



**ELEMENT**  
**SUSTAINABILITY**

# **LAND TO THE WEST OF NEW STREET, LITTLEBOROUGH**

## **ENERGY STATEMENT**

**JANUARY 2023**

**REF: 2021.166**



## ELEMENT SUSTAINABILITY – ISSUE NOTES

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**Title:** Energy Statement

**Site:** Land to the West of New Street, Littleborough

**Client:** Russel Homes

**Status:** Final

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## 1. INTRODUCTION

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Element Sustainability has been commissioned by Russell Homes Limited to review the energy performance of the proposed residential development off New Street, Littleborough.

The purpose of this statement is to summarise the relevant policy background and requirements of Rochdale Borough Council (hereafter referred to as the council) and demonstrate the ways in which the developer has addressed these aims through their proposals, ensuring all practicable measures have been taken in order to deliver a sustainable development at this site.

Details of the design attributes, specifications and characteristics of the scheme are appraised in order to demonstrate how the proposals contribute to sustainable development in Littleborough and seek to mitigate the environmental impacts of the scheme.

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## 2. DEVELOPMENT PROPOSALS

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### 2.1 Development Site Description

The proposed development plot is currently a greenfield site within the suburban area of Littleborough within the Metropolitan Borough of Rochdale, in Greater Manchester. The application site is bound by New Street and existing dwellings to the north, a residential housing estate to the east and agricultural land with scattered dwellings to the south and west.

The site is predominantly greenfield and contains a number of mature trees to the perimeter. The development proposals under review within this statement include for full planning permission for the construction of sixty-two dwellings, including access and associated works.

*Figure 2.1 – Pre-development Site Location*



### 2.2 Development Proposals

The development proposal comprises the erection of sixty-one dwellings, including access and associated works. The accommodation schedule is presented in Table 2.1 below.

*Table 2.1 – Accommodation Schedule*

| DWELLING TYPE                 | NUMBER OF UNITS |
|-------------------------------|-----------------|
| Type A – 4 Bed Detached       | 2               |
| Eccleston – 4 Bed Detached    | 6               |
| Renshaw 1 – 4 Bed Detached    | 2               |
| Renshaw 2 – 4 Bed Detached    | 1               |
| Renshaw 3 – 4 Bed Detached    | 2               |
| Turner 1 – 4 Bed Townhouse    | 4               |
| Turner 2 – 4 Bed Townhouse    | 1               |
| Kenyon – 4 Bed Detached       | 4               |
| Bower – 4 Bed Townhouse       | 8               |
| Cromwell – 4 Bed Detached     | 1               |
| Worrall – 4 Bed Detached      | 8               |
| Orrell – 3 Bed Detached       | 2               |
| Orrell 3 – 3 Bed Detached     | 2               |
| Talbot – 3 Bed detached       | 7               |
| Scott – 3 bed Semi Detached   | 2               |
| Philips – 3 Bed Semi Detached | 2               |
| Buckley – 2 Bed Semi Detached | 5               |
| Cromwell – 4 Bed Detached     | 2               |
| <b>Total</b>                  | <b>61</b>       |

The site plan is presented below in Figure 2.2.

*Figure 2.2 – Proposed Site Layout*

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## 3. POLICY REVIEW

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### 3.1 Local Planning Policy

#### 3.1.1 Local Plan Core Strategy

The Core Strategy for Rochdale Borough Council was adopted on 19<sup>th</sup> October 2016 and is the lead document in the Local Plan, containing the following relevant policies:

**SO4 - To promote a greener environment:** To do this the council will focus on:

1. Minimising Rochdale's contribution to climate change and mitigating and adapting to its adverse effects;
2. Ensuring in particular that development is energy efficient and contributes to carbon reduction;
3. Reducing the likelihood of flooding through appropriate flood risk management, especially in Rochdale town centre and parts of Littleborough and Heywood;
4. Improving our urban open spaces and making them more accessible;
5. Maximising the value of our green open areas and countryside to provide opportunities for recreation, amenity, biodiversity and flood management;
6. Minimising and managing waste and managing minerals resources sustainably; and
7. Ensuring no detriment to the conservation interests of European and other protected natural sites.

**SO5 - To improve accessibility and deliver sustainable transport:** To do this the council will focus on:

1. Directing development to the most accessible locations or those that can be made more accessible by public transport;
2. Improving strategic transport connections including links with Manchester city centre and key destinations in and beyond Greater Manchester;
3. Improving access to the public transport network;
4. Promoting transport improvements that enhance access to town and local centres and employment areas (existing and new) within and outside the borough; and
5. Ensuring new development contributes to transport improvements and the use of public and other sustainable transport.

