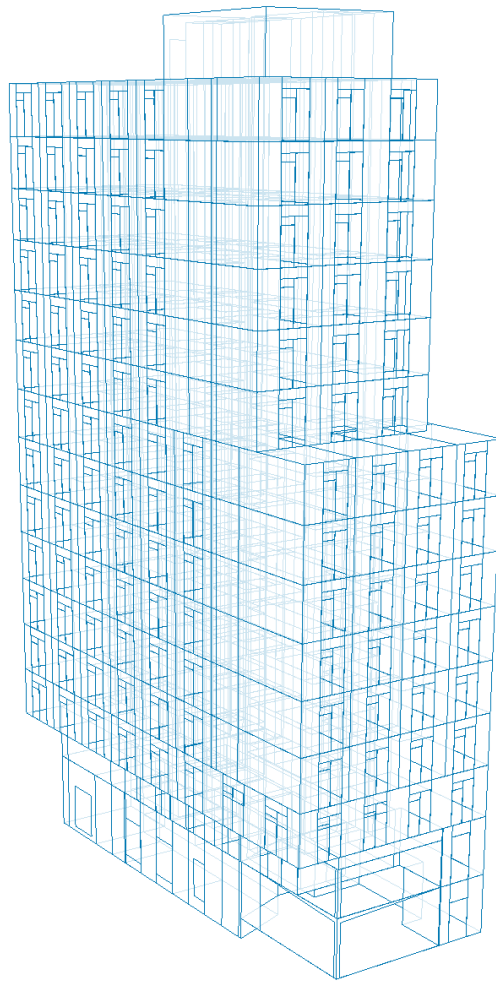


Charles Street

Energy and Sustainability Statement



Caldwell



B1106 Charles Street Student Accommodation Manchester

Energy and Sustainability Statement

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2.0	Dec 23	Minor Amendments	HI	AG

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1 Executive Summary

This energy and sustainability statement has been prepared in the support of the planning application for the development of land at Charles Street Manchester. The application site is located within the administrative boundary of Manchester City Council.

This document summaries the relevant planning policies applicable to the development proposals and sets out how the development proposals will address the relevant policy requirements.

Analysis through the AM11 compliant software found that the development design achieved a carbon reduction of 56% and a 36% reduction in energy demand through the energy hierarchy in comparison to the Be Lean baseline. The carbon reduction has been achieved through the use of an ASHP for the DHW and VRF for the space conditioning, as well as highly efficient fabric, low energy lighting and overall conscientious design decisions. To comply with policy EN6 of Manchester's Local Development Framework, the model was run in Part L 2010, and achieves a 54% carbon reduction on the TER under these regulations. Overall, the design meets and exceeds compliance with Approved Document L 2021 with an 11% reduction and the relevant planning policies.



2 Introduction

This Energy and Sustainability Statement has been prepared on behalf of Jadebricks (Charles Street) Ltd in support of their full planning application for an aparthotel development at Charles Street, Manchester.

The development is described as:

“Full planning permission for the erection of 15-storey purpose-built student accommodation building, including site preparation works, works over the public highway and associated works.”

There are 107 studios in total, over 15 storeys, with a large external student amenity area on the ground floor as well as an upper-level internal amenity area. The development has a gross internal floor area of 4155m² and is situated in central Manchester.



3 General Location

The development is located at the block formed by Charles Street, and York Street northern Manchester. See below site location.

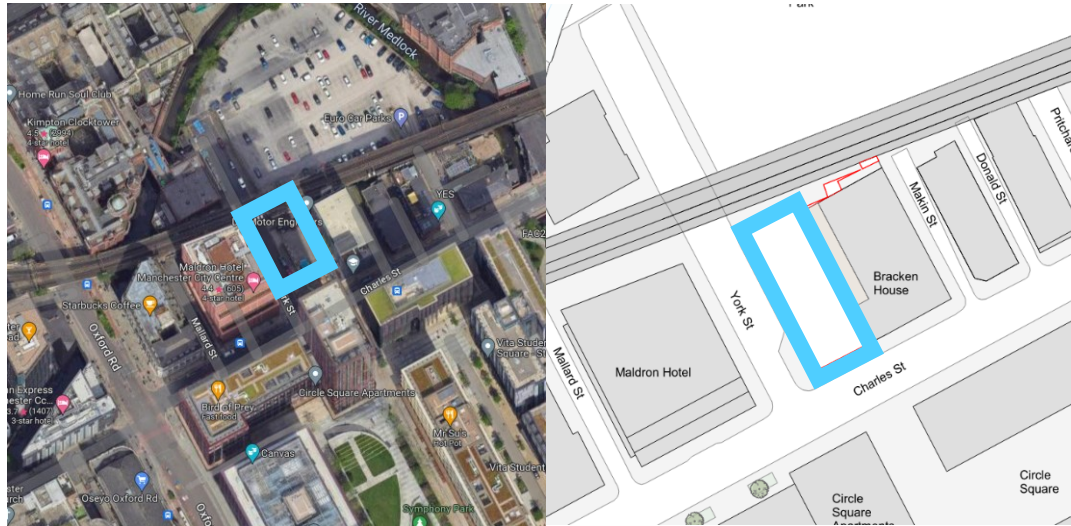


FIGURE 1 – SITE LOCATION AND PLAN

The location has advantages with access to utilities such as electricity and natural gas, connectivity to high-speed internet services and excellent transport options. At the time that this report has been written communication has been made to investigate the potential for district heating, but as there has been no formal confirmation for such it has been excluded from the report.

