Draft Manchester Zero Carbon Framework 2020-2038

Our approach to creating a thriving, healthy, zero carbon Manchester

February 2019

MANCHESTER CLIMATE CHANGE BOARD

MANCHESTER CLIMATE CHANGE AGENCY

ZERO CARBON MANCHESTER

Contents

1. Purpose of this Document and Background

On 14th November 2018 Manchester City Council:

1. Adopted new science-based carbon reduction targets for Manchester, based on independent analysis and recommendations by the Tyndall Centre at the University of Manchester[1]

2. Committed to develop a draft action plan by March 2019 and a final detailed plan by March 2020, to set out how the city will meet its targets,

3. Recognised that by taking urgent action to become a zero carbon city, starting in 2018, Manchester will achieve more benefits for the city's residents and businesses than previously planned,

4. Agreed to work with partners to ensure that Manchester accelerates its efforts to encourage all residents, businesses and other stakeholders to take action on climate change.

These commitments were based on the 'Playing Our Full Part' proposal[2] developed by Manchester Climate Change Board and Agency and submitted to the City Council in October 2018.

Manchester's science-based targets

1. 15m tonne carbon budget for 2018-2100
2. Rapid carbon reduction, starting in 2018, and averaging 13% year-on-year
3. Zero carbon by 2038

1 Kuriakose J, Anderson K, Broderick J, McLachlan C . Quantifying the implications of The Paris Agreement for the city of Manchester 2018

2 Playing Our Full Part document

1. Purpose of this Document and Background

Manchester Climate Change Board and Agency

This document has been developed by Manchester Climate Change Board and Agency to set out our proposed approach for Manchester to achieve its climate change targets. It has been published in February 2019 to maintain the momentum established by the Board, the Agency, and their partners during 2018, and to be used as a key step towards producing a Final Framework and Action Plan by March 2020. The approach described in this document has been designed to engage and mobilise stakeholders across the city, to help ensure that all residents, businesses, the public sector and all other sectors take urgent and sustained action on climate change.

This draft framework is underpinned by the commitments of the Manchester Climate Change Board members. They represent approximately 20% of Manchester's CO_2 emissions, from across the public, private, housing, academic, faith and community sectors. In developing this document Board members have committed to play their full part in helping Manchester to meet its targets, both within the scope of their own operations, and through influencing their partners, customers, supply chains and other stakeholders.

Throughout 2019 the Board and its members will take urgent action to reduce their own CO_2 emissions, influence their stakeholders, put in place bespoke plans for 2020+ and engage new organisations and sectors to be part of the city's zero carbon journey.

MANCHESTER
CLIMATE CHANGE BOARD

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1. Purpose of this Document and Background

Our Manchester

In 2015 Manchester City Council asked the city's residents and businesses *'what's your dream Manchester?'*

"A city with the cleanest air"

"A city with cycling at its heart"

"Economically and environmentally sustainable

"Green industry powerhouse"

"A world leader in urban sustainability"

"A carbon neutral city"

These responses are among the approximately 800 – one-third of the 2,500 total responses – that were focused on climate change action and environmental sustainability

As a result, the commitment to climate change action is embedded throughout the Our Manchester Strategy, the city's overarching strategy for 2016-25:

'Our vision is for Manchester to be in the top flight of world-class cities by 2025, when the city will:

- *Have a competitive, dynamic and sustainable economy that draws on our distinctive strengths in science, advanced manufacturing, culture, and creative and digital business – cultivating and encouraging new ideas*
- *Possess highly skilled, enterprising and industrious people*
- *Be connected, internationally and within the UK*
- ***Play its full part in limiting the impacts of climate change***
- *Be a place where residents from all backgrounds feel safe, can aspire, succeed and live well*
- *Be clean, attractive, culturally rich, outward-looking and welcoming'*

1. Purpose of this Document and Background

Climate Change Impacts Globally and Locally
There is no escaping the fact that climate change is now increasingly becoming a global crisis, disproportionately affecting those least able to bear it and with the least responsibility for causing it.

Extreme weather linked to climate change has wrought devastation around the world over the last 12 months. From Athens to the Arctic Circle, tinderbox dry conditions set Europe on fire last summer, including the moorlands on our own doorstop. Hurricane Michael left 'unimaginable destruction' in Florida, adding to the 385 billion dollars' worth of damage from hurricanes in 2017. Flash floods in Majorca claimed the lives of UK tourists in October 2018. All on top of the floods, droughts and heatwaves that continue to plague countries where many of Manchester's residents have family and friends, including Bangladesh, India, and Pakistan. There is now no corner of the planet that is not affected by the impacts of climate change, Manchester included.

Since the 1950s, there has been a 10-fold increase in surface water flooding across Greater Manchester[1]. On the 26th December 2015, Storm Eva brought unprecedented rainfall to Manchester, resulting in record river levels and flooding across the city region. The impacts[2] included:

- More than 2,250 homes and 500 businesses that were flooded,
- More than 31,200 properties that lost their power supplies,
- Damage to infrastructure that totaled £11.5m.

More recently, the prolonged dry and hot weather of spring and early summer of 2018 resulted in wildfires in June and July across Manchester's surrounding moorlands. The result was severe and far reaching impacts:

- Resident, worker and landowner health issues caused by poor air quality,
- Biodiversity loss,
- Financial losses for our public services,
- Increased carbon emissions from burning vegetation and peatland carbon sinks.

Experts at the University of Manchester forecast that events of this nature are likely to continue to become more severe and more frequent unless urgent action is taken to reduce global CO_2 emissions.

1 – University of Manchester & Greater Manchester Combined Authority, Research and Data for Climate Change Adaptation and Resilience - A Baseline Assessment for Greater Manchester, 2017
2 – Greater Manchester Combined Authority, Boxing day flood report, 2015

2. Our Aim

Manchester will play its full part in limiting the impacts of climate change, locally and globally, by acting in line with the latest climate science, the Paris Agreement, and the views of the city's residents and businesses.

2. Our Objectives

1) Carbon Reduction and Contributing to the Paris Agreement

Manchester will play its full part in limiting the impacts of climate change by adopting and meeting science-based targets, in line with the Paris Agreement.

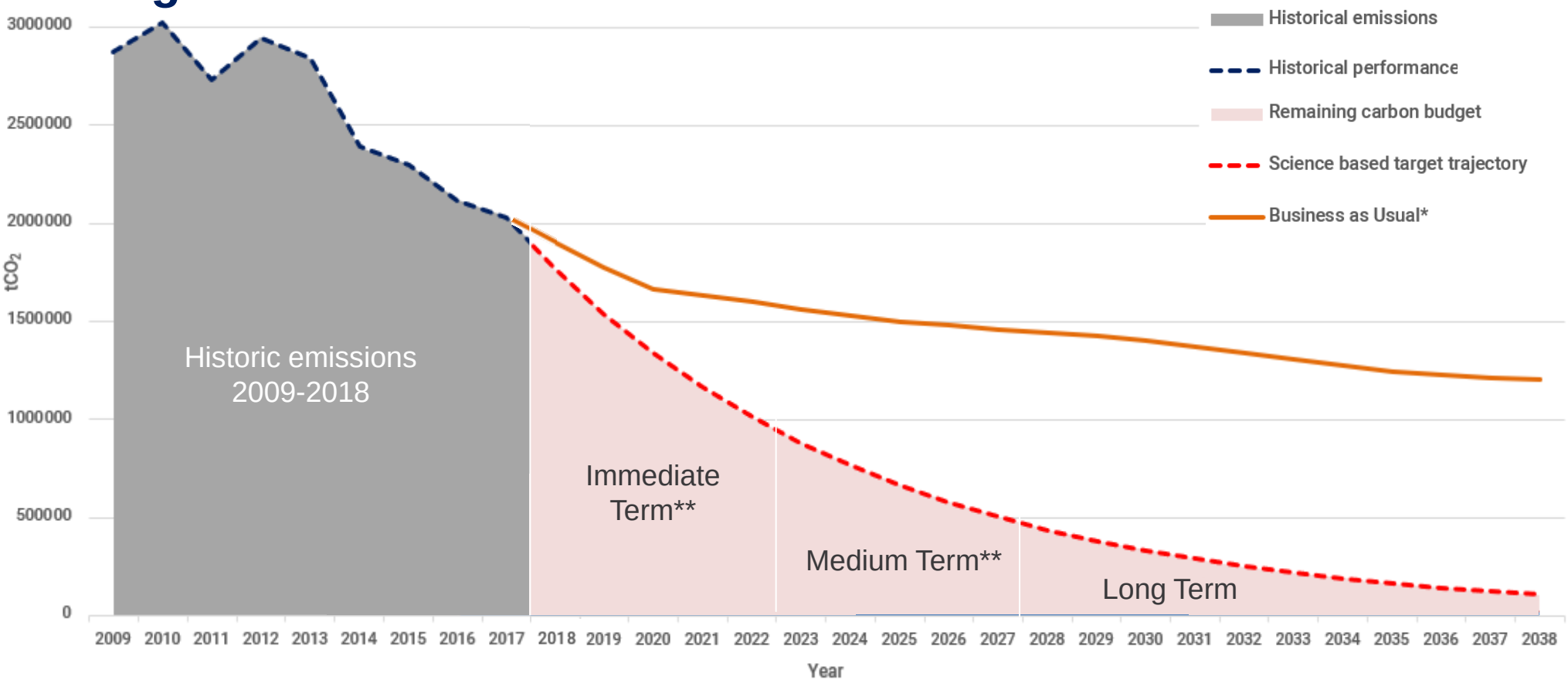
Our current targets are based on analysis by the Tyndall Centre at the University of Manchester[1] and were adopted by Manchester City Council in November 2018:

- 15 million tonne carbon budget for 2018-2100,
- Urgent and deep carbon reduction; 50% reduction by 2022, from 2018 levels,
- Zero carbon by 2038.

