

ENERGY & SUSTAINABILITY STATEMENT



**80 Queensway,
Rochdale,
OL11 1TJ.**

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Appendix 1 – Sample BRUKL Report

DISCLAIMER: This report is to be used for planning purposes only. This is not a full SBEM calculation. Full SBEM calculations should be carried out at detailed design stage to inform the full specification of the building and outline further requirements on thermal bridging and photographic evidence. UKBC takes no responsibility for building regulation compliance if we have not carried out full SBEM reports.

1.0 EXECUTIVE SUMMARY

1.1 UK Building Compliance have been appointed to undertake an Energy Statement on a proposed non-residential development at 80 Queensway, Rochdale, OL11 1TJ.

1.2 The development comprises of a single story extension to an existing building.

1.3 This document has been produced to satisfy:

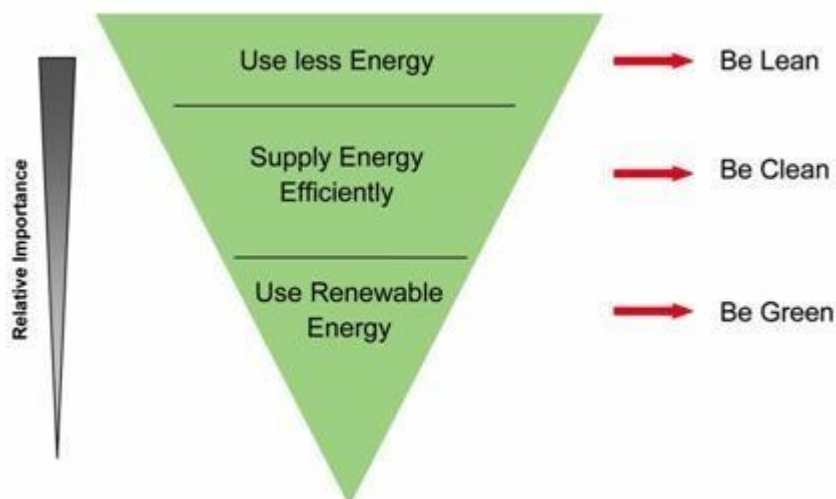
- Policies JP-P1 and JP-S2 of the local authorities development plan document.
- Part L2B of the Building Regulations England & Wales 2021

1.4 This document details how the targets are met via:

- Passive Design Measures
- Low U-Values

2.0 POLICY FRAMEWORK

2.1 The following section outlines the relevant policy frameworks at national, regional and local level.



2.2 The widely regarded Energy Hierarchy, as shown above, will be followed on this development, to ensure best practice is being followed.

2.3 NATIONAL POLICIES

2.4 In June 2022, Part L2A of the Building Regulations England & Wales was updated.

2.5 In addition to tightening of the previous 'Building Emission Rating' criteria, a new compliance metric 'Primary Energy Demand' was also introduced.

2.6 A combination of lower U-Values and the introduction of renewable technology can summarise the main changes between the previous and new Part L standards.

2.7 The new Part L standards ensure a carbon reduction of approximately 35%, compared to the previous version.

2.8 REGIONAL POLICIES

2.9 Policy JP-P1 Sustainable Places outline attributes that, where possible, developments should be consistent with:

1. Resilient, capable of dealing with major environmental events
2. Adaptable, able to respond easily to varied and changing needs and technologies
3. Durable, being built to last and using robust materials that reflect local character, where well and are easily maintained

4. Resource-efficient with:
 - a. Low carbon footprint
 - b. Efficient use of land
 - c. Minimised use of new materials
 - d. High level of recycling
5. Supported by critical infrastructure, such as, energy, water and drainage and green spaces

2.10 Policy JP-S2 Carbon and Energy looks to deliver a carbon neutral Greater Manchester no later than 2038 via a range of measures including:

1. Promoting retrofitting existing buildings with measures to improve energy efficiency and generate renewable and low carbon energy, heating and cooling
2. Promoting the use of life cycle cost and carbon assessment tools to ensure the long term impacts from developments can be captured
3. Taking a positive approach to renewable and low carbon energy schemes
4. An expectation that development will, unless it can be demonstrated that it is not practicable or financially viable:
 - a. Be net zero which applies:
 - From adoption – to regulated operational carbon emissions
 - From 2028 – to all emissions ‘in construction’

Development proposals should set out how this is achieved in accordance with the energy hierarchy. 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.

