possible. Doing this will require reliable, affordable and efficient connections to the rest of the UK and Europe, to enable a shift in the behaviours of our residents and workers.

**Flying:** work with UK Government to ensure that flights from Manchester Airport and all UK airports are fully in line with the Paris Agreement. Manchester residents and organisations to look at their own travel behaviours and minimise the number and length of flights through taking holidays closer to home, taking trains, and replacing meetings with video and teleconferencing.

### 4) Food

Manchester is part of a complex global system whose climate and environmental impacts are vast. Consider both the direct production of crops and livestock, and the associated land clearing. Fossil fuels power the machinery, fishing vessels, transport, packaging and processing of our food. Chemical fertilisers and over 60 billion land animals contribute significantly to the emission of greenhouse gases.

However, the capacity exists for the food system to transform from a carbon source into a sink; capturing carbon as a means to increase fertility, soil health, water availability and ultimately, food security. Changes to agricultural production, food preparation, consumption and waste are needed at a global level, combined with positive action at an individual, family, community and city-level. We need to grow, buy/sell, cook and eat in a way that supports our local economy, in a healthy and environmentally sustainable way.

This includes:

- Waste less food, both individually and commercially
- Buy seasonal, local produce; ideally organic, from more sustainable farms, or at least buy British supporting UK agriculture.
- Support local, independent food outlets.
- Avoid processed food, buying fresh or minimally processed food.
- Adopt a plant-rich diet and reduce overall meat consumption
- If choosing meat or other animal products, buy better quality. Organic, free range, Freedom or pasture-reared are all signs that your animal products are coming from a more sustainable source, and will be higher quality and healthier.
- If choosing fish, buy it from more sustainable sources i.e. not on the 'fish to avoid' list<sup>32</sup>.
- Grow your own, use an allotment, help at a community growing project or get growing at our workplace.
- Buy only what we need and plan our meals.
- Buy Fairtrade coffee and tea.
- Drink tap water, avoid bottled water.
- Buy/sell food which has minimal packaging which avoids single-use plastics.
- Ask your shop/supplier about where your food has come from.

## 5) The things we buy and throw away

Whilst they might be produced and disposed of outside of Manchester's boundary, we have a responsibility for the carbon footprint of the things that we buy and throw away. Research by the C40<sup>33</sup> estimates that these emissions, also known as 'consumption-based' or 'indirect' emissions can be as much as 60% higher than a city's direct CO<sub>2</sub> emissions. For Manchester that would mean an estimated 3.4 million tonnes CO<sub>2</sub> per year for our consumption-based emissions, compared to 2.1 million tonnes for our direct emissions.

There are five headline actions we need to take:

- **Buy less:** before we buy things, as citizens and as organisations, we need to ask ourselves 'do I really need this?'
- **Buy better:** where a new product, material or service is needed, we need to select those that have the lowest carbon footprint and other positive environmental and social attributes. This may mean reusing or repurposing previously used goods or hiring rather than buying what we need.
- **Local businesses:** as well as growing the demand for greener products, we also need to grow the supply. This means supporting the growth of local businesses that can offer reusable, reused, repurposed and for-hire products and materials.
- **Repair:** extending the life of products and supporting repair cafes and upcycling workshops.
- **Recycle:** when a product or material finally reaches the end of its current life we need to ensure it is recycled.

## 6) Green infrastructure and nature-based solutions

Our parks, gardens, woodlands, street trees and other elements of the city's green infrastructure have an essential role to play in helping Manchester to meet its climate change objectives. This is in terms of both adapting Manchester to the changing climate (by helping to manage flood risk and heat stress) and helping to reduce our CO<sub>2</sub> emissions (to stay within our carbon budget we need our land to become a net remover of carbon). And at the same time also delivering myriad other benefits such as improved health, increased biodiversity, supporting jobs, creating attractive neighbourhoods, and many others.

A term increasingly being used to describe the use of green infrastructure that can address climate (and other) challenges is 'nature-based solutions'. At the time of writing Manchester is delivering an EU-funded project in West Gorton to demonstrate how we can integrate nature-based solutions into the city's communities to manage flood risk, increase biodiversity and improve health and wellbeing. This project provides us with an exciting model to replicate in other parts of the city. And in doing so building on many years of action on the city's natural environment, driven by strategies for green and blue infrastructure, trees and biodiversity.