1 Kuriakose J, Anderson K, Broderick J, McLachlan C. Quantifying the implications of the Paris Agreement for the city of Manchester [Internet]. Manchester; 2018

2. Our Objectives

1. Carbon emissions pathway consistent with 2°C Paris Agreement

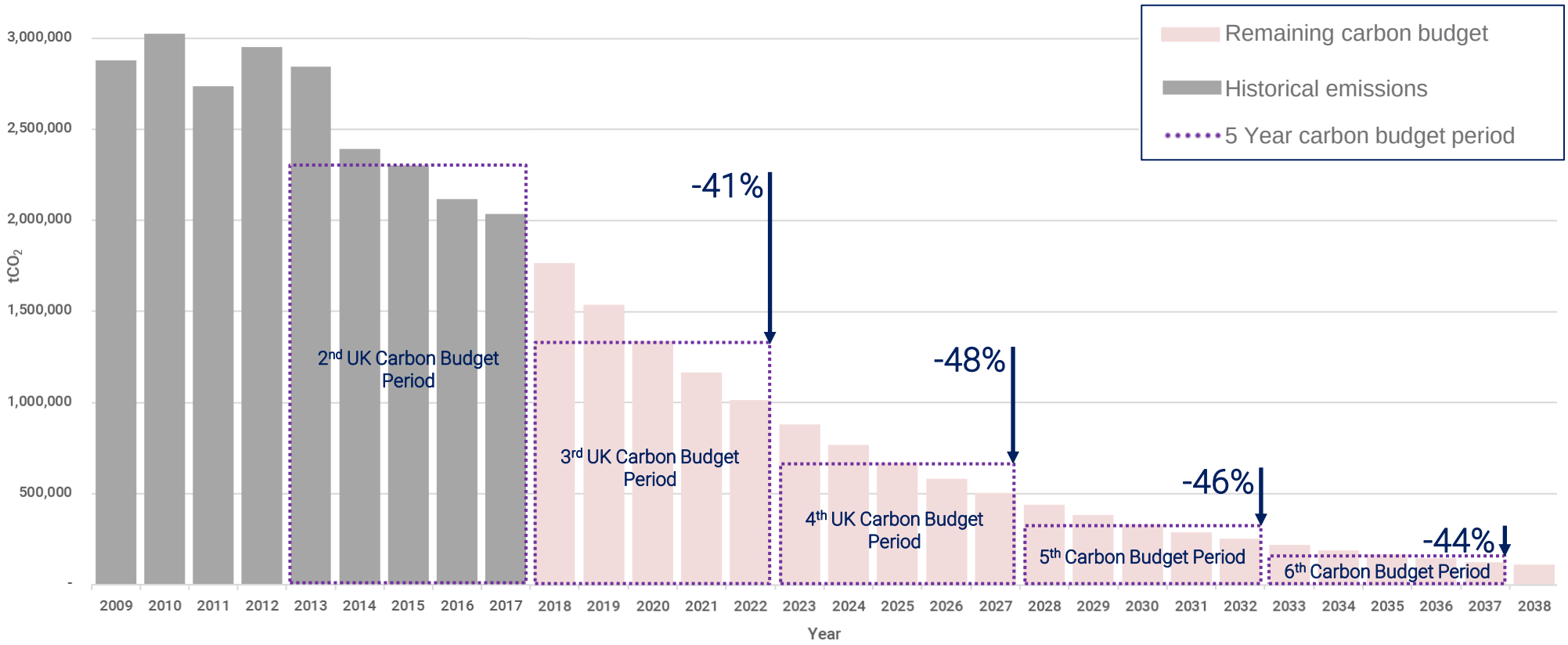


Total budget (2018-2100) tCO_2	Immediate term (2018-2022) tCO_2	Medium term (2023-2027) tCO_2	Long term (2028-2037) tCO_2
15,187,610	6,928,620	3,593,560	3,046,920

* Business as usual as defined by Level 1ambition thresholds within the Anthesis' SCATTER model.
** Immediate Term & Medium Term periods align with the 3rd and 4th nationally legislated carbon budget periods (respectively) under the UK Climate Change Act (2008).

2. Our Objectives

Manchester's Carbon Budget to 2038



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15,187,610	6,928,620	3,593,560	3,046,920

*Budget periods align with the nationally legislated Carbon Budget periods under the UK Climate Change Act (2008). The 5 yearly Paris aligned Carbon Budgets require a significantly more ambitious level of reduction relative to the legislated Committee on Climate Change budget reductions. The Committee on Climate Change are currently considering revising their approach to budgets and whether to adopt a (net) zero carbon approach. Reduction % estimates represent the average (mean) emissions of each 5 year Carbon Budget period compared against previous 5 year Carbon Budget period average.

2. Our Objectives

2) Improving our residents' health, wellbeing and quality of life

We will deliver activities to improve the health, wellbeing and quality of life of our residents, at the same time as reducing the city's CO_2 emissions to zero. This will include improving the energy performance of the city's homes, replacing existing polluting vehicles with zero emission alternatives, and ensuring walking, cycling and zero emission public transport become the modes of choice for the vast majority of residents, workers and visitors.

3) Creating good jobs, supporting successful businesses and attracting investment

We will create good jobs for the city's residents and students, support businesses to succeed and attract investment by developing the city's green industry sector and enabling all other city sectors to reduce their CO_2 emissions to zero. Manchester will be recognised as a leading city to do business, using our climate change and sustainable development credentials to attract investors, students and workers from around the world.

3. Living and Working in a Zero Carbon Manchester

Living

- Households will save between £49m and £141m every year through improving the energy efficiency of their homes.
- 34,000 households will be taken out of fuel poverty by eradicating cold, damp and energy inefficient homes.
- Healthcare services will be used by residents 16% less than today after the energy efficiency of their homes has been improved.
- 12,000 households will no longer experience food poverty, thanks in part to the major shift towards eradicating food waste and the availability of fresh, seasonal, locally produced food.
- Households will no longer be wasting between £470 and £700 every year on food that currently goes in the bin.

Working

- 30,000 new jobs will be created in Manchester's growing environment and sustainability sector.
- Over 80% of Manchester graduates with environmental degrees will secure good, well-paid jobs in the environment and sustainability sector.
- Manchester will be a leading city for STEM education, helping the UK to avoid the £6.7bn annual cost to the national economy that is currently forecast if the UK STEM skills-gap isn't filled.
- 55,000 jobs will be created across Greater Manchester to retrofit homes.

3. Living and Working in a Zero Carbon Manchester

Improving Health

- Our residents will no longer need to be treated for asthma due to poor air quality, a reversal of our current position as the worst city in the country, with 1,000 people dying prematurely every year, mainly from vehicle emissions.
- The many other impacts of poor air quality – lung cancer, cardiovascular disease, worsening of heart conditions, slower thinking skills in older people, mental and physical developmental problems in children, lower productivity and school absenteeism – will also be problems of the past.
- Across Manchester, residents will be moving a lot more on foot and by bike, reducing our levels of inactive adults from 66% towards zero.

More Money for Public Services

- £17m per year savings to the NHS will be achieved through eradicating cold, damp and energy inefficient homes.
- The NHS will save at least £500,000 every week from helping Greater Manchester residents to significantly increase their levels of walking and cycling.
- If not zero, our levels of food waste will be very low, saving Greater Manchester local authorities the £1bn which is currently spent on food waste disposal.

Travelling

- By 2025 up to 116,000 electric vehicles will be on the road, saving households £674 yearly in fuel and maintenance costs compared to petrol and diesel vehicles, amounting to a cumulative yearly saving to residents of up to £78m.
- Greater Manchester's businesses will be at least £1.3bn better off once congestion becomes a problem of the past.

4. Developing this Framework

The city's carbon budget sets out a finite emissions limit that the should not be exceeded (15 million tonnes CO_2).

