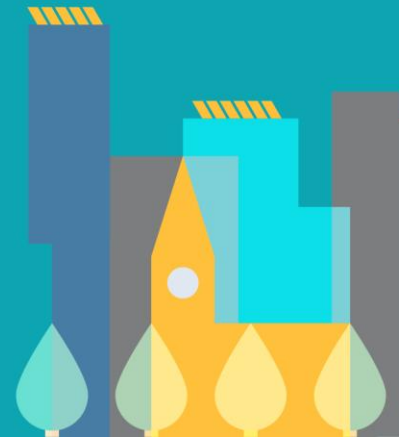


MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



INTRODUCTION

Background

The Manchester Climate Change Partnership, including Manchester City Council, has agreed the Manchester Climate Change Framework 2020-25, the strategy towards making Manchester a thriving, zero carbon, climate resilient city. Part of this framework addresses the challenge of helping new buildings play their full part in meeting the carbon emission reductions that the city needs, to achieve compliance with our obligations under the Paris Agreement. The framework suggests that all new development should be zero carbon from 2023 at the latest, when the new Manchester Local Plan is expected to become operational.

A Task Group of private, public and third sector representatives was brought together with support from the UK Green Building Council (UKGBC), to provide guidance on how zero carbon should be defined for new buildings in Manchester and how this ambition could be implemented. This output is submitted for consideration by the Manchester Climate Change Partnership, with a view to endorsing the key recommendations and proposed actions arising.

It must be made clear that this is just the start of a journey. There are a range of key challenges that must be addressed if the city is to realise the ambition contained within the framework, and that will require momentum to be maintained following the end of this Task Group's work, and processes put in place that enable key actions to be implemented as quickly as possible.

Definition – Net Zero Carbon for Manchester

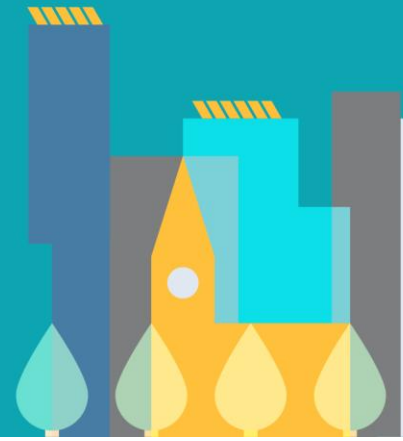
In the last couple of years, a growing consensus has emerged in the UK around the concept of net zero carbon buildings. A key moment was the publication of the Net Zero Carbon Buildings Framework in 2019, by a UKGBC-led industry task group, and a growing body of resources which are helping the built environment sector better understand the key requirements for net zero carbon new buildings, such as performance targets developed by LETI and RIBA.

A key point of clarification is the scope that 'net zero' is being applied to. The Net Zero Carbon Buildings Framework differentiated between:

1. Net Zero Carbon in operation: When the amount of carbon emissions associated with a building's operational energy on an annual basis is zero or negative.

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



2. Net Zero Carbon in construction: When the amount of carbon emissions associated with a building's construction is zero or negative.
3. Net Zero Carbon Whole Life: When the amount of carbon emissions associated with a building's construction, operation, maintenance, repair and end of life is zero or negative.

In the past, when referring to zero carbon buildings, many often meant 'in operation' only. More recently, embodied carbon has risen rapidly up the agenda - with a focus on the construction phase where we have better understanding and data. The simplicity of the definitions above mask a great deal of complexity - and to an extent controversy - in terms of what sits behind them.

It is generally agreed that the key components of a net zero carbon building should be:

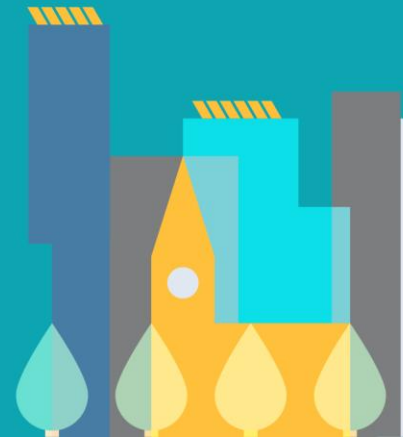
- Reduced energy demand – optimising the efficiency of the building fabric
- Reduced embodied carbon – driving down the carbon impacts related to product and construction stage
- Measuring in-use performance to close the gap between modelled and actual energy performance and ensure the build performs in operation as intended
- Low carbon energy supply – with low carbon heat, hot water and electricity

What represents best or leading practice in relation to the components above is the subject of ongoing debate, research and testing on live projects, and although guidance exists from the likes of UKGBC, RIBA and LETI on some aspects of this, it is not necessarily consistent. There is also a spectrum of views on how to address the 'zero carbon balance' - i.e., any shortfall in achieving net zero carbon once the steps above have been taken. Particularly around the appropriateness of carbon offsetting.

The Task Group has taken the guidance that exists to date and made recommendations for applying this to a Manchester context. However, the Manchester Climate Change Framework 2020-25 is amongst the most (or actually is the most) ambitious such plan of any UK city. Therefore, it is natural that there are gaps in industry understanding and guidance, which this Roadmap must accommodate and plan around.

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



Wider context

This work sits within a wider context - locally, regionally, nationally and internationally. The local plan has already been referred to and is a key point of reference in what follows. So too the strategic plan at the combined authority level - the two of which should dovetail and be mutually reinforcing.

The picture is also in flux nationally, in terms of zero carbon policy. There will be changes to Part L both in respect of homes and non-domestic buildings, and Government has committed to both a Future Homes Standard and Future Building Standard for 2025. Despite the rhetoric, the standard(s) are likely to fall some way short of net zero carbon in operation and in construction - not least because embodied carbon remains a blind spot for central government.