The Manchester Green and Blue Infrastructure to 2025<sup>34</sup> is being refreshed during 2020. Rather than duplicate the details here, our headline action is to ensure that the city's climate change objectives are fully embedded in the development and implementation of the refreshed strategy.

Based on the *GM IGNITION project*: increase urban green infrastructure by 10% by 2038, from 2018 levels<sup>35</sup>.

<sup>33</sup> <https://www.c40.org/consumption>

<sup>34</sup> [https://secure.manchester.gov.uk/info/500002/council\\_policies\\_and\\_strategies/7061/green\\_and\\_blue\\_infrastructure](https://secure.manchester.gov.uk/info/500002/council_policies_and_strategies/7061/green_and_blue_infrastructure)

<sup>35</sup> <https://www.greatermanchester-ca.gov.uk/what-we-do/environment/ignition/>

## 6.2 Urgent Actions for Every Resident, School and Organisation

To realise our potential to become a leading city for action on climate change we need every resident, school and organisation in the city to take urgent and sustained action.

Right now, thousands of people and organisations across Manchester are already on board.

### Our residents and communities

From our young people to the city's older generation, and everyone in between, more residents by the day are joining our citywide movement of committed climate actors.

**The Fallowfield Secret Gardens Residents Group** was established by local residents to help people learn how to grow their own food and live more sustainably. The group is helping Fallowfield residents to become more self-sufficient and reduce their emissions by relying less on imported produce.

**The Barlow Road Community Orchard** has been created by Levenshulme residents to plant more trees in their neighbourhood. With support from a Manchester City Council grant to purchase apple, cobnut and plum trees, a piece of land previously used by fly-tippers is now on its way to becoming a flourishing area for the local community.

### Our schools

**Parrs Wood High School** are a leading school when it comes to solar energy – they have one of the largest solar energy systems at any school in the UK with almost 1,000 solar panels on its main roof, generating more than 200,000 kWh of renewable power per year. This project makes a saving of 119 tonnes CO<sub>2</sub> annually, whilst also being a huge educational benefit to the pupils of the school.

**Pupils at MEA Central** have been planting trees, eliminating single use plastic water bottles from their school and running Meat Free Mondays – putting them on track to move from their current bronze Eco-Schools badge up to silver.

### Our organisations

Organisations are also playing their part. **The University of Manchester** has completed three LED lighting projects across their campus buildings, saving 116 tonnes of CO<sub>2</sub> per year, on track for lifetime savings of 2,300 tonnes CO<sub>2</sub>.

**Manchester City Football Club** have completed a similar project – switching to LED lightings across the stadium has reduced consumption by just over 1 million kWh.

For those in the early stages of their zero carbon journey, inspiration isn't far away. The Manchester Climate website has a growing number of examples of the actions the city's residents, schools and organisations are taking<sup>36</sup>.

## 15 Actions

To help residents, schools and organisations to play their part we are promoting 15 actions. This list is likely to develop over the next five years so we haven't included the full details here. For a copy of the most up-to-date list visit:

**WWW.**  
**manchesterclimate.**  
**com/15-actions**

### GETTING STARTED

1. Commit to zero carbon and taking urgent action now
2. Measure and report your CO<sub>2</sub>
3. Climate change education and Carbon Literacy

### TAKING ACTION

4. Existing buildings
5. New developments and construction
6. Renewable energy
7. Transport
8. Flying
9. Reduce, reuse, recycle our stuff
10. Food
11. Green space and gardens
12. Water conservation

### INSPIRING AND INFLUENCING OTHERS

13. Where you put your money
14. Spread the word

### ASK FOR HELP

15. Ask politicians and decision-makers for help

## Manchester Climate Change Partnership

The Partnership is the city's main mechanism for engaging and inspiring organisations and residents to act. The Partnership currently has 60 members, across 10 sectors, with responsibility for over 20% of Manchester's direct CO<sub>2</sub> emissions. Its members also have reach into the remaining 80% through their staff, students, customers, tenants, football fans, theatre-goers, worshippers, and others. By working with their supply chains members are also starting to take a chunk out of the city's consumption-based CO<sub>2</sub> emissions.

