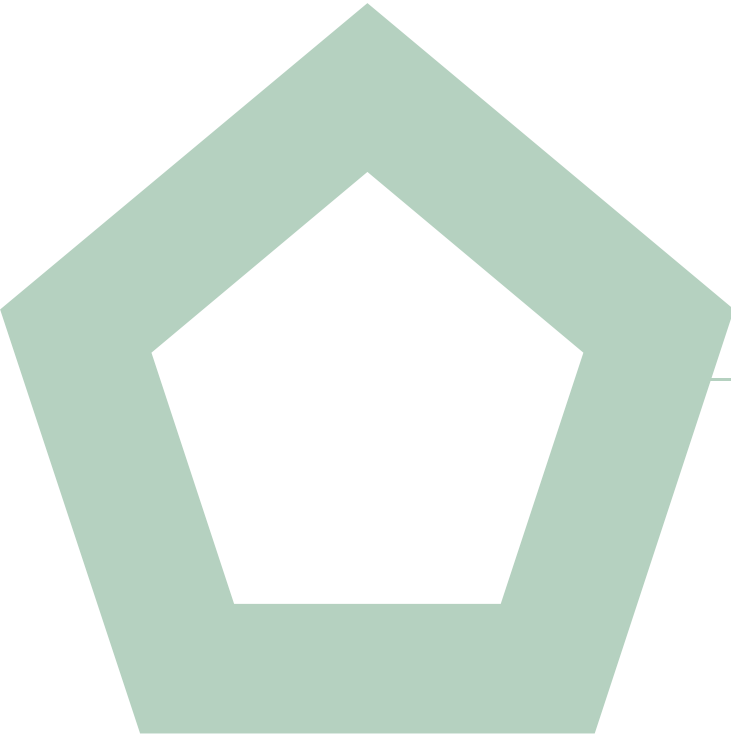


Mayfield Mobility Hub.
Manchester.
Mayfield Medlock Limited.

SUSTAINABILITY
STAGE 3 REPORT – ENERGY STRATEGY AND PART L REPORT
STAGE 3 REPORT
REVISION 01 – 13 MARCH 2026



STAGE 3

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	13/03/2026	Stage 3 Issue for Comment.	N. Flannigan	K.Krasowska	J.Nuttall

This document has been prepared for Mayfield Medlock Limited only and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This report has been based solely on the specific design assumptions and criteria stated herein.

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Executive summary.

1.1 Development description.

This energy strategy has been prepared on behalf of Mayfield Medlock Limited in support of the proposed Mayfield Mobility Hub building office development in Manchester - hereafter referred to as the Proposed Development.

The building under assessment is part of a larger masterplan development which has been parcelled into several plots with the offices building (Plot O) directly adjacent to the Mobility Hub. The proposed development will serve most of the Mayfield development's parking provision.

1.2 Energy strategy summary.

Passive design and energy efficiency measures will provide the cornerstone to the energy demand and CO₂ emission reduction achieved for the proposed development.

The baseline scenario, which each step of the energy hierarchy will be compared against, is established by the Part L Target Emission Rate for a notional building specification.

1.3 National drivers - Approved Document Part L of the Building Regulations.

Part L of the Building Regulations is the mechanism by which government is driving reductions in the regulated CO₂ emissions from new buildings. The assessment of the proposed development against policy targets has been carried out using Building Regulations Part L 2021 methodology.

1.4 Planning policy.

The Manchester Core Strategy (2012) Policy EN6 stated that all other non-residential developments over 1,000m² will be expected as a minimum to meet the following targets (*unless this can be shown not to be viable*):

Table 1. CO₂ emission reduction targets, Manchester Core Strategy

Target	% Minimum Requirement
Target 1; Network Development Area	CHP / District heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target 2; Electricity Intense Buildings	+ 10% increase on Part L 2010
Target 3; Micro Generation Area	+ 15% increase on Part L 2010

The above local plan has been further updated upon implementation of 'Places for Everyone' Joint Development Plan in March 2024. The Policy JP-S2, adopted in the revised strategy, introduced the following expectations:

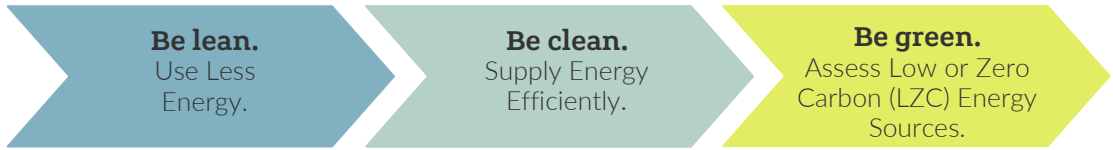
- The new development will, unless it can be demonstrated that it is not practicable or financially viable, be **net zero carbon** (regulated operational carbon emissions only) until 2028. The proposals should set out how this has been achieved in the energy statement in accordance with the energy hierarchy, and in interim, be assessed under Part L2021.
- From 2025, the development should also calculate and minimise carbon emissions from **unregulated emissions** alongside regulated emissions.
- From 2025, any residual carbon emissions that cannot be fully mitigated on-site should be **offset**, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund.

This Energy Strategy addresses the above requirements and assesses the scheme under Part L2021 where possible. However, with regards to the third requirement, offsetting is not applicable in this case as this policy

framework was not enforced at the time of planning for this project. The energy strategy does demonstrate how all energy efficiency avenues have been maximised in order to achieve the greatest possible reduction.

1.5 Approach.

The design approach, in respect to minimising carbon emissions from the development, aligns with the best practise guidelines adopted by the Local Planning Authority in their Core Strategy policies. This policy states that Lean, Clean and Green energy savings should be considered sequentially.



Energy Hierarchy

	Mayfield Mobility Hub
Be Lean	A fabric first approach and energy efficiency building services will be utilised to reduce carbon emissions and energy demand through best practice passive design measures.
Be Clean	CHP would offer very little benefit in terms of carbon emission reduction and further loses any value as the grid decarbonises. Therefore, CHP has not been considered.
Be Green	Use of the ASHP's and incorporation of PVs for the development is anticipated to significantly reduce energy consumption and carbon emissions in operation by generation zero carbon electricity onsite.
	Overall reduction in regulated carbon emissions is 37% over the current building regulations target (For detailed results refer to the Appendix E)

1.6 Energy Strategy Compliance Overview.

The energy strategy indicates that the Proposed Development (final option with maximum PV area) achieves a reduction, over the Part L 2021 baseline, of **37%**. As such, meets Policy EN6 within the Manchester Core Strategy document and Policy JP-S2 of the Places for Everyone Joint Development Plan. The proposed energy strategy in this report ties in closely with Manchester City Councils carbon zero 2028 / 2038 targets.

Whilst the development demonstrates that the local policies are met i.e. carbon reduction targets over Part L 2010, the design has evolved to focus on operational energy, embodied carbon and health & wellbeing. In recent years, focus has shifted away from metrics such as regulated carbon emissions (Part L) to be more focussed on real world outcomes and operational energy.

1. Introduction.

This strategy has been prepared on behalf of Mayfield Medlock Limited in support of the proposed Mayfield Mobility Hub development in Manchester - hereafter referred to as the Proposed Development.

The project is part of a large masterplan development and will be contributing retail space, cycle hub and car parking, as well as retail.

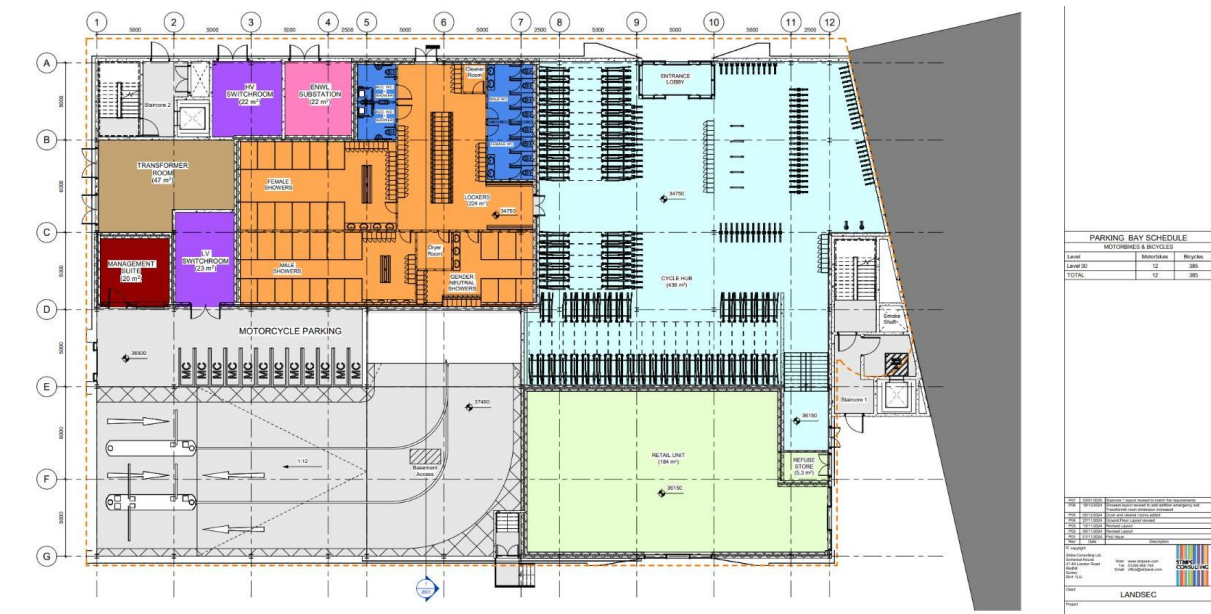


Figure 1: Ground floor layout

This strategy summarises the relevant regulatory and planning policies applicable to the development and sets out how the development will address and achieve the relevant policy targets.

Manchester has recently set an ambitious target to be a 'zero carbon city' by 2038, with new development to be zero carbon by 2028. Whilst the shorter-term target is not included in current policy, the Proposed Development is expected to support these ambitions through incorporation of low carbon and renewable energy instead of fossil fuels.

'Manchester Core Strategy' (2012 – 2027) states within Policy EN6 that applications for commercial developments exceeding 1,000m² will be expected to achieve a minimum +10% increase on Part L 2010 and residential developments a minimum 15% increase on Part L 2010. Since the publication of the Core Strategy document, Approved Document Part L has since been updated in 2013, and again in 2021.