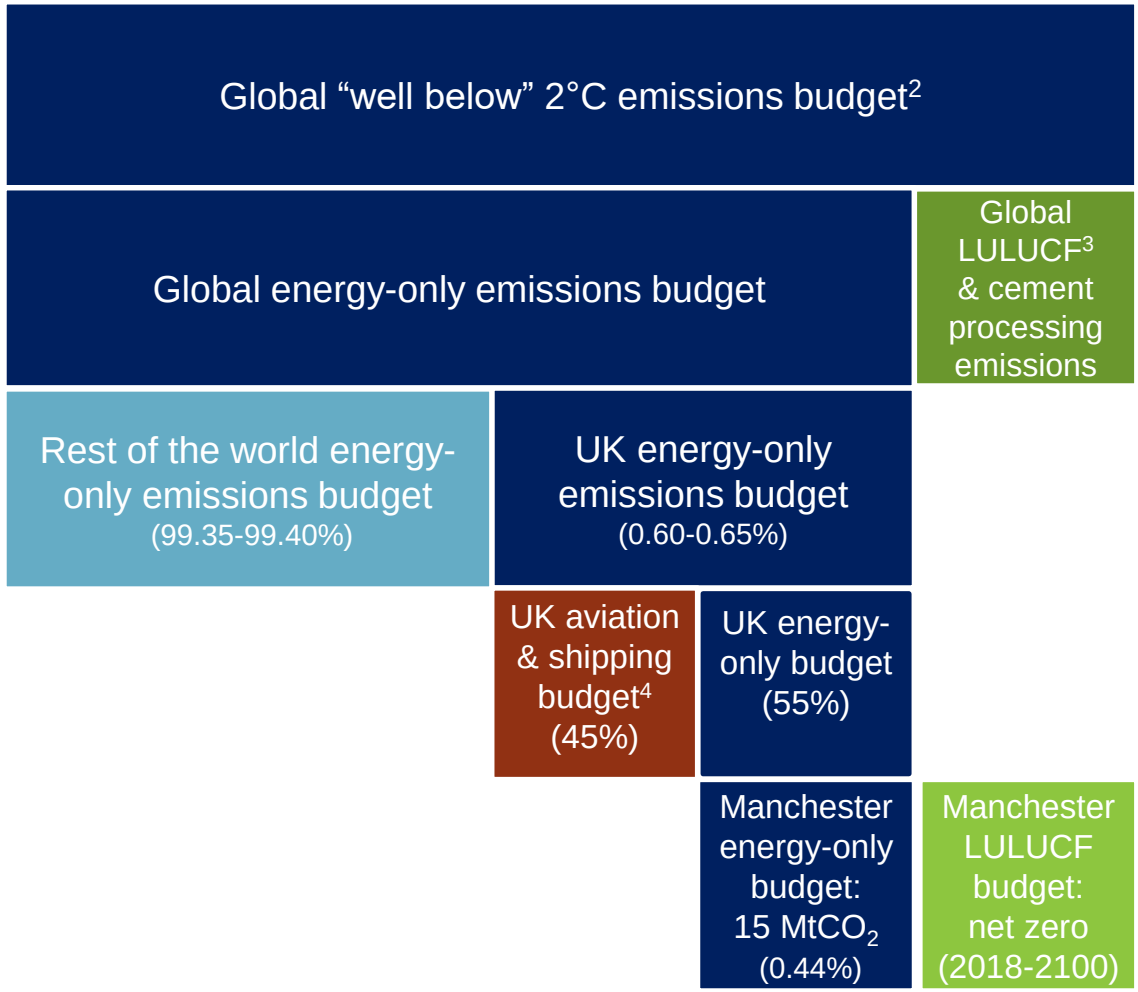
The Tyndall Centre for Climate Change Research have based our budget on a 2°C global average temperature rise, on the basis that:

1) The Paris Agreement commits us to limiting warming to this level.
2) Global modelling for both 1.5°C and 2°C assume planetary scale negative emissions.

However:

1) NETs[1] at the huge scale in the IPCC models remain highly speculative.
2) NETs are not likely to be viable within the city boundary of Manchester due to the profile of emissions.
3) If research, development and demonstration of NETs shows that they may work at scale, and then they are rolled out globally at unprecedented rates, 1.5°C may, theoretically, be achievable. But only if rapid & deep 2°C mitigation begins now & additional feedbacks do not occur.

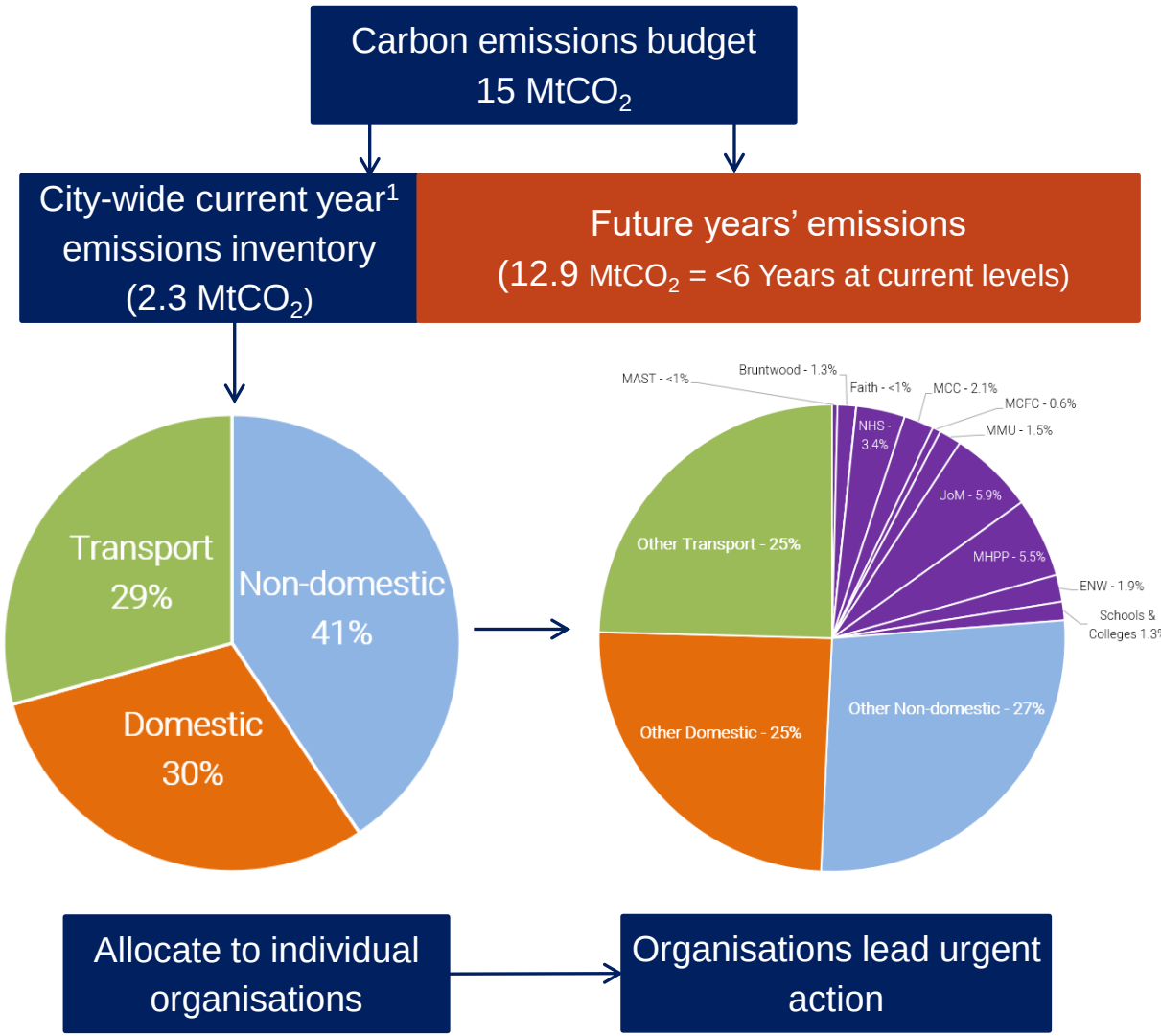
Carbon budget methodology



Notes:
Bars/boxes in the diagram are not to sized scale of budgets
1 - NETs = Negative Emissions Technologies. Refer to Frequently Asked Questions for further information.
2 - Budget derived from IPCC AR5 synthesis report and represents a 66-100% probability of global warming not exceeding 2°C ("well below"). Due to the inertia in our energy systems and the amount of carbon we have already emitted, the Paris 1.5°C commitment is now only likely to be viable if negative emissions technologies (NETs) prove to be successful at a global scale. If the 13% emissions reduction rates for Manchester are achieved and NETs are deployed at the scales assumed in the global models, then the targets adopted may be considered as a 1.5°C compatible. This also expressly assumes that other carbon cycle feedbacks, such as methane released due to melting permafrost etc., do not occur, and that an overshoot of 1.5°C does not result in increased feedbacks that further accelerate warming at lower budgets than the IPCC budgets currently estimate.
3 - Land Use, Land Use Change & Forestry
4 - UK Aviation & Shipping is accounted for at the national level – see Appendix 6. If sufficient progress isn't made to reduce these the remaining UK budget for other sectors, and therefore Manchester's budget, will be reduced