**SD1 - Delivering sustainable development** - When considering development proposals the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. It will always work pro-actively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.

Planning applications that accord with the policies in this Local Plan will be approved without delay, unless material considerations indicate otherwise.

Where there are no policies relevant to the application or relevant policies are out of date at the time of making the decision then the Council will grant permission unless material considerations indicate otherwise – taking into account whether:

- Any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole; or
- Specific policies in the National Planning Policy Framework indicate that development should be restricted

**G1 – Tackling and adapting to climate change** – The council will address climate change and ensure growth does not increase CO2 Emissions by:

- Locating growth in areas which are likely to minimise the need for travel and which are well served by public transport, services and infrastructure;
- Expecting all development and regeneration schemes to be well connected to surrounding areas and facilities by sustainable means of transport (Policy T2);
- Encouraging and promoting renewable energy developments, including standalone and community developments, that do not, by virtue of their scale, siting, construction or operation, cause harm to the local area, its character and environmental assets and adjoining uses, which cannot be satisfactorily mitigated (Policy G3);
- Promoting the efficient re-use of buildings, especially those of heritage value, and the recycling of construction waste;
- Ensuring that development does not cause unacceptable harm to the borough's peatlands and woodlands, and encouraging their restoration and responsible management;
- Promoting sustainable waste management through the operation of policies in the Core Strategy and Greater Manchester Joint Waste Plan;
- Making the best use of open space to contribute to climate change mitigation and adaptation; and
- Securing planning obligations for energy infrastructure and climate change adaptation measures.

New developments will be expected to:

- Be zero carbon in line with national targets and definitions
- Adhere to the 'energy hierarchy' as outlined in policy G2, being designed in such a way that ensures that buildings require the minimum amount of energy to function over their lifetime;
- Reduce CO2 emissions through the use of renewable and low carbon decentralised energy technologies and networks. This will be through both on-site provision in new developments and through connection to local networks;
- Address the impacts of climate change by incorporating comprehensive adaptation measures, including:
  - Suitable measures, such as urban greening, for tackling the 'urban heat island' effect;
  - Where possible, the opening up of covered and culverted sections of waterways and provision of new water features, to help cooling and provide biodiversity, landscape and flood prevention benefits;
  - The incorporation of appropriate water conservation and management measures, such as Sustainable Drainage Systems (SuDS), including ensuring that the rate of run-off on 'greenfield' sites is not increased and on 'brownfield' sites is significantly reduced, and avoiding the use of impermeable surfaces;
  - The retention of existing trees wherever possible and the taking of all appropriate opportunities to plant trees and other suitable vegetation on site; and
  - The incorporation of 'green roofs' wherever possible, such as with flat roofs

**G2 - Energy and new development:** All new development will be expected to adhere to the following energy hierarchy to the extent that policy G2 reflects national policy, targets and requirements for that type of development:

1. Demand Reduction – Achieve the maximum possible reduction in demand for energy through building design (i.e. the use of passive systems). At the design stage of new developments, every effort should be made to ensure that buildings use as little energy as possible throughout their lifetimes, using siting, orientation, layout, construction and landscaping to optimise use of natural passive systems such as solar gain and natural lighting, shading, ventilation and cooling to minimise heating, cooling and lighting demands. Green roofs and green walls should be incorporated into developments wherever feasible.
2. Energy efficiency and low / zero carbon technologies and networks – Design to maximize energy efficiency, and use on-site or linked low or zero carbon technologies or direct connection to a low or zero carbon heat source (not necessarily on-site).
3. ‘Allowable solutions’ – use wider energy efficiency / CO2 reduction measures, which could include developer contributions, to compensate for ‘residual emissions’ not addressed by 1 or 2 above.

**G6 - Enhancing green infrastructure:** The council will sustain and enhance a green network to support growth and regeneration in the borough and provide a high-quality environment that meets the needs of the community and visitors to the borough. Water bodies and green spaces will be protected to ensure that their value to sustainable development and regeneration is maximised. This is to improve opportunities for recreation in urban areas and the countryside, improve opportunities for healthy lifestyles, and to help manage and respond to environmental risks such as flooding and the impacts of climate change. We will also ensure that the network supports the sustainable growth of the Greater Manchester city region and links with a wider Greater Manchester strategic green infrastructure network.