Broadly speaking, compliance with Part L 2013 required a 9% reduction in carbon emissions compared to Part L 2010. A new non-domestic building built to Part L 2021 standards will deliver a 27% reduction in CO₂ emissions on average across the new non-domestic building mix relative to ADL 2013, and a new domestic building will deliver a 31% reduction.

Since the 'Places for Everyone' adoption in March 2024, as an interim measure, from 2025, the developments should be consistent with the 2021 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies. Proposals should seek to demonstrate within energy statement that the energy hierarchy has been followed. The above points have been addressed in this Energy Strategy.

1.1 Proposed development.

The proposed development will consist of a ten-storey building providing retail spaces on the ground floor and car parking spaces on 1st-9th floor. Since then, the fabric of the city has been evolved due to large investments in favour of high-rise commercial buildings. As a result, the area has been reinvented as a new central district for office, retail, leisure and public realm spaces.

The floor plate has been designed to allow conversion into two separate tenanted spaces for retail/leisure functions. The basement and ground floor areas are dedicated to the retail/leisure venue space as well as cycling storage and changing facilities. The plant rooms, dedicated to building services and systems, will be in the basement.

The table below details the indicative areas of the Proposed Development included in the assessment.

Table 2. Indicative areas schedule

Space use	GIA (m ²)
Retail	190
Management suite	18
Showers/Changing/WCs inc. Cleaner Cupboard and Drying room	245

*As estimated from the Architectural drawings.

2. Policy and key drivers.

The following section outlines the national and local policies and drivers.

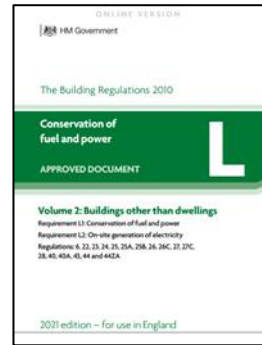
2.1 Building Regulations Part L (2021).

Approved Document Part L (2021, England edition) is the Building Regulations relating to the conservation of fuel and power in buildings. The Approved Document is separated into two sections: Volume 1 and Volume 2:

- Part L Vol.1 relates to dwellings specifically, with an individual criterion for this building-use type
- Part L Vol.2 relates to buildings other than dwellings 'Conservation of fuel and power in buildings other than dwellings' and sets out specific criteria for this building use type.

Schedule 1: Conservation of Fuel and Power

Schedule 1 of the Building Regulations Part L states that reasonable provisions shall be made for:



- Limiting Heat Gains and Losses through;
 - Thermal elements and other parts of the building fabric; and;
 - From pipes, ducts and vessels used for space heating, space cooling and hot water services.
- Providing fixed building services which are:
 - Energy Efficient;
 - Have effective controls; and;
 - Are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances

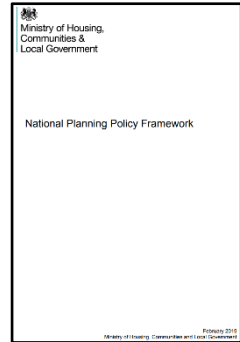
Developments should aim to at least meet the limiting values for system and fabric requirements in order to better the Building Emission Rate set by a notional building which uses standardised inputs based on the system and fabric design of each building.

Part L (2021) Conservation of Fuel and Power.

With the release of the update to the Part L of Building Regulations in December 2021, the newest iteration is applicable to all developments commencing work after June 2022 which did not submit an initial notice.

2.2 Planning policies.

2.2.1 National Planning Policy Framework



The National Planning Policy Framework (NPPF) was first published in on 27 March 2012 and most recently updated in February 2025. The updated NPPF has superseded all Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) documents, with the exception of PPS10 (Waste). The NPPF sets out the Government's strategy on the delivery of sustainable development.

The NPPF states that there is a presumption in favour of sustainable development.

The following is extracted from paragraph 8 of the NPPF:

“Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways

- an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

Furthermore, in relation to energy policy, paragraph 161 sets out that:

“The planning system should support the transition to net zero by 2050 and take full account of all climate impacts including overheating, water scarcity, storm and flood risks and coastal change. It should help to:

- shape places in ways that contribute to radical reductions in greenhouse gas emissions,
- minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings;
- and support *renewable and low carbon energy and associated infrastructure.*”

In respect of energy policy contained within the NPPF, paragraphs 162 to 167 set out that:

162. Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating and drought from rising temperatures. Policies should support appropriate measures to ensure the future health and resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.

163. The need to mitigate and adapt to climate change should also be considered in preparing and assessing planning applications, taking into account the full range of potential climate change impacts.

164. New development should be planned for in ways that:

- avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through incorporating green infrastructure and sustainable drainage systems; and
- help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings in plans should reflect the Government's policy for national technical standards.

165. To help increase the use and supply of renewable and low carbon energy and heat, plans should:

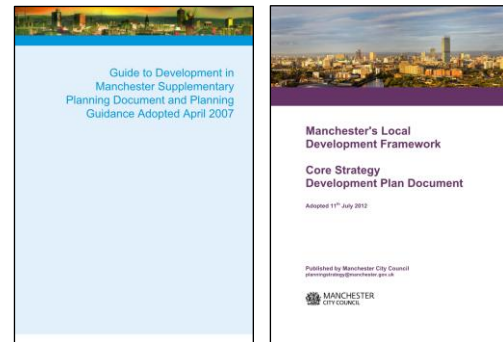
- provide a positive strategy for energy from these sources, that maximises the potential for suitable development, and their future re-powering and life extension, while ensuring that adverse impacts are addressed appropriately (including cumulative landscape and visual impacts);
- consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and
- identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

166. In determining planning applications, local planning authorities should expect new development to:

- comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and

- b. take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.
167. Local planning authorities should also give significant weight to the need to support energy efficiency and low carbon heating improvements to existing buildings, both domestic and non-domestic (including through installation of heat pumps and solar panels where these do not already benefit from permitted development rights). Where the proposals would affect conservation areas, listed buildings or other relevant designated heritage assets, local planning authorities should also apply the policies set out in chapter 16 of this Framework.

2.2.2 Local Planning Policy



Manchester City Council (MCC) documentation:

- Core Strategy (CS) (July 2012)
- Supplementary Planning Documentation and Planning Guidance (SPDPG) (April 2007)

This strategy summarises the response of the proposed development's design to the policy framework of the MCC Adopted Core Strategy, and SPDPG documentation that together form the city's policy landscape. The CS documentation supersedes the SPDPG and therefore the CS documentation will take precedence.

2.2.3 Manchester Climate Change Framework (2020-2025)



The Manchester Climate Change Framework 2020-25 is the city's high-level strategy for tackling climate change, formally endorsed by Manchester City Council in March 2020,

The aim of the framework is stated as: *'Manchester will play its full part in limiting the impacts of climate change and create a healthy, green, socially just city where everyone can thrive.'*

It identifies four objectives we need to meet by 2025.

- Objective 1 – Staying within our carbon budgets
- Objective 2 – Climate adaptation and resilience
- Objective 3 – Health and wellbeing
- Objective 4 – Inclusive, zero carbon climate resilient economy

Six priority areas for action have been identified as follows:

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

The 2022 Update was a response to the city not being on track to stay within its carbon budget by 2025 and aimed to provide more detailed targets for different sectors and different types of energy use in buildings and ground transport to help guide increased action.

2.2.4 5-Year Environment Plan for Greater Manchester



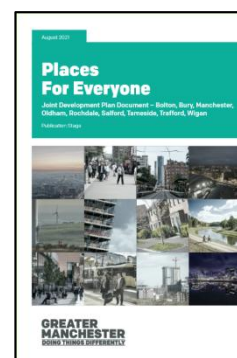
The Greater Manchester Combined Authority (GMCA) set an ambitious target to be a zero-carbon city by 2038. As part of this plan, the Greater Manchester Spatial Framework sets out plans for all new development to be zero carbon by 2028.

Included in the five-year plan, are amongst others; increasing local renewable electricity generation, increasing the diversity and flexibility of energy supply and decarbonising how buildings are serviced. These items encourage passive design and a shift away from fossil fuels to service buildings. The five-year plan also notes that new developments should seek to generate 20% onsite renewable energy generation.

Additionally, the strategy includes a clean air plan to help tackle poor air quality – safeguarding Manchester residents from high levels of Nitrogen Dioxide (NO₂).

With first version released in 2019, the five-year plan has been updated in December 2024. Based on the lessons learnt, the new plan adopted challenging but achievable targets for the next 5 years replacing the fixed carbon budget approach. This was, the progress can be regularly monitored and reported upon.

2.2.5 Places for everyone



Places for Everyone is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. The plan, adopted in March 2024 is the result of a process that began with the publication of the first Greater Manchester Spatial Framework in 2016 and has been informed by the feedback received from residents, businesses, and the development industry.

The plan addresses the sustainable integration of all new into Greater Manchester's transport network or supported by new infrastructure.

As a part of the 'Places for everyone' plan, the following sustainability policies have been included.

- JP-S1: Sustainable development
- JP-S2: Carbon and energy
- JP-S3: Heat and energy networks
- JP-S6: Resource efficiency
- JP-G8: A net enhancement of biodiversity and geodiversity
- JP-P1: Sustainable places
- JP-C1: An integrated network
- JP-C8: Transport requirements of new development

3. Sustainability Strategy overview.

As required in CP3 and CP16 in which the development aims to respond to various headline sustainability categories (and relevant local policies as appropriate). This strategy statement identifies how aspirations and measures of sustainability will be considered and implemented (as appropriate) to help address the following.