Figure 2 shows the proposed development in red on the Local Development Framework Area Map Browser from Manchester City Council. As shown by the light blue line this project is within the city centre boundary and shown in yellow (overlapping the city boundary) is the regional

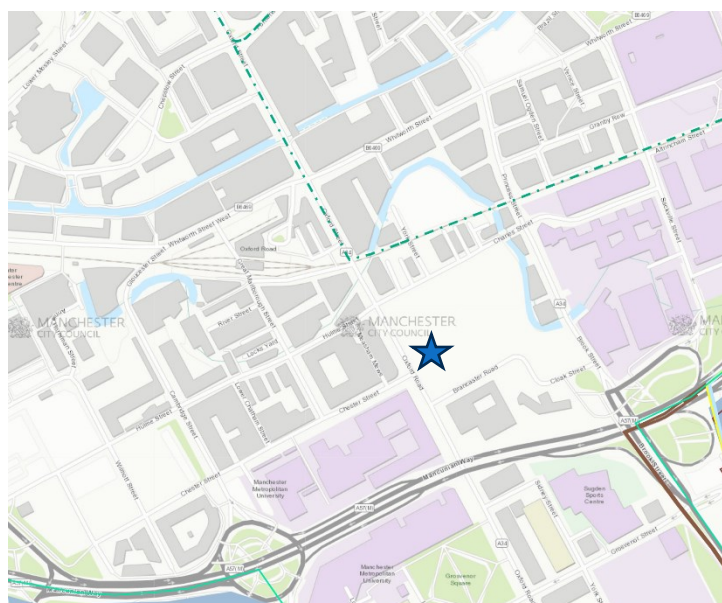


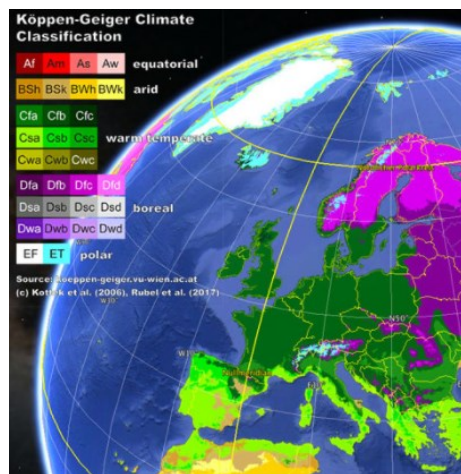
FIGURE 2 – DEVELOPMENT ON LOCAL PLAN MAP



centre. When referred to in the policies, the proposed development will be evaluated against any area specific sections relating to the city centre or regional centre.

3.1 Weather

The Manchester area is classified by ASHARE as a 5A location i.e., Cool and Humid and by the Koeppen-Geiger¹ Classification system as Cfb i.e., Humid temperate (mild winters), Fully humid; no dry season, Warm summer (marine), Mild winters with heavy precipitation, warm/short/dry summers, on western continental coasts.



This classification is expected to remain, even with climate change predictions.

Therefore, the approach to sustainability can be informed by this and so winter is potentially most dominant in terms of energy. Although in global terms the summer is cool it can still have significant impact with the solar radiation on south/east/west walls and roof areas being significant

FIGURE 3 - CLASSIFICATION MAP - PRESENT CLIMATE

Some metrics are shown in Figure 4 - Climate weather metrics, they show that the August is the warmest month and February the coldest. In recent years, the pace of climate change has been more noticeable with recent very hot spells and unpredictable cold weather. However, it is still expected that the general format of the metrics will remain.

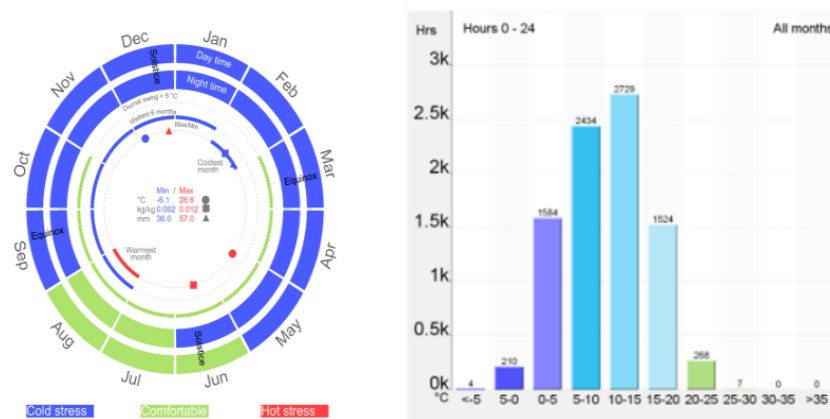


FIGURE 4 - CLIMATE WEATHER METRICS

¹ <http://koeppen-geiger.vu-wien.ac.at/present.htm>



4 Review of Planning Requirements

4.1 National Planning Policy Framework (2023)

The National Planning Policy Framework 2023 sets out the Government's planning policies for England. It provides a framework within which locally prepared plans for proposed developments can be used. The framework does not contain specific policies for projects but forms part of the wider planning system to contribute to the achievement of sustainable development. The United Nations defines Sustainable Development:

"As meeting the needs of the present without compromising the ability of future generations to meet their own needs."

Sustainable Development is achieved through the 3 objectives of sustainable development, as seen below which are "interdependent and need to be mutually supported".

The 3 objectives are:

- Social
- Economic
- Environmental

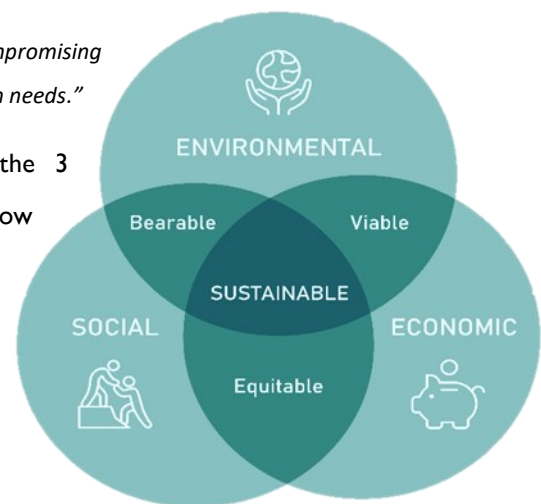


FIGURE 5 – OBJECTIVES OF SUSTAINABILITY

4.2 Greater Manchester: Places for Everyone – Adopted Early 2024

This document outlines the vision for a "new normal" in the face of challenging times, which makes reference to the National Planning Policy Framework, and contextualises it within Greater Manchester. An ambition is to be carbon neutral by 2038, and section 5 Sustainable and Resilient Places goes into further detail.