The council will protect, improve and create green infrastructure to help deliver strategic sustainable development priorities and meet local needs in the following locations:

- The Roch Valley corridor where the focus will be on establishing a Roch Valley Trail between Heywood and Littleborough
- Urban areas and new development where the focus will be on incorporating green infrastructure into new development, sustainable urban drainage, increasing the number of street trees, greening housing areas and main roads, developing new green spaces, and incorporating green roofs and walls in new development.

**G7 - Increasing the value of biodiversity and geodiversity:** The council will expect development proposals and improvements to:

- a. Protect and include existing biodiversity (including established biodiversity interest on brownfield land) within new developments, public realm and open spaces and meet the requirements of the Biodiversity and Development SPD, Greater Manchester and Local Biodiversity Action Plans;
- b. Protect and enhance existing features such as peatland, ponds, wetlands, reservoirs, mill lodges, trees, hedges, wooded areas, meadows, flora and fauna;
- c. Take opportunities to promote biodiversity and create new habitats through new development using landscaping and building and construction features wherever possible (e.g. ponds, species of vegetation, green roofs and walls, bat boxes, roof space, appropriate nest boxes and landscaping);
- d. Enhance strategic wildlife corridors and the most natural areas and ensure that habitats and corridors are not fragmented by development;
- e. Improve access where appropriate to new or existing biodiversity interest for public enjoyment; and

- f. f. Protect important geology and take opportunities to increase interest and accessibility.

**G8 - Managing water resources and flood risk:** The council will ensure that new development (including flood risk mitigation measures) does not lead to any form of increased flooding locally or further downstream, does not impede natural water and flood risk management, is not detrimental to existing or potential flood storage areas, contributes where possible to alleviating existing flood risk, is itself well protected from flood risk and ensures prudent use of water resources. We will require:

- a. Compliance with a 'sequential' approach to new development and flood risk, directing development away from areas of high risk, in accordance with the National Planning Policy Framework;
- b. Full regard to and compliance with the advice of the Environment Agency (or equivalent agency) and the objectives and priorities for flood risk management set out in the Local Flood Risk Management Strategy, including any mitigation measures recommended for particular sites;
- c. Full regard to the published evidence of local flood risk and its significance as included in Strategic Flood Risk Assessments, Surface Water Management Plans and other recognised sources of flood risk data and the production of additional Flood Risk Assessments (FRAs) as appropriate;
- d. Incorporation of appropriate measures for the management of surface and flood water, including flood storage areas, Sustainable Urban Drainage Systems (SUDS) and the protection of 'overland flow paths';
- e. Compliance with any Surface Water Management Plan or drainage strategies produced, such as for the identified critical drainage areas of Littleborough and Heywood;
- f. The avoidance of culverting, and support the opening up of existing culverts wherever possible;
- g. The incorporation of measures for the conservation of water to minimise potable water consumption, including rainwater collection measures, which should be integral to the design of buildings and spaces;
- h. Development that does not directly or indirectly lead to pollution of existing water resources such as watercourses and groundwater or the derogation of the quantity of groundwater;
- i. The incorporation of measures to improve water quality; and
- j. The taking of opportunities to improve the habitat value of watercourses and water bodies.

In addition, we will identify additional flood storage areas which will be protected from development.

**G9 - Reducing the impact of pollution, contamination and land instability:** The council will reduce all forms of pollution, contamination and land instability in the borough, by:

- a. Focusing on measures that reduce air pollution in Air Quality Management Areas, and other areas where pollution levels are unacceptable, particularly around motorways and main roads;
- b. Requiring that development does not have impacts that lead to an unacceptable increase in air, water, noise, light or other pollution;
- c. Ensuring sensitive new developments such as housing, schools and hospitals are not adversely affected by existing sources of pollution such as roads and certain types of industry;
- d. Requiring a Low Emissions Strategy (LES) where development requires a Transport Assessment, and in other circumstances as appropriate;
- e. Requiring that any risks arising from contaminated land or land instability, and appropriate actions to address these risks, are identified prior to any development taking place on that land and the identified actions taken;
- f. Requiring that any risk to surface water and ground water resources from the disturbance of contaminated land be ascertained and preventative measures devised and carried out; and
- g. Using planning conditions or obligations to control pollution from new development, or the impact of pollution on new development.

**T1 - Delivering sustainable transport:** The council will work with relevant agencies to secure strategic, borough-wide and local transport improvements that support our overall spatial strategy. This programme of sustainable

transport proposals will ensure accessibility for all users (prioritising low and non-carbon modes of travel in line with the councils Accessibility Hierarchy) focusing particularly on town centres, economic growth corridors and regeneration areas. It will also meet borough responsibilities to reduce pollution (NOx and PM10) and climate change (CO2) emissions from traffic to meet GM and national targets.