Meanwhile the whole planning system is subject to controversial changes, with serious questions raised as to whether the proposed shake-up will help or hinder climate targets, and wider environmental commitments contained within the Environment Bill.

Despite the challenging national context, many at a local authority or city-region level continue to push on, not just in the UK but around the world. 'Sub-national actors' are a key player in the global race to zero and implementation of the Paris Agreement, and several key alliances and initiatives exist to catalyse and support this drive. This includes the C40 Cities Commitment (which has both a net zero carbon buildings and clean construction component) which Manchester aspires to meet.

RECOMMENDATIONS

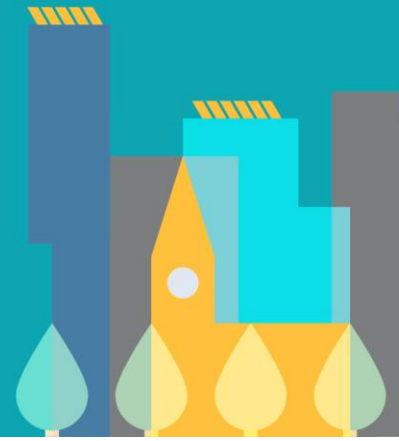
Key recommendations

A 'Manchester Standard' for Net Zero Carbon New Buildings should be adopted by the Manchester Climate Change Partnership, which is considered by Manchester City Council for application in planning policy, public procurement and by developers and clients who wish to demonstrate voluntary leadership ahead of policy requirements. The focus of this report is the detail of that standard for adoption in planning at the next available opportunity (assumed to be 2023), and the steps required to implement that.

The Task Group propose that all new development should be net zero carbon in operation from 2023, without use of offsetting or a Carbon Tax. All new development should also be required to

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



deliver a significant reduction in embodied carbon in construction from 2023, with more stringent requirements introduced in future. Details of the proposed standard for 2023 can be found in section 4, below.

The Standard should be strengthened over time and subsequently adopted into future updates to the local plan in due course. By MCCP/MCC setting out, in advance, an indication of how the Standard is intended to be strengthened, developers can plan ahead and seek to future-proof their designs and investment, staying ahead of policy requirements and positioning themselves favourably in the market.

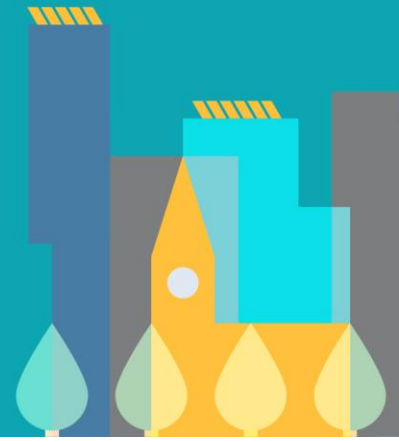
Supporting recommendations

There are a range of inter-related actions and dependencies that require close collaboration between Manchester City Council, GMCA, industry and other built environment stakeholders. Several ideas have emerged through this process, which are intended to help ensure successful delivery of the standard. All require much more exploration. These include:

1. There is a critical need for an **ongoing governance and implementation function**, properly resourced, to manage a programme of crucial actions between now and 2023, and subsequently in terms of ongoing implementation and update. Neither the City Council nor the Climate Change Agency have the resources at present to do this, although the Climate Change Agency - working in partnership with the likes of UKGBC - provides an obvious 'home' for this function. Even scoping this out, putting together a business plan and liaising with GMCA and other key partners, is a full-time job in the short term - and a resourcing plan, with seed funding from corporate sponsorship or otherwise, needs to be urgently addressed.
2. Build an **evidence base** that informs and supports the standards being set for new construction, specifically around Energy Use Intensity and embodied carbon targets. This could be informed by a database of existing energy performance and embodied carbon data gathered from Manchester buildings (e.g., MCCP members) to provide a baseline. Research of ongoing best practice from Manchester and other jurisdictions, along with stakeholder engagement, would be added to support the adopted standards' feasibility and ambition. An ongoing process of research and feedback into the evidence base would allow for more detailed and specific guidance for individual use classes, and

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER

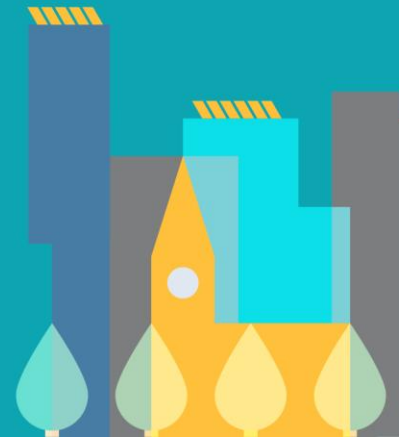


associated cost and financing assessments would be modelled to better understand the costs and added value of adopting net zero standards across all building types.

3. Explore the need for **verification mechanisms** for (i) the as-designed performance of new development proposals, to ensure that they are realistically projected to meet the new embodied carbon and energy use standards, pre-planning approval, and (ii) ongoing in-use performance of new buildings, to verify that the adopted standards are resulting in new buildings that are demonstrably Net Zero Carbon in practice. Such responsibilities could be delivered through the planning system, or via public-private partnership, contingent on resources. Use existing industry initiatives as much as possible to avoid re-inventing the wheel, such as NABERS UK for offices.
4. Design and facilitating a **skills framework** that (i) identifies gaps in the knowledge and skills of each part of the built environment sector that will be needed to successfully implement the Standard, and (ii) coordinates the roll out of programmes to up-skill and train all parts of the sector to ensure that these gaps are addressed. This should be a collaborative process, involving all relevant parts of local and regional government, professional bodies, the education sector, and industry, to achieve buy-in to the necessary process of up-skilling, and ensure that all knowledge gaps are identified and addressed.
5. Create a **pilot scheme** of test site(s) to adopt the upcoming standards ahead of their wider roll-out. This could take the form of existing proposed developments by Manchester Climate Change Partnership members that are modified to meet the proposed standards, and/or through designation of an enterprise zone, with possible incentives offered by MCC for developers to trial different approaches to meeting the targets. It would then act as a demonstration of the feasibility of building to the new standards and show examples of best practice across each of the elements of net zero carbon construction. It is crucial that the City Council is actively driving this and offers up schemes in which it is a partner to act as trailblazers.
6. Develop a **Net Zero Carbon Guide** for Manchester, providing a framework for the sector to align with Energy Use Intensity and embodied carbon targets, including by embedding principles of passive design and design-for-performance into new proposals. Acting as a route-map for industry to meet the new targets, this would include guidance on BIM level

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



2 to 3 alignment. As embodied carbon targets are adopted into policy, the Guide would expand to include a framework for low carbon construction.