4.2.1 Policy JP-S1 Sustainable Development

This policy refers to the use of brownfields where possible for new developments and in support of becoming carbon neutral by 2038 encourages movement away from gas and reducing the heating and cooling demand where possible, to name a few options. The use of the energy hierarchy is encouraged to reach net zero carbon, however if this cannot be achieved, payment can be made to offset the remaining carbon. A whole life carbon assessment is encouraged to show embodied emissions from the construction to end of life stages, and post occupancy



evaluation should be considered to identify that the in use operation follows a pattern seen in the modelled energy.

This development has followed the energy hierarchy, showing a 55% reduction in carbon emissions on the Be Lean baseline. This has been achieved by using a fully electric design with no fossil fuels implemented, and an ASHP to provide DHW. A whole life carbon assessment has been provided as a separate document, and as per BREEAM, operational energy will be undertaken at design, and at post construction.

4.2.2 *JP-S2 Carbon and Energy*

This policy promotes the reduction of carbon emissions through retrofitting where feasible, the use of a life cycle cost and carbon assessment tool to understand the long term impacts of the development, and to incorporate renewables where possible. For non residential developments a BREEAM excellent standard for ENE01 must be achieved and a detailed energy statement showing how carbon reductions were maximised in line with the relevant policies.

This development will undertake a BREEAM Life Cycle Cost analysis prior to stage 2, and as shown in section 5.2 as well as the Appendix A, an ASHP has been incorporated as a renewable technology. This development has complied with the relevant policies of the core strategy and has been target to achieve BREEAM Excellent.

4.2.3 *JP-S3 Heat and Energy Networks*

There is an expectation to connect to an existing or planned heat network and this has been investigated at the time this report has been written, however there has been no formal communication as to where this is practically and economically feasible. Provisions for a future connection have been included in the design.

4.3 *Manchester's Local Development Framework - Core Strategy Development Plan Document Adopted 11th July 2012*

The Core Strategy that was adopted in 2012 covers a fifteen-year period to 2027 and has six key objectives which headline the planning policies. The objectives cover the topics of Spatial Principles, Economy, Housing, Centres, Transport and Environment. These objectives along with the specific policies will be fully evaluated within this sustainability statement.

This report evaluates the following policies:

EN 4 Reducing CO2 Emissions	EN 6 Target Framework for CO2 reductions
EN 5 Strategic Areas for LZC	EN 7 Energy Infrastructure opportunities



4.3.1 S06 Environment

This objective reads as follows:

“Protect and enhance both the natural and built environment of the City and ensure the sustainable use of natural resources, in order to mitigate and adapt to climate change, support biodiversity and wildlife, improve air, water and land quality, recreational opportunities and provide networks of high quality green infrastructure, ensuring that the City is inclusive and attractive to residents, workers, investors and visitors.”

In accordance with the S06 – Place Making and Sustainable design referenced in the core strategy section 12.6, Manchester is expected to follow the seven design principles:

1. Character: a place with its own identity
2. Continuity and enclosure: a place where public and private places are clearly distinguished
3. Quality of the public realm: a place with attractive, and successful outdoor areas
4. Ease of movement: a place that is easy to get to and move through
5. Legibility: a place that has a clear image and is easy to understand
6. Adaptability: a place that can change easily
7. Diversity: a place with variety and choice

4.3.1.1 EN4 – Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development

This policy indicates that the development must follow the energy hierarchy:

- To reduce the need for energy through design features that provide passive heating, natural lighting, and cooling.
- To reduce the need for energy through energy efficient features such as improved insulation and glazing
- To meet residual energy requirements through the use of low or zero carbon energy generating technologies

Overall, the key takeaway from this policy is that the development should show a reduction in carbon emissions through the design which at minimum complies with building regulations, but should be exceeded through the use of the energy hierarchy.

There is a legally binding contract for a reduction in CO₂ emissions of 80% by 2050 and Manchester aims to become a zero carbon city by 2038, becoming one of the leading cities in



Europe for its economy which means that it is vital to reduce emissions in line with the national targets as a Low Carbon Economic Area.

Justification: The current design of the development shows a 56% carbon reduction and a 36% reduction in energy demand through the use of the energy hierarchy, see figure 6 below. This has been achieved through incorporating highly efficient fabric at Be Lean stage (see U-values in Appendix A) and an ASHP for the DHW at Be Green stage. The design strategy laid out in this report is shown to be in line with the vision of Manchester as a city, as the building is entirely fossil fuel free, with a significant reduction in carbon emissions.

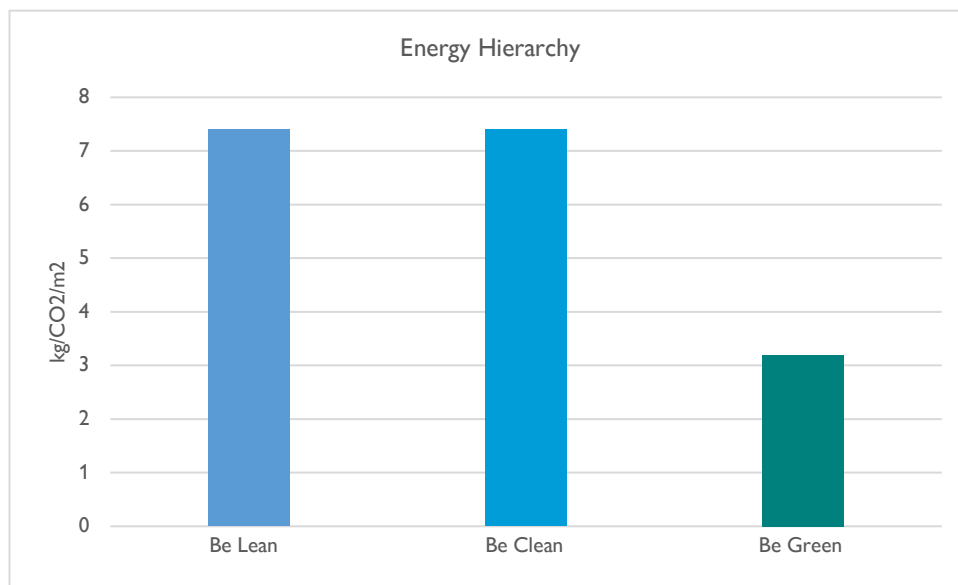


FIGURE 6 – ENERGY HIERARCHY

4.3.1.2 EN5 – Strategic Areas for low and zero carbon decentralised energy infrastructure

This policy refers to the strategic areas, of such the regional centre falls under. It is expected that developments in these areas will have detailed energy proposals to show a low/zero carbon design. This is due to these areas being the focus for “new development and population growth” and so it is fundamental to include these proposals at an early design stage. The energy proposal will be used to evaluate the most viable renewable opportunities to maximise carbon reduction whilst remaining cost effective.