### 3.1.2 Great Manchester Joint Waste Development Plan

The Greater Manchester Joint Waste Development Plan was adopted on 1<sup>st</sup> April 2012 and makes up part of the Core Strategy for the Councils local plan. The overall aim of the Waste Plan is to provide a sound spatial planning framework to deliver sustainable waste management in Greater Manchester consistent with national planning policies.

#### Objectives:

- **Objective 1:** To ensure that Greater Manchester's waste is dealt with in line with Scenario 2 of the needs assessment.
- **Objective 2:** To promote the movement of waste up the waste hierarchy, assuming minimisation at source, increasing reuse, recycling and recovery, whilst recognising there may still be a need for additional landfill capacity for residual wastes.
- **Objective 3:** To assist in reducing greenhouse gas emissions and assist in adaption/mitigation of climate change, including resource efficiency and minimising the need for energy in accordance with targets at national, regional and local level.
- **Objective 4:** To ensure waste growth within the sub-region does not increase to the same degree as growth in economic activity i.e. to decouple waste growth from economic growth.
- **Objective 5:** To provide a flexible approach for the delivery of the required waste management facilities, allowing emerging technologies to come forward.
- **Objective 6:** To ensure appropriate protection of the quality of life of communities.
- **Objective 7:** To protect the sub-region's natural environment, biodiversity, geodiversity, cultural and historic heritage. Objective 8: To reduce waste movements and, where waste needs to be moved, to promote the sustainable movement of waste across the sub-region.

## 3.2 Supporting Planning Documents

### 3.2.1 Climate Change Adaptation Supplementary Planning Document

This document gives guidance to developers and planners in respect of how new developments can meet the requirements of policies set out in national guidance and the emerging Core Strategy of the Local Development Framework.

## Environmental Performance (Buildings)

Applicants will be required to demonstrate how they have taken the following into account in the design of new buildings:

- Use of natural ventilation;
- Louvres and shutter systems;
- Provision of well ventilated and cooled internal spaces;
- Appropriate storage of composting and waste in hot weather; and
- The provision of bird and bat boxes within and/or on new buildings

## 3.3 Emerging Policies

### 3.3.1 Places for Everyone Plan

The Draft 'Places for Everyone' (PfE) Plan is a new 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. It has been prepared by the GMCA on behalf of these nine districts.

The Draft Plan will determine the kind of development that takes place across the city-region, maximising the use of brownfield land and urban spaces while protecting green belt land from the risk of unplanned development. It will also ensure all new developments are sustainably integrated into Greater Manchester's transport network or supported by new infrastructure.

On 1<sup>st</sup> March 2022, the Secretary of State appointed three planning inspectors to conduct an independent examination of the Places for Everyone Joint Development Plan Document. It is therefore considered that the Plan is in an advanced stage of preparation.

## 3.4 Climate Emergency

In July 2019, Rochdale Borough Council declared a Climate Emergency. Highlighting the impact it will have on the lives of everybody who lives and works in the borough of Rochdale unless action is taken.

As a council there is a responsibility to take meaningful action to reduce carbon emissions, alongside preparing the borough for the impacts of a changing climate. The council has set the ambitious target for the borough of Rochdale to work towards being carbon neutral by 2038. The target was set to match the target set for the whole of greater Manchester.

## 3.5 National Planning Policy

The National Planning Policy Framework (NPPF) 2021 states that the planning system should play an active role in guiding development to sustainable solutions. At the heart of the 2021 updated NPPF lies the 'presumption' in favour of sustainable development. There are three dimensions to sustainable development, as stated within the NPPF: economic, social, and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:

**An economic role** – contributing to building a strong, responsive, and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;

**A social role** – supporting strong, vibrant, and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating beautiful and safe places, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and

**An environmental role** – contributing to protecting and enhancing our natural, built, and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

These dimensions are considered to be mutually dependent with the NPPF, in its entirety, defining sustainable development. The NPPF states that 'the purpose of the planning system is to contribute to the achievement of sustainable development' (paragraph 7). It summarises the objective of sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their needs. It goes on to state that at a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being, and environmental protection.

## 3.6 Regulatory Framework

### 3.6.1 Building Regulations

**Building Regulations, Part L - Conservation of Fuel and Power** sets the compliance standards for energy demand and carbon dioxide emissions from buildings. Guidance on how to meet the requirements of this regulation is provided within a number of approved documents. The relevant document is referenced below:

**Approved Document Volume 1: Dwellings:** Gives guidance on how to comply with Part L of Schedule 1 to the Building Regulations and the energy efficiency requirements for dwellings. These standards came into effect in June 2022 and are subject to a twelve-month transitional arrangement period. Part L 2021 standards are expected to reduce dwelling carbon emissions by 31% in relation to Building Regulations Part L, 2013.