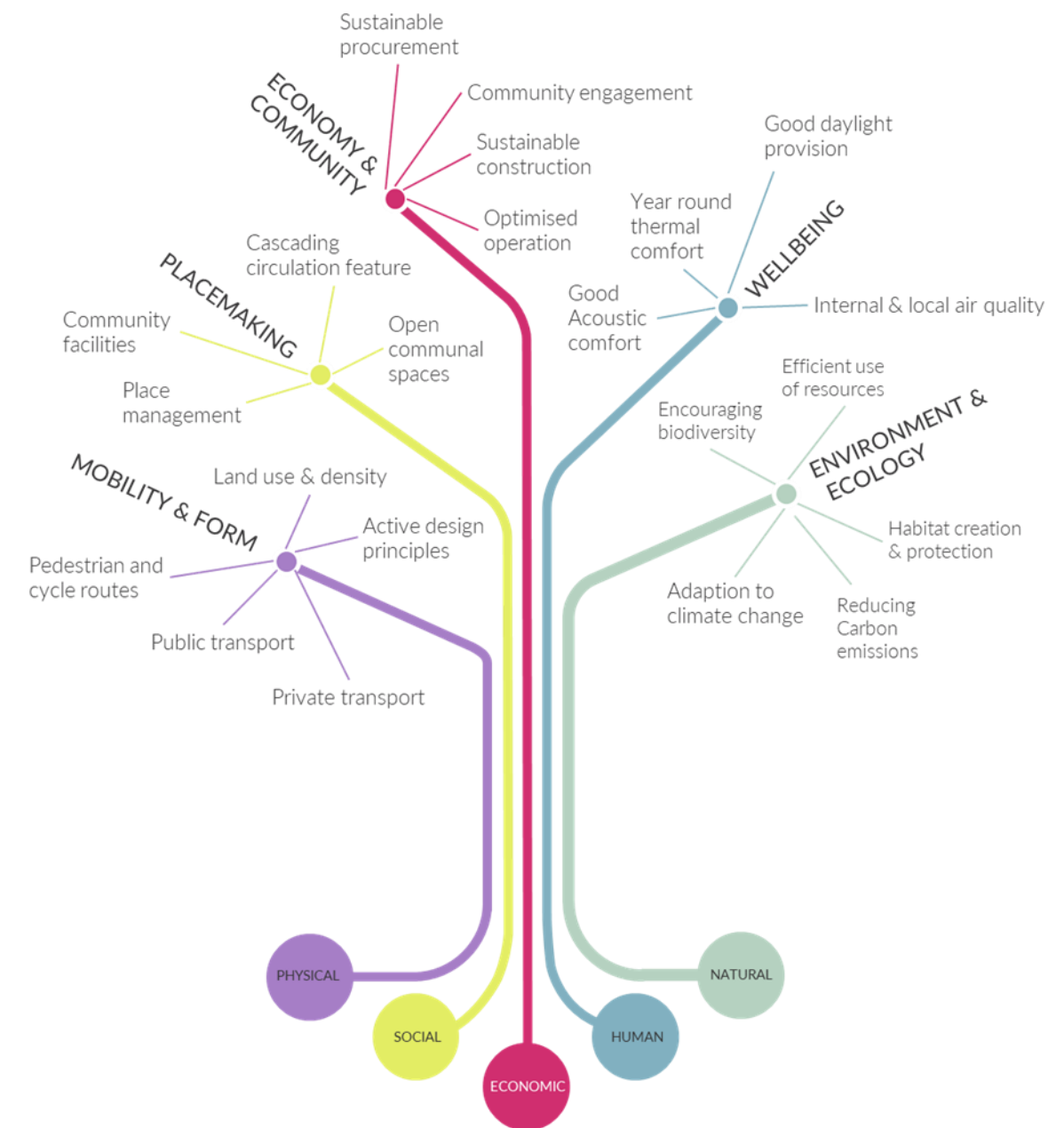


Figure 2: The five capitals of sustainability

4. National Grid decarbonisation.

4.1 Future projections.

The Future Energy Scenarios (FES) document, produced by the National Grid, discusses how the UK's energy landscape is changing. The FES 2022 makes projections of how the mix of generation in the grid is likely to change between now and 2050 – the year by which the Climate Change Act 2008 set the target of reducing the UK's CO₂ emissions by 80% from 1990 levels. This target has now been revised to be Net Zero in light of the Committee on Climate Change's recent report and the declaration of a Climate Emergency.

The latest version, FES 2022, discusses these projections in four scenarios. Figure 3 below combines these future trajectories with the actual carbon intensity of the National Grid over the past 14 years. The reported emissions associated with electricity generation have fallen steeply since 2012 and in three cases, the FES 2023 scenarios see carbon factors trending towards zero by the late 2040s. This is on the basis that FES 2023 have deemed it necessary to offset other industries such as freight, shipping and aviation, which will be unable to reduce their carbon emissions to zero. Offsetting the emissions of other industries will involve Carbon Capture and Storage (CCS) technologies on a significant scale in order for the UK, as a nation, to meet net zero carbon by 2050. It is important to note that CCS technology is not currently commercially demonstrated at a large scale, but the FES 2022 studies are useful as future forecasts.

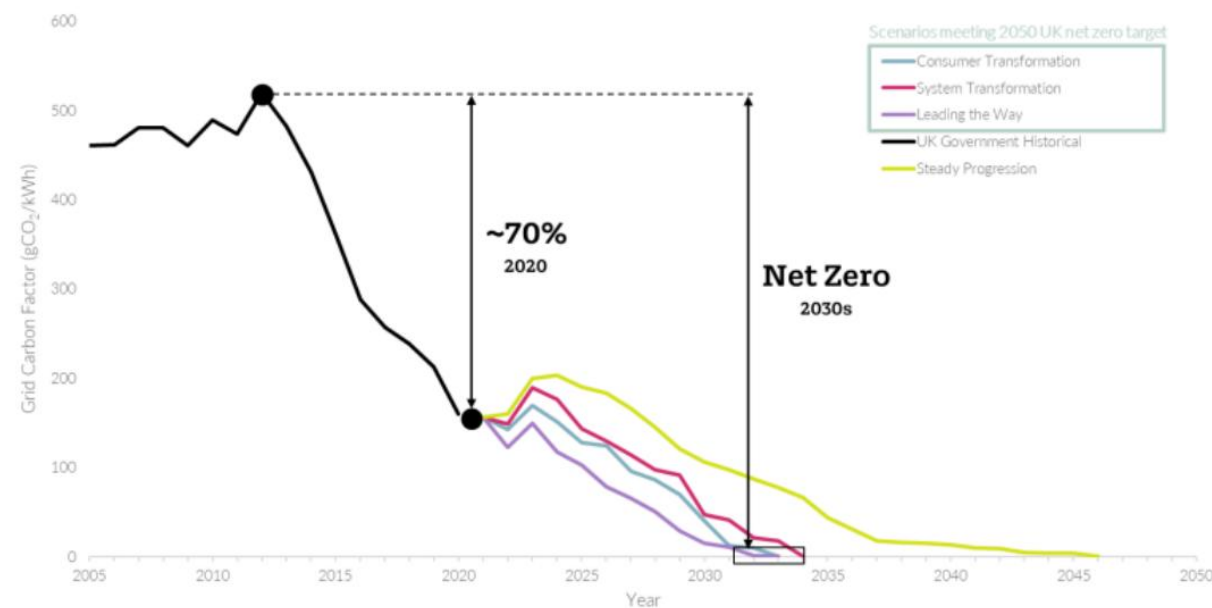


Figure 3: The carbon factor of grid electricity and the projected future energy scenarios published by the national grid

As a response to the decarbonisation trend, the latest Building Regulations (ADL 2021) include a significantly reduced carbon emission factor for grid electricity of 0.136 kgCO₂/kWh (SAP10.2) compared to 0.519 kgCO₂/kWh used in Part L 2013. This reduction reflects the increased contribution of renewable energy into the national mix of electricity generation. In 2020, renewable sources accounted for 43% of the electricity generated in the UK, up from 24.4% in 2016 (Ofgem).

4.2 Historic progress.

Figure 4 shows how the mix of generation technologies serving the National Grid, as well as the associated carbon factor, has varied between 2012 and 2018 based on the mix of generation techniques serving the National Grid over this six-year period.

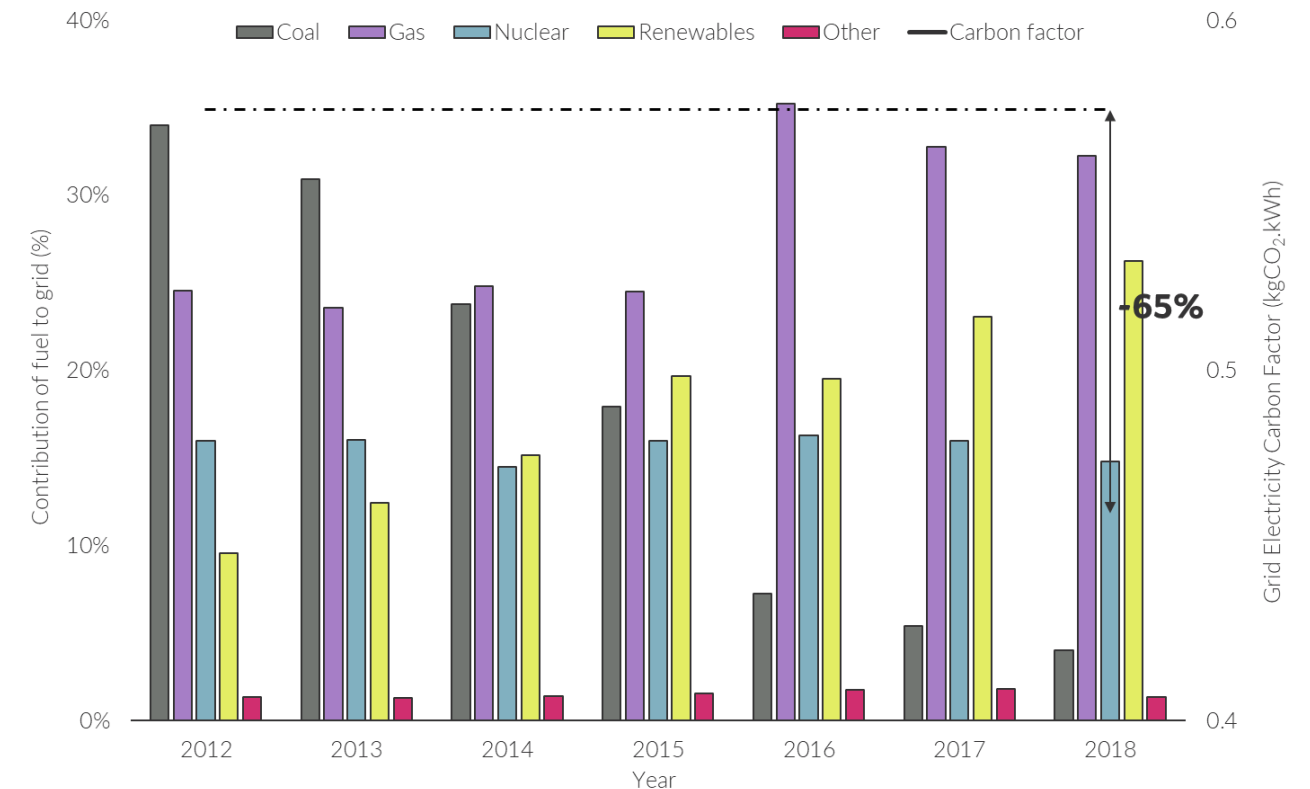


Figure 4: Historic mix of generation methods and associated carbon factor for the National Grid. 8% transmission and distribution losses are included. Sources: electricityinfo.org (generation mix); BEIS Green Book (historic carbon factors)

5. Assessment methodology.

The following is a summary of the data used and inputs / assumption made for simulation geometry modelling.