(Pg. 83-189, Places for Everyone Joint Development Plan For Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan.)

2.11 The following sections will outline the predicted annual energy demand and associated carbon emissions of the development in order to comply with the above.

2.12 This will be achieved by following the widely regarded energy hierarchy, whereby demand is reduced first and foremost, before the efficient supply of heating and energy is introduced.

3.0 BASELINE CALCULATIONS

3.1 SBEM Calculations have been carried out on a full sample using the Design Builder software to gain the regulated emissions for the site.

Regulated Emissions are the CO₂ emissions covered under Part L of the Building Regulations and comprise of:

- a) Space Heating and Cooling
- b) Hot Water
- c) Lighting
- d) Pumps and Fans
- e) Equipment
- f) Auxiliary Energy

A licensed and Level 4 NDEA accredited SBEM Assessor has carried out the calculations.

3.2 Development carbon emissions and energy demand at this stage of the hierarchy are as follows:

	Regulated CO ₂ Emissions – kgCO ₂ /m ² annum	% Improvement
Notional Building Emission Rating (BER)	72.85	
Proposed Building Emission Rating (BER)		
Notional Building Primary Energy Rating (BPER)	441.43	
Proposed Building Primary Energy Rating (BPER)		

4.0 ENERGY EFFICIENCY

4.1 High energy efficiency standards are demonstrated in the table below. Construction Details have been selected to ensure that all fabric U-Values meet or exceed the requirements of Part L of the Building Regulations (2021) and all Heating, Hot Water and Ventilation elements are in compliance with the Non-Domestic Building Services Compliance Guide.

The proposed construction details for the unit are as follows:

Elements	U Value	Development Notes
Ground Floor (Existing)	0.70 W/m ² /K	
Ground Floor (Proposed)	0.12 W/m ² /K	
External Walls (Existing)	0.70 W/m ² /K	
External Walls (Proposed)	0.18 W/m ² /K	
Roof (Existing)	0.35 W/m ² /K	
Roof (Proposed)	0.13 W/m ² /K	Glazing taken into account
Windows/Glazed Doors	1.4 W/m ² /K	
Air Permeability	Default : 15 m ³ (h.m ²)	Extensions do not require air testing
Ventilation	Natural with Extract Fans	Extracts in WC/Kitchen
Heating	Gas Boiler	Efficiency = 92%
Water Heating	From Main Heating System	
Secondary Heating	No	
Lighting	100% LED	Efficacy: 110 lm/w
Renewable Technology	N/A	

A full sample BRUKL document can be found in Appendix 1 to verify the above inputs.

4.2 Following SBEM Calculations, CO₂ emissions & energy demand at this stage of the hierarchy are as follows:

	Regulated CO ₂ Emissions – kgCO ₂ /m ² annum	% Improvement
Notional Building Emission Rating (BER)	72.85	

Proposed Building Emission Rating (BER)	59.73	18.00%
Notional Building Primary Energy Rating (BPER)	441.43	
Proposed Building Primary Energy Rating (BPER)	346.73	21.45%

4.5 Without renewable technology, the building achieves a carbon reduction of 18%. Section 5 will illustrate the renewable technology required to achieve net zero – if it is not viable to install this, a minimum reduction of 18% will be achieved and a carbon offset payment will be discussed with the local planning authority.