Minimum energy performance requirements shall be approved and expressed in accordance with the methodology for:

- a) New buildings (which shall include new dwellings), in the form of target CO<sub>2</sub> emission rates;
- b) New buildings, in the form of target fabric efficiency rates; and
- c) New buildings in the form of target primary energy rates.

## 4. ENERGY STRATEGY

The energy strategy for this development prioritises an enhanced 'fabric led' solution coupled with the inclusion of boilers and low carbon technology. An enhanced building fabric specification throughout the scheme allied to efficient servicing and controls, plus renewable energy technology will achieve compliance with the new build carbon dioxide emission reduction and fabric energy efficiency targets stipulated by Building Regulation, Part L Approved Document Volume 1.

Details of the proposed energy strategy are presented below.

### 4.1 Build Fabric and Thermal Performance

The standard measurement of heat transfer through a given building material or construction type is the U-value ( $\text{W/m}^2\text{K}$ ). The lower the U-value, the more slowly heat transfers and is lost out of a building. In buildings, heat loss generally occurs through the following main areas and elements of the construction:

- Ground Floor;
- External Walls;
- Roofs;
- Doors and windows;
- Thermal bridging; and,
- Uncontrolled ventilation.

The proposed material specification that will be incorporated to limit heat loss and ensure efficient operation of the dwellings is presented in Table 4.1.

*Table 4.1 – Proposed Build Fabric Specification*

| Item             | Specification                                     |
|------------------|---------------------------------------------------|
| Ground Floor     | $U=0.12 \text{ W/m}^2\text{K}$                    |
| External wall    | $U=0.17 \text{ W/m}^2\text{K}$                    |
| Party wall       | $U=0.00 \text{ W/m}^2\text{K}$ (full fill & seal) |
| Windows          | $U=1.40 \text{ W/m}^2\text{K}$                    |
| Roof             | $U=0.09 \text{ W/m}^2\text{K}$                    |
| Air Permeability | $4.00\text{m}^3/\text{hm}^2$ (@50Pa.)             |
| Cold Bridge      | Bespoke Details & Psi values                      |

This specification and design will provide the following benefits:

- **High performance thermal insulation** will ensure low U-values for all heat loss elements and will minimise heat loss through the building's thermal envelope;
- **Thermally efficient, 'A' rated, double glazed windows** will be specified with argon gas fill and low emissivity coatings to limit heat loss through the pane. Thermal breaks will be incorporated within the frames of the vision panels to further limit heat loss. The glazing g value will be specified to optimise beneficial solar gains but limit the propensity for the dwellings to overheat;

- **Low air tightness** (design air permeability targeting 4.00m<sup>3</sup>/hm<sup>2</sup>) will minimise uncontrolled ventilation. This will reduce heat losses and provide high levels of occupant comfort; and,
- **Improved cold bridging junctions** will significantly improve the emission rate of the dwellings through the provision of insulation, limiting heat losses that occur at the junctions between building elements and around openings. 'Bespoke' psi values have been used to achieve a low  $\gamma$ -value, thus minimising heat loss through cold bridge junctions.

This enhanced fabric specification **will deliver a Building Regulation, Part L Approved Document Vol1 (2021) compliant scheme** for all aspects of the proposed development. It ensures an inherently energy efficient development, **focussing upon limiting demand side reductions** in accordance with the energy hierarchy.

## 4.2 Building Services Specification

Tables 4.2 presents the currently proposed mechanical and electrical specification that is anticipated to be incorporated to ensure efficient and comfortable operation of the proposed dwellings.

*Table 4.2 – Proposed Mechanical and Electrical Specification*

| Item             | Specification                     |
|------------------|-----------------------------------|
| Lighting         | 100% 'Low E' / LED                |
| Ventilation      | Intermittent Extract Fans         |
| Space Heating    | Ideal Logic Gas Fired Boiler      |
| Water Heating    | From Combi Boiler                 |
| Heating Controls | Time and Temperature Zone Control |

The mechanical and electrical specification will provide the following benefits:

- **Low energy and LED lighting** will be specified throughout the site in order to maximise operational efficiencies and lifespan of the fittings. LEDs operate with an estimated energy efficiency of up to 90% when compared to traditional lighting and conventional light bulbs. This means that about c.90% of the electrical energy is converted to light, rather than wasted heat as in conventional bulbs;
- **Sophisticated heating controls** including time and temperature zonal controls will ensure the efficient delivery of heat to further reduce the homes energy demand; and
- **Intermittent Extract Ventilation** will be specified in all houses throughout the development, which will draw moisture laden, stale air out of the rooms and maintain a healthy living environment. Additionally, intermittent extract ventilation aids in achieving suitable internal sound levels.