4. Developing this Framework

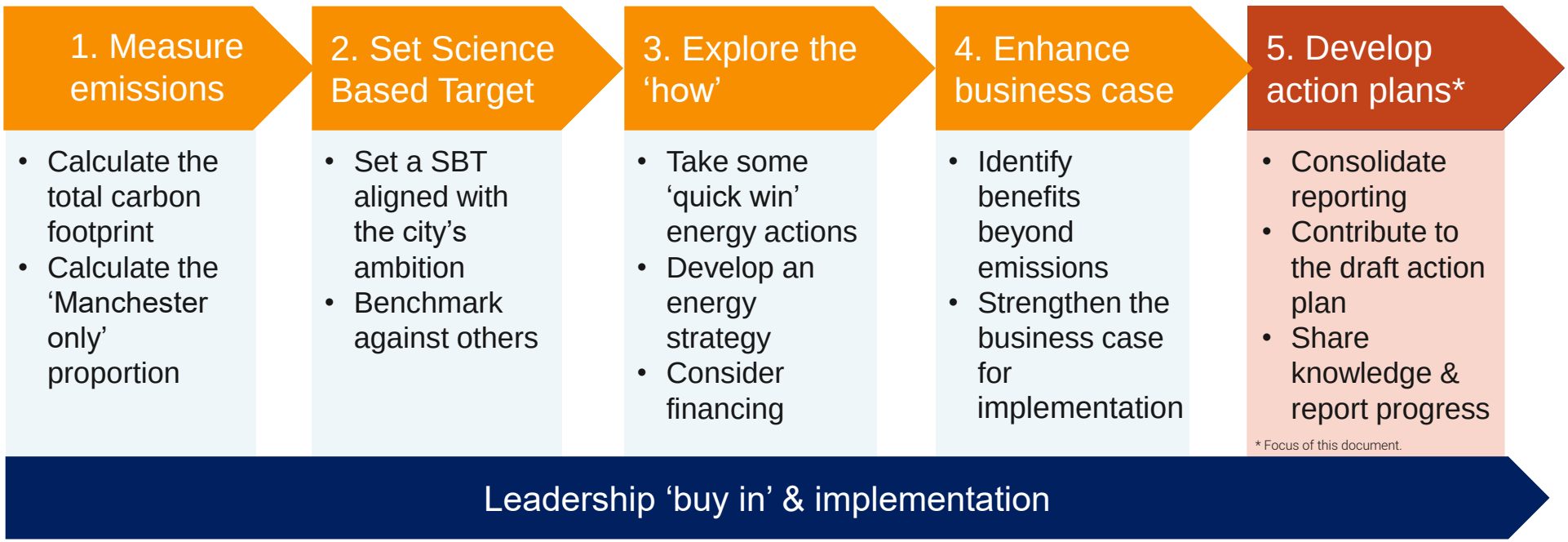
- The city's emissions inventory represents one year's worth of emissions, which can be used to track progress against the budget
- Both the carbon budget and current year inventory use UK Government Local Authority Emissions data
- We have built on the Our Manchester approach, which has been designed to establish a collective approach to achieving city priorities
- This approach allocates responsibility to organisations and sectors in an engaging way that engages and empowers them to act
- Current allocations to organisations and sectors are based on existing partnerships within the Manchester Climate Change Board membership.



1 – Based on 2017 BEIS data (2 years in arrears, therefore relates to 2015)

4. Developing this Framework

A step-by-step process for organisations to follow is set out below. A separate user guide is available to support with Steps 1-5 (see Appendix 5).

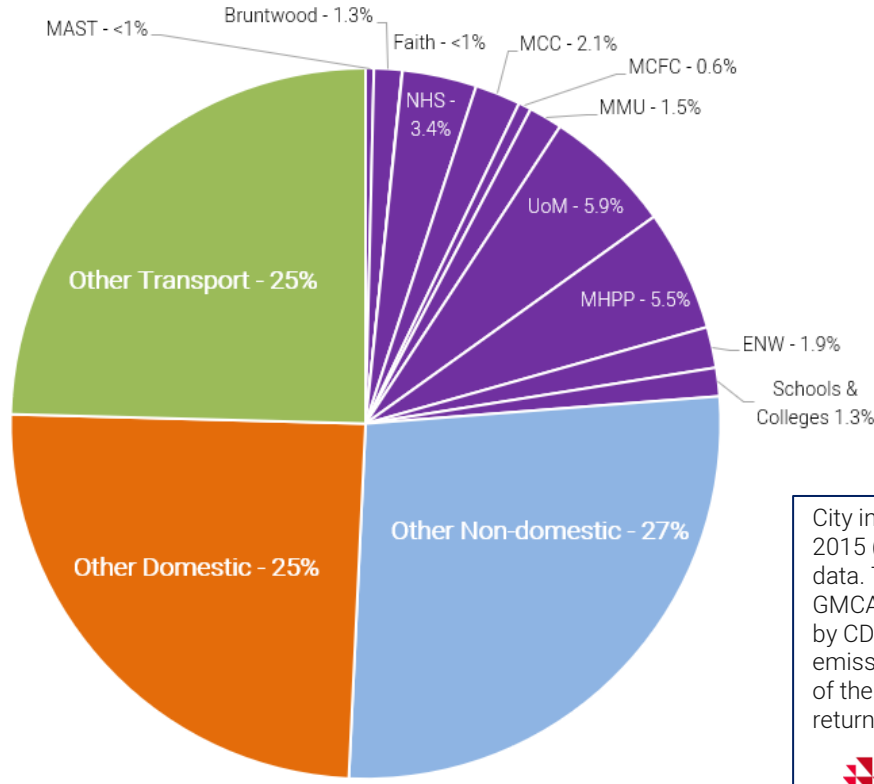


5. The MCCB ‘Pioneers’ – Sector and Organisation Summary

Who are the Pioneers?

- 10 MCCB Board Members representing over 60 individual organisations have committed to act and help achieve the city's targets. These are:
  1. Manchester Arts Sustainability Team (MAST)
  2. Bruntwood
  3. Our Faith, Our Planet (Faith)
  4. Manchester University NHS Foundation Trust (NHS)
  5. Manchester City Council (MCC)
  6. Manchester City Football Club (MCFC)
  7. Manchester Housing Providers Partnership (MHPP)
  8. Manchester Metropolitan University (MMU)
  9. University of Manchester (UoM)
  10. Electricity North West (ENW)

- These organisations represent over **500,000 tonnes CO_2 per year** which is over **20%** of Manchester’s emissions.



City inventory prepared using 2015 (2017) BEIS local emissions data. This data feeds into the GMCA GPC inventory supported by CDP and used to fulfil the emissions reporting requirements of the Global Covenant of Mayors return for GMCA.

Action during 2019/20

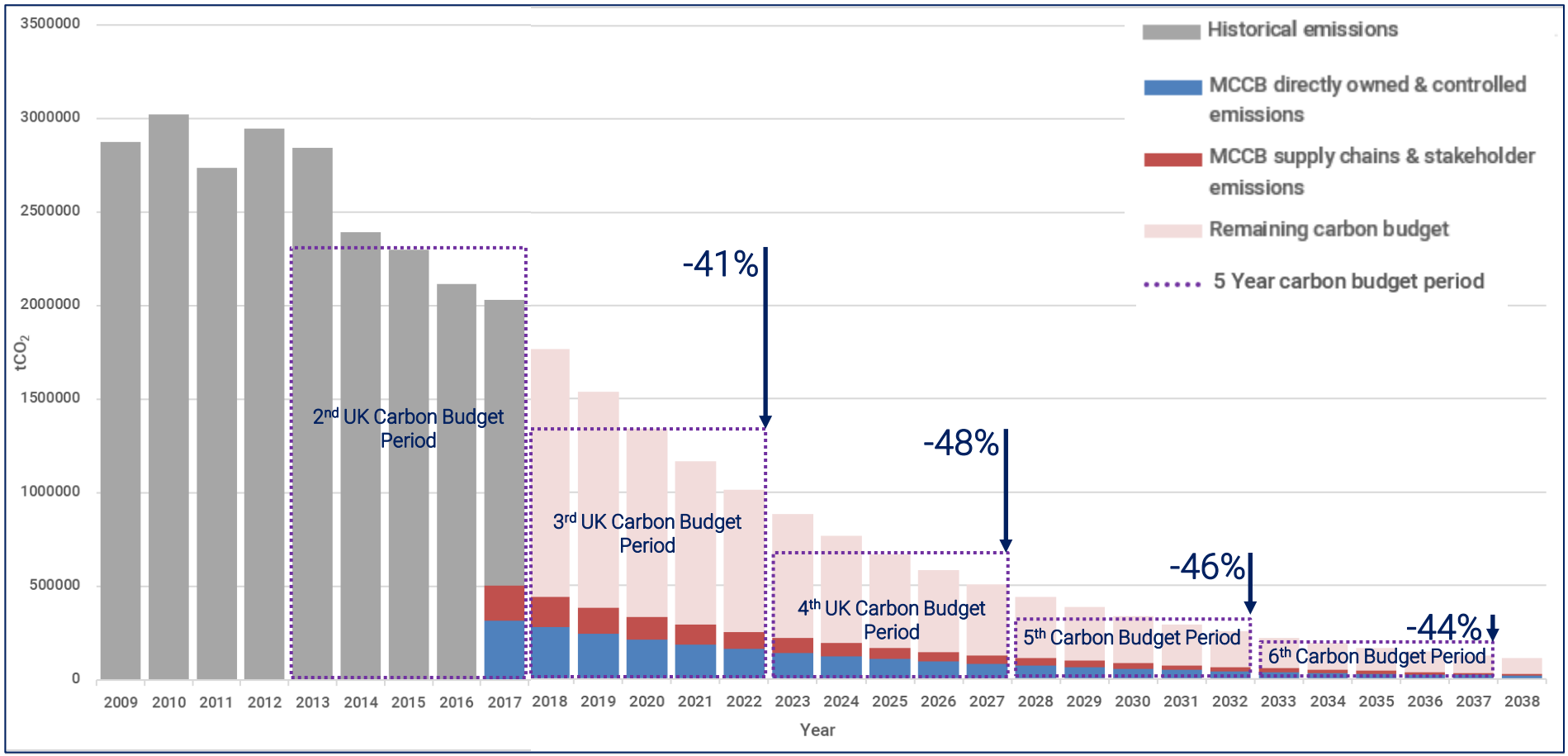
All Pioneer sectors/organisations have set out their priority action plans for 2019/20. These are provided in Appendix 4.