7. Establish a database and directory of **local supply chain resources** that can support net zero carbon development throughout the design, construction and maintenance lifecycle. The database would give assurance to MCC and other stakeholders that the local economy is able to accommodate the necessary changes within the sector, while a publicly available directory would showcase local businesses that are zero-carbon ready in their product and service offerings, smoothing the path for developers to meet the new standards, while potentially bolstering the local economy.
8. Create of a **platform for communication and collaboration** on Manchester's progress towards Net Zero. This would seek to go beyond compliance with the Standard, showcasing the work of leaders in the industry who are exhibiting best practice and leadership in their projects' construction and performance, with the aim of bolstering a market for more highly performing buildings. It would aim to create momentum within the sector by rewarding leaders with exposure, and incentivising those lagging behind to catch up, by highlighting their relative position within the market.
9. Explore mechanisms to **incentivise developers** to meet or exceed future standards, through consultation with stakeholders across GMCA. Financial incentives (through, for example, rates relief) could be used to encourage higher standards of design and in-use performance by developers and building operators.
10. Consider how to build a business case to central government for **public funding** for Manchester's drive towards Net Zero. As a pioneering local government in its ambition to decarbonise, there is a strong argument to be made for why the UK government should provide support for Manchester's implementation of the Standard. Additional funding would enable the programme to be rolled out more quickly, providing an active case study example for how local governments can support the UK's decarbonisation targets, while catalysing action from other local authorities that can then follow and adapt Manchester's leading example.

Manchester Standard - 2023

	Domestic	Non-Domestic
Reducing energy demand	<ul style="list-style-type: none"> ● Energy Use Intensity (EUI) target of <60kWh/m²/year (GIA) operational energy use, excl. renewable generation (covers both regulated and unregulated consumption), with future uplift set out in advance (e.g., <35kWh/m²/year from 2028) ● Ultra-high energy efficiency consistent with space heating demand of 15-20kWh/m²/year 	<ul style="list-style-type: none"> ● New office development should target an Energy Use Intensity of <75kWh/m²/year GIA from 2023, with future uplift set out in advance (e.g., <55kWh/m²/year from 2028). ● EUI targets for other building types to be added when guidance becomes available (see Roadmap)
	<ul style="list-style-type: none"> ● At the design stage, demonstrate adherence to a design-for-performance methodology (for offices, NABERS UK) 	
Reducing embodied carbon	<ul style="list-style-type: none"> ● Calculate whole lifecycle carbon emissions through a nationally recognised methodology, and demonstrate actions taken to reduce lifecycle carbon ● Major developments should target <500kgCO₂e/m² upfront embodied carbon (RICS Modules A1-A5 excluding sequestration) with future uplifts set out in advance (e.g. <300kgCO₂e/m² from 2028 for major developments and likely expansion of the 2023 target to smaller schemes) 	<ul style="list-style-type: none"> ● New office developments should target <600kgCO₂e/m² upfront embodied carbon (RICS Modules A1-A5) with future uplift set out in advance (e.g. <350kgCO₂e/m² from 2028) (excluding sequestration) ● New retail developments should target <550kgCO₂e/m² upfront embodied carbon (RICS Modules A1-A5) with future uplift set out in advance (e.g. <300kgCO₂e/m² from 2028) (excluding sequestration) ● Targets for other building types to be added when guidance becomes available (see Roadmap)
Measuring in-use performance	<ul style="list-style-type: none"> ● Principles of Soft Landings to be followed and a recognised performance gap/assured performance tool used to minimise gap between design aspiration and the completed development. The effectiveness of measures will be reviewed and ratified as part of the post-completion discharge of conditions. For office buildings, Display Energy Certificates and/or NABERS UK can be used to demonstrate the differing responsibilities and performance of landlord and tenant ● All developments shall put in place a recognised monitoring regime to allow the assessment of energy use, indoor air quality and overheating risk 	
Low-carbon energy supply	<ul style="list-style-type: none"> ● New development should not have any onsite combustion of fossil fuel. ● All developments shall assess the viability for onsite renewable generation. For developments with SE/SW facing roof(s), a minimum 40% solar technologies installation as a percentage of building footprint area shall be met unless it can be clearly demonstrated that this is not practically viable ● Major developments will be expected to consider the integration of new energy networks in the development. Any new energy networks should prioritise non-combustible, non-fossil fuel energy as the primary heat source ● All developments shall match their total annual energy demand through a combination of investment in renewable generation capacity or a 15-year minimum renewable energy PPA, energy storage and smart controls. 	

Domestic

Non-Domestic

Zero carbon
balance

For Net Zero in operation:

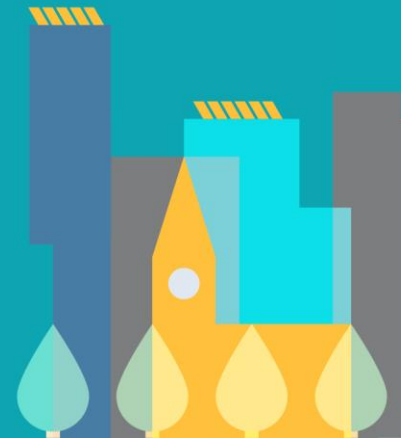
- The aspiration of the Task Group is to eliminate the need for offsetting to meet net zero in operation, via the energy performance standards outlined above, and through a requirement to invest in renewable generation capacity. However, small developers may require some sort of system to enable them to meet this obligation with minimal administrative burden.