Partnership members have developed their own bespoke action plans, setting out how they will contribute towards the successful delivery of this Framework. A summary of their action plans is available in *Appendix 2*.

A methodology is currently in development to support organisations and sectors to set carbon reduction targets, in line with the city-level targets in this document. The Tyndall Centre have developed recommendations to support the development of this methodology. See *Appendix 1* for further information.

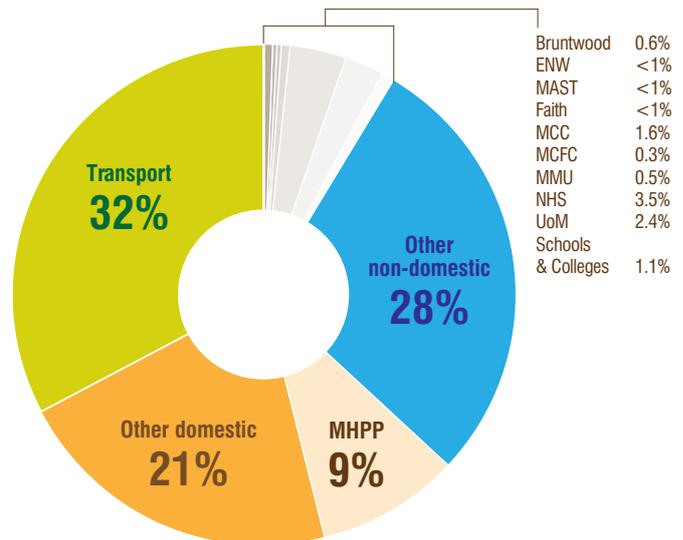


Figure 6: Direct CO<sub>2</sub> emissions from MCCP members' buildings

The Partnership will continue to grow throughout the life of this Framework and beyond, aiming to ultimately engage and inspire every community and organisation in the city to get involved in the city's collective action. Further information on the Partnership is available from: [www.manchesterclimate.com/MCCP](http://www.manchesterclimate.com/MCCP)

### **6.3 Supporting and enabling residents and organisations to act: urgent actions for Manchester City Council, Manchester’s Strategic Partners, Greater Manchester Combined Authority, UK Government and their agencies.**

At the time of publishing this Framework, we know that Manchester is not currently on track to meet its climate change objectives, despite the many actions being delivered across the city.

To address this, in combination with the engagement work of the Manchester Climate Change Partnership, we need our public authorities and strategic partners to provide the necessary support, incentives, standards and infrastructure.

We know from survey work undertaken in 2019 that 75% of Manchester residents are worried about climate change (15% extremely worried, 21% very worried, 39% somewhat worried).

Large numbers of Manchester residents are already taking some level of action (minimising food waste and reusing plastic bags) but stated that they would be willing to do even more (retrofitting their home, switching to an electric vehicle or eating more seasonal food) if they had more information.

There is a clear need for further information to be provided: respondents believe the Council and partners could increase awareness of climate change (44% of respondents) and help residents to understand how to reduce the impact of it (42%).

The most common activity identified as a priority for Manchester City Council and partners was for better public transport (47%). Financial incentives were also identified as having a role to play in helping residents to take action (26% of respondents).

There are examples from other UK and international cities where local, regional and national government have worked together, often with the involvement of local partners, to address a city’s climate change needs. These precedents provide us with valuable inspiration and learning so that we can replicate the solutions that we know already work.

Doing so will require our public authorities and strategic partners to deploy the powers and resources they have available to them. Some of which we already have at the local level, some of which we will need to secure through working in partnership with the Greater Manchester Combined Authority and UK Government.

Research by the Coalition for Urban Transitions<sup>37</sup> estimates that for cities around the world to realise their climate ambitions the powers and responsibilities for action are:

- 14% with the city
- 67% with the national government
- 19% through working together

when decarbonisation of the electricity supply is included.

- 28% with the city
- 35% with the national government
- 37% through working together

when decarbonisation of the electricity supply is not included.

This makes it clear that we need our partnership-based approach to extend beyond the city’s boundaries, to build a strong collaboration between Manchester City Council, the city’s strategic partners, Greater Manchester Combined Authority, UK Government and their agencies. Further information on each of these organisations and their existing commitments to support residents and organisations are provided here.