This mechanical and electrical specification **will deliver a Building Regulation Part L Approved Document Volume 1 (2021) compliant scheme** for all aspects of the Proposed Development.

### 4.3 Renewable Energy Feasibility

A number of renewable energy technologies have been considered for this site, including:

- District Heating
- Solar Hot Water;
- Photovoltaics (PV);
- Wind;
- Heat Pumps; and,
- Biomass heating

A review of the Land to the West of New Street proposals and site location has been completed to determine the appropriate option(s) for this development, as detailed in Table 4.3 below.

Table 4.3 – Renewable Energy Feasibility Study

| Technology         | Description                                                                                                                                                                                                                                                                                   | Advantages                                                                                                                                                            | Limitations                                                                                                                                                                                                          | Feasibility                                                                                                                                                                                                                                                                                                                      |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| District Heating   | District Heating systems provide multiple buildings or dwellings with heat and hot water from a central boiler house, or 'energy centre'. The system can provide heating or cooling which is transferred from the energy centre through a network of highly insulated pipes to each dwelling. | <ul style="list-style-type: none"> <li>✓ Efficient use of fuel.</li> <li>✓ Eliminates the need for gas to be installed.</li> </ul>                                    | <ul style="list-style-type: none"> <li>✗ Relies upon the installation of nearby heat networks.</li> </ul>                                                                                                            | <b>No</b> - It has been determined that there are no existing or proposed heat networks/energy centres within a moderate radius from the development and there are no existing networks local to the site.                                                                                                                       |
| Solar Hot Water    | The solar collector absorbs the radiant energy of the sun and converts it to heat energy for use as hot water in buildings.                                                                                                                                                                   | <ul style="list-style-type: none"> <li>✓ Feasible for small scale developments.</li> <li>✓ Low maintenance.</li> </ul>                                                | <ul style="list-style-type: none"> <li>✗ Panels ideally facing south at 30° tilt for optimum efficiency.</li> </ul>                                                                                                  | <b>No</b> - Solar thermal is considered not to be a technically feasible option for the residential buildings, but is discounted on the grounds of viability. Available roof space would be better utilised for future PV panels which offer a better energy yield and emissions reduction per pound (£) of capital expenditure. |
| Photovoltaics (PV) | PV panels harness solar thermal energy and convert it into electricity which can then be used within a building. The panels may be roof or floor mounted.                                                                                                                                     | <ul style="list-style-type: none"> <li>✓ Low maintenance.</li> <li>✓ Easy to integrate into building design.</li> <li>✓ Cost of PV is constantly dropping.</li> </ul> | <ul style="list-style-type: none"> <li>✗ Panels ideally facing south at 30° tilt for optimum efficiency.</li> <li>✗ Overshadowing will reduce performance.</li> <li>✗ Can require significant roof space.</li> </ul> | <b>Yes</b> – This technology is feasible for this site and would ensure significant energy demand and emissions reductions for the dwellings.                                                                                                                                                                                    |
| Biomass Heating    | Biomass boilers typically burn wood chips or pellets as fuel to provide space heating and hot water.                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>✓ Almost a carbon neutral technology.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>✗ Frequent and large fuel deliveries.</li> <li>✗ Large fuel store required.</li> <li>✗ Regular maintenance.</li> </ul>                                                        | <b>No</b> – This technology would be capable of delivering the target CO <sub>2</sub> emission reductions but is considered inappropriate for this type of development due to the need for a large fuel                                                                                                                          |