For Net Zero in construction:

- The Task Group believes that using a Carbon Tax or offset fund to reduce or eliminate the carbon balance remaining after meeting the embodied carbon target, is likely to be prohibitively expensive if this is introduced in 2023. Instead, focus should be on ensuring developers make every effort to meet the target itself. A decision by MCC will be required on whether (if this target is not met) developers should be required to offset the carbon balance to meet the target (but not achieve full net zero carbon in construction), or if demonstration of maximum effort is sufficient.

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



OVERVIEW OF 'ENABLERS'

This section introduces the key challenges that need to be addressed to deliver against the 2023 targets (and beyond).

POLICY & GUIDANCE

Challenges

The key challenges broadly fall into three categories – the process of policy development; the need for education and training within the policy making environment; and the link across to technical challenges and how to evaluate what should be an appropriate policy response. In terms of policy development process, there are concerns that the current policy environment, both in planning and procurement, is still lagging behind what will be required to deliver zero carbon developments. This links into education and training where there is a gap in the knowledge within the planning policy making community that needs to be addressed through appropriate and timely information for policy makers. The technical standards being considered elsewhere in this report will need to be tested and evaluated against a range of other key policy asks that planning policy is expected to deliver including, for example, affordable housing and open space requirements.

Opportunities

The timing of this work means there are opportunities to influence policy both at the strategic level (Places for Everyone plan) and at the local level (Manchester Local Plan). Places for Everyone will undergo a further round of consultation and then move onto the examination stage over the next year to eighteen months. The Local Plan will be consulting on key policy directions later in 2021. It is therefore very timely to consider what standards and policy approaches could be incorporated into both processes. In terms of procurement, there is significant activity already underway including the Manchester Low Carbon Build Standard; development of a series of carbon metrics which will be included within the Strategic Capital Board business cases and utilised by the SCB to enable the prioritisation of the capital spend; and work at the national level to identify a set of national carbon KPIs which can be rolled out to all National Association of Construction Frameworks (NACF) contractors.

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



GOVERNANCE & DELIVERY PROCESSES

Challenges

The key challenges are around the current lack of available governance and resources in MCC and limited understanding of net zero carbon, particularly across different types of projects. Another challenge is that while there are published zero carbon targets for some use classes (namely office and residential), targets for other use classes are yet to be developed.

From a governance perspective there is no defined process to track, assess and monitor buildings from the design stage right through to operation. This is likely to require a new process, with implications for resourcing and personnel with appropriate experience to review applications and monitor performance of the project, not just at completion but also in-use.

From a developer perspective there are insufficient incentives to build to net zero unless required by policy, nor to maintain low carbon emissions while operational. Processes need to ensure different building stakeholders are appropriately incentivised/penalised and that new net zero buildings are financially competitive in the rental market.

Opportunities

A monitoring and verification process, once defined and operational, could provide a roadmap for expansion across the rest of the GMCA, providing job creation in monitoring and verification processes. Use of companies external to MCC via secondments could provide assessors for the process and ensure that those carrying out the assessments have relevant and up to date experience of the design and monitoring process of net zero carbon buildings. For some building typologies, e.g., offices, there are industry schemes available (e.g., NABERS UK) and these should be utilised as much as possible. It is also important to note the direction of travel from central government towards ratings for in-use performance.

Financial incentives could be explored as a method to encourage building owners to lower their carbon emissions throughout the lifetime of the building, and not rely on offsetting to achieve net zero carbon. This will encourage better designs and commitment to maintaining the efficiency of buildings in operation.

Data obtained on new developments can be used to inform the development of energy performance and embodied carbon targets for all use classes, and subsequent strengthening of the standard.

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



FINANCIAL CAPITAL

Challenges

The viability of developments will be impacted by the building cost of achieving the Manchester Standard. For net zero carbon in operation, this is estimated to increase by 4-6% for office developments and 8-10% for residential developments. For the reductions proposed for 2023 in embodied carbon, this is estimated to be 20-30% across offices and residential assets.

We need to acknowledge that building design will change from current design standards, which could be a challenge given current planning requirements/process. Funders will also need to get comfortable with new technologies and methods of construction to prevent a shortfall of funding into the market.

There is limited understanding around the positive/negative impact delivering net zero could have on future valuations. Delivering net zero does not necessarily translate into a higher building or rental value. It is also challenging to understand this impact given the different valuation methodologies across different tenures, especially social housing.

Organisations struggle to understand and articulate the positive/negative impact delivering net zero could have on their business plans, which can be linked to an inability to measure and report on delivering Net Zero. There is a lack of clarity regarding what public support is, or will be available, which appears to be delaying organisations' ability to transition, whilst maintaining viable business plans. Business plans are also restricted by traditional financial covenants which might not accommodate initial increased levels of investment.

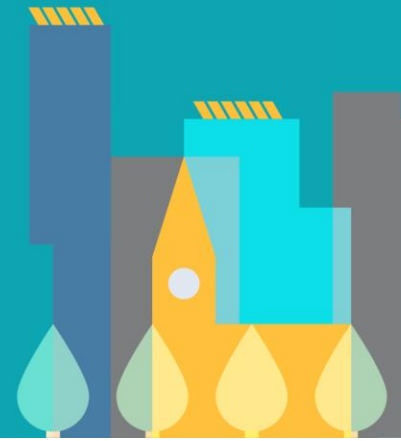
Opportunities

As new supply chains, labour forces, technology and methods of construction are developed, there is a potential that development costs could reduce over time, improving the viability of developments. Future public funding will also assist in helping to fill some of the funding gaps preventing transition to net zero.