<sup>37</sup> <https://urbantransitions.global/en/publication/climate-emergency-urban-opportunity/>

## Manchester City Council

Manchester City Council (MCC) is a member of the Manchester Climate Change Partnership. The Council is expected to publish its own climate change action plan for the period 2020-25<sup>38</sup> in March 2020. As well as setting out how the Council will reduce its own operational emissions, the plan will commit the Council to supporting and enabling the city's residents and organisations to reduce their CO<sub>2</sub> and adapt to the changing climate.

The Council has good examples to build on from the last 10 years:

### Supporting and enabling residents and communities

- **Metrolink Expansion** - MCC has worked with Transport for Greater Manchester and has supported the recent Greater Manchester five-year plan to expand the Metrolink tram network, connecting more people across the city-region.
- **Cycling Infrastructure** - MCC has worked with partners to improve the city's cycling infrastructure including the Oxford Road and Wilmslow Road 'Dutch Style' cycling lanes. Most of the route between Didsbury and Manchester City Centre provides cyclists with a dedicated cycle lane, separated from the traffic by special new kerbs. Passing through Withington, Fallowfield, Rusholme, and the university district, there are special lanes to navigate cyclists round bus stops and parked cars. Traffic signals are also timed to give cyclists a head start from junctions too.
- **GrowGreen** - is a project looking at how implementing Nature Based Solutions (NBS) in cities can help them adapt to climate change. It is addressing issues of flooding and rising temperatures via solutions including tree planting, green roofs, green walls, permeable paving and sustainable urban drainage systems. In West Gorton, MCC are building a community park that demonstrates how solutions can manage water and flood risk – 'a park that drinks water'.
- **The Nature of Hulme** - In 2017 MCC's Central Neighbourhood Team commissioned the Westcountry Rivers Trust (WRT) to undertake a community-based environmental appraisal and visioning exercise in the Ward of Hulme in Manchester. The 'Nature of Hulme' Project was designed to include a comprehensive, local

and collaborative 'natural capital' benefits assessment and needs/opportunity mapping exercise for the ward. This approach incorporated refined and improved Green Infrastructure and Sustainable Drainage Systems (SuDS) opportunity mapping methods.

### Supporting and enabling schools

- **Protecting Playgrounds** - Funded by MCC and Transport for Greater Manchester, and working with Groundwork and Lancaster University, a new pilot scheme 'Protecting Playgrounds' is underway. The aim is to boost air quality in school playgrounds located next to major roads (Abbott Community Primary (Collyhurst) - Rochdale Road, Manchester Communication Academy Primary (Harpurhey) - Rochdale Road, Saint Ambrose RC Primary (Chorlton) - Princess Parkway, and Medlock Primary (Ardwick)- A6). It involves greening to provide natural filters to absorb pollution from passing traffic, as well as training pupils to monitor air pollution and devise cleaner routes.
- **Youth Climate Summits in July 2019 and January 2020** - The summit in January 2020 provided young people with a platform to express their concerns about climate change, question politicians and other agencies about what they are doing to address this issue and influence action for change. The summit was attended by 49 schools and youth groups including, 14 secondary schools, 33 primary schools and two youth groups (250 young people and 50 staff attended the event).

### Supporting and enabling businesses and organisations

- **Civic Quarter Heat Network (CQHN)** - MCC are working in partnership with Vital Energi to create the Manchester Civic Quarter Heat Network. The network will provide a highly efficient heat and power solution for some of Manchester's most iconic buildings (Including the Town Hall, Central Library, The Midland Hotel and Manchester Central), making significant carbon reductions.
- **C-Change** - Funding has been secured by MCC to deliver a project working in collaboration with Manchester Arts and Sustainability Team (MAST) to enable the group to develop a zero carbon roadmap aligned to Manchester's zero carbon priorities, to further engage with residents and secure funding for key measures to support leadership capacity both within MAST and across the broader culture sector in the city.

## **Manchester's Strategic Partners**

The Our Manchester Forum structure is made-up of a range of key strategic partners and groups. These include the Manchester Health and Wellbeing Board, the Manchester Work and Skills Board, the Age Friendly Manchester Older People's Board, Manchester Youth Council, and others.