The Action Plans cover the following 4 actions:

1. Urgent action 2019/20: organisational emissions,
2. Urgent Action 2019/20: stakeholder support,
3. Your Action Plan 2020+,
4. Support you need.

5. The MCCB ‘Pioneers’ – Sector and Organisation Summary

Manchester’s carbon budget to 2038 with MCCB ‘Pioneers’



Budget periods align with the nationally legislated Carbon Budget periods under the UK Climate Change Act (2008). The 5 yearly Paris aligned Carbon Budgets require a significantly more ambitious level of reduction relative to the legislated Committee on Climate Change budget reductions. The Committee on Climate Change are currently considering revising their approach to budgets and whether to adopt a (net) zero carbon approach. Reduction % estimates represent the average (mean) emissions of each 5 year Carbon Budget period compared against previous 5 year Carbon Budget period average.

5. The MCCB ‘Pioneers’ – Sector and Organisation Best Practice

The 60 organisations and sectors represented by MCCB have already started to make progress on their zero carbon journeys, some going back over 10 years and more. There has already been significant action to reduce emissions – from thousands of energy efficiency improvements and renewable technologies fitted by the city's social housing providers, to tried and tested SMART energy systems in commercial offices, to innovative methods for calibrating and maintaining temperatures for priceless works of art at the city’s galleries.

The following “Manchester Best Practice” highlights some of the progress that the city’s climate change pioneers have already achieved:

- **Bruntwood Bright Building** is itself a ‘living lab’ for technology and innovation. The building utilises Tesla’s powerpack battery which aims to make the building energy self sufficient within 12 months. It is being used to test new Building Management Systems (BMS) technologies and smart lighting as part of the Innovate UK funded CityVerve project.
- **Manchester Metropolitan University's** £140million Birley Campus is cited as an exemplar by the Higher Education Funding Council for England (HEFCE) for community engagement and regeneration, achieving BREEAM Excellent. The site has an independent district heating system, extensive solar PV arrays and LED lighting.
- **Northwards Housing** has carried out a £300m Home Improvement Programme, including external and/or internal insulation to almost 2,500 ‘hard to treat’ homes, solar photovoltaic (PV) panels onto 2,334 houses and 21 blocks of flats, solar thermal panels onto seven block of flats, ground source heat pumps at five locations serving 90 flats, air source heat pumps to 153 properties, two communal combined heat and power units serving 213 flats, eight micro combined heat and power units to eight homes and soft measures such as low energy lighting.

Case studies from each MCCB member can be seen in Appendix 4 (a separate document).

6. Clean Growth and New Development

Growth in context

Manchester is a growing city. During 2017 to 2019 the population grew from 559,531 to 583,157 residents. This growth is set to continue, with 605,674 residents forecast to be living in Manchester by 2021 – a rise of 8.2%.

While this growth reflects positively on the city as the economic driver for the north of England and a world-renowned centre for sport, culture and education, it presents significant challenges to our zero carbon commitments. Growth and development generally equates to more energy-consuming buildings, increases in the movement of people and goods and associated transport infrastructure, the consumption of more materials, and the generation of increased levels of waste.

Areas for Action

For the city's growth to be compatible with our climate change targets, we urgently need to challenge and help to rapidly transform this global paradigm:

- New buildings need to generate zero emissions when occupied and have significantly less emissions embodied in their materials and the construction phase,
- Renewable energy generated within the city and city-region, and the supplies for the National Grid, are needed to power our buildings and transport system,
- Well-connected walking and cycling routes, public transport and electric vehicle charging points need to be key components of all new development,
- Our materials and waste will need to come from a new circular economy, involving the reuse and recycling of materials already in circulation, and significantly increased use of sustainable and renewable materials.

6. Clean Growth and New Development

From risk to opportunity

Some cities would view these challenges as potential barriers to growth and investment. Others would view them as opportunities to become leaders in a new zero carbon global economy. Opportunities to attracts thinkers and researchers that want to break the mould, opportunities to provide a location for innovative businesses that want to test and commercialise new ideas, and opportunities to provide a platform for investors that want to be at the forefront of rapidly growing sectors. Opportunities to retain and attract residents that want the best quality of life, good jobs, and the knowledge that their city is contributing positively to global society and the natural environment.

We know which kind of city Manchester is.

6. Clean Growth and New Development

Cross-cutting actions

To realise the opportunities and benefits for the city we need an integrated approach that embeds zero carbon commitments throughout all aspects of the city's short, medium and long-term development, including:

1. **Public Private Partnerships:** shared commitments and partnerships between Manchester City Council, the private and public sectors to make Manchester a thriving, zero carbon city.

2. **Spatial Planning**: clear, long-term planning policies that ensure any buildings we build today that are not zero carbon will need to be retrofitted in the very near future. The consultation draft of the Greater Manchester Spatial Framework sets out the proposal that all new developments should be zero carbon from 2028. This draft policy needs to be reviewed in the context of Manchester and Greater Manchester's climate change commitments.

3. **Local skills and supply chains** need to be further developed to respond to the rapidly growing demand for the expertise and products that are needed to build a zero carbon city.

4. **Innovation Centre**: open up Manchester as a city that attracts and fosters zero carbon innovation. The Oxford Road Corridor, social housing providers and others have all provided the platform for research and innovation projects so far. We now need to extend this concept across the city and Greater Manchester to drive further innovation and roll-out of proven technologies and business models.

5. **Devolution:** a shared commitment is needed between Manchester City Council, Greater Manchester Combined Authority and Government to enable the city and city-region to fully contribute towards the UK's climate change and clean growth commitments. Building this into successive Devolution deals to provide the powers and funding to act is key to the successful realisation of such a commitment.

7. Barriers, Enablers and New Policies

Working with our stakeholders has identified various cross-cutting barriers, enablers and policies that MCCB members recognise as being critical in taking forward their ambitions and the city's zero carbon ambitions more widely. At this stage we have not established a comprehensive list of barriers, enablers and new policies. The following provides an initial set to build on during 2019.

Barriers and Enablers Identified to Date

1. **Business Engagement, Carbon Literacy and Support**

We need a comprehensive citywide programme that engages businesses, helps them to understand climate change, what it means for their organisation and then provides the necessary support and signposting to enable them to put in place and deliver their own bespoke zero carbon plans. The Carbon Literacy project's work provides a good platform and should be built on from now.

2. **Community Engagement, Carbon Literacy and Support**

We need to establish a citywide programme for communities. Beyond pilots and one-off initiatives the city currently has no systematic approach for engaging and enabling Manchester's communities and individuals to act. Again, the Carbon Literacy project, and organisations such as Groundwork, have provided some good progress in this area, but with much wider and accelerated roll-out of community engagement, support and signposting now urgently needed.

3. **Funding and Investment**

Once zero carbon plans are in place funding is needed for their implementation. In many cases projects such as energy efficiency and renewable technologies will be able to deliver a return on investment. In these cases access to funding is the barrier. Given the scale of action needed, the funding is expected to reach into the billions of pounds. We need to engage with investors and lenders that are already active in this market as well as draw on Greater Manchester's previous experience of setting up new funding mechanisms to deliver local priorities, including through community-owned renewable energy models.

4. **New Business Models**

Where zero carbon projects don't deliver a return on investment, we need to create innovative business models. Manchester has one of the largest financial and professional services sectors in the UK, plus the expertise of the two Manchester universities and their business schools. That expertise needs to be employed as a matter of urgency.

7. Barriers, Enablers and New Policies

5. Financial Incentives
Previously public policy has been used to create financial incentives to change the behaviours and investment decisions of individuals and businesses. We need to look urgently at the incentives we could introduce within our existing policy and legislative framework, and engage with Government to create new mechanisms through Devolution where they are needed.

6. Multi-level Policy and Governance
The commitment to zero carbon needs to be embedded across all levels of governance and policy-making, from the United Nations and international agreements, to the European Union, to the UK, to Greater Manchester, to Manchester, and even further down to wards, communities and individual residents and businesses. This 'multi-level governance' is a key principle of the Paris Agreement. By embedding zero carbon within policies at all levels this will help to ensure climate change action becomes an integrated part of wider strategies for sustainable development in Manchester and cites and around the world.

The following does not set out a comprehensive list of areas policies and strategies where climate change and science-based targets need to be embedded, but it provides a starting point for further work during 2019:

Manchester City Council
- Local Industrial Strategy – being produced during 2019
- Digital Strategy
- City Centre Transport Strategy
- Local Plan – now in the early stages of development
- Housing Strategy
- Work and Skills Strategy
- Health and Wellbeing Strategy

Greater Manchester Combined Authority
- Greater Manchester Spatial Framework – public consultation open until 18th March 2019
- Transport 2040 Delivery Plan
- Clean Air Plan
- GM Local Industrial Strategy

UK Government
- UK Climate Change Act Review

8. Working with Greater Manchester and UK Government

Manchester, Greater Manchester and UK Government have already worked together to deliver common objectives; for example on Metrolink expansion, house-building, transformation of the local healthcare system, and others. These outcomes have been possible through developing shared commitments, partnerships, policies, programmes, and the necessary funding to make things happen.