5.1 Site context.

The site is located in Manchester and is flanked by the Mancunian Way to the South and Plot O to the North. Its location near the main road provides ease of access for vehicles and a connection point the rest of the site for pedestrian access.



Figure 5: Location of the Mayfield Mobility Hub building existing site and building with respect to the surrounding area

5.2 Site location and weather data.

A building's thermal performance is its response to external environmental conditions. The more dependant a building is on passive features to achieve acceptable internal comfort, the more important the use of external weather information becomes.

Climate data is assigned to the virtual environment of the dynamic model to simulate external weather conditions that are likely to occur. Thermal comfort calculations require the simulation to be tested against Chartered Institute of Building Services Engineers (CIBSE) Design Summer Year (DSY) climate data to best assess how spaces will perform during a year with hot summer conditions.

The UK Meteorological Office (MO) collects weather data at stations across the UK. Climate variables measured at hourly intervals include air temperatures, wind speed and direction and air pressure amongst various other characteristics.

CIBSE licenses the historic weather data from the MO for 14 locations in the United Kingdom: Belfast, Birmingham, Cardiff, Edinburgh, Glasgow, Leeds, London (3 sites), Manchester, Newcastle, Norwich, Nottingham, Plymouth, Southampton and Swindon.

The weather variables are synthesised into 2 types of CIBSE weather file:

- **Design Summer Year (DSY): 2006 and 2016**
The DSY is a single continuous year rather than a composite one made up from average months. The DSY is used for overheating analysis.
- **Test Reference Year (TRY): 2006 and 2016**
The TRY is composed of 12 separate months of data each chosen to be the most average month from the collected data. The TRY is used for operational energy analysis and for compliance with the UK Building Regulations (Part L).

A Manchester CIBSE weather file exists therefore following the standardised methodology behind the Part L requirements, this weather file was used.

5.3 Architectural drawings.

The geometry used to assess the proposed development was determined by the following information received.

We understand that minor updates to architectural drawings and models may have been made since the below issued documents, this list simply details the information our models have been developed from.

Table 3. Architectural information

Project	Information type	Document Package	Data Type	Date Received
Plot N (Mayfield Mobility Hub)	Drawings	J2965-STRIPE-XX-00-DR-AX-2101-P017- PROPOSED GROUND FLOOR PLAN	PDF	13/02/2026
		J2965-STRIPE-XX-01-DR-AX-2102-P012- PROPOSED LEVEL 01 FLOOR PLAN		
		J2965-STRIPE-XX-09-DR-AX-2110-P011- PROPOSED LEVEL 09 FLOOR PLAN		
		J2965-STRIPE-XX-B1-DR-AX-2100-P06- PROPOSED BASEMENT FLOOR PLAN		
		J2965-STRIPE-XX-01-DR-AX-2111-P04- PROPOSED ROOF PLAN		04/12/2025
		0439E-SEW-N01-ZZZZ-DR-A-001310 [ELEVATION DRAWINGS]		12/02/2026

5.3.1 Dynamic Simulation Model

Based on the information above a series of Dynamic Simulation Models were created to undertake appropriate assessments on the proposed design.

Integrated Environmental Solutions Virtual Environment (IESve) is an approved Dynamic Simulation Model (DSM) software package that has the capabilities of enabling the user to create a virtual representation of a building.

Models built in the IESve have been used to consider compliance with Approved Document Part L2 2021 using the National Calculation Methodology alongside the assessment of operational energy consumption.

One of the DSM models, with simplified versions of the surrounding buildings (as appropriate) is displayed below.

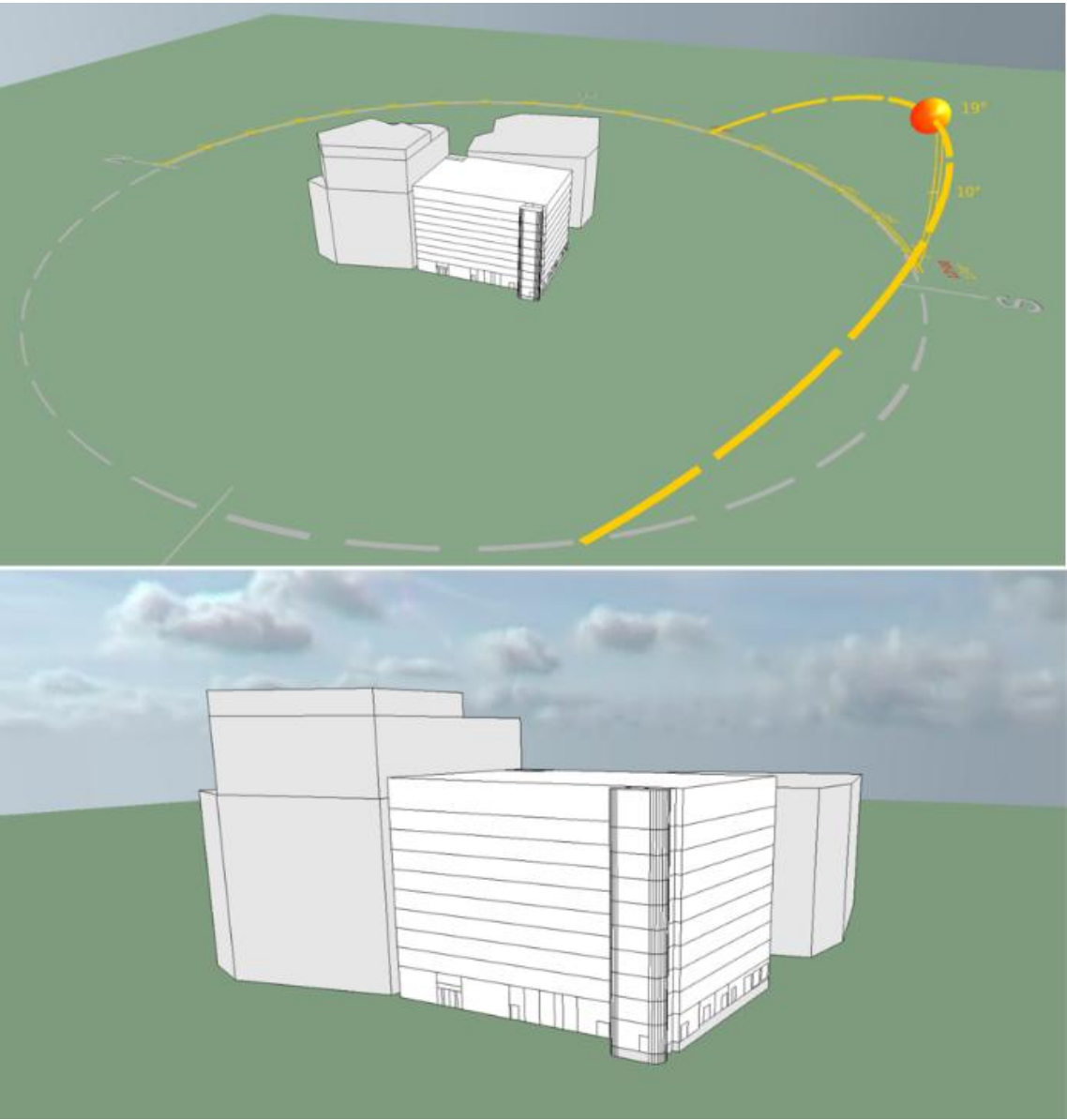


Figure 6: DSM model images

5.4 Scope of the assessment.

The Part L assessment described in this report excludes any unheated spaces beyond the thermal line. The figure below illustrates the scope of the assessment with thermal line highlighted in green.