Each of them will have their own unique potential, powers and resources they can contribute to the city's climate change commitments. For example, ensuring that we respond to the health and wellbeing risks and opportunities associated with climate change. Ensuring that the city's education organisations are helping our residents to develop the green skills they need to secure jobs in the city's zero carbon economy. And ensuring that we tap into the passion, energy and experience of Manchester's older people and younger residents.

Each of these strategic partners and groups will need to develop their own bespoke plans, alongside those developed by members of the Manchester Climate Change Partnership.

## **Greater Manchester Combined Authority**

The Greater Manchester Environment Plan for 2019-24<sup>39</sup> sets out the Combined Authority's commitments to climate change. Many of the actions in this Framework will be best delivered by working in partnership with GMCA and the other nine Greater Manchester districts.

As with Manchester City Council, we have examples of where the Combined Authority is already responding positively to the needs of residents and organisations, to enable them to shift to lower carbon lifestyles and operations.

### **UK Government**

Government also has its own plans<sup>40</sup>, to realise the commitment in the 2019 manifesto for the UK to 'Reach Net Zero by 2050 with investment in clean energy solutions and green infrastructure to reduce carbon emissions and pollution<sup>41</sup>.

Manchester and Greater Manchester need to build a strong partnership with Government to enable us to help meet the city, the city-region, and the UK's commitments. COP26 in November 2020 provides a vital opportunity for us to this.

39 [www.greatermanchester-ca.gov.uk/what-we-do/environment/](http://www.greatermanchester-ca.gov.uk/what-we-do/environment/)

40 [www.gov.uk/environment/climate-change-energy](http://www.gov.uk/environment/climate-change-energy)

41 <https://vote.conservatives.com/our-plan>

## New actions

The above plans will get us some way towards providing the support, incentives, standards and infrastructure that Manchester's residents and organisations need. However, it is likely that there will be gaps. To fill them we need two things to work in tandem:

- Proactive joint-action by Manchester City Council, Manchester's strategic partners, Greater Manchester Combined Authority and UK Government to deploy the powers and funding they have available, including instances where devolving Government powers and funding to the local level will enable us to move even quicker, and
- Proactive residents and organisations setting out the help they need and the action they'll be able to take as a result.

It's in Manchester's DNA for our residents and organisations to develop their own ideas to help make the city the best place it can be. Here are some points that might be useful when developing your ideas:

- Can you include examples of where your idea has been successfully delivered in other cities?
- Can you set out the potential health, wellbeing, employment, and other benefits to the city?
- Can you describe what you'll be able to do differently if the proposal is implemented. 'Dear politician, if you do X, I'll be able to do Y...' can help create a powerful argument for our politicians to act.

Manchester City Council, Greater Manchester and UK Government politicians can be contacted at:

**[www.writetothem.com/](http://www.writetothem.com/)**

# 7. GOVERNANCE AND OUR PARTNERSHIP-BASED APPROACH

We have established a devolved, partnership-based approach to meet our climate change commitments. It is built on two key components:

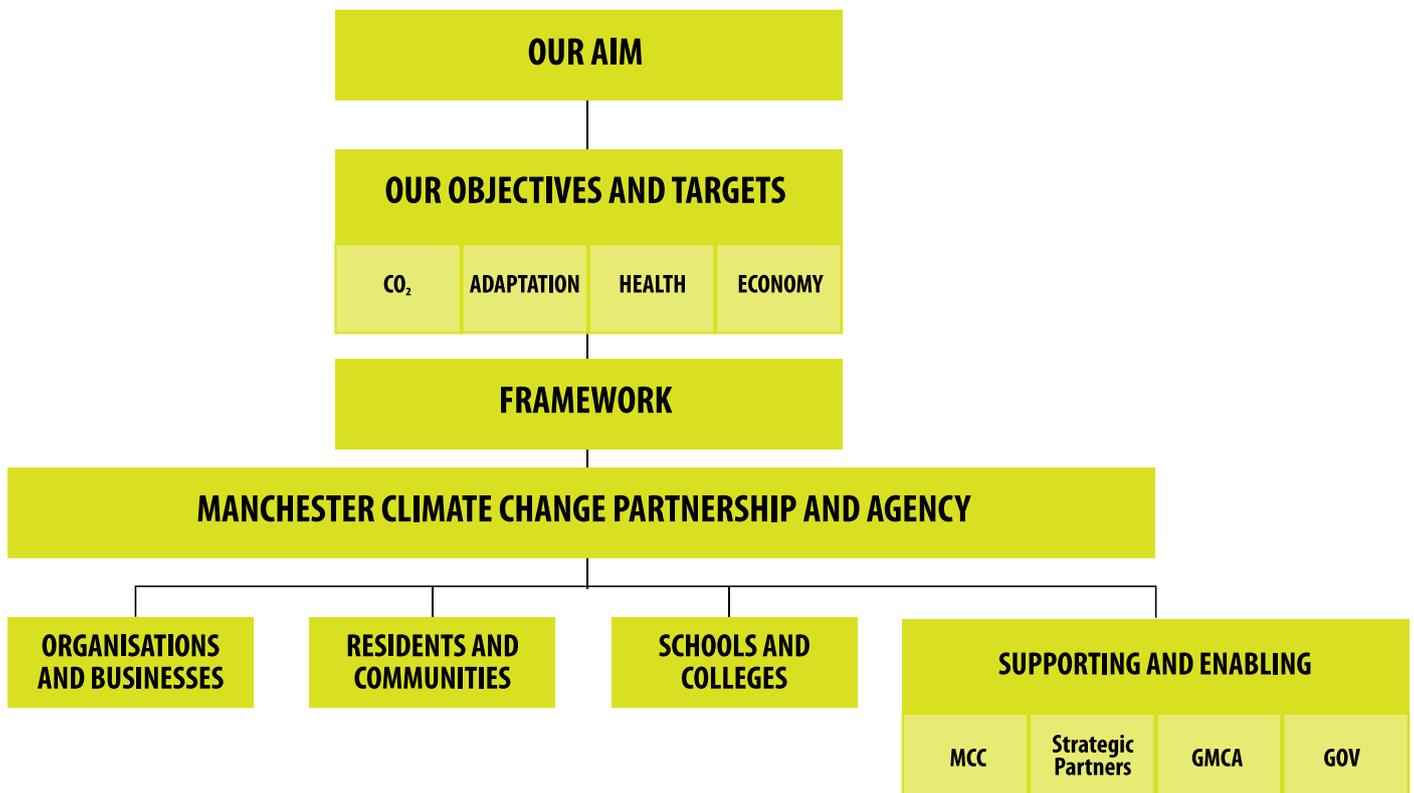
- Engaging and empowering Manchester residents and organisations to take action, using the Manchester Climate Change Partnership and its networks as our key engagement mechanism, and
- Joint working between Manchester City Council, Manchester’s strategic partners, Greater Manchester Combined Authority, UK Government, and their agencies to provide the support, incentives, standards and infrastructure residents and organisations need

This structure forms part of the city’s wider partnership-based structure of key groups and strategic partners.

## Our Manchester Forum and Manchester’s Strategic Partners

The Our Manchester Forum sits at the heart of the city’s partnership-based governance structure. It has responsibility for overseeing and championing the delivery of the Our Manchester Strategy. The Forum’s membership includes representatives from the Manchester Health and Wellbeing Board, the Manchester Work and Skills Board, the Strategic Education Partnership Board, the Age Friendly Manchester Older People’s Board, Manchester Youth Council, and others.

The Chair of the Manchester Climate Change Partnership is a member of the Forum. This enables the Partnership and Agency to work with strategic partners to help embed climate change as part of their core activities.



## **Manchester Climate Change Partnership and Agency**

The Partnership and Agency are responsible for championing, coordinating and facilitating the implementation of this Framework. Their activities are focused on working with partners on the following headline objectives:

- 1) Helping our city to set the right objectives and targets, in line with the Paris Agreement and the latest science
- 2) Helping our city to establish the strategy, governance and partnerships needed to meet the targets
- 3) Helping our city to take action
- 4) Helping our city to understand its progress

The Partnership and Agency will develop their own action plan to set out further details on how they will deliver their objectives during 2020-25. It is envisaged this will be published in time for the Manchester Climate Change Annual Conference 2020 in July 2020.

