

Energy Statement

Client: Mr. R Sidebottom

Site: Victoria Buildings

Silver Street

Bury

BL9 0DP

Date: 18th Oct 2024

Ref: 22674

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1.0 Executive Summary

An energy statement has been carried out for the proposed redevelopment known as Victoria Buildings in Bury, Greater Manchester. The structure and philosophy of the report has been based upon utilising best practice methodology and adheres to the “Be Lean, Be Clean and Be Green” hierarchy as follows:

Energy Efficient Measures (Be Lean – Use Less Energy)

To maximise the energy efficiency of the redevelopment and reduce the energy demand; the redevelopment will benefit from the following:

- High specification building fabric with U values that will improve on the Retained Thermal Elements i.e. walls, roof and floor, to be in line with Part L compliance. Any New Thermal Elements to be in line with the current standard of Part L (AD).
- Controlled Fittings – Openings; Where windows, roof windows and/ or doors have a U- value greater than 3.3 w/m²k, i.e. single glazed units, they should be replaced with units meeting the standards in Table 4.2, Summary Report. If replacement windows are unable to meet Table 4.2 due to need to maintain external appearance of the building, replacement glazing should have centre pane U-value of 1.2 w/m²k. Alternatively, if replacement is not possible, single glazing should be supplemented with a low-E secondary glazing.

Energy Efficient Systems (Be Clean – Supply Energy Efficiently)

- The redevelopment will use electric boilers for heating and hot water.
- Programmer and room thermostats.
- Dedicated LED low energy efficient light fittings within all areas. Incorporate motion sensors and daylight controls in common areas to reduce energy waste.
- Ventilation system- Intermittent extract fans.

Renewable Technologies (Be Green – Use Renewable Energy)

The following renewable technologies have been evaluated as part of this report:

- Solar Thermal
- Solar PV
- Combined Heat and Power (CHP)
- Air Source Heat Pump
- Ground Source Heat Pump

16no. PV panels are to be provided to the development to offset the carbon emissions.

Be Lean	Performance (Improved U-values)
Ground Floor	0.25 W/m ² k
Wall – External/Internal Insulation	0.3 W/m ² k
Wall – Cavity Insulation	0.55 W/m ² k
Roof- Pitched/Flat	0.16 W/m ² k
Windows including Roof Lights	1.4 W/m ² k
External Doors	1.4 W/m ² k
Air Permeability	(Not required, optional)

Be Clean
Heating and Hot Water to be provided by electric boiler.
Efficient heating controls – Room Thermostat
100% LED lighting
Low energy / Intermittent extract fans
Be Green
16no. PV panels will be provided to the development.

Table 1. Summary of all Be Lean, Be Clean and Be Green Measures.

Property Ref.	Proposed EPC Rating	Proposed CO ₂ Emission t/yr	Proposed Notional kgCO ₂ /yr/m ²
Apartment No.3	76C	10.27	12.89
Apartment No.14	61D	13.32	15.50

To meet compliance with Part L the proposed CO₂ emissions must be lower than the notional CO₂ emissions.

2.0 Introduction

Complete Sustainability Solutions have been commissioned by Four Architects to assist with their planning submission for the redevelopment of Victoria Buildings.

The purpose of this energy statement is to model two of the proposed 15no. of apartments, utilising SAP 10 software; to identify the baseline carbon emissions; then utilise the energy hierarchy to minimise energy usage and carbon emissions, thus ensuring compliance with both national and local policy.

2.1 Development Description

The proposed development is located in Bury within Greater Manchester. Victoria Buildings in Silver Street dates back to 1898. The proposal includes converting the existing building into 15No. self contained apartments.

2.2 Site Plan



South Elevation as Proposed Planning

3.0 Policy Context

Within this section of the report we will review both local and national policy, establishing key principles that can be taken forward and applied across the development.

3.1 Policy Context – Unitary Development Plan (UDP), Supplementary Planning Documents (SPDs), or the emerging Local Plan.

- Bury Local Plan (Emerging)
- Greater Manchester Spatial Framework (GMSF) / Places for Everyone
- Supplementary Planning Documents (SPDs)

Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

a) 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;

b) 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

c) 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.

3.2 Policy Context

In regards to energy-related policy in Bury Council's planning documents there are ongoing updates to local planning frameworks.

Unitary Development Plan (UDP) Saved Policies

1. The existing Bury UDP includes "saved" policies from 1997, some of which remain in use until the new Local Plan is adopted. Relevant policies regarding energy might fall under sections like:
 - a. **EN4/1 (Renewable Energy)**
 - b. **EN1 (Environmental Improvement)**
2. **Greater Manchester Spatial Framework (GMSF) / Places for Everyone**

- Under the "Places for Everyone" framework, energy and sustainability policies have reference identifiers starting with "GM" followed by specific numbers.
- Relevant sections may include policies such as **GM-S 2 (Carbon and Energy)**, focusing on sustainable energy use across the region.

Supplementary Planning Documents (SPDs)

3. Bury Council's SPDs provide more specific guidelines, such as **"SPD 14" for Development Control Policy Guidance Note: Energy Efficiency and Renewable Energy**.

Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities.

For renewable energy generation priority should be given to PV installation where technically feasible, alternative technologies will be appropriate where the equivalent generation is evidenced.

An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable; Be net zero carbon.

In residential developments, achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation.

Design buildings to maximize natural lighting and ventilation to reduce the need for artificial lighting and air conditioning.

With respect to the Best Practice Thresholds for Reducing Energy Demand and Onsite Renewable Energy Generation within residential developments, Table 5.1; the designer has worked closely with the developer to create an energy efficient design and construction; Incorporating energy-efficient design principles into the planning and construction of residential buildings. This includes proper insulation, energy-efficient appliances, LED lighting, intermittent fans.

By utilising the SAP 10.2 Software to model each dwelling has enabled us to meet the criteria for space heat demand, the hot water energy demand as well as the renewable energy generation targets, as laid out in Table 5.1.

Places for Everyone Joint Development Plan - Policy JP-S1, JP-S2, and JP-S3.

The Places for Everyone Joint Development Plan Document now forms a part of the development plan that should be consistent with the 2022 Part L Building Regulations.

"Policy text has removed reference to new dwellings seeking a minimum 19% carbon reduction against Part L of the 2013 Building Regulations. However, the policy instead states that as an interim measure, development should be consistent with the 2022 Part L Building Regulations unless superseded by changes to building regulation or local/national policy. It is considered that this strengthens the policy by ensuring requirements follow the most up to date regulations."

Policy JP-S1: Sustainable Development

To help tackle climate change, development should aim to maximise its economic, social and environmental benefits simultaneously, minimise its adverse impacts, utilise sustainable construction techniques and actively seek opportunities to secure net gains across each of the different objectives.

Policy JP-S2: Carbon and Energy

Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities.

For renewable energy generation priority should be given to PV installation where technically feasible, alternative technologies will be appropriate where the equivalent generation is evidenced.

An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable; Be net zero carbon.

In residential developments, achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation.

Design buildings to maximize natural lighting and ventilation to reduce the need for artificial lighting and air conditioning.

With respect to the Best Practice Thresholds for Reducing Energy Demand and Onsite Renewable Energy Generation within residential developments, Table 5.1; the designer has worked closely with the developer to create an energy efficient design and construction; Incorporating energy-efficient design principles into

the planning and construction of residential buildings. This includes proper insulation, energy-efficient appliances, LED lighting, PV design, and efficient low energy / carbon mechanical ventilation.

By utilising the SAP 10.2 Software to model each dwelling has enabled us to meet the criteria for space heat demand, the hot water energy demand as well as the renewable energy generation targets, as laid out in Table 5.1.

Policy JP-S3: Heat and Energy Networks

The provision of decentralised energy infrastructure is critical to the delivery of our objectives for low carbon growth, carbon reductions and an increase in local energy generation.

4.0 Carbon Reduction Strategy

Within this section of the report, we will be utilising SAP 10 software, carry out an assessment of the proposed development against current Building Regulations. We will establish CO₂ baseline, then following the energy hierarchy, establish a low-carbon specification to ensure CO₂ emissions meet the requirements of both national and local policy.

Full SAP calculations will be carried out at detailed design to ensure the specification meets the local policy. If any amendments are required these will be incorporated at this point.

4.1 – Review and implement the Energy Hierarchy: Be Lean – Be Clean – Be Green

The **Energy Hierarchy** is a classification of energy options, prioritised to assist progress towards a more sustainable energy system. The energy hierarchy uses a step-by-step process:

- Step 1 Be lean – use less energy.
- Step 2 Be Clean – use energy efficiently.
- Step 3 Be Green – utilise renewable technology.

4.2.1 Be Lean - Use Less Energy

The developer, in accordance with both national and local planning policy, has stated their wish towards ensuring the development follows a fabric first approach, therefore reducing demand on the national grid as reasonably possible. Below we have highlighted the proposed U values, going beyond the requirements of Building Regulations; thus improving upon the baseline CO² emissions.

Be Lean	Performance (Improved U-values)
Ground Floor	0.25 W/m ² k
Wall – External/Internal Insulation	0.3 W/m ² k
Wall – Cavity Insulation	0.55 W/m ² k
Roof- Pitched/Flat	0.16 W/m ² k
Windows including Roof Lights	1.4 W/m ² k
External Doors	1.4 W/m ² k
Air Permeability	(Not required, optional)

Table 2. Summary of proposed Be Lean measures.

4.2.2 Be Clean – Supply Energy Efficiently

Within this section of the energy hierarchy, we see an emphasis being placed upon ensuring the regulated energy demands of the development are met as efficiently as possible.

Both district-wide and site-wide heat networks can be utilised to provide heating and hot water to a development in an efficient

manner. In this instance there isn't a district wide network within the vicinity of the scheme.

Furthermore, in many cases we also see opportunities to include a combined heat and power system (CHP), which allows for the production of electricity. Due to the development only being 15 units there is not a big enough hot water demand to justify the use of CHP.