Justification: As this development falls under the regional centre, it is expected to follow EN5 and therefore an energy proposal has been undertaken in chapter 5. As shown in the justification for EN4 there has been a 56% reduction of carbon through the energy hierarchy. EN6 further evaluates the comparison between the 2010 building regulations model and the current regulations to show further reductions in carbon emissions.



4.3.1.3 EN6 – Target Framework for CO₂ reductions from low or zero carbon energy supplies

This policy sets out framework to follow to show CO₂ reductions and expects an energy statement for this. There are three target areas which apply to non-domestic developments.

Non-domestic CO ₂ emissions reduction targets	
Table 12.2	
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 (Applies to commercial uses with a high proportion of emissions from electricity use (>45 kg CO ₂ /m ²))	+10% increase on Part L 2010
Target 3: Micro generation area	+15% increase on Part L 2010

FIGURE 7 – TARGET FRAMEWORK EN6

The policy further suggests that in the expectation that there are future revisions for Part L since the 2010 edition then the reduction of carbon must be what is required from the building regulations. An energy statement is required from this policy using Appendix A for guidance.

There is reference to the governments preferred energy hierarchy which follows a pyramid diagram from 'allowable solutions' to 'energy efficiency'.

Justification: As shown in figure 8 below there is a 11% carbon reduction over the building regulations target which complies with EN6 as there is an evident reduction under the most up to date revision to Part L. The energy statement is included in chapter 5 of this report. The adoption of the energy hierarchy within this development can be seen in figure 6 which shows a comparative graph of the Target, Be Lean, Be Clean and Be Green which follows building compliance, and the actual development design which shows major improvement. The model was run under the 2010 Building regulations and shows a 54% reduction over the TER. The BRUKL is shown in Appendix A.

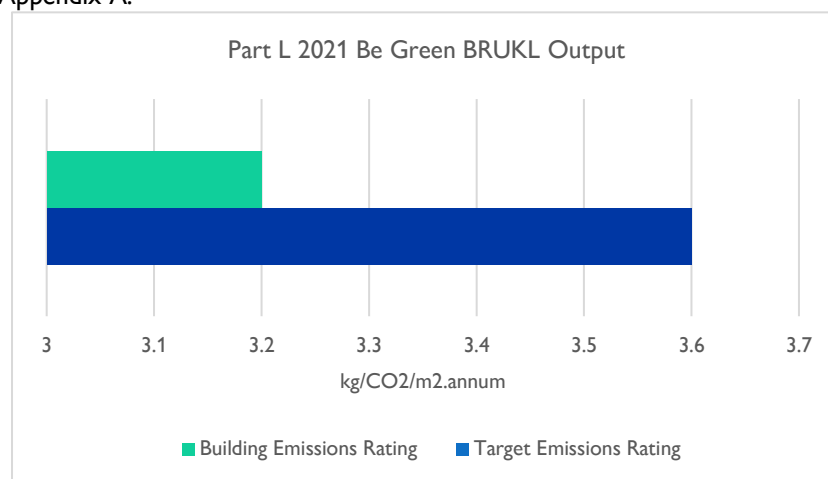


FIGURE 7 – BER AND TER COMPARISON FROM BRUKL



4.3.1.4 EN7 – Energy Infrastructure opportunities

This policy references the considerations of a heating and cooling system which can facilitate a future connection. There is also consideration to the integration of any substations of plant rooms on the development so to not impact on the landscape of the area.

Justification: Considerations have been made within the plant room for future connections, however at present no district connections have been considered due to costing and sustainable feasibility. The substation and plant rooms have been cleanly integrated into the envelope of the building.

4.4 *Manchester Climate Change Framework 2020-25*

This framework introduced in 2020 was designed to support the city's goal of achieving net zero carbon emissions by 2038 and builds upon the draft document *Manchester Zero Carbon Framework 2020-38*. This is split into four main objectives:

1. Stay within our Carbon Budget
2. Climate Adaptation and resilience
3. Health and Wellbeing
4. Inclusive, zero carbon and climate resilient economy

The principle of this framework is to set objectives in line with the Paris agreement, contribute to the overall environmental goals and encourage development within Manchester whilst maintaining the commitment to become net zero carbon.

The relevant section to this report discusses how renewable energy plays a key role in achieving net zero carbon by 2038. This development achieves this by being a completely fossil fuel free building, powered solely by electricity. The use of heat pumps for space heating/cooling and to supply the DHW follows the option for replacing gas with another renewable heating technology. Comparing the development design to the baseline model there is an evident reduction in carbon emissions, 56% reduction in carbon and 36% in primary energy. A document O compliance report supports this energy statement showing that there is no risk of overheating for this development at this stage, and a thermal comfort report will be produced off the basis of this further on in the design.

4.5 *Manchester Standard 2023*

Embodied carbon is described as all the CO₂ emitted from the materials used to create a product, this includes the emissions produced during the manufacturing process.



Under the *Manchester Climate Change Framework 2020-25* and *A Roadmap to Net Zero Carbon New Buildings in Manchester* the reduction of embodied carbon is seen as a key component of achieving net zero carbon. These documents reference *The Future Building Standard 2025* and have adopted their own 'Manchester Standard' which expects that new buildings should operate as Net Zero Carbon from 2023. This also states that there must be a significant reduction in embodied carbon for 2023.