By delivering net zero organisations and governments will mitigate the inevitable risk of climate change. This will preserve the value of assets and returns for stakeholders. Whilst there is limited evidence that delivering net zero will translate into higher building or rental value, there

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



are some suggestions that enhanced returns (measured by profit levels) could potentially be achieved for best-in-class sustainable offices in the short to medium term .

There are increasing amounts of ‘sustainable financing’ solutions available for organisations, which can often result in lower financing costs. There is also a genuine push by banks and investors to work with organisations to deliver net zero, which will support conversations regarding new technologies and methods of construction, and with conversations around existing credit policies and financial covenant controls.

SKILLS & TRAINING

Challenges

For the Manchester Standard to be both achievable and deliverable it is important that all resources and personnel involved in the lifecycle of a building from the initial concept through to the demolition at the end of life have a clear understanding of the necessary requirements and constraints of what is being required through policy.

The challenges for the skills and training that will be necessary to enable the policy are:

- Major elements of the existing resource pool will need to be upskilled and, in many instances, retrained to meet the necessary levels of understanding and expertise
- Schools, colleges and HE establishments will have to ensure that their curriculums provide the necessary awareness, understanding, and specialist skills to sufficiently educate the future workforce
- All skills and training will need to remain relevant to changing legislation and best practice

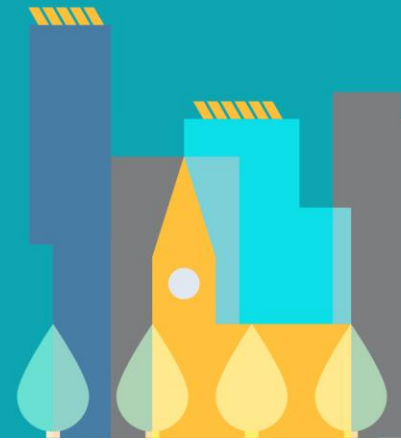
Finally, as with all training programmes there is a time lag involved.

Opportunities

The opportunities that exist around skills and training in relation to net zero carbon are immense both for the providers and the recipients. There is a huge appetite particularly amongst the younger generation for any knowledge and skills that will help in the drive towards net zero carbon and sustainability more widely.

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



The property and construction sector are now actively using digital technologies, science, and modern methods of construction to help address the net zero carbon challenge and Manchester's leadership in this space can only help to accelerate this innovative approach. The more enlightened companies are driving the necessary awareness and upskilling through both in-house and external training providers. In time this enhanced skill base will filter through to the rest of the sector.

Schools, HE providers and universities are actively encouraging participation from industry specialists to help provide practical and realistic prospectuses and courses.

TECHNOLOGY, INNOVATION AND INFRASTRUCTURE

Challenges

Technology, innovation, and infrastructure are key to delivering zero carbon buildings in Manchester. For this to be achieved, the status quo is going to be radically challenged. Both operational energy and embodied carbon require equal focus and engagement from those involved in the built environment to combat the potential skills shortage, funding gap and to guard against fuel poverty in a post-fossil fuel environment.

There is currently a lack of consistency and clarity for the industry, and insufficient available data on different building typologies' respective energy intensity performance in-use. There is also a general lack of awareness, understanding and real data about embodied carbon and how the supply chain can contribute to meeting embodied carbon targets. This all risks 'over-engineering' and sub-optimal engineering solutions, and/or unrealistic performance criteria of individual elements.

Net zero buildings also require a different way of designing and operating buildings and require improvements in infrastructure in order to deliver this.

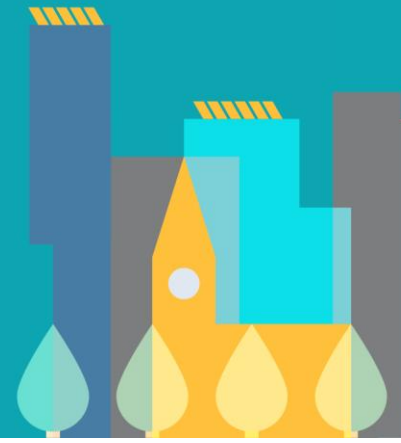
Opportunities

There are various possible ways to address these challenges. A robust, moderated database of existing energy performance and embodied carbon data derived from local collaborators, developers and suppliers' feedback could help with:

- Identifying local supply chains to support low carbon construction

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



- Defining a local building energy intensity baseline based on typology
- Defining a local embodied carbon baseline based on typology

In addition, the development of a local Low Carbon Guide document, founded on data provided from industry collaborators and manufacturers, could provide clear and concise guidance to developers and industry professionals. Combined with a moderated database of local manufacturers, the Low Carbon Guide will assist in reducing both in-use and embodied carbon by supporting the construction of low impact buildings.

The opportunities listed could be demonstrated within a net zero carbon Enterprise Zone or pilot scheme that would provide tangible evidence of these benefits and serve as a case study.

Delivering the improvements needed in infrastructure will require clarity over funding, further consideration over the role of Section 106, and collaboration with providers such as Electricity North West.