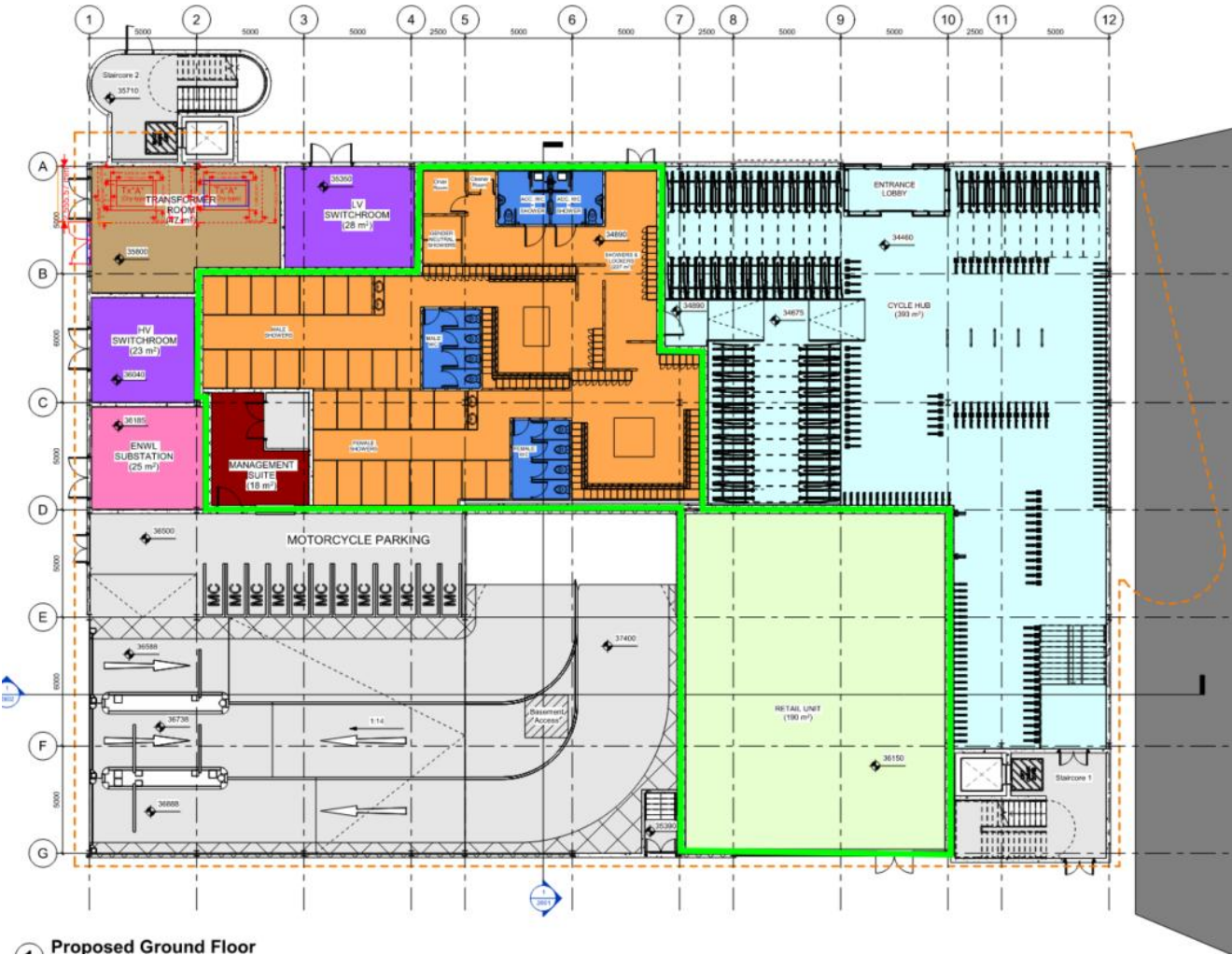


Figure 7: Proposed ground floor layout

For these spaces, the exposed walls and ceilings to unheated spaces have been assumed to be insulated as per the specification in section 5.5.

5.5 Building fabric specification.

Optimising the development’s fabric is seen to be the most robust and effective way to improve energy efficiency and in turn reduce carbon emissions whilst also impacting thermal comfort.

The performance of the envelope i.e., material performance is unlikely to deteriorate significantly with time and therefore the benefits of these measures will continue at a similar performance for the duration of their installation. The current values used are as indicated by the architects and the fabric performance parameters are detailed below.

Table 4. Fabric assumptions

Parameter	Non-Domestic
Fabric Air Permeability (m³/m².h @ 50Pa)	3.00
External/ Exposed Wall U-value (W/m².K)	0.20
Ground/Exposed Floor U-value (W/m².K)	0.15
Exposed Roof/Ceiling U-value (W/m².K)	0.15
Personal Door U-value (W/m².K)	1.60
Glazing U-value (W/m².K) (glazed doors / windows)	1.40
Glazing g-value	0.40
Thermal bridges	Heat loss through thermal bridges to be minimised as far as reasonably possible during construction. The model assumes alpha value of 29%.

*The spaces outside of the thermal line (as specified on the architectural drawings) have been modelled as buffer spaces and excluded from the analysis, i.e. plant rooms, stair cores, cycle hub, lobby, and the car park areas. The exposed walls and ceilings of the heated spaces have been insulated as per the above specification.

6. Energy Strategy.

In order to develop the energy strategy, a ‘baseline’ case is created which aligns with the notional building specification as per the Building Regulations Part L 2021.

The baseline case helps to inform the benefit of low and zero carbon technologies – which are implemented in the ‘Clean’ and ‘Green’ stages.

6.1 Baseline case.

Table 5. Baseline case building performance parameters

	Fabric performance The baseline case utilises the same fabric performance as the Building Regulations Part L2 ‘notional’ building; <ul style="list-style-type: none">- External Walls; 0.18W/m²·K- Exposed Floors; 0.15W/m²·K- Roof; 0.15W/m²·K- External Glazing; 1.60W/m²·K- External Door: 1.90 W/m²·K- Air permeability; 5.00m³/hr·m² @ 50Pa top lit spaces; 3.00m³/hr·m² @ 50Pa side lit spaces
	Space heating & cooling For non- domestic developments, the notional building according to 2021 Building Regulations specified the same system and fuel as actual building with efficiencies as per NCM Modelling Guide 2021 Table 7, as follows: <ul style="list-style-type: none">- Heat pump SCOP=264%- Direct electric SCOP=134% Cooling is assumed to be electrically powered. In air-conditioning mode, the Notional building will have a cooling SSEER of 4.4.
	Mechanical ventilation The use of heat recovery is used throughout the office development. Recovering heat from the extract air can help reduce annual heating energy considerably with no impact on the air quality of the incoming fresh air. The air handling plant will have efficient fan motors and will be designed with low static fan pressures to help reduce the energy consumption associated with delivering fresh air into the building. All assumptions regarding auxiliary energy for the notional building can be found on p.21 of NCM Modelling Guide 2021.

	Lighting The internal lighting design incorporates the use of high efficiency LED lighting combined with daylight linking (where applicable). The use of presence and absence detection prevents the internal lighting being ‘on’ when the occupied spaces are not occupied. The efficient lighting design also help to drive down the cooling energy consumption. The illuminance level used for the general lighting in the Notional building is determined by the illuminance values for the activity type in the NCM Activity Database and the design illuminance for the Actual building or higher, if specified in actual building.
	Domestic hot water (DHW) system Domestic hot water is supplied via the electric domestic hot water (DHW) heater with 1,500 litres of storage, as well as assumed Pont of Use system serving the future fit-out retail area with the following efficiency: <ul style="list-style-type: none">- Electric system- SCOP= 100%
	Photovoltaic Panels The notional building in Building Regulations Part L 2021 includes the PV panels. The amount of area covered by PV in baseline case can be reduced by proportion of space heating demand covered in actual building by ASHP. This adds benefit for the proposed building over baseline. The Notional building’s PV array is specified as follows: <ul style="list-style-type: none">- Orientation updated to current specification- 90° from the north- 30° pitch from the horizontal- ‘no or very little over-shading’- ‘strongly ventilated or forced ventilated modules’

6.1.1 Baseline case results

Figure 8 shows the energy demand for the notional building.

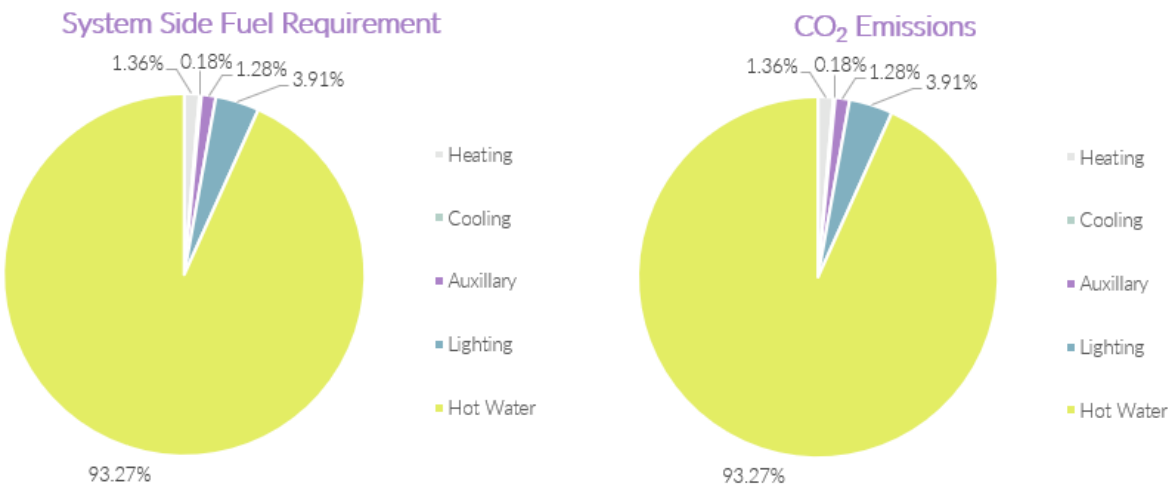
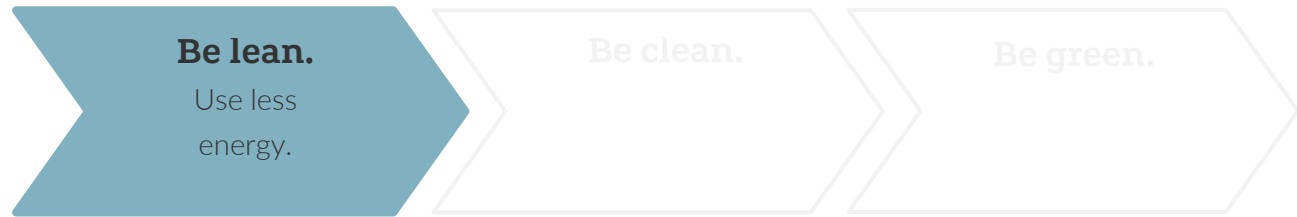


Figure 8: Baseline energy demand and emissions

6.2 Be Lean.

Passive design and energy efficiency measures form the basis for the reduction in overall energy demand and carbon emissions for the proposed development. This energy strategy aims to reduce the energy demand initially by optimising the envelope and building services within the development.



6.2.1 Passive design and energy efficient features

Passive design measures are those which reduce the demand for energy within buildings, without consuming energy in the process.

These are the most robust and effective measures for reducing CO₂ emissions as the performance of these solutions, such as façade insulation, are unlikely to deteriorate significantly with time, or be subject to change by future property owners. In this sense, it is possible to have confidence that the benefits these measures will continue at a similar level for the duration of their installation.