Further information on the Partnership and Agency is available from:

**WWW.  
manchesterclimate.  
com/involved.**

## **Working with Manchester City Council**

Manchester City Council is a member of the Manchester Climate Change Partnership. This enables the other Partnership members to set out the barriers that are preventing them and their wider networks from fully delivering their climate change commitments. Where Manchester City Council has the powers and/or the resources to respond to these barriers, they will work collaboratively with the rest of the Partnership to deliver on them. Where they don't they, will work to secure the necessary support from the relevant body, including Greater Manchester Combined Authority and/or Government.

## **Working with Greater Manchester Combined Authority**

Many of the projects and programmes and the work we need to do with Government will be best delivered in partnership with Greater Manchester. The relationship between Manchester City Council, the Greater Manchester Combined Authority and the other nine local authorities will be key to enable this to happen.

## **Working with UK Government**

There will be activities which require additional powers and/or funding from Government to enable them to be delivered. For example, changes in Government legislation to enable the Mayor of Greater Manchester to re-regulate the buses and deliver the planned improvements to bus services.

In these instances we need to build on the existing relationship between the Greater Manchester Combined Authority and Government.

The preparations for COP 26 provide us with a vital opportunity to cement an ambitious programme and partnership between Manchester, Greater Manchester and Government, ready to showcase to the world in November 2020.

# 8. MEASURING AND REPORTING PROGRESS

We will produce an annual report setting out the city's progress at:

**www.  
manchesterclimate.  
com/progress**

These reports will describe progress against the city's four climate change objectives, supported by monitoring and analysis by four independent advisory groups:

- **Staying within our carbon budgets objective:**  
supported by the Manchester Zero Carbon Advisory Group<sup>42</sup>
- **Adaptation and resilience objective:**  
supported by the Manchester Adaptation and Resilience Advisory Group, to be set up in 2020
- **Health and wellbeing objective:**  
group to be set up, in partnership with Manchester Health and Wellbeing Board
- **Inclusive and zero carbon economy:**  
group to be set up, in partnership with the Manchester Work and Skills Board

We will also report progress as part of Manchester's membership of the Global Covenant of Mayors, through the CDP-ICLEI Unified Reporting System. Copies of our reports will be available from [www.cdp.net/en/responses](http://www.cdp.net/en/responses), including our first submission from 2019.

Ongoing news stories will be available from:  
[www.manchesterclimate.com/news](http://www.manchesterclimate.com/news).

We will establish a system to enable Manchester organisations and sectors to measure and report their performance according to a consistent methodology.

<sup>42</sup> <http://www.manchesterclimate.com/zero-carbon-advisory-group>

# 9. KEEPING OUR TARGETS AND FRAMEWORK UP TO DATE

Action on climate change is a fast-moving agenda. It is likely there will be developments over the life of this Framework that will require it to be updated.

Developments could include a new scientific report, in particular from the Intergovernmental Panel on Climate Change, such as their Special Report on 1.5°C in 2018, which led to our review of targets in late 2019/early 2020 (see Section 5.1).

They could include recommendations from the independent advisory groups that we are setting up to monitor progress against the city's objectives (see Section 8). CDP, who support cities around the world, will also continue to provide important input, building on their recommendation for us to add a new adaptation and resilience objective to this document (see Section 5.2).

Significant changes in local, national or international policy will likely require us to update our approach. Including those resulting in projects such as High Speed 2, Northern Powerhouse Rail, which will have a significant impact on the city.

The UK's departure from the European Union will also likely have an impact on the content and implementation of this Framework, including changes in the accessibility of EU funding to UK organisations.

As set out in Section 5, we know this Framework would benefit from further details on what needs to be achieved and by when. It is intended these details will be developed as part of a refreshed version of this Framework. The timescales for this refresh are to be determined but are currently envisioned to be by 2023, balanced with the need to focus our limited resources on ensuring practical action happens as quickly and widely as possible.

Learning and best practice from other cities will also inform the development of this Framework. This will include through participating in the networks and projects referenced in Section 10.

# 10. WORKING WITH OTHER CITIES

We want Manchester to be a leading city for action on climate change. Part of that leadership will come from testing and proving new solutions here that can be rolled out to other cities. However, it will also mean taking tried-and-tested solutions from elsewhere and using them to accelerate our rate of progress.