COMMUNICATION, COLLABORATION AND CULTURE

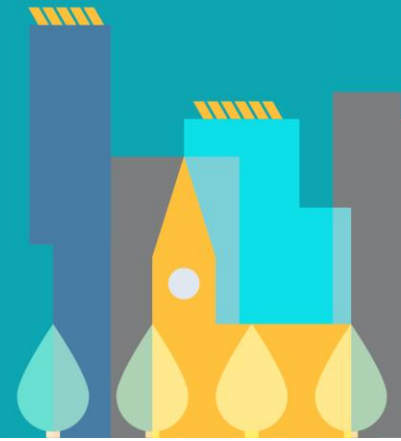
Challenges

Several challenges currently prevent those involved in the delivery of buildings, or those occupying them, from making the most sustainable choices:

- Without a strong enough policy driver, there is insufficient incentive for many developers to raise their standards. For those who do, there is inconsistency in the standards and criteria used, which confuses the market.
- We do not have enough understanding or visibility of how buildings perform in-use, therefore purchasers and occupiers are not making informed choices based on empirical data. Currently, building performance is predicted during design stage and decisions on specification are driven by cost, not long-term value, in part because the demand for net zero carbon buildings is perceived as not yet strong enough or quantifiable.
- It is difficult for industry professionals, let alone non-experts to know where to go to find out the carbon performance of a building, or how to understand what is being presented even if information is available.

MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



- Even where data exists, there is a reluctance on behalf of building owners to be transparent about real performance - unless all peers are doing likewise.

Opportunities

A Manchester Standard for net zero carbon has the potential to provide a common language, and when adopted into policy it sets a level playing field, which helps to address some of the key challenges outlined above. However, to fully engage citizens - building users - in net zero carbon and help support their efforts to live more sustainability, something additional is required. There is an opportunity to create an ongoing communications campaign in support of the standard, which can speak to a range of people - from those highly engaged in sustainability to those just curious.

The intention, perhaps through a web platform or app, would be to help showcase leadership that goes beyond either national or local policy requirements. This would likewise show poor performance amongst those lagging behind, and therefore support the business case for net zero by providing a reputational benefit for leaders - influencing customer decisions. For this to be of maximum value, it would need to be linked to real-performance data, which is intended to be driven by requirements of the standard. There is also the potential for this to link to the idea of a database that informs ongoing updates to energy performance targets.

ENABLER ACTION PLANS

Policy & Guidance

Focus	2021-22	2022-23	2023+
Policy Development	<ul style="list-style-type: none"> Places for Everyone Plan (Consultation – Summer 2021): Opportunity to provide response to the consultation with recommendations on standards that might be applied. Manchester Local Plan (Consultation on Preferred Policy Directions in autumn/winter 2021): Feed ideas on potential standards and policy approaches into the consultation process. 	<ul style="list-style-type: none"> Places for Everyone (Examination): Potential requirement to support any proposed policies at the examination Manchester Local Plan (Publication Consultation in 2022 and Examination in 2022/23): Potential requirement to support any proposed policies at the examination 	<ul style="list-style-type: none"> Places for Everyone and Manchester Local Plan Adopted: Consider any further need for additional supplementary guidance. Policy Monitoring Framework in place for both plans – ongoing monitoring of application of policies.
Education and Training	<ul style="list-style-type: none"> Identify potential training opportunities for planners to consider proposals set out elsewhere in this report. Procurement – build upon existing approaches (i.e., working with contractors via the Manchester Low Carbon Build Standard¹ and new opportunities arising from proposed work via National Association of Construction Frameworks (NACF) contractors. 		<ul style="list-style-type: none"> Dissemination of good practice and real-world examples of developments being delivered under the new planning policy frameworks
Technical and Evaluation	<ul style="list-style-type: none"> Identifying the key metrics and standards to incorporate into policy development (reviewing what has already been done both in planning policy and procurement) Understanding the financials around the delivery of zero carbon (linking to appraisal of policies for Zero Carbon and other key policy asks – see above) 	<ul style="list-style-type: none"> Places for Everyone (Examination): Potential requirement to support any proposed policies at the examination Manchester Local Plan (Publication Consultation in 2022 and Examination in 2022/23): Potential requirement to support any proposed policies at the examination 	<ul style="list-style-type: none"> Places for Everyone and Manchester Local Plan Adopted: Consider any further need for additional supplementary guidance Policy Monitoring Framework in place for both plans – ongoing monitoring of application of policies.

¹ Manchester Low Carbon Build Standard: development of a series of carbon metrics which will be included within the Strategic Capital Board business cases and utilised by the SCB to enable the prioritisation of the capital spend; and work at a national level to identify a set of national carbon KPIs which can be rolled out to all National Association of Construction Frameworks (NACF) contractors.

Governance & Delivery Process

Focus	2021-22	2022-23	2023+
Create a Clear Governance Structure	<ul style="list-style-type: none"> • Create a Net Zero Task Group with strong endorsement by MCC and build partnerships with the industry to engage on a programme of work • Establish a clear programme for roll out of the Standard with scalable requirements in consideration of different use classes, development size, building/construction types and occupancy types • Develop and maintain a Roadmap in relation to key events/policies/regulatory changes etc. to enable the industry and funders to plan in advance • Design a pilot scheme ahead of wider adoption • Scope out Design Assessor/Post-Occupancy Assessor roles & use of NABERS UK. 	<ul style="list-style-type: none"> • Procure/recruit Design Assessor and Post-Occupancy Assessor roles • Set up forums for collaboration and sharing of approaches • Agree wider GMCA roll-out strategy • Finalise use classes and development sizes to be included in 2023 adoption of Standard • Confirm operational and embodied carbon targets for building types to be included • Confirm approach for different use classes and any differences for smaller scale developments (consider phased roll-out for use classes that are more difficult to decarbonise) 	<ul style="list-style-type: none"> • Ongoing engagement with GM peers to align approaches across the region • Ongoing review and adaptation of process to suit emerging needs • Scope out possible Carbon Tax or offset scheme for introduction in (e.g.) 2028 to meet zero carbon balance of upfront embodied carbon • Implement process for determining future EUI and embodied carbon targets in subsequent uplifts (e.g., 2028).
Understanding	<ul style="list-style-type: none"> • Create standardised definitions and models of best practice • Establish minimum standards and reporting processes (energy, carbon, etc.) for different use classes • Begin developing a Net Zero Carbon Guide for Manchester 	<ul style="list-style-type: none"> • Refine targets for commercial and large-scale domestic development based on emerging findings from pilot scheme • Publish the Net Zero Carbon Guide for Manchester 	
Application, Control & Monitoring	<ul style="list-style-type: none"> • Design an incentivisation scheme • Scope out new planning/building control requirements • Establish post-occupancy verification methodology 	<ul style="list-style-type: none"> • Launch incentivisation scheme • Trial new planning requirements for major new builds 	<ul style="list-style-type: none"> • Implement Design Assessor/Post Occupancy Assessor processes, along with associated internal monitoring • Implement standard across any outstanding use classes