Table 6. Passive design measures

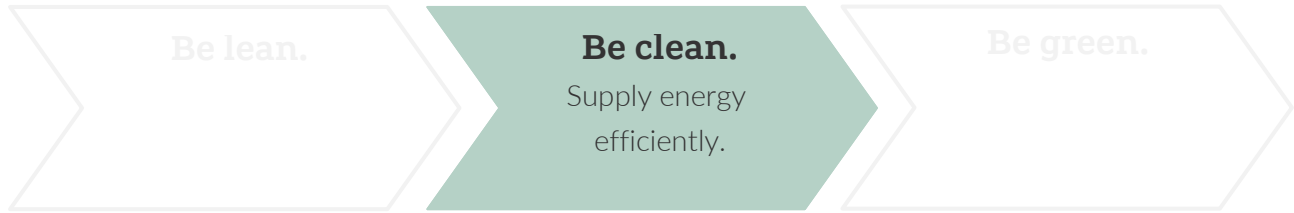
	<p>Fabric performance</p> <p>A 'fabric first' approach has been taken in order to reduce the energy demand and CO₂ emissions from the proposed development. The overriding objective for the façade design of each building will be to achieve the optimum balance between providing natural daylighting benefits to reduce the use of artificial lighting, the provision of passive solar heating to limit the need for space heating in winter and limiting summertime solar gains to reduce space cooling demands. See Table 7 opposite.</p>
	<p>Mechanical ventilation</p> <p>The use of heat recovery is used throughout the office development. Recovering heat from the extract air can help reduce annual heating energy considerably with no impact on the air quality of the incoming fresh air.</p> <p>The air handling plant will have efficient fan motors and will be designed with low static fan pressures to help reduce the energy consumption associated with delivering fresh air into the building.</p>
	<p>Lighting</p> <p>The internal lighting design incorporates the use of high efficiency LED lighting combined with daylight linking (where applicable). The use of presence and absence detection prevents the internal lighting being 'on' when the occupied spaces are not occupied. The efficient lighting design also help to drive down the cooling energy consumption.</p>

Table 7. Fabric performance

Parameter	'Standard Building' Part L 2021 – Notional	'Proposed Building' Target Initial
Fabric Air Permeability (m ³ /m ² ·h at 50Pa)	5.00	3.00
External/ Exposed Wall U-value (W/m ² ·K)	0.18	0.20
Ground Floor U-value (W/m ² ·K)	0.15	0.15
Roof/ Exposed Ceiling U-value (W/m ² ·K)	0.15	0.15
Personal Door U-value (W/m ² ·K)	1.90	1.60
Glazing (External Windows / Glazed doors) (W/ m ² ·K)	1.40	1.40
Glazing (External Windows / Glazed doors) (g-value)	0.29	0.40
Glazing light transmittance (inclusive of External Windows / Glazed doors / External and Internal Atrium Glazing)	60%	71%

6.3 Be Clean.

This stage of the energy hierarchy refers to the use of heat networks which typically consists of Combined Heat and Power (CHP) to provide carbon emission reductions. A CHP system consists of an engine, usually gas fired, which generates thermal energy and electrical energy – which is fed into the development.



Due to the development being electrically led the utilisation of technology such as CHP would offer very little benefit in terms of carbon emission reduction. Furthermore, due to grid decarbonisation, the carbon emission benefit of gas fired CHP will diminish as the national grid continues to decarbonise.

Table 8. Clean energy supply

	<p>Combined heat and power (CHP)</p> <p>Due the proposed changes to the carbon emission factors in future revisions of Part L – the use of Combined Heat and Power (CHP) is likely to offer a ‘negative benefit’ within the next five years and therefore has not been explored as part of the energy strategy.</p>
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6.4 Be Green.

The final step of the energy hierarchy explores the feasibility of Low and Zero Carbon (LZC) technologies to allow for the production of renewable energy onsite in order to offer a further reduction in carbon emissions.

Table 9 Examples of Low and Zero Carbon Technology

	<div>Be lean.</div> <div>Be clean.</div> <div>Be green. Assess 'low or zero carbon' (LZC) energy sources.</div>
	<p>Energy from Waste</p> <p>Energy from waste (EfW) is the process of generating electricity and/or heat from the primary treatment and processing of waste usually by incineration.</p> <p>It is generally placed higher in the waste hierarchy than throwing waste into landfill as described above. Further, where an EfW facility is in place to generate electricity, with heat generation essentially a by-product, it can be considered a low carbon heat source.</p> <p>Suitability to proposed development:</p> <p>Although a low carbon heat source, Energy from Waste systems usually operate on a large scale rather than on a single building basis. Furthermore, since EfW is not yet ubiquitous across the country and is not yet available in Manchester, Connection to this EfW district heat network (DHN) is not deemed a solution for the proposed development.</p> <p>Therefore, Energy from Waste is currently not proposed for the development.</p>
	<p>Air source heat pumps</p> <p>Air source heat pumps (ASHP) use thermodynamic principles to convert heat from the air into useable heat within the building. Unlike some other sources of renewable energy, heat pumps do require energy (typically electricity or gas) to pump and compress refrigerant through the system. However, under the Renewable Energy Directive 2009/28/EC they are classified as renewable technologies provided that the final energy output significantly exceeds the primary energy input required to drive the heat pump. ASHP need to be located externally with access to the ambient air, typically at roof level.</p> <p>They can typically operate at an efficiency of around 350% when delivering heating for space conditioning.</p> <p>Suitability to proposed development:</p> <p>Air source heat pumps use the air temperature to reject and extract heat to provide energy within the building.</p> <p>The ability of the heat pump to transfer heat from the outside air to the building depends on the outdoor temperature. As this temperature drops the ability of the heat pump to absorb heat also drops. In the UK external ambient temperatures do not historically drop to levels that would make air-to-air heat pumps unviable. In this way Air Source Heat Pumps (ASHP) technology could potentially be used to provide heating and/or hot water to the office development.</p> <p>The use of this technology fits well with grid decarbonisation.</p> <p><u>Therefore, this technology is proposed for the development.</u></p>

	<p>Ground Source Heat Pumps (GSHPs)</p> <p>GSHPs work similarly to ASHP, except they extract heat from the ground. GSHPs are best suited to developments with a balanced heating and cooling load, to avoid long-term heating or cooling of the ground /ground water and associated decreased efficiency of the heat pump.</p> <p>Suitability to proposed development:</p> <p>There will be a relatively small cooling demand for the proposed building. In addition, the groundworks for a GSHP system are significant, and would require higher costs and effort than the proposed connection to low carbon local district, overall making this option unsuitable.</p> <p>Therefore, this technology is not proposed for the development.</p>
	<p>Photovoltaics</p> <p>Photovoltaic (PV) panels harness energy from sunlight and convert this into useful energy in the form of electricity. A PV system requires sufficient roof space for the system array to be installed and function effectively.</p> <p>Suitability to proposed development:</p> <p>Often, roof space can cause conflict of interest between the necessity to provide plant space, PV panels or social spaces. In this specific case, maximum allowable area of 840 m² of the roof space has been specified for the PV panels. This has been estimated to cover 52% of the available roof space (excluding potential maintenance access) and yield a total of 37% carbon saving over the notional building (when compared the Building Emission Rate to the Target Emission Rate).</p> <p>Please refer to section 6.4.2. for the sensitivity analysis estimating carbon savings based on different PV areas specified.</p> <p><u>Therefore, the PV panels have been proposed for the development as 'Be Green' measure.</u></p>
	<p>Solar thermal</p> <p>Solar Thermal Panels are similar to PV Panels in that they harness energy from solar energy. This technology however converts solar energy into thermal energy that can offset the demand on hot water generation systems.</p> <p>Suitability to proposed Development:</p> <p>Often, solar PVs would be prioritised over solar thermal panels since the electrical output from PV panels will be more suitable for implementation. However, in this case, neither technology can be considered because the roof space has been dedicated to the PV panels.</p> <p>Therefore, solar thermal is not proposed for the development.</p>

	<p>Wind turbine</p> <p>For efficient operation and to yield high energy output, wind turbines require a consistent flow of air to generate electricity using wind energy.</p> <p>Suitability to proposed development:</p> <p>The proposed development is located within a dense urban environment. Therefore, the wind flow profile is erratic and consequently is not conducive to high annual yields from a turbine. Moreover, mounting wind turbines on the roof of the building could result in unacceptable vibration and resonance being felt within occupied spaces. The turbines are also likely to generate noise which may be a nuisance to neighbouring buildings.</p> <p>Therefore, given the complexities of installing this technology, the use of wind turbines is not proposed at the proposed development.</p>
	<p>Biomass</p> <p>Biomass boilers burn wood fuel or other bio-fuel sources to generate heat. These boilers can operate at high efficiencies, comparable to condensing gas boilers. However, they require a large fuel store to maintain continuous operation during the winter months. As such, area take for such plant is high. Furthermore, fuel deliveries in city-centre locations can prove difficult and security of fuel supply is an important consideration.</p> <p>Suitability to proposed development:</p> <p>The reasons listed above alongside high maintenance implications and air quality implications mean that biomass boilers are not considered a suitable technology for the scheme.</p> <p>Therefore, given the implications associated, the use of biomass boiler technology is not proposed at the proposed development.</p>

6.4.1 Be Green results

The Be Green technologies applicable to the development include the Variable Refrigerant Flow (VRF) System and the Photovoltaic Panels (PVs).

The Be Green energy consumption and associated emissions have been reduced through implementation on low carbon VRF system to provide space heating and cooling.

As per the Figure 9 below, the DHW accounts for most of the energy consumption for the Proposed Building due to high proportion of showers/ changing rooms to the total assessed area. This is currently supplied by an electric calorifier; however, potential savings can be made when switching to the ASHP with higher efficiency.

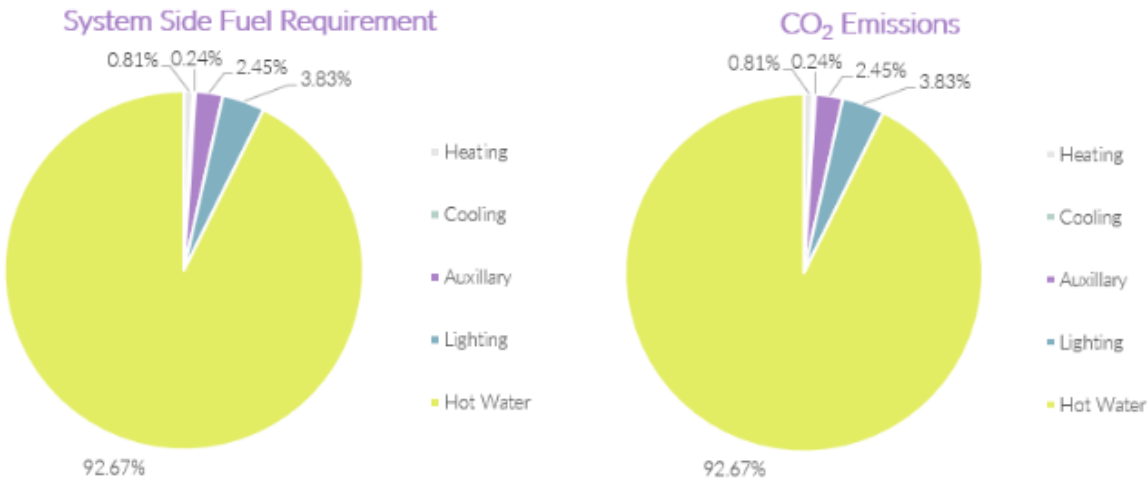


Figure 9: Be Green energy demand and emissions

Be Green PV analysis

Sensitivity analysis has been performed to estimate potential carbon savings for the scheme based on varying PV active area (excluding area for access and maintenance). Please note the current PV specification as per the section 7.5 in the Appendix C (i.e. orientation, inclination, module efficiency)

The graph below describes reduction of carbon emissions for the Proposed Building against the Notional building as per Building Regulations Part L 2021.