The same is true for climate change action. Across all three levels local and national Government need to come together to develop and deliver a joint programme for action, as part of the UK's wider commitment to contribute to the Paris Agreement.

Manchester-Greater Manchester
At a Manchester-Greater Manchester level we need Manchester City Council, the Mayor of Greater Manchester and the other nine districts to come together and make a formal commitment to adopt and meet science-based targets.

We call on Greater Manchester's political leaders to achieve this in time for the Mayor's next Green Summit on 25th March 2019 and then urgently put in place a clear and consistent GM-wide policy framework and work programme to enable these targets to be achieved, including any new powers and funding required from Government.

"Manchester's ambitious target highlights how this city is confronting this challenge head on, while seizing one of the greatest industrial opportunities of our time"

Claire Perry MP, Government Minister for Business, Energy and Industrial Strategy, 14th November 2018 , on Manchester's adoption of science-based targets

8. Working with Greater Manchester and UK Government

Greater Manchester-UK Government
At a Greater Manchester-UK Government level we need a new pact that will enable the city-region and its ten districts to fully contribute to UK Government's commitment to the Paris Agreement. Given the likely need for new powers and funding it is likely that a new Devolution deal provides the best vehicle for such an arrangement. This should take account of the impact that Brexit may have on local climate change action – Manchester and Greater Manchester currently benefit from millions of Euros every year to deliver ground-breaking research, innovation, policy-development, knowledge exchange and practical action on-the-ground.

We call on the GM Combined Authority and UK Government to establish a new programme that enables Greater Manchester and its districts to make a full contribution to the Paris Agreement and local science-based targets, including through providing new powers and funding where needed.

9. Working with Other Cities

Manchester is one of thousands of cities around the world committing to and taking action on climate change. Many of these cities' efforts are being accelerated by working together with others, sharing experiences on common challenges and opportunities, and inspiring each other to raise their ambitions and accelerate their progress.

Manchester is well-placed to participate in the many initiatives that enable this kind of joint-working and knowledge exchange. Many organisations in the city have been participating in such initiatives for many years, collaborating with other European cities, sharing knowledge and making progress at a speed and quality standard that would not have been possible from working in isolation. The Triangulum project on Smart Cities, C-Change project on arts, culture and climate change, the mPower project to create clean, fair and democratic energy systems, and many others provide recent examples.

We call on Manchester City Council to build on this previous work and, during 2019, to formally commit the city to join and actively participate in initiatives that will enable the city to share with others and accelerate our progress towards zero carbon, including through networks of UK, European and international cities.

Options include:

UK:

- Core Cities https://www.corecities.com/ (already a member)

Europe:

- Eurocities http://www.eurocities.eu (already a member)
- Energy Cities http://www.energy-cities.eu/

International:

- Global Covenant of Mayors https://www.globalcovenantofmayors.org/ (already a member)
- C40 https://www.c40.org/
- Carbon Neutral Cities Alliance https://carbonneutralcities.org/
- ICLEI https://www.iclei.org/

10. Governance and Reporting

Our Manchester

The commitment to ‘play our full part’ on climate change is part of the Our Manchester Strategy for 2016-25. As such it is a commitment for all residents and organisations, with high-level progress overseen on behalf of the city by the Our Manchester Forum.

Manchester Climate Change Board

The Manchester Climate Change Board (MCCB) was established in February 2018 to champion and oversee progress in relation to this commitment. The chair of MCCB is a member of the Our Manchester Forum, working to ensure that Forum members are kept up-to-date with progress, they are engaged and taking action on climate change, and that the city’s commitments are embedded across the wider Our Manchester governance structure, including the Health and Wellbeing Board, Work and Skills Board, Housing Board, and others.

MCCB is made up of representatives from the city’s public, private, academic, faith and community sectors. The Board’s draft aim and objectives are:

Draft aim

Work with partners to create a citywide movement for action on climate change.

Draft objectives

Work with partners to:

1. Policy and Political Decisions: support and influence policymaking and political decisions to be consistent with, the latest climate science, The Paris Agreement and stakeholders’ views.
2. Engage, influence and support Manchester citizens and organisations to take action on climate change, including through initiating and supporting new projects and programmes.
3. Honestly and transparently report and communicate the city’s progress against its climate change commitments.
4. Knowledge Sharing: share our experiences, learn from others, and contribute to a global movement of cities acting on climate change.

The Board and the Agency’s aim and objectives will be finalised during 2019.

10. Governance and Reporting

Manchester Climate Change Agency
MCCB's work is supported by the Manchester Climate Change Agency, which shares the same aim and objectives. The Agency is a not-for-profit Community Interest Company.

Annual Reports
Annual reports will include progress against the three objectives at the front of this document: carbon reduction; residents' health, wellbeing and quality of life, and; jobs, successful businesses and attracting investment. Where the city is not on track to meet its objectives, this will be clearly set out in annual reports and the necessary remedial action specified.

The Climate Change Board and the Agency's progress against its objectives will also be included in the annual report.

Annual reports will be publicly available from www.manchesterclimate.com (where reports since 2013 are also available) and promoted through an annual conference.

Online Communications
Ongoing progress will also be communicated on an ongoing basis via www.manchesterclimate.com, @McrClimate and other social media.

11. Next Steps

This draft Framework sets out Manchester Climate Change Board and Agency's approach to help Manchester meet its science-based climate change targets. The key principle is that all residents and organisations in the city ultimately need to be engaged and playing their full part.

The work to develop this draft Framework during November 2018 to February 2019 has engaged over 60 organsations that are directly responsible for approximately 20% of the city's emissions.

To address the remaining 80% the following work needs to be completed during March 2019 to February 2020, by the Board and its individual members, the Agency, Manchester City Council, and new partners yet to be engaged:

Organisations and sectors:

Pioneers:

- Take urgent action to reduce CO_2 and influence stakeholders during 2019
- Finalise organisation/sector actions plans for 2020-22
- Secure resources and prepare for action plan delivery from 2020+
- Further details are provided in Appendix 4

Fast movers:

- Engage new organisations and sectors
- Support development of bespoke zero carbon organisation/sector action plans

Crucial contributors:

- Establish a programme(s) to engage and support businesses to take action

11. Next Steps

Residents and communities

- Establish a programme(s) to engage and support residents and communities to take action

Transport

- Engage Transport for Greater Manchester and support the refresh of the GM Transport Strategy 2040 to help ensure it is fully aligned with Manchester's climate change targets

Key Dates

The Manchester Zero Carbon Framework 2020-38 and Action Plan 2020-22 will draw together each of the above activities and be completed according to the following timescales:

- February-March 2019 – this Draft Framework submitted to Manchester City Council for endorsement
- February-March 2020 – Final Framework and Action Plan 2020-22 submitted to Manchester City Council for endorsement
- April 2020 – Action Plan 2020-22 delivery commences

Urgent Carbon Reduction During 2019

Alongside the development of the Framework and Action Plan, Manchester residents and organisations also need to take action to reduce their CO_2 emissions during 201. These actions can be based partly on the delivery of existing plans, but also need to include new efforts to accelerate citywide carbon reduction.

Resources

The delivery of the above work is incredibly challenging and requires resources that are yet to be secured from within in the city and beyond. Manchester Climate Change Board and Agency, Manchester City Council and partners will work together during 2019 to secure the resources needed. Potential sources currently being explored include: local partners' contributions; Manchester City Council; UK Government; European Union (pending the outcome of Brexit), and; trusts and funds, including philanthropic contributions.

Appendices

Appendix 1 – Tyndall Centre Statement

The following statement was released by the Tyndall Centre shortly after the publication of the IPCC Special Report on Global Warming of 1.5ºC, in October 2018:

"Adhering to a carbon budget perspective, rather than a simple long-term goal, is essential for both 1.5°C and 2°C of warming. Although a 1.5°C carbon budget is smaller than that for 2°C, the emissions pathways for 1.5°C typically rely on planetary levels of future negative emission technologies (NETs) and very significant afforestation.

Our proposed mitigation framework for delivering 2°C is already very ambitious, with 15% per annum reduction in CO_2 emissions for GM and 13% for Manchester City. If such rates are achieved, and NETs do develop and are deployed at the scales assumed in the models, then, theoretically at least, 1.5°C is possible. Consequently, we recommend initiating an immediate programme of mitigation aligned with the 2°C carbon budgets; that is annual reductions in emissions of between 13 and 15% - starting now. Then review the latest data on carbon budgets and pathways on a five yearly basis to reflect the most up to date science, as well as any changes in global agreements on climate mitigation and progress on the successful deployment, at scale, of NETs".

Appendix 2 - Frequently Asked Questions

How have varying base year's been accounted for in the Action Plan?

We have noted the period for which the most readily available data relates to, and adjusted the carbon budget to 2022 accordingly. For example, if an organisation has a base year ending 31st December 2016, they will get an additional 12 months worth of budget to 2022, compared to an organisation that has a base year ending 31st December 2017. Base year periods that do not match with the calendar year (or that are less than 12 months) will have a budget adjustment made on a pro-rata basis i.e. 3 months added if their base year ended 30th September.