The development has been designed to achieve the Manchester Standard 2023 Non – Domestic listed in the roadmap:

TABLE 1 – TARGET JUSTIFICATION (MANCHESTER STANDARD 2023)

Target		How target is achieved
Reducing Demand	Energy	There are currently no RIBA Energy Use targets for student accommodations, but an operational energy report has been included in BREEAM to encourage energy demand reduction.
Reducing Carbon	Embodied	A whole lifecycle carbon calculation has been included under using the RIBA target of <800kgCO ₂ e/m ² with aspiration to achieve the 2030 target of <625kgCO ₂ e/m ² , this has been used as it is the residential target and therefore feels the most applicable.
Measuring Performance	In-use	The development will be operated with a BMS to monitor the energy use of the building. This feedback will be part of the Operational Energy section of BREEAM. Also, under BREEAM an Indoor Air Quality credit has been targeted, as well as a Thermal Comfort report which will ensure the mitigation of overheating. This development complies with Approved Document O.
Low-Carbon Supply	Energy	There are no fossil fuels used on this development. PV is not applicable for this development due to the lack of space on the roof, however an ASHP has been included as a renewable energy source. There has been consideration for new energy networks and there is potential for a connection in the future. There is on-site energy generation using ASHP technology to supply DHW.
Zero Carbon Balance		This development has not yet achieved net zero carbon, however, is working towards this goal and therefore in line with the targets.



Figure 9 below shows a graph taken from the whole life carbon assessment. A separate report has been produced which shows a detailed Whole Life Carbon Assessment and refers to the circular economy. Furthermore, a concept design Life Cycle analysis has been submitted for BREEAM which consisted of workshops with the design team discussing the most appropriate materials for the development, keeping in mind the embodied carbon potential for each scenario.

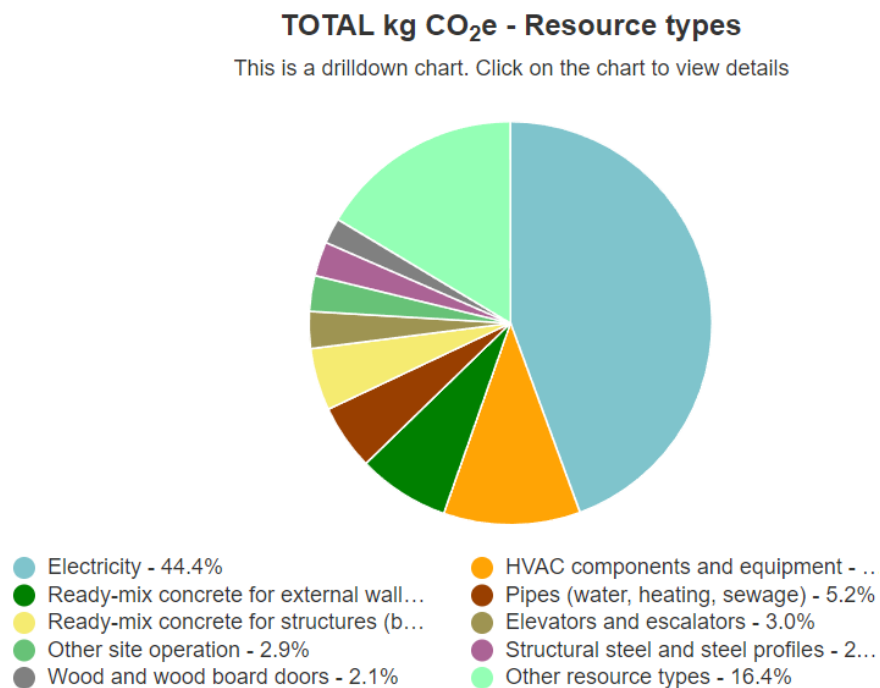


FIGURE 9 – SNIPPET OF RESOURCE BREAKDOWN TAKEN FROM THE WHOLE LIFE CARBON ASSESSMENT

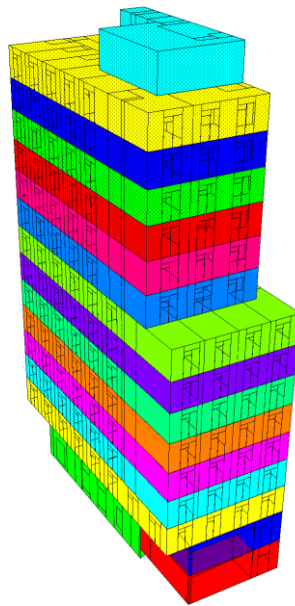


5 Energy Statement

5.1 Baseline Information

The main use of the development falls under C2: University and College with 107 studios over 15 storeys. The proposed servicing strategy is DHW fully served by ASHP and VRF for the heating and cooling with supply and extract fans. All fixed M&E services are compliant with the Approved Document L 2021. A full model settings table can be seen in Appendix A.

5.2 Dynamic Simulation Model



To explore these stages, we developed a range of Dynamic Simulation Models for the development using IESVE 2021 which is an AM11 compliant simulation software package. The simulations are of level 5 quality with simulation points calculated every 10 minutes and recorded in a data file every hour for a full year. The simulation year weather file used was the CIBSE Test Reference year for Manchester.

IESVE module VE Compliance was used for the Part L Calculations which use the NCM methodology.

The design model was also run under 2010 Part L regulations to demonstrate direct compliance with EN6. However, as showing from the Be Green stage, the building shows a significant saving in carbon emissions under the most recent building regulations.

All BRUKL reports can be seen under Appendix A with the model settings table.



5.2.1 *Be Lean*

At this stage, there has been an incorporation of highly efficient U-values, these can be seen in Appendix A.

This model produced 7.4kgCO₂/m²/annum.

5.2.2 *Be Clean*

At the time this report was written, communication had been made to Manchester City Council regarding the potential to connect a district heating network, however no response had been received. The development has been designed to allow the possibility for future connections.

This model, therefore, is identical to the Be Lean stage.

5.2.3 *Be Green*

The Be Green model shows a significant reduction in carbon emissions through the use of a highly efficient ASHP for DHW production. The ASHP should be designed and installed for 100% of the load. Through this, there is a 56% reduction on the target notional model, and a 11% reduction in the BRUKL.