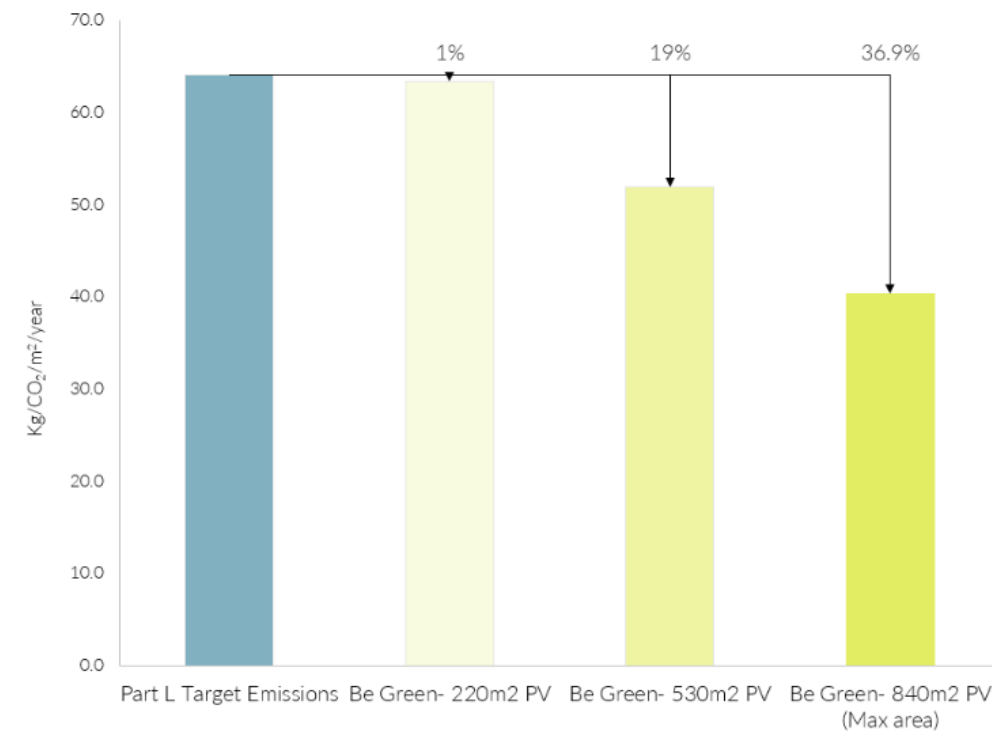


Figure 10: Baseline and Be Green; regulated carbon emission reduction depending on the PV active area

It has been estimated that the minimum active area for the Part L 2021 compliance is **220m²**. The maximum specified allowable area of 840m² yields a 37% reduction of carbon emissions against the notional.

Therefore, the combination of passive design, the use of the VRF system and generation of renewable energy results in a **37%** reduction in annual regulated carbon dioxide emissions compared to the Part L 2021 baseline. The overall results surpass Policy EN6 within the Manchester City Core Strategy documentation.

6.4.2 Net Zero Carbon and offsetting

As per the Manchester Core Strategy (2024) due to adaptation of the Places for Everyone Plan in March 2024, the policy JP-S2 (adopted in CS Policy EN4), states the following:

- An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable, be **net zero carbon** (regulated operational carbon emissions only) until 2028;
- From 2025, development should also calculate and minimise carbon emissions from **unregulated emissions** alongside regulated emissions.

Based on the Part L model, the unregulated emissions have been estimated at 1.49 tCO₂/yr accounts for 3.9% of the total carbon emissions (excl. renewables), therefore is not considered a significant contributor.

- From 2025, any residual carbon emissions that cannot be fully mitigated on-site should be **offset**, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund.

This Energy Strategy addresses the relevant policy requirements and assesses the scheme under Part L2021 where possible. However, with regards to Places for Everyone, adopted in March 2024, the offsetting requirement is not applicable in this case as this policy framework was not enforced at the time that this development went through planning.

The energy strategy does demonstrate how all energy efficiency avenues have been maximised through highly efficient equipment and renewable energy in order to achieve the greatest possible reduction.

7. Conclusion.

This energy strategy has been prepared on behalf of Mayfield Medlock Limited in support of the proposed Mayfield Mobility Hub building office development in Manchester - hereafter referred to as the Proposed Development.

This strategy summarises the relevant regulatory and planning policies and sets out how the development will address and achieve the relevant policy targets. The strategy responds to the UK planning and regulatory framework, and specifically to the Manchester Core Strategy policy documentation.

7.1 Planning policy.

The Manchester Core Strategy Policy EN6 states that for all developments over 1,000m² will be expected as a minimum to meet the following targets *(unless this can be shown not to be viable)*:

Table 10. CO₂ emission reduction targets, Manchester Core Strategy

Target		% Minimum Requirement
Target 1; Network Development Area		CHP / District heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target 2; Electricity Intense Buildings		+ 10% increase on Part L 2010
Target 3; Micro Generation Area		+ 15% increase on Part L 2010

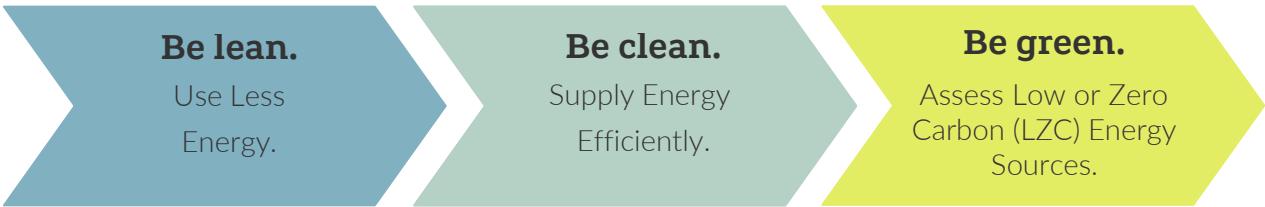
Manchester Core Strategy (2012 – 2027) states within Policy EN6 that applications for commercial developments exceeding 1,000m² will be expected to achieve a minimum +10% increase on Part L 2010 and residential developments a minimum 15% increase on Part L 2010. Since the publication of the Core Strategy document, Approved Document Part L has since been updated in 2013, and again in 2021. Broadly speaking, compliance with Part L 2013 required a 9% reduction in carbon emissions compared to Part L 2010. A new non-domestic building built to ADL 2021 standards will deliver a 27% reduction in CO₂ emissions on average across the new non-domestic building mix relative to ADL 2013, and a new domestic building will deliver a 31% reduction.

Since the adoption of 'Places for Everyone' in March 2024, as an interim measure, from 2025, the developments should be consistent with the 2021 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies. New proposals should seek to demonstrate within energy statement that the energy hierarchy has been followed and net zero carbon has been targeted. The above points have been addressed in this Energy Strategy to a feasible extent and has been derogated where inapplicable.

Please refer to the Appendix E for the detailed results showing the compliance against Building Regulations 2021.

7.2 Approach.

This report evaluates the Proposed Development against the energy hierarchy; be lean, be clean and be green.



7.2.2 Be Lean.

The building fabric performance and engineering systems have been optimised in order to use less energy prior to the inclusion or consideration of Low and Zero Carbon (LZC) technology.

7.2.3 Be Clean.

The be clean step of the energy hierarchy refers to the use of 'clean energy supply'. This includes, but is not limited to, the use of Combined Heat and Power (CHP) and District Heat Networks. Because the majority of the building's energy is electrically fuelled i.e., chillers, fans, pumps and lighting the benefit of connecting or using a CHP system is limited. Given that the national grid is continually decarbonising, the use of gas systems are less preferential over electrically fuelled systems.

7.2.4 Be Green.

The final step of the energy hierarchy is to utilise low and zero carbon technology. The energy strategy identified that the use of Air Source Heat Pumps (ASHP) in combination with energy generating PV panels can provide a substantial reduction in regulated carbon dioxide emissions.

7.3 Energy Strategy.

Combining efficient fabric design and efficiency building services systems provides the following regulated carbon emission results:

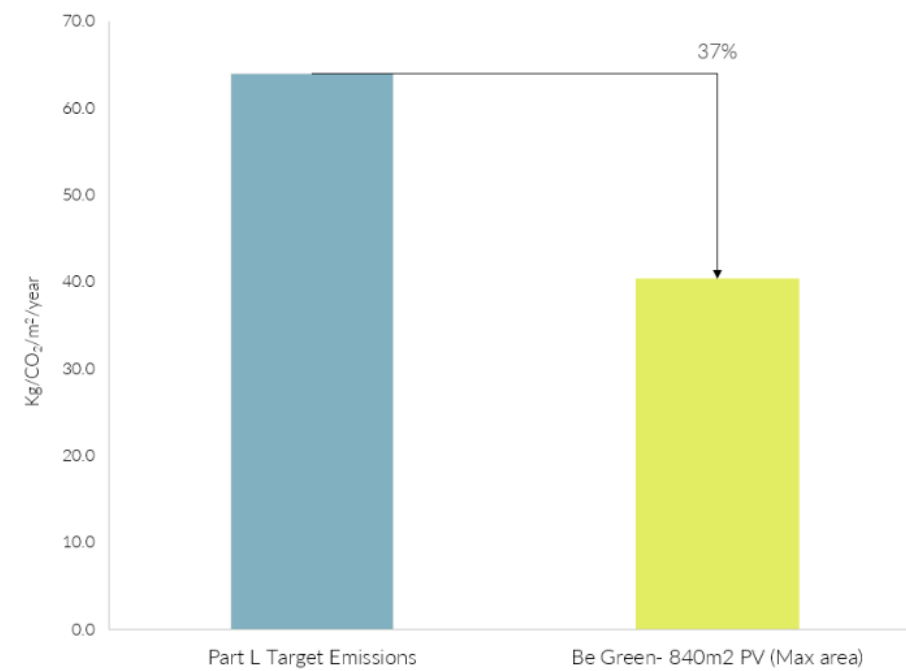


Figure 11: Energy Strategy summary

The energy strategy indicates that the Proposed Development achieves a **37%** reduction over the Part L 2021 baseline and as such meets Policy EN6 within the Manchester Core Strategy document and Places for Everyone guidance regarding developments in 2025. The decarbonisation of the grid has resulted in the carbon intensity of mains gas being higher than for electricity and therefore strengthening the argument that building services strategies moving forward should be electric led. The proposed energy strategy in this report reflects this philosophy and ties in closely with Manchester City Councils carbon zero 2028 / 2038 targets.