How will renewable electricity purchases and offsets be accounted for in measuring performance?

Renewable electricity purchases and offsets should be reported **in addition to** 'gross' emissions figures (i.e. emissions totals without renewables or offsets deducted or 'netted off'). This is to maintain comparability with organisations that do not make similar purchases, and also the BEIS city-level (Local Authority) emissions data, which do not currently reflect renewable purchases made by a city or Local Authority region. This dual reporting approach also follows the reporting principles of the WRI's Greenhouse Gas Protocol (Corporate Standard) and the Global Protocol for Community Scale Inventories (GPC), which sets out that both market based emissions (i.e. renewable electricity consumption purchases via a green tariff) and location based emissions (i.e. electricity consumption converted using a UK-wide grid factor) should be reported separately.

How should acquisitions & disposals be treated when tracking performance against the budget?

In the same way as for regular organisation-wide emissions reporting. The base year (and other interim years) would need adjusting, as would the projected targets for future years. Therefore, if Company A acquired Company B in 2021, and both were based in the city boundary, Company B's emissions would need to be back-dated to the base year (2017) and the budged allowance re-calculated.

Why are indirect Scope 2 emissions included under 'Directly owned and controlled' emissions' after being added to Scope 1 emissions?

We acknowledge that this is inconsistent with the Greenhouse Gas Protocol (Corporate Standard) accounting standards, to refer to these in that way. However, the intention is to better highlight where organisations have opportunity to influence their emissions (i.e. via reduced electricity consumption), and simplify terminology where possible (i.e. users may not be familiar with the various emissions scopes).

What emissions factors have been used?

Further detail on assumptions has been included in the section below, however, in the context of the overall city's emissions, emission factors are not believed to have a material impact on the level of action required, as the overall city benchmark is the city inventory data.

1 - Kuriakose J, Anderson K, Broderick J, McLachlan C. Quantifying the implications of the Paris Agreement for Greater Manchester [Internet]. Manchester; 2018

Appendix 2 - Frequently Asked Questions (cont.)

Why have NETS been excluded / why is a 2°C budget still relevant?

Please refer to Box 1 (p11) within the Tyndall report[1]. An extract has been included below:

Virtually all of the 2°C scenarios within the IPCC's database include negative emissions technologies removing several hundred billion tonnes of carbon dioxide directly from the atmosphere across, and beyond, the century (20). However, there is wide recognition that the efficacy and global rollout of such technologies are highly speculative, with a non-trivial risk of failing to deliver at, or even approaching, the scales typically assumed in the models (21).

Whilst the authors of this report are supportive of funding further research, development and, potentially, deployment of NETs, the assumption that they will significantly extend the carbon budgets is a serious moral hazard (20). Ultimately, if there is genuine action to mitigate emissions in line with a "likely" chance of staying below 2°C, and NETs do prove to be a viable and scalable option, then, in theory at least, an opportunity arises for holding the temperature rise to 1.5°C. By contrast, if action to mitigate for 2°C is undermined by the prospect of NETs, and such technologies subsequently prove not to be scalable, then we will have bequeathed a 3°C, 4°C or higher legacy. As is clear from the 2°C scenarios submitted to the IPCC, the inclusion of carbon capture and storage (CCS) and biomass energy with carbon capture and storage (BECCS) include considerably more fossil fuel combustion than those without them. It is evident, that mitigation advice to government is already being influenced by assumptions about NETs, and indeed the rapid uptake of CCS, neither of which shows any sign of approaching the scales of rollout in the models.

How does Net Zero Carbon differ from Zero Carbon?

Net Zero implies that a instrument (e.g. an offset) or technology is used to notionally subract a carbon balance and 'net-off' against a total. Zero carbon is simply an absolute or 'direct' total within a geographic boundary.

The Tyndall Centre[1] define these terms as follows:

A.2.1 Zero carbon and zero emissions
These terms would indicate that there are no direct emissions of carbon dioxide (only) or GHGs respectively, from an organisation or individual's activities. This is a strict criterion to fulfil and depends upon the boundary established for reporting.

A.2.2 Carbon neutrality and net zero
Reducing carbon emissions and GHG emissions to zero will be very challenging for most economic sectors and some organisations will look to reductions beyond their direct reporting boundaries. The 2014 Emissions Gap Report by UNEP (28) uses the term 'carbon neutrality' to refer to a situation where global anthropogenic carbon dioxide emissions from energy, industry, and land use / land cover change (LULC) are quantitatively balanced to be 'net zero' by carbon dioxide removals. This approach could be extended to geographic or administrative areas which capture both emissions and removals within their boundaries. The idea of carbon neutrality has also been extended by organisations and individuals to include carbon offsetting relationships where the balance extends across organisational boundaries.

1 - Kuriakose J, Anderson K, Broderick J, McLachlan C. Quantifying the implications of the Paris Agreement for Greater Manchester [Internet]. Manchester; 2018

Appendix 2 – Key Assumptions

Key assumptions in emissions calculations

Introduction

In the absence of accurate 'primary' data (i.e. data provided directly by MCCB members), loose estimates for emissions have been formed using publicly available data and by applying a number of assumptions. Less accurate estimates have been justified on the basis that:

- BEIS city level emissions data will serve as the overall annual benchmark for how much emissions reduction has taken place at the city level. Therefore what companies choose to report (or not report) won't impact this benchmark.
- As a proportion of the city's emissions, adjustments to individual organisations are likely to be immaterial. To put this in context, no single organisation contributes over 5% individually (even MHPP at circa 5% have 18 members). There is also currently a large proportion of unallocated city emissions (circa 75%).
- Relative to defining the urgent, high impact nature of actions that organisations need to take, emissions reporting for this process is a lower priority. It is the emission saving actions that will be subject to more scrutiny by the MCCB, rather than the base year figures presented in this document.
- We do of course recognise that robust measurement is an important enabler to effective management within individual organisations. We do not wish to imply that it is no longer necessary or important at that level; it is more that for this document we are comfortable with the lower accuracy (in some cases) of figures presented for the reasons above.
- We encourage and anticipate better data to feed into this process over time which will naturally replace the data assumptions used in this document.

Key points of judgement

Common reasons that emissions figures may differ from organisation's currently reported figures include:

- **Assumptions around the City of Manchester proportion of overall footprint** These were often made using crude apportionment and allocation techniques using suitable proxy values such as number of offices in the boundary as a % of the total number of offices).
- **Assumptions around indirectly influenced emissions that occur in the city boundary** Also referred to as an organisation's Scope 3 emissions that occur within the City of Manchester. In the spirit of maximising action, it was deemed more appropriate to estimate *something* for this category, rather than leave blank or un-estimated completely. If omitted, figures may understate the potential level of influence that an organisation may have to bring meaningful change.

1. MAST

- Data based on the 2011-2016 report: "5 years of cultural collaboration for a more sustainable Manchester" (which uses data reported via Julie's Bicycle).
- Estimates have been made for the 13 organisations that did not report in the 2011-2016 report, using an average of 13 that did (12 excluding the Lowry due to it being out of boundary in Salford).
- The City Council and University of Manchester (UoM) are reported separately. Broadcasters (BBC & ITV) and the Lowry are outside of the City boundary, however will be included in the process/represented in the plan.
- Indirect influence does not include emissions beyond transport to events (staff and public).
- Transport to events assumes every organisation has associated car travel of 25.78 tCO2e per year, which assumes:
    - Weekly attendance of 4 x 450 people (450 is the average capacity, of the top 4 largest emitters in the report, excluding the Lowry
    - 60% of attendees travel 3km by car
    - Average car emissions of 162.2g/km (which is an average of 2018 'average car' DEFRA factors for petrol, diesel, hybrid)

2. Bruntwood

- Emissions data within the direct influence and control is based on the 2017 Annual Review
- Emissions data outside of Bruntwood's direct ownership and control is based on assumptions around tenant and employee transport:
    - 50,000 businesses + 650 employees apportioned to Manchester based on floorspace within the portfolio (41%) = 20,601 journeys per day
    - Assumed that 30% of these journeys are performed by car
    - Assumed distance travelled is 3km 4 times 46 weeks of the year
    - Average car emissions of 162.2g/km (which is an average of 2018 'average car' DEFRA factors for petrol, diesel, hybrid)

3. Faith sector

- Data is based on an estimate of the number of Churches (56), Mosques (80), Synagogues (54) and Hindu Temples (4) in the city boundary (194 in total).
- Assuming an average square meterage based on capacity of building (c250m^2).
- Applying an average CO_2 per m^2 (0.023482 tCO_2/m^2) to the total floorspace estimated.
- Average CO_2 based on Bruntwood's 2017 CO_2e per m^2 (acknowledging this will be a significant underestimate for the faith sector due to lower efficiency/less frequent use etc).
- Transport assumes an average of 50 people attending per building, of which 30% drive 3km per visit, and visit for 46 weeks of the year in a car producing 162.2g/km (which is an average of 2018 'average car' DEFRA factors for petrol, diesel, hybrid).

Appendix 2 – Key Assumptions (cont.)