5.0 RENEWABLE ANALYSIS

5.1 The potential renewable energy applicable to this development and its feasibility is investigated below:

Renewable	Advantages	Disadvantages	Feasibility
Photovoltaic Panels	Can have significant impact on carbon by offsetting electricity which has a high carbon footprint. Low maintenance. No noise issues associated with PV. No additional land use from the installation of PV panels.	High capital investment required. Needs unobstructed space on roof.	The development incorporates a pitched roof which could accommodate PV.
Solar Thermal Collectors	No additional land use from the installation of solar thermal collectors. Low maintenance and easy to manage. Low capital cost. No noise issues associated with Solar thermal collectors.	Limited CO2 offset No Grants or Tariffs for new build installations.	The hot water demand for this building is a very small proportion of the total required. It is therefore unlikely to be feasible, and would not make much difference to the overall carbon reduction.
Biomass Heating	Potential to reduce large component of the total CO2. A biomass boiler would replace a standard gas heating system so some of the cost may be offset through money saved on a traditional boiler.	Regular maintenance will be required. Reliability of fuel may become a problem, therefore limited cost saving for residents. A plant room and fuel store will be required which may take additional land from the proposed development or surroundings. The fuel will need to be delivered, which can cause issues with access etc.	Biomass is not considered feasible for such a development due to the need for space to accommodate fuel storages, access for delivery vehicles and local NOX emissions. The total heating demand for a building of this size is too great to make this option feasible.
Ground Source Heat Pumps	Low maintenance and easy to manage Optimum efficiency with under- floor heating systems. As heat pumps would replace standard heating systems, some of the cost may offset through money saved on a traditional boiler.	The heat pump has a noise level around 45- 60dB so some attenuation may be required, and it should be sensibly located. Relatively high capital cost. Requires electricity to run the pump, therefore limited carbon savings in most cases. For communal systems plant room required which may take additional land from the proposed development/ surroundings. High payback.	Limited Space on site and large communal infrastructure required. Not suitable for an industrial area.

Air Source Heat Pumps	ASHP systems are generally cheaper than ground source as there is no requirement for long lengths of buried piping. Low maintenance and easy to manage. Optimum efficiency with under- floor heating systems. As heat pumps would replace standard heating systems, some of the cost may offset through money saved on a traditional boiler.	The heat pump has a noise level around 50- 60dB so some attenuation may be required, and it should be sensibly located. The potential noise from the external unit may mean there is local opposition to their installation. Requires electricity to run the pump, therefore limited carbon savings in most cases. For communal systems, plant room is required which may take additional land from the proposed development/surroundings Potential noise issues.	There is external space to the rear and sides of the unit for plant. The existing building has a similar system installed.
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5.2 The most feasible renewable options have been selected in order to achieve compliance in the most viable way.

5.3 Solar PV is deemed the most suitable technology for the nature of this building.

5.4 To achieve net zero a solar PV system > 20kWp is required. A system of this size is not feasible due to space restrictions.

6.0 SUSTAINABLE CONSTRUCTION

6.1 The Developer will monitor, and record waste produced from site activities to ensure that the maximum possible will be diverted from landfill and reused in line with the waste hierarchy (below). This may be via a SWMP or via a licensed waste contractor.



6.2 All timber will be purchased in line with the Government's Policy for UK Timber Procurement.

6.3 As per local authority requirements - a minimum of 10% of the total value of materials to be used will be derived from recycled content in products and materials selected.

6.4 Should the developer and client wish to go further than the mandatory requirements, the following voluntary BREEAM options could be considered when sourcing materials:

- Responsible sourcing certifications e.g. EMS (EMAS, ISO14001).
- Chain of custody and/or BES6001 for key and supply chain processes.
- Legally sourced timber: Chain of custody and certificate (FSC, SFI, PEFC, MTCC, SGS, TFT, Verified etc).

6.5 The proposed extension has been designed to minimise embodied carbon

through efficient form, careful material selection, and a long-term, adaptable design approach. The following measures demonstrate how carbon reductions have been considered and how they will be achieved:

- Retention and reuse: Existing building is retained and integrated into extension to avoid demolition and preserving embodied carbon within that structure.
- Renewable and sequestering materials: Use of sustainably sourced timber provides a renewable, carbon-sequestering material, reducing reliance on high-carbon alternatives.
- Fabric-first performance: High insulation standards and efficient glazing will minimise operational energy demand, reducing both operational and embodied emissions.
- Durability and adaptability: Robust materials such as brickwork and aluminium provide longevity and minimal maintenance requirements. Internal layouts and structural grids allow for future adaptation, extending the building's functional life.

7.0 DYNAMIC THERMAL MODELLING

7.1 The simulation tool used for this investigation is Design Builder version 7.2.0.032

The calculation methodology adopted was full Dynamic Thermal Simulation over a period of 365 days. Calculations are based on first-principal models of heat transfer process and are driven by real weather data.

7.2 The thermal modelling for the proposed dwelling incorporates glazing, glazing openable areas and angles, balconies, and external shading.

7.3 Natural ventilation paths are modelled by algorithms that control the windows and door openings where applicable.

7.5 The assessment is undertaken in accordance with methodology and criteria contained within CIBSE TM59: Design Methodology for the Assessment of Overheating Risk in Homes (2017) using current Design Summer Year (London) weather data. This provides a robust method of assessment and is in line with guidance, current industry standard and best practice.