Will we continue to compete with other cities? Absolutely. But built on a principle that has served Manchester so well in our previous endeavours: local solutions that we'll share to help address this most urgent of global challenges.

## Greater Manchester

As set out above, working with the other nine districts and Greater Manchester Combined Authority is key to delivering programmes at the rate and scale we need, including where we need to secure support from Government.

## UK Cities and the Core Cities Network

In the UK, the Core Cities network<sup>43</sup> provides a group of key peers for Manchester to share with and learn from. It also provides a critically important vehicle for developing proposals to Government, including the October 2019 climate emergency declaration<sup>44</sup>.

## European and International Cities and Networks

Manchester will continue to benefit from the opportunities that we've already realised from participating in European and international networks and projects. These include the EU Covenant of Mayors<sup>45</sup>, Global Covenant of Mayors<sup>46</sup>, Eurocities<sup>47</sup> and the many EU-funded projects that have enabled the city to accelerate its action on climate change, at the same time as sharing with others to support them.

We will continue this work during 2020-25, include through the GrowGreen project to use nature-based solutions to help Manchester and our five partner cities adapt to the changing climate<sup>48</sup>. The C-Change project to support the arts and culture sectors in Manchester and five other cities to act<sup>49</sup>. We will build on the platform established by the Triangulum project and look to establish the Corridor as a zero carbon innovation district<sup>50</sup>.

The Zero Carbon Cities project will support the development of a refreshed version of this Framework and help our six partners cities to develop Paris Agreement-aligned targets and plans, and the governance needed to deliver them<sup>51</sup>. We will also work with the University of Manchester and five EU cities to share and support the further development of Manchester's partnership-based approach to climate action<sup>52</sup>.

43 [www.corecities.com](http://www.corecities.com)

44 [www.corecities.com/cities/agenda/environment/core-cities-uk-climate-emergency-declaration](http://www.corecities.com/cities/agenda/environment/core-cities-uk-climate-emergency-declaration)

45 [www.covenantofmayors.eu/en/](http://www.covenantofmayors.eu/en/)

46 [www.globalcovenantofmayors.org/](http://www.globalcovenantofmayors.org/)

47 [www.eurocities.eu](http://www.eurocities.eu)

48 <http://growgreenproject.eu/>

49 <https://urbact.eu/c-change>

50 <https://www.triangulum-project.eu/>

51 <https://urbact.eu/zero-carbon-cities>

52 'Polycentric pioneers? Explaining variations in governance models and their impacts on local climate change policy'; <https://www.research.manchester.ac.uk/portal/paul.tobin.html>

# 11. FURTHER INFORMATION AND GET INVOLVED

## Further Information

For further information you can contact the Manchester Climate Change Agency at:

[info@manchesterclimate.com](mailto:info@manchesterclimate.com)

[@McrClimate](https://www.instagram.com/McrClimate)

[www.manchesterclimate.com](http://www.manchesterclimate.com)

## Get Involved

Get involved right now! Visit our list of 15 Actions to get started or to add a new action to your existing commitments:

[www.manchesterclimate.com/15-actions](http://www.manchesterclimate.com/15-actions)

# 12. THANK YOU

This Framework is built on the need for collective, citywide action by everyone in Manchester. This isn't a new thing for the city, we've been doing it for over 10 years now.

So, to all of those who have been on this journey, whether for 10 years, or for 10 days, thank you.

To the youth strikers and the campaigners, thank you; keep up your passionate proposals to help make Manchester the city we all want it to be.

Thank you to Manchester City Council for the opportunity to develop this Framework. Through opening up the policy-making process we believe this creates the platform for the structural and systemic changes we all need, through both local policy and working with Government on the national policies and funding we need.

Thank you to those who have taken time to support the development of this Framework, including the Tyndall Centre for Climate Research at the University of Manchester, CDP, the University of Manchester, Anthesis and other partners. We look forward to continuing our work with you.

And finally, if this document has inspired you to get involved in climate change action for the first time, thank you for joining us!

**Manchester Climate Change Partnership**

February 2020



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February 2020

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CLIMATE CHANGE PARTNERSHIP

MANCHESTER  
CLIMATE CHANGE AGENCY