Financial Capital

Focus	2021-22	2022-23	2023+
Cost & Viability	<ul style="list-style-type: none"> Review the proposed approach to the Standard to understand how this will impact development viability and other potential project contributions Clarify the implications of the embodied carbon component of the Standard for external infrastructure such as drainage, access roads, and ground remediation Review approach to design consideration through the planning process. Acknowledge that building design will change from current design standards. 	<ul style="list-style-type: none"> Model the implications of any future Carbon Tax or offset scheme on viability in order to be able to provide clarity on (e.g.) 2028 Standard in time for introduction of 2023 Standard. 	
Valuations	<ul style="list-style-type: none"> Work with valuers to understand the positive/negative impact delivering the Standard could have on future valuations. Any findings should include valuation methodologies across different tenures, including social housing. 		
Finance	<ul style="list-style-type: none"> Develop a white paper that clearly outlines the positive and negative impact reaching net zero could have on business plans. Identify possible methods regarding measuring & reporting direct and indirect credit enhancements. Seek to propose a series of modelling base case assumptions as a guide. Stress test business plans to identify where traditional financial covenants cannot be achieved. MCC should work with the financial sector to propose alternative covenants or funding solutions. Early engagement with bank risk functions to have a proactive approach to the risks. Deliver training to decision makers explaining the benefits of Sustainability Linked Funding solutions. Assuming public funding not currently available then MCC should build a business case to central gov for such support and consider alternative solutions to cross subsidise initial investment in delivering net zero. 	<ul style="list-style-type: none"> Ensure financial considerations are part of the proposed communications campaign, to encourage short-, medium- and long-term behaviour change amongst key stakeholders. MCC should demonstrate practical application of Net Zero and all other ESG objectives in their control (e.g., places maintained and built by the Local Authority, investment into government buildings and infrastructure (updates & new), including showcasing new technologies, acting as a test bed – potentially with financial assistance MCC should create a profile of emerging and successful MMC and new technology, to provide confidence for developers, funders and consumers. MCC should work with the financial sector to promote these benefits of these methods. 	

Skills & Training

Focus	2021-22	2022-23	2023+
Create a Skills & Training Framework	<ul style="list-style-type: none"> Set up of advisory group to drive the skills and training framework objectives - linked to the Net Zero Task Group Secure in principle buy in from Government, LPA, Building Control, professional bodies, educational sector, and the industry to collaboratively deliver a skills & training framework Evaluate current skills and training initiatives across the built environment Identify the areas of skills & training current shortfall to facilitate the formation of the framework Identify the emerging trends/changes to this sector and the potential future Finalise the appropriate areas of skills and training to be implemented Review current policy/emerging policy & best practice 	<ul style="list-style-type: none"> Complete first draft of the skills & training framework. Review with key stakeholders, collaborative amendments to the first draft, agree roles/responsibilities, and finalise buy-in from these bodies Set up forums for collaboration and sharing of information Review policy/best practice changes Set up forums for collaboration and sharing of information Review policy/ best practise changes 	<ul style="list-style-type: none"> Agree framework with key stakeholders Continuous forums for collaboration are set out regularly with the key stakeholders as the framework is implemented
Implementation of the framework	<ul style="list-style-type: none"> Set and agree programme for adoption and delivery of the framework Establish resource requirements to formulate and deliver the framework 	<ul style="list-style-type: none"> Agreement of skills and training curriculum with educational sector, and programme for implementation Finalise and standardise programme for implementation of the framework for the existing resource pool 	<ul style="list-style-type: none"> Implementation of skills and training framework to the existing resource pool to upskill current working practices Delivery of skills and training curriculum as agreed with key stakeholders
Governance & Monitoring of the framework	<ul style="list-style-type: none"> Agree programme for the monitoring and evaluation following the implementation of the framework Establish governance structure and roles/responsibilities of the advisory committee 	<ul style="list-style-type: none"> Establish governance process for the framework Continue to review resource application to ensure delivery, and adopt new Initiative If failing to deliver to agreed requirements 	<ul style="list-style-type: none"> Ensure roles/responsibilities are being carried out by key stakeholders Commencement of monitoring processes of the implementation of the framework, and of emerging changes to policy/best practice (if appropriate, amend the framework to reflect the emerging changes)