Key assumptions in emissions calculations

4. Manchester NHS Foundation Trust

- Based on NHS 2015 national data reported via the Sustainable Development Unit (SDU).
- Building Energy & Commissioned outside the NHS assumed within direct ownership and control.
- Procurement and travel assumed to be indirectly influenced.
- National figures apportioned to GM based on population (4.8% of the national based on 2017 ONS data). City of Manchester is then 19.5% of GM total.
- Of procurement and travel, only 5% and 30% are assumed to occur within the city boundary respectively. This is an arbitrary assumption, in need of refinement in the future.

5. Manchester City Council

- Footprint focuses on estate & fleet rather than impact via policy (this role is however acknowledged, but not quantified in the figures/charts).
- Directly owned and controlled emissions figures are based on 2017/2018 MCC reported data.
- Indirectly influenceable emissions figures will be confirmed in due course by MCC.

6. Manchester City Football Club

- Travel figures taken from the (Draft) Example of Match/Concert Day Impact report (not publicly available).
- Energy consumption for buildings (and other sources) taken from the (Draft) Corporate Responsibility – Headlines 2016–7 (not publicly available).
- Assumed 30% of Scope 1 transport occurs within the city boundary (with the exception of Aviation where it is all assumed to be out of boundary as per the WRI GPC accounting methodology). 30% is an arbitrary assumption, in need of rebutting in the future.
- Assumed 5% of Scope 3 transport occurs within the city boundary. This is an arbitrary assumption, in need of refinement in the future.

7. Manchester Housing Providers Partnership

- 2015 BEIS local emissions data (domestic total) apportioned based on the GM proportion of social housing providers (21%, ONS data 2011).
- Transport assumes 80,000 households have 1 car per household, with 50% of households making at least 1x 3km trip per day. This accounts for the emissions outside of the organisations of direct ownership and control.
- Average car emissions of 162.2g/km (which is an average of 2018 'average car' DEFRA factors for petrol, diesel, hybrid).

8. Manchester Metropolitan University

- 2017/18 data is used as the primary source.
- The sum of Scope 1 and 2 figures represent the Directly owned and controlled emissions.
- The sum of all Scope 3 emissions represents the Indirect supply chain and stakeholder emissions.
- 30% has been applied to the sum of all transport and supply chain Scope 3 emissions, which represents the Indirectly influenced and emissions that occur within the city boundary. 30% is an arbitrary assumption in the absence of city specific proxies.
- The split between residential & non-domestic buildings (for the pie chart) follows a 15:85 ratio as detailed in their earlier 15/16 scope 3 report here.

9. University of Manchester

- Based on 2016/17 data.
- The sum of Scope 1 and 2 figures represent the Directly owned and controlled emissions.
- 30% of the sum of all Scope 3 emissions represents the Indirectly influenced and controlled emissions. 30% is an arbitrary assumption in the absence of city specific proxies.
- All Scope 3 'in-boundary' emissions are assumed to relate to transport with the exception of water and waste treatment (which have been allocated against 'non-domestic').

10. Electricity North West

- Losses and operational emissions 'Business Carbon footprint' based on 17/18 reporting (page 12), scaled to the Manchester region based on Manchester's population proportion of the North West (7% of the North West region based on 2015 ONS data).
- All indirect emissions relate to Electrical losses (totaling 520,176 tCO2e for the region).

11. Schools & Colleges

- Buildings emissions use EDASH report data for 17/18, for schools & colleges.
- Transport assumes 100 people per school/college, 30% of which drive 3km per day, 5 days per week, 42 weeks per year.
- Average car emissions of 162.2g/km (which is an average of 2018 'average car' DEFRA factors for petrol, diesel, hybrid).

Appendix 3 – Draft Manchester Business Case for Climate Change Action

Available from www.manchesterclimate.com/plan

Appendix 5 – User Guide for Organisations and Commitment To Act Template

A guide to support organisations
A guidance document has been produced by Anthesis & The Manchester Climate Change Agency to provide further detail and support in each of the 5 stages to the process outlined on page 12.

A copy of this is available here:
www.manchetserclimate.com/getinvolved

Commitment to act
If your organisation believes that the city should stay within a science-based carbon budget that is aligned with the Paris Agreement and set 2038 as the target date to become a zero carbon city, then please download the commitment (http://manchesterclimate.com/content/commitment-act) or email to info@manchesterclimate.com

Commitment to Act Signatories So Far
The following organisations have already signed the Commitment To Act:

- Band On The Wall
- Castlefield Gallery
- Chinese Centre For Contemporary Art (CCFCA)
- Electricity North West (ENW)
- Jonny Johnson Housing
- Great Places Housing Group
- HOME
- Irwell Valley Homes
- Manchester Arts & Culture Team (MAST)
- Manchester Cathedral
- Manchester City Football Club (MCFC)
- Manchester Pride
- Manchester Metropolitan University (MMU)
- Mosscare St Vincent (MSV)
- National Football Museum
- Northwards Housing
- One Manchester
- Our Faith, Our Planet, (OFOP)
- Radio Reform
- Royal Exchange Theatre
- Royal Northern College of Music (RNCM)
- Southway Housing Trust
- Walton Arawack Housing Association
- Wythenshawe Community Housing Group (WCHG)
- University of Manchester (UoM)

Appendix 6 – Aviation Emissions

Context

On a global scale, emissions from flights are currently the second most-polluting form of transport after the diesel car. However, the projected global growth of aviation means it represents a major challenge for meeting the Paris Agreement commitments.

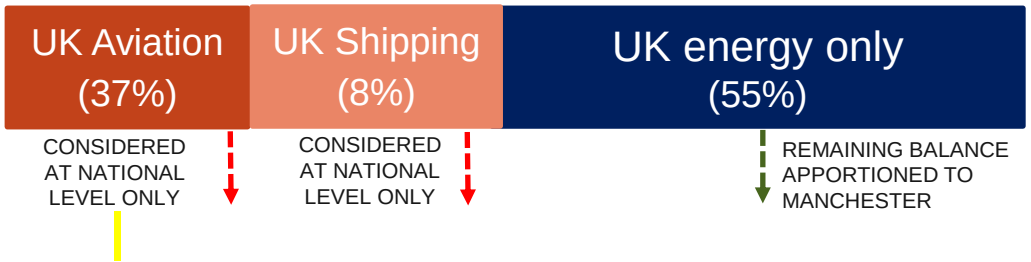
The more of the global and UK carbon budget that is allocated to aviation, the less we have for every other activity.

Manchester has a part to play in addressing this challenge. In 2015, 23 million passengers passed through Manchester International Airport. This figure is currently projected to double by 2050.

Manchester City Council owns a 35.5% share in the airport, it is located within the city's boundary and it drives a significant part of the local and regional economy. However, the responsibility for the airport is not Manchester's alone - people travel from Greater Manchester and across the UK to use the airport.

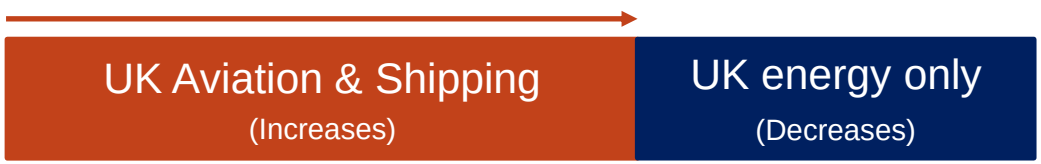
We need Manchester Airport to be part of a national and international strategy for managing aviation emissions. We also need to discuss what contribution Manchester residents and organisations can make to ensuring that aviation emissions are managed within the context of the Paris Agreement and our own climate change commitments.

Manchester Carbon Budget Methodology Extract

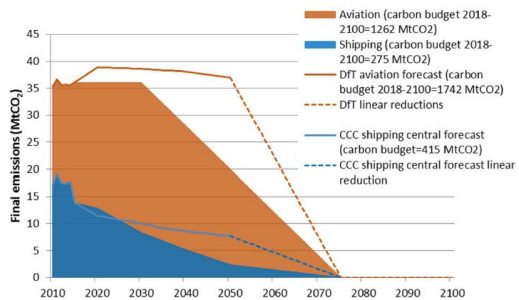


The methodology applied by the Tyndall Centre[1], assumes a more optimistic aviation emissions reduction scenario than DfT projections[2]. This is treated separately from the UK energy budget that is then scaled down to a city level.

If a less optimistic scenario was assumed in the budget methodology, the remaining share for UK sub-regions (including Manchester) would be reduced, increasing the level of ambition and rate of annual reductions from 13% p.a by as much as 20% p.a.



UK Aviation & Shipping budget assumptions[1]:



Greater Manchester's emissions from flights departing 2015/16

GM category	$MtCO_2e$	%
GM residents flying from Manchester:	0.76 $MtCO_2e$	**22%**
GM residents flying from "other" UK airports:	0.07 $MtCO_2e$	**2%**
Non-GM residents flying from Manchester:	2.58 $MtCO_2e$	**76%**

1 - Kuriakose J, Anderson K, Broderick J, McLachlan C. Quantifying the implications of the Paris Agreement for Greater Manchester [Internet]. Manchester; 2018
2 - Department for Transport (DfT) 2017 Baseline Central Forecast
3 – Figure quoted relates to Greater Manchester which is assumed to be a valid proxy.

Published by Manchester Climate Change Board and Agency in February 2019

Available from
www.manchesterclimate.com

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