7.6 The assessment is undertaken in accordance with methodology and criteria contained within CIBSE TM52: The Limits of Thermal Comfort: Avoiding Overheating in European Buildings (2013) using current Design Summer Year weather data. This provides a robust method of assessment and is in line with guidance, current industry standard and best practice.

7.7 CIBSE recommends that new buildings, major refurbishments and adaptation strategies should conform to category II which sets a maximum acceptable temperature of 3 degrees above comfort temperature. The criteria are all defined in terms of Δt the difference between the actual operative temperature in the room at any time and the limiting maximum acceptable temperature. CIBSE sets out 3 criteria, two of which must be achieved:

Criterion 1: Hours of Exceedance

-The number of hours (H_e) during which Δt is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3% of occupied hours.

Criterion 2: Daily Weighted Exceedance

- To allow for the severity of overheating the weighted exceedance shall be less than or equal to 6 in any one day.

Criterion 3: Upper Limit Temperature

- To set an absolute maximum value for the indoor operative temperature the value of Δt shall not exceed 4K.

European standard seeks to define indoor environments consistent with occupant satisfaction in order to ensure that energy efficiency is as far as possible achieved without cost to the comfort, performance or wellbeing of building occupants.

7.8 Cooling Hierarchy

The cooling hierarchy is set out within the GLA Energy Statement Guidance (2020) document as follows:

- Reduce the Amount of Glazing of Heat Entering the Building – through orientation, shading, high albedo materials, fenestration, insulation, and the provision of green infrastructure. It is also expected that external shading will form part of major proposals.
- Minimise Internal Heat Generation – through energy efficiency design. For example, heat distribution infrastructure within buildings should be designed to minimise pipe lengths, particularly lateral pipework in corridors of apartment blocks, and adopting pipe configurations which minimise heat loss.
- Manage Heat Within the Building – through exposed internal thermal mass and high ceilings. Increasing the amount of exposed thermal mass can help to absorb excess heat within the building. Efficient thermal mass should be coupled with night time purge ventilation.
- Provide Passive Ventilation – For example, through the use of openable windows, shallow floorplates, dual aspect units or designing in the ‘stack effect’ where possible.
- Provide Mechanical Ventilation – Mechanical ventilation can be used to make use of ‘free cooling’ where the outside air temperature is below that in the building during summer months. This will require a by-pass on the heat recovery system for summer mode operation.
- Provide Active Cooling Systems – The increased use of air conditioning systems is generally not supported, as these have been significant energy requirements and expel hot air, thereby adding to the urban heat island effect. However, once passive measures have been prioritised if there is still a need for active cooling systems, such as air conditioning systems. These should be designed in a very efficient way and should aim to reuse the waste heat they produce.

7.9 CURRENT BUILDING DESIGN

7.10 The following table shows the percentage of occupied hours the internal operative room temperature exceeds 26°C in all occupied areas:

Criteria for Predominantly Mechanically Ventilated Homes				
Zone	Criterion 1 (% Hours Exceeded)	Criterion 2 (K.hr)	Criterion 3 (hr)	Pass/Fail
GF Shop Floor	68.03	232.50	803.17	Fail
FF Shop Floor	55.87	125.67	388.00	Fail

7.11 The current building design is at risk of overheating. However, it is important to note that extensions are exempt from Part O Building Regulations.

7.12 If the overheating risk needs to be addressed, mechanical ventilation or cooling is required.

8.0 CONCLUSION

8.1 This document is written in accordance with the guidelines and requirements of:

- Policies JP-P1 and JP-S2 of the local authorities development plan document.
- Part L2B of the Building Regulations England & Wales 2021

8.2 The development has CO₂ baseline emissions that are Part L compliant via passive Energy Efficiency Measures as highlighted in Section 4.

8.3 A minimum carbon reduction of 18% is outlined as the solar PV required to achieve net-zero is not feasible due to the size of the system.

8.4 The waste hierarchy will be followed on site to minimise whole-life carbon emissions of the development, as well as to ensure wider sustainability.

8.5 The building is at risk of overheating, however, extensions are exempt from Part O Building Regulations. If the overheating risk is to be addressed, mechanical ventilation or cooling is required.