Technology, Innovation and Infrastructure

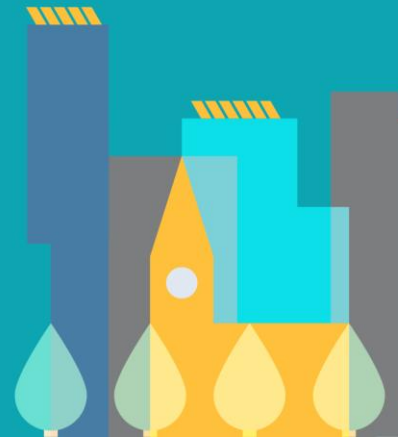
Focus	2021-22	2022-23	2023+
Funding/Skills	<ul style="list-style-type: none"> Establish a database of local supply chain resources that support the construction of low impact buildings Identification of a pilot scheme/enterprise zone as a demonstrator for low carbon design, supported by the public sector Consider how Section 106 should support the upgrade of local energy infrastructure in an equitable manner Set up a Zero Carbon Task Group with associated technical advisory and private sector feedback groups 	<ul style="list-style-type: none"> Share the local supply chain directory publicly Develop business case and masterplan for the pilot scheme/enterprise zone 	<ul style="list-style-type: none"> Continued investment in pilot scheme/enterprise zone as a showcase
Operational Carbon	<ul style="list-style-type: none"> Establish a database to enable generation of a building energy intensity baseline for Manchester buildings across various building typologies Begin to draft a Net Zero Carbon Guide for Manchester that embeds principles of passive design and design for performance principles, and informs supplementary planning guidance 	<ul style="list-style-type: none"> Share the building energy intensity database publicly where possible Publish the Net Zero Guide for Manchester, including guidance on BIM level 2 to 3 alignment 	<ul style="list-style-type: none"> Embed building energy intensity targets into planning policy and guidance
Embodied Carbon	<ul style="list-style-type: none"> Research and agree the principles and practices of achieving low embodied carbon design, circular economy and modern methods of construction that should be adopted for Manchester 	<ul style="list-style-type: none"> Add embodied carbon guidance to the Net Zero Guide for Manchester through amendment, as analysis becomes available 	<ul style="list-style-type: none"> Embed embodied carbon targets into planning policy and guidance

Communication, Collaboration and Culture

Focus	2021-22	2022-23	2023+
Recruiting / building the team	<ul style="list-style-type: none"> Establish what specialist skills are required to create a comms strategy and recruit specialists required for the successful implementation of the strategy and actions required Engage partners, e.g., central and local government, universities 	<ul style="list-style-type: none"> Assemble team with marketing, digital and technical skills to establish system platform and launch 	<ul style="list-style-type: none"> Target setting and continued outcome definition Develop team in response to evolving regulations, market demands and general performance
Comms strategy based on collaboration	<ul style="list-style-type: none"> Create a comms strategy with dates, actions and stakeholders etc. Fully scope out how any form of public platform is financed, policed, monitored and overseen. Explore links with other ideas, including technical database to inform carbon targets 	<ul style="list-style-type: none"> Dovetail comms strategy with policy implementation - e.g., links between a POE platform and the POE policy requirements 	<ul style="list-style-type: none"> Refresh narrative in response to shifting regulatory landscape in response to market facing effectiveness
Data collection	<ul style="list-style-type: none"> Identify early adopters to prove the principle of the communications platform to act as a demonstrator for wider market benefit and adoption. Collect projects that would act as exemplars to be included in first wave of mapping 	<ul style="list-style-type: none"> Shape and prepare an optimal system of metric collection and presentation, taking sounding from market participants from all perspectives, regulatory, vendors, purchasers and occupiers. 	<ul style="list-style-type: none"> Policy requirements (the Standard) drive data collection Continued and ongoing data collection to be used for mapping building performance
Mapping building performance data	<ul style="list-style-type: none"> Research and explore pre-existing digital platforms that already provide a similar function at land estate or private owner use, that could be adapted and evolved to employ at city scale. Engage MappingGM team 	<ul style="list-style-type: none"> Use the exemplar first wave buildings to map initial building data 	<ul style="list-style-type: none"> Iteratively develop, refine and enhance performance and user interface, offering targeted support and presence to different sectors of the market.

MANCHESTER CLIMATE CHANGE AGENCY

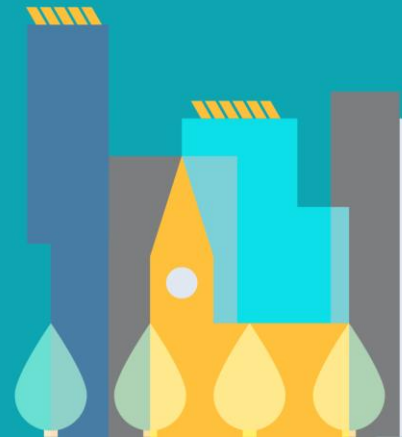
A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER



CONCLUSION

A number of conclusions arise from the work of this Task Group:

- 1) The engagement of major industry players across the built environment sector in Manchester has been fantastic. There is no doubting the appetite and support from businesses across the value chain for the city taking a leading position on net zero carbon new buildings. Industry leaders stand ready and willing to support this transition. This should provide all stakeholders, particularly the Council, with confidence to take forward the key recommendations in this report.
- 2) Delivering net zero carbon new buildings is not easy, particularly taking embodied carbon into consideration, as it absolutely should be. The challenges are many and varied – understanding, skills, data, technology – but probably above all, upfront cost. There are decisions to be made around priorities and the balance between different objectives, which are ultimately for the Council to take.
- 3) Because of the complexity of delivering net zero carbon new buildings, a whole range of things need to happen – very quickly, involving a large number of stakeholders – if the intended timeline is to be adhered to. This process needs to be co-ordinated and funded and is unlikely to happen without a concerted and collaborative ongoing effort between key stakeholders.
- 4) The City Council's role is pivotal. Although this will not happen without collaboration with the industry, the Council holds many of the key levers, most obviously through planning, but also through its own procurement, investment, land disposal and partnerships – that can be leveraged to trailblaze the Manchester Standard. Acknowledging capacity and resources are seriously constrained, there are opportunities – as a national leader – to engage central government for support.
- 5) Despite the challenges and the complexity, there is much to be gained by pursuing a radical approach to net zero. There is widespread acknowledgement that net zero new buildings are a crucial component of high quality, liveable and thriving places, and early indications from this Task Group's work suggest that net zero carbon new buildings deliver higher returns for investors, and opportunities for the city and region's supply chain. The long-term value is clear – for the city, its economy and its residents.



MANCHESTER CLIMATE CHANGE AGENCY

A ROADMAP TO NET ZERO CARBON NEW BUILDINGS IN MANCHESTER

FOR APPENDIX SEE SEPARATE PAPER

ACKNOWLEDGMENTS

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