This model produced 3.2kg/CO₂/m²/annum.

5.2.4 *Building Regulations Part L (2010)*

Due to the reference to the Part L 2010 within the policies the model was run under the 2010 regulations to estimate if the development would pass the 15% carbon reduction that is required. The model achieved a 54% carbon reduction over the target emissions rating and produced 11.5 kgCO₂/m²/annum. The emission is higher in the 2010 model due to the carbon factor of electricity being 0.517, however in the 2021 model the carbon factor for electricity is 0.136.



5.3 Consideration of Low Carbon Technologies

Our approach to sustainability follows the overarching sustainable hierarchy as illustrated below:

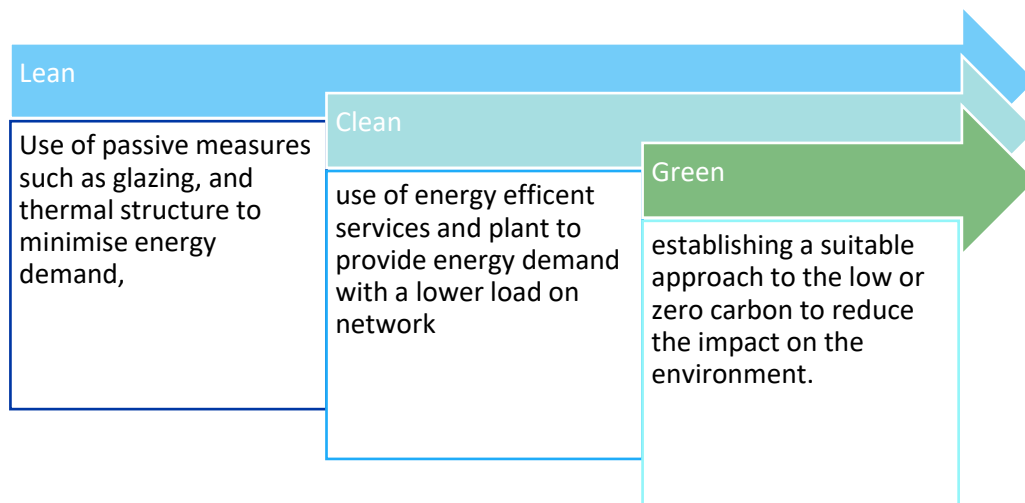


FIGURE 8 - LEAN CLEAN GREEN GRAPHIC

5.3.1 Brief review of possible LZC solutions

The use of low or zero carbon (LZC) technologies can have a positive impact on the development. It's important that any development does not simply provide LZC as a token and that each could be considered as a benefit to the environment and the building users. In the summary the use of heat pumps and PV is proposed.

5.3.1.1 Heat pumps

The use of Air-to-Air heat pumps is currently in the proposal to provide heating and cooling for the development. Heat pumps have advanced to a very high degree with improved efficiency at part load and most can overtake the ground source heat pump. An Air-to-Water heat pump will also be used to provide the part - full load for the domestic hot water system. These also reduce the energy demand of the development due to their very high efficiency drawing less energy than delivered.

The Seasonal Coefficient of Performance (SCOP) used in the model is based on typical commercially available products heating and represents the amount of energy provided in comparison with the energy drawn by the unit. System Seasonal Energy Efficiency Ratio (SSEER) is a similar figure is used for cooling energy This would be calculated in full once actual installed mix of internal units and external units are fixed during the technical design and construction stages. For building regulations calculations if SCOP is not available the use of COP is allowed as this is a worst-case scenario, similarly EER can be used instead of SSEER.



OUTDOOR UNITS		PURY-P200YNW-A
CAPACITY (kW)	Heating (nominal)	25.0
	Cooling (nominal)	22.4
	High Performance Heating (UK)	25.0
	COP Priority Heating (UK)	22.8
	Cooling (UK)	20.0
POWER INPUT (kW)	Heating (nominal)	4.71
	Cooling (nominal)	4.43
	High Performance Heating (UK)	5.93
	COP Priority Heating (UK)	4.71
	Cooling (UK)	2.57
COP / EER (nominal)		5.30 / 5.05
SCOP / SEER*		-

FIGURE 9 - EXAMPLE VRF MANUFACTURERS DATA

Above is an example of a manufacturer data showing COP and EER at 5.3 and 5.05 respectively. In this energy assessment the levels have been set at conservatively at 3.8 for SCOP and 5 for SSEER to comply with the Approved Document L 2021.

The air-to-water heat pump is proposed for the 100% of the Domestic Hot Water System (DHW) an example system is illustrated below:

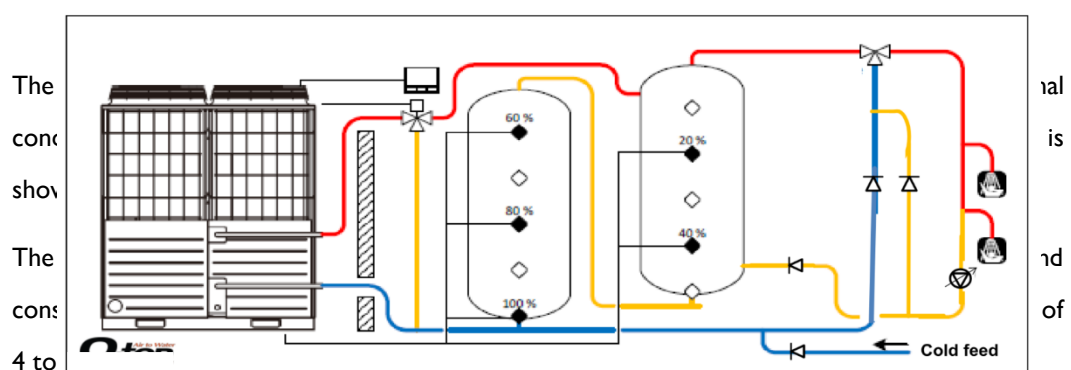


FIGURE 10 - TYPICAL HEAT PUMP ARRANGEMENT USED IN DHW

ASHP Efficiency

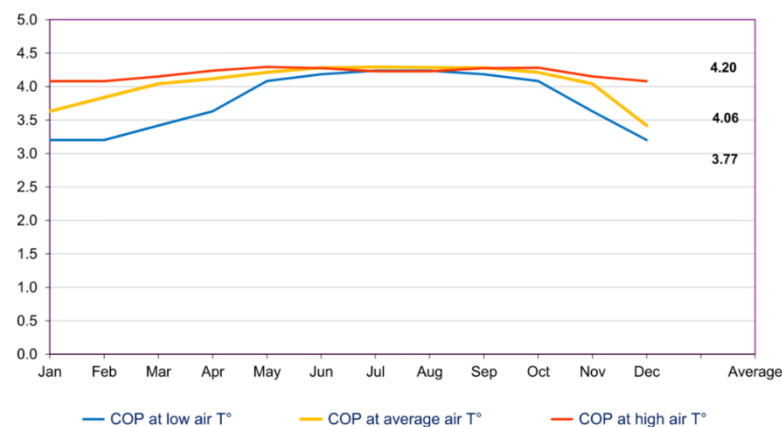


FIGURE 11 - EXAMPLE MANUFACTURERS COP VALUES OVER A YEAR



5.3.1.2 *Combined Heat and Power Plant (CHP)*

CHP is not currently in the proposal as the electricity generated would not result in a significant carbon reduction when viewed in the SAP 10 carbon factors that have been implemented in the Building Regulation changes in June 2021. Also, the DHW ASHP is already meeting the main demand of the CHP.

5.3.1.3 *Wind Power:*

Significant wind power for this urban site is not practical due to limitations of the roof area and the lack of a consistent strong wind speed i.e. 3.7 m/s average less than 5 m/s average suggested for viable wind power.

5.3.1.4 *Solar thermal water heating*

Solar water heating has a potential use for the DHW demand however this will compete with the air source heat pump, which is anticipated to have higher carbon emission savings. Solar thermal water heating is not part of the development.

5.3.1.5 *Solar Photovoltaic*

Solar PV has the potential to feed into all electrical systems. However, roof space is limited due to plant requirements as such PV is not included in the proposal as the yield would be minimal when compared to the annual carbon emissions.

5.3.1.6 *Biofuel*

Biomass can have a significant impact on carbon emissions however the location could impact on the air quality aspects of the biomass fuel emissions with respect to local pollution limits. The reaction times of biomass are slow and may suffer in responding to a spiked demand profile. Also, the deliveries of fuel would be problematic for plant areas. Bio diesel type solutions we consider to be not yet fully developed commercially and that the ethical issues surrounding energy crops are still to be fully resolved. Biomass is not proposed for the development.

5.3.1.7 *Green Energy Tariffs:*

Although not considered a renewable as part of any offsetting calculations the possibility for building occupants to avail of green energy tariffs can be considered during the assessment of utility providers.

5.4 *Most Feasible Option*

For this project it is most feasible cost wise and for the most carbon reduction to add an Air Source Heat pump into the development for DHW and for space heating/cooling. As seen as a comparison to the target model and the building control compliance there is a high reduction of carbon by incorporating an ASHP into the development.



6 Sustainability Commentary

The development focuses on sustainability throughout. The BREEAM approach is covered in a separate BREEAM pre-assessment report and below is a summary of some of the main items that will be incorporated as part of the sustainable approach. This development has targeted BREEAM excellent.

6.1 *Management*

The project delivery stakeholders will meet to identify and define their roles, responsibilities, and contributions for each of the key phases of project delivery.

A BREEAM AP will be involved in the project to work with the project team to assist them in maximising the project's overall performance against BREEAM.

The construction site will be managed in an environmentally and socially considerate, responsible, and accountable manner.

A schedule of commissioning and testing will be prepared. The schedule will identify and include suitable timescales for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric.

6.2 *Energy*

Operational energy will be analysed to help guide the design development to match anticipated real-life load and then measured against the targets to help reduce any performance gap, and a report will be issued at design stage.

Energy sub-metering will be installed to facilitate the monitoring of operational energy consumption, following the specific criteria of the BREEAM credit.

An energy specialist will be appointed to complete a low and zero carbon feasibility study with the aim of finding the most appropriate energy sources and LZC technologies for the development.

As lifts are specified, an analysis of the transportation demand and usage patterns has been carried out to determine the optimum number and size of lifts. The energy consumption will be estimated using the appropriate standard and the system with the lowest energy consumption will be specified.



6.3 *Health and Wellbeing*

An indoor air quality plan will be produced with the objective of minimising indoor air pollution during occupation of the building.

Thermal modelling will be carried out during the design stage with the aim of providing appropriate levels of thermal comfort, this will be shown in a BREEAM report.

A suitably qualified security specialist will be appointed to conduct an evidence-based Security Needs Assessment (SNA). The purpose of the SNA will be to identify attributes of the proposal, site and surroundings which may influence the approach to security for the development.

6.4 *Transport*

A site-specific travel plan and assessment has been prepared for the site and recommendations will be made as per this report. The site is central and in a good location, close to shops and restaurants.

6.5 *Water*

The consumption of potable water will be reduced where possible including the specification of water efficient sanitary ware where possible.

To further reduce the consumption of water a water meter will be specified on the mains water supply. This will allow water consumption to be monitored and therefore better managed.

A leak detection system which can detect a major water leak on the utilities water supply, will be installed.

6.6 *Materials*

A building life cycle assessment has been carried out. This will help optimise the selection of products with a low environmental impact, including embodied carbon, over the life cycle of the building.

All timber and timber-based products used on the project are 'Legal' and 'Sustainable' as per the UK Government's Timber Procurement Policy (TPP).

A sustainable procurement plan will be used by the design team to guide specification towards sustainable construction products.

Protection measures will be incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring.



A life cycle analysis report has been issued to BREEAM to assist in selecting the most appropriate materials for the development and a life cycle cost report will be undertaken in support of this development also.

6.7 *Waste*

A pre-demolition audit will be completed. This is to determine whether refurbishment or reuse is feasible and to maximise the recovery of material for subsequent high grade or value applications.