|                                 |                                                                                                                                                                               |                                                                                                                                                                                                                                       |                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |                                                                                                                                                                               |                                                                                                                                                                                                                                       | ✗ Air quality issues in urban areas.                                                                                                                                                                                   | storage facility and frequent, large fuel deliveries combined with regular maintenance.                                                                                                                                                                                                                                   |
| Wind                            | Wind generation equipment harness the wind to turn a propeller and in doing so, drive an alternator to generate electricity. The turbines may be pole or roof mounted.        | <ul style="list-style-type: none"> <li>✓ Low maintenance.</li> <li>✓ Excess electricity can be exported to the grid.</li> <li>✓ Vertical Axis Turbines able to operate at wind speeds as low as 2m/s.</li> </ul>                      | <ul style="list-style-type: none"> <li>✗ A wind speed of at least 6m/s is typically required for traditional turbines to operate efficiently.</li> <li>✗ Visual and noise impact risk.</li> </ul>                      | <b>No</b> – The NOABL wind speed database records a wind speed of approximately 4.5m/s at 10m above ground level for this site. In order to operate efficiently a wind speed of at least 6m/s is typically required. Furthermore, there are potential planning issues and perceived safety concerns with this technology. |
| Ground Source Heat Pumps (GSHP) | GSHPs collect low-grade heat from the ground to supply useful heat for space and water heating requirements by applying additional energy input (in the form of electricity). | <ul style="list-style-type: none"> <li>✓ Flexible installation methods - vertical ground collector boreholes can be used when space is more limited.</li> <li>✓ Can provide both heating and cooling as well as hot water.</li> </ul> | <ul style="list-style-type: none"> <li>✗ Full ground survey required to determine suitability/ geology.</li> <li>✗ Large area required for horizontal ground collector loops.</li> <li>✗ Prohibitive costs.</li> </ul> | <b>No</b> – Such technology is considered unsuitable for this site due to prohibitive costs and technical complexity of installing the vertical ground collector boreholes within the site boundary.                                                                                                                      |
| Air Source Heat Pumps (ASHP)    | ASHPs collect low-grade heat from the air to supply useful heat for space and water heating requirements by applying additional energy input (in the form of electricity).    | <ul style="list-style-type: none"> <li>✓ Highly efficient method of producing heat.</li> <li>✓ Can provide both heating and cooling as well as hot water.</li> </ul>                                                                  | <ul style="list-style-type: none"> <li>✗ Prohibitive costs.</li> <li>✗ Internal and external unit space required.</li> <li>✗ Potential noise issues from external plant.</li> </ul>                                    | <b>Potentially</b> – This technology is considered to be a feasible option for this site but is discounted on the grounds of viability                                                                                                                                                                                    |



## 4.4 Proposed Renewable Energy Solution

Photovoltaic (PV) arrays have therefore been selected as an appropriate renewable energy technology to contribute to the CO<sub>2</sub> emission reduction target for this development. PV arrays are relatively straightforward to install, benefit from low maintenance costs and will reduce the operational cost of the building. The use of PV in general at this site would provide the following benefits:

- Reducing the buildings electrical energy grid load;
- Simple installation and commissioning;
- Low maintenance; and,
- Reliable, proven technology.

### *Proposed System Details -*

- It is proposed that PV panels will be mounted upon the sloped roofs of the dwellings in tilted arrays and where feasible, orientated due south in order to optimise the operating efficiency of the systems.

Table 4.4 presents the PV capacity required for representative dwellings on the site to help deliver a Building Regulation Part L Approved Document Volume 1 compliant scheme.

*Table 4.4 – PV Capacity Requirement*

| Dwelling Type | PV Specification (kWp) |
|---------------|------------------------|
| Eccleston     | 3.91                   |
| Cromwell      | 3.07                   |
| Bower         | 2.02                   |

### *Land use -*

- There are no land use issues associated with PV technology at this site
- Each house type has sufficient roof area to accommodate the proposed PV arrays

### *Local Planning Issues -*

- There are no planning policy issues associated with this technology.

### *Noise Issues -*

- PV is silent in operation.

### *Whole life cost and lifecycle impact -*

- Current installed costs for PV are approximately £1,500 / kWp installed.
- Additional costs throughout the system's 30-year lifecycle are limited to:
  - Cleaning of the arrays;
  - Potential vandal damage to the arrays; and,
  - Replacement of the DC / AC inverter unit which typically have a lifespan of around 10 years.



## 5. CARBON DIOXIDE EMISSIONS CALCULATIONS

In order to demonstrate the environmental benefits associated with the energy strategy for the proposed houses, approved SAP 10 software has been used to generate representative energy demand models for the development. SAP software calculates the regulated energy demand and associated carbon dioxide emissions in accordance with the requirements of Building Regulations, Part L Approved Document Volume 1 (2021) that this development will be constructed in compliance with.

### 5.1 Regulated Energy Performance Calculations

Representative SAP models have been calculated for representative house type variants to provide a complete data set for all of the residential units within the proposed scheme. The following units have been selected for assessment as they are representative of the entire development in terms of their size, layout, location and orientation:

- Eccleston;
- Cromwell; and,
- Bower

Table 5.1 below presents a summary of the results, which show the dwelling emission rate and energy demand performance associated with the proposed energy strategy for the representative dwellings.