Appendix A: Software Details.

Compliance software and procedure

The proposed Mayfield Mobility Hub building development has been assessed using the National Calculation Methodology to demonstrate compliance with Approved Document Part L. 2021.

Part L2 Non-domestic

Integrated Environmental Solutions Virtual Environment (IESve) is an approved Dynamic Simulations Modelling (DSM) software package which has the capabilities of enabling the user to create a virtual representation of a building. The results presented in this report for the Non-residential aspects were calculated using the approved compliance software IESve 2022 (v2022.2.0.0).

The IESve models were drawn using information provided by the relevant architects.

IESve modelling disclaimer

The calculations produced by Hoare Lea have been carried out with the information provided by the architects to determine whether the proposed development can achieve compliance with Approved Document Part L of the Building Regulations.

It should be noted that the data generated by this work is obtained using approved calculations and computer simulations. These simulations are the best means of predicting the performance of the buildings at this stage. Full certainty can only be achieved by measuring the performance of the building and associated systems after a period of use.

The actual energy usage for the buildings once occupied may vary from the calculated values submitted to Building Control. These differences will occur due to several variable parameters between the modelled building and the actual building. Such differences will include the hours, levels of occupancy, how the plant is used and the design criteria with regards to how the rooms are environmentally controlled.

Whilst the simulations have been undertaken in good faith using reasonable skill and care, Hoare Lea can take no responsibility for differences between the computer simulations and the actual performance of the completed buildings due to the inherent complexity and variability of the physics in a building and its environment.

Appendix B: Suitably qualified energy modeller

This section provides details of the Suitably qualified energy modeller involved in overseeing these works.

This is defined as an individual who:

- Holds a degree or equivalent qualification in building services or a sustainability related subject
- Has a practical experience of conducting energy modelling and has appropriate knowledge of the tool being used, e.g. has attended training by independent providers.
- Is a member of a professional body such as CIBSE.

Relevant qualifications	
Name	Ian Andrews
EA Number	176847
Organisation	Hoare Lea LLP

Appendix C: Input Parameters.

7.4 Heating, cooling and ventilation system parameters.

The system parameters regarding the heating, cooling and ventilation for the proposed development are listed below.

Table 11. Heating, cooling and ventilation systems

	VRF with S+E	Elec Rads with S+E	DX_AC
System type	Fan coil systems	Other local room heater - unfanned	Split Systems
Heating source	VRF	Direct Elec	None
Heating fuel	Elec	Elec	-
Heating efficiency	4.30	-	-
Cooling System type	VRF	-	-
Cooling Fuel	Elec	-	-
Cooling Seasonal Energy Efficiency Ratio (SEER)	6.30	-	5.00
Ductwork Leakage tested	Yes - Class B	Yes - Class B	-
AHU CEN Leakage Standards	Class L2	Class L2	-
AHU Specific Fan Power	1.8	1.8	-
Pump Type	Variable speed multiple pressure sensors	-	Variable speed multiple pressure sensors
System Metering	No	No	No
Out of Range warning	No	No	No
Ventilation Type	Central Balanced A/C Mech	Central Balanced A/C Mech	-
Air Supply	-	-	-
Heat Recovery	Thermal Wheel	Thermal Wheel	-
Seasonal Efficiency	82%	82%	-
Variable Heat Recovery Efficiency	Yes	Yes	No
System Controls	Central Time Control Optimum Start/Stop Local Time Control Local Temp Control Weather Compensation	Central Time Control Optimum Start/Stop Local Time Control Local Temp Control Weather Compensation	Central Time Control Optimum Start/Stop Local Time Control Local Temp Control Weather Compensation
Terminal Specific Fan Power:	-	-	-
Extract	-	-	-
Extract Specific Fan Power:	-	-	-
Extract Flow Rate	-	-	-
Demand Controlled Ventilation (DCV)	Demand Control based on Gas sensors	-	-
DCV Airflow Regulation	Damper Control	-	-
Zones Applicable	Showers/ Changing Management Suite Retail (Shell and Core)	WCs Cleaner Cupboard Drying Room	Comms Room

7.5 Domestic Hot Water Systems.

Table 12. DHW information

Domestic Hot Water system						
Generator Split	Heating source 1	<i>Electric Calorifier</i>	Heating source 2	Electric Point of Use		
	<i>Load %</i>	100	Load %	100		
	<i>Heating fuel</i>	Electric	Heating fuel	Electric		
	<i>Heating efficiency</i>	99%	Heating efficiency	99%		
Storage	<i>Storage (litres)</i>	<i>2500</i>	Storage (litres)	15 L/unit		
	<i>Storage losses(kWh/l/day)</i>	<i>0.0047</i>	Storage losses(kWh/l/day)	0.016		
Secondary Circulation	<i>Circulation Losses (W/m)</i>	<i>12</i>	Circulation Losses (W/m)	None as it's a single system only		
	<i>Pump Power (kW)</i>	<i>0.2</i>	Pump Power (kW)			
	<i>Loop Length (m)</i>	<i>60</i>	Loop Length (m)			
	<i>Time Switch</i>	<i>Yes</i>	Time Switch			
Zones served		<i>Basement Showers & WCs</i>		Retail		

7.6 Photovoltaics.

Table 13. PV information

Photovoltaics	
Reference drawing	'J2965-STRIPE-XX-09-DR-AX-2111-P01-PROPOSED ROOF PLAN'.pdf'
Orientation	90° (clockwise from the North)
Inclination	30° (from horizontal)
Module efficiency	20.1%
Nominal Cell Temp	42.0°C
Shading factor	1.0
Annual Electrical Output (based on active area)	153 m2-22,828 kWh/yr 216 m2-32,298 kWh/yr 500 m2-74,598 kWh/yr 840 m2-125,325 kWh/yr
% of available roof	<ul style="list-style-type: none"> – Planning policy does not include minimum renewable generation targets for the non-domestic developments currently. – However, the client's own aspiration (as per Landsec's Sustainable Development Toolkit) is as follows: 'Min.40% of available roof space to include solar PV' <p>Based on 840 m2- this is 52% of the available roof area.</p>

7.7 Lighting parameters.

The estimated Power Density (W/m²/100 lux) values have been based on suggested figures shown below and have been used in preference to Lamp Efficacy at this stage.

Table 14. Lighting parameters

Space	Design Lux	Lighting lm/W	Light Output Ratio (LOR)	Radiant Fraction	Constant illuminance control	Local manual switching yes/ no	Lighting Controls *	Photoelectric (Daylight) Control	Total Parasitic Power (W/m²)	Time Switch	Display lamps (lm/W)
Cleaner Cupboard	100	110	0.90	0.45	No	Yes	None	-	0.10	Y	-
Dryer Room	100	110	0.90	0.45	No	Yes	None	-	0.10	Y	-
Management Suite	100	110	0.90	0.45	No	Yes	Man On-Auto Off	-	0.10	Y	-
Showers	300	110	0.90	0.45	No	No	Auto On-Off	-	0.10	-	-
Changing (lockers)	100	110	0.90	0.45	No	No	Auto On-Off	-	0.10	-	-
Retail	200	110	0.90	0.45	No	No (Bare shell unit)	None	-	0.10	-	Y- 110lm/W
WC	200	110	0.90	0.45	No	No	Man On-Auto Off	-	0.10	Y	-

Appendix D: BRUKL report.

BRUKL Output Document

Compliance with England Building Regulations Part L 2021

HM Government

Project name

20250115-MSCP-840PV-90deg

As designed

Date: Thu Mar 12 14:57:19 2026

Administrative information

Building Details

Address: Mayfield Mobility Hub, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.28

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.28

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 46.23

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²·annum	64.03
Building CO ₂ emission rate (BER), kgCO ₂ /m²·annum	40.36
Target primary energy rate (TPER), kWh _e /m²·annum	698.23
Building primary energy rate (BPER), kWh _e /m²·annum	419.45
Do the building's emission and primary energy rates exceed the targets?	BER <= TER BPER <= TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _g Limit	U _g Calc	U _f Calc	First surface with maximum value
Walls*	0.26	0.2	0.2	L0000011:Surf[1]
Floors	0.18	0.15	0.15	L0000011:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	-	-	No flat roofs in building
Windows** and roof windows	1.6	1.38	1.4	L0000000:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.6	1.6	L0000000:Surf[6]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

U_g Limit = Limiting area-weighted average U-values [W/(m²K)]

U_g Calc = Calculated area-weighted average U-values [W/(m²K)]

U_f Calc = Calculated maximum individual element U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check.

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability

Limiting standard

This building

m³/(h.m²) at 50 Pa

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

Building Use

	Actual	Notional
Floor area [m²]	508.6	508.6
External area [m²]	9093	1589.2
Weather	MAN	MAN
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	1782.76	266.53
Average U-value [W/m²K]	0.2	0.17
Alpha value* [%]	29.17	10

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

% Area	Building Type
40	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
54	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
1	Others: Miscellaneous 24hr Activities
4	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	4.28	6.46
Cooling	1.25	0.83
Auxiliary	12.81	6.08
Lighting	20.26	18.51
Hot water	490.5	441.56
Equipment*	21.56	21.56
TOTAL**	529.11	473.43

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	246.45	0.09
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	246.45	0.09

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	78.72	76.66
Primary energy [kWh _{FE} /m²]	419.45	698.23
Total emissions [kg/m²]	40.36	64.03

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Appendix E: Detailed Part L 2021 results.

Table 15. Part L 2021 results

Energy performance metric	Notional Building	Proposed building	% reduction	Compliance
Building Emission Rate<Target Emission Rate	BER=40.36 kg/m ²	TER=64.03kg/m ²	37%	Yes, BER<TER
Building Primary Energy Rate<Target Primary Energy Rate	BPER=419.45kWh/m ² /annum	TPER=698.23kWh/m ² /annum	39.9%	Yes, BPER<TPER



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