The next stage is to look at possible be clean measures that can be introduced to individual dwellings on site. Below we have identified the practical measures to be introduced:

Be Clean
Highly efficient electric boiler to provide heating and hot water.
Efficient heating controls – Programmer and room thermostat
100% efficient LED lighting
Low energy / Intermittent extract fans

Table 3. Summary of proposed Be Clean measures.

4.2.3 Be Green-Review of Renewable Technologies

The final phase of the report is to ascertain if the development will benefit from renewable/low carbon technologies and the following renewable/low carbon technologies will be analysed for this development;

- Solar Thermal
- Solar PV
- CHP
- Air Source Heat Pump
- Ground Source Heat Pump

Solar Thermal - Solar thermal hot water collectors are panels or evacuated tubes which are typically located on the roof of the buildings. The collectors harness the sun's energy to warm domestic hot water.	
Pros	Cons
Reduced fuel bills and carbon footprint.	Only compatible with boilers that have hot water storage.
Low maintenance.	Need south facing roofs to optimise efficiency.
Proven technology.	Carbon saved is low comparative to the savings offered by PV.
Suitability – Solar Thermal HW is not considered appropriate for this development due to the relatively low carbon savings offered by this technology. Greater savings will be achieved using passive measures.	

Solar PV - Solar Photovoltaic (PV) panels work by converting energy from the sun into electricity. This can then be used with the development to offset the electrical usage.	
<u>Pros</u>	<u>Cons</u>
Reduced bills and carbon footprint. Benefit from the feed in tariff. Proven technology. Relatively maintenance free.	PV panels lose efficiency over their lifetime.
Suitability - PV would be suited to this development as it is a simple bolt on technology that will assist with meeting the energy demand of the building and ensure compliance with the local planning policy. The use of PV panels will supplement the electric boiler providing heating and hot water.	

CHP - CHP is a technology which develops heat and power from the same energy source, typically mains gas. The CHP engine is fed by mains gas which then drives an alternator to provide electricity	
<u>Pros</u>	<u>Cons</u>
Reduced fuel bills and carbon footprints. Eligible for the feed in tariff. Proven technology which is in use in many schemes in the UK.	Not a true renewable technology. Heating and electricity demand must remain fairly stable to ensure CHP is running at optimum efficiency. Requires a centralised/district heating network scheme so is therefore more suited to apartment blocks. Noise. Capital intensive.
Suitability - The total size and nature of the development does not lend itself to CHP. It would add to the capital costs of the development making the development not financially viable. For these reasons, CHP has been discounted.	

Air Source Heat Pump - Air source heat pumps extract heat from the external air which can be used to heat radiators/underfloor heating and hot water within a dwelling. An ASHP can also be used to provide heating and hot water.	
<u>Pros</u>	<u>Cons</u>
Can offer lower heating bills and reduce carbon footprints (when compared to electric systems).	Requires space to locate the external condenser unit. The unit requires lots of space around it to ensure adequate air flow.
Relatively maintenance free.	Requires the use of underfloor heating or large radiators due to low grade heat.
Offers high efficiencies.	Noise issues.
Can offer heating and cooling depending on the system chosen (air to air).	
Suitability – As this is an existing building, there is no plan space proposed to locate the external condenser units of the ASHPs therefore this technology has been discounted.	

Ground Source Heat Pump - Ground source heat pumps (GSHP) work in a similar way to air source heat pumps, however they extract heat from the ground.	
<u>Pros</u>	<u>Cons</u>
Can offer lower heating bills and reduce carbon footprints (when compared to electric systems).	High capital costs.
Relatively maintenance free.	Requires space for boreholes or trenches to locate ground loops.
Offers high efficiencies.	Requires the use of under floor heating or large radiators due to low grade heat.
Suitability - Ground source heat pumps have been discounted on this development as the building is an existing building located in a town center so there is no scope for boreholes.	

Be Green

16No. PV panels will be provided to the development.

Table 5. Summary of proposed Be Green measures.

4.3 Embodied Carbon

As this development is a conversion project it will perform better and have lower embodied carbon than a newbuild development. This is due to the re-use of existing material which reduces the use for new materials.

5.0 Conclusion

This report is based upon a review of the proposals and a thorough analysis of relevant national and local planning policy requirements. Both the National Planning Policy Framework 2023.

The development will follow the Be Lean, Be Clean, Be Green Energy Hierarchy as follows:

Energy Efficient Measures (Be Lean – Use Less Energy).

To maximise the energy efficiency of the redevelopment and reduce the energy demand, the redevelopment will benefit from a high specification of building fabric with U-values that will improve on Part L1B values for retained and new thermal elements.

Energy Efficient Systems (Be Clean – Supply Energy Efficiently)

The apartments will be provided with electric boilers to provide heating and hot water.

Highly efficient Intermittent Extract Fans will be installed to each apartments.

Highly efficient LED lighting will be installed to each apartment.

Renewable Technologies (Be Green – Use Renewable Energy)

The following renewable technologies have been evaluated as part of this report;

- Solar Thermal
- Solar PV
- Combined Heat and Power (CHP)
- Air Source Heat Pump
- Ground Source Heat Pump

Due to the nature of the scheme, it is proposed to 16No. PV panels to the scheme.

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