A Resource Management Plan will be developed covering the non-hazardous waste materials including demolition and excavation waste. Refer to the appropriate report for more information.

6.8 *Land Use and Ecology*

A suitably qualified ecologist has been appointed and carried out an ecology appraisal of the site to determine the ecological baseline of the site and identify possible measures to protect local ecology throughout construction and where possible enhance the ecological value of the site because of the development. Refer to ecology report for further information.

6.9 *Pollution*

A noise impact assessment has been prepared by a suitably qualified acoustic consultant and if applicable, noise attenuation measures will be specified. For more information, the assessment itself goes into detail of the findings.



7 Summary

This document summaries the relevant planning policies applicable to the development proposals and has set out how these proposals will respond the to the relevant policy requirements with justifications related to the specific sections. Focus on the sustainable approach was demonstrated with the adoption of energy efficient measures.

A review of how the development contributes to the sustainability related polices: and EN4-7 referenced the Local Plan. It was made aware in this sustainability statement that this project will show energy efficiency and overall improvement to the building which supports the Climate Change framework 2020-25 and Core Strategy Development Plan 2012-2027. An assessment of low carbon energy was undertaken of the site under the feasibility statement which indicated how ASHP for DHW and VRF technology would be utilised and helped to contribute to lowering carbon emissions. Furthermore, this allows the development to have its energy demand supplied for a clean fuel that will continue to become cleaner over time.

The building showed a 56% reduction in carbon from the target notional model, furthermore the Current design model showed a 11% reduction in carbon from the Approved Document L Compliant Model.

In conclusion, we consider that the project is in accordance with the planning polices and will provide a vibrant, sustainable and carbon efficient development within Manchester.



8 Appendix A

TABLE 2 - MODEL SETTINGS

	Be Lean	Be Green
U - Values (w/m2.K)		
External Wall	0.13	
Floor	0.12	
Roof	0.12	
Glazing	1.4	
Air Permeability q50 m ³ /(hr.m ²)	3	
Mechanical Services		
DHW:	Gas Boiler	ASHP
Storage (L):	2000	2000
SCOP:	0.93	3.8
Heating and Cooling	VRF	VRF
Serving the studios and FOH		
SCOP:	2.5	5
SEER:	4	5
Ventilation:	MVHR	MVHR
SFP:	2.3	1
Heat Recovery (%):	65	80
Electrical Services		
Lighting (lm/W)	95	
Lighting Controls	PIR in circulation areas	
Power Factor Correction	>0.95	



8.1 Be Lean

BRUKL Output Document



HM Government

Compliance with England Building Regulations Part L 2021

Project name

Charles Street PBSA (Be Lean)

As designed

Date: Fri Dec 01 11:58:20 2023

Administrative information

Building Details

Address: Manchester,

Certifier details

Name: Hannah Ireland

Telephone number: 02890699720

Address: Unit 6 Forestgrove Business Park,
Newtownbreda, BT8 6AW

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.23

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.23

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

Foundation area [m²]: 174.21

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

The building does not comply with England Building Regulations Part L 2021

Target CO ₂ emission rate (TER), kgCO ₂ /m ² :annum	7.24
Building CO ₂ emission rate (BER), kgCO ₂ /m ² :annum	7.37
Target primary energy rate (TPER), kWh _{PE} /m ² :annum	54.64
Building primary energy rate (BPER), kWh _{PE} /m ² :annum	56.23
Do the building's emission and primary energy rates exceed the targets?	BER > TER BPER > TPER

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	7.74	6.83
Cooling	1.36	1.63
Auxiliary	5.8	2.12
Lighting	7.57	7.15
Hot water	20.21	23.68
Equipment*	18.46	18.41
TOTAL**	42.69	41.41

* 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	94.2	95.45
Primary energy [kWh _{PE} /m ²]	56.23	54.3
Total emissions [kg/m ²]	7.37	7.19



8.2 Be Green

BRUKL Output Document



HM Government

Compliance with England Building Regulations Part L 2021

Project name

Charles Street PBSA (Be Green)

As designed

Date: Thu Nov 30 13:35:52 2023

Administrative information

Building Details

Address: Manchester,

Certifier details

Name: Hannah Ireland

Telephone number: 02890699720

Address: Unit 4 Forestgrove Business Park,
Newtownbreda, BT8 6AW

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.23

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.23

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

Foundation area [m²]: 174.21

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

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.57
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3.21
Target primary energy rate (TPER), kWh _{PE} /m ² annum	38.32
Building primary energy rate (BPER), kWh _{PE} /m ² annum	34.77
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	4.09	6.96
Cooling	1.28	1.58
Auxiliary	5.58	2.12
Lighting	7.58	7.17
Hot water	4.95	7.79
Equipment*	18.46	18.41
TOTAL**	23.48	25.61

* 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	91.65	95.92
Primary energy [kWh _{PE} /m ²]	34.77	38.08
Total emissions [kg/m ²]	3.21	3.54



8.3 2010 Building Regulations

BRUKL Output Document



Compliance with England and Wales Building Regulations Part L 2010

Project name

Charles Street PBSA (2010 Regulations)

As designed

Date: Fri Dec 01 10:10:34 2023

Administrative information

Building Details

Address: Manchester,

Certification tool

Calculation engine: Apache

Calculation engine version: 6.4.0.16

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 6.4.0.16

BRUKL compliance check version: v4.1.h.0

Certifier details

Name: Hannah Ireland

Telephone number: 02890699720

Address: Unit 6 Forestgrove Business Park,
Newtownbreda, BT8 6AW

Criterion 1: The calculated CO₂ emission rate for the building should not exceed the target

1.1	CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	28.4
1.2	Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	28.4
1.3	Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	13
1.4	Are emissions from the building less than or equal to the target?	BER ≤ TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	4.85	26.23
Cooling	0.69	1.59
Auxiliary	7.49	6.4
Lighting	5.5	10.23
Hot water	26.08	70.03
Equipment*	18.46	18.41
TOTAL**	44.6	114.48

* Energy used by equipment does not count towards the total for 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m ²]	92.17	147.94
Primary energy* [kWh/m ²]	71.48	152.46
Total emissions [kg/m ²]	13	28.4

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