*Table 5.1 – Calculated Regulated Dwelling Emission Rates*

|                                                       | Eccleston   | Cromwell    | Bower       |
|-------------------------------------------------------|-------------|-------------|-------------|
| Dwelling DER (kgCO <sub>2</sub> /m <sup>2</sup> /yr.) | 9.54        | 10.71       | 9.83        |
| Dwelling TER (kgCO <sub>2</sub> /m <sup>2</sup> /yr.) | 9.55        | 10.72       | 9.87        |
| % DER Reduction over AD: Volume 1 (2021)              | <b>0.10</b> | <b>0.09</b> | <b>0.41</b> |
| Dwelling DPER (kWh/m <sup>2</sup> /yr.)               | 49.73       | 55.77       | 51.44       |
| Dwelling TPER (kWh/m <sup>2</sup> /yr.)               | 49.89       | 55.97       | 51.53       |
| % DPER Reduction over AD: Volume 1 (2021)             | <b>0.32</b> | <b>0.36</b> | <b>0.18</b> |
| Dwelling DFEE (kWh/m <sup>2</sup> /yr.)               | 37.57       | 37.07       | 33.16       |
| Dwelling TFEE (kWh/m <sup>2</sup> /yr.)               | 39.82       | 39.05       | 33.94       |
| % DFEE Reduction over AD: Volume 1 (2021)             | <b>5.66</b> | <b>5.06</b> | <b>2.29</b> |

The proposed development has the potential to **secure compliance with the current Part L Approved Document Volume 1 (2021) requirements.**

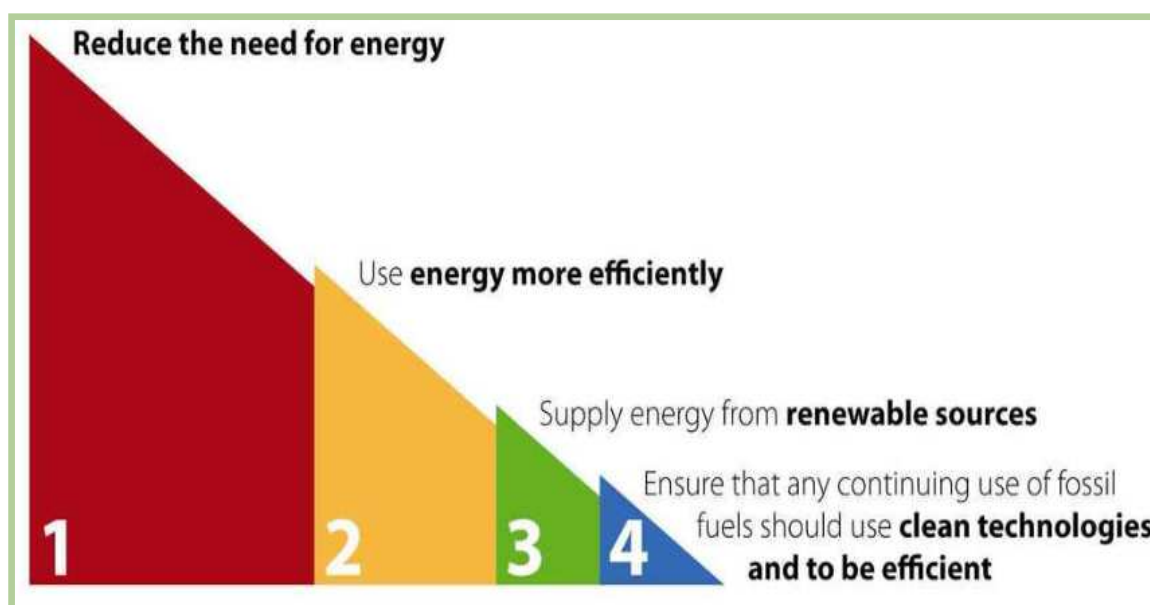


## 5.2 Energy Hierarchy

The scheme will incorporate an enhanced material specification along with high quality design and construction standards in order to improve energy efficiency. The construction, design and specification proposed for this scheme will deliver a building that is inherently efficient and cost-effective during occupation.

The Energy Hierarchy provides a framework to guide energy policy and decision making to achieve practical and cost-effective carbon emission reduction strategies. The hierarchy prioritises demand-side activities to reduce wastage and improve efficiency (see Figure 5.1).

Figure 5.1 – The Energy Hierarchy



### First Principle

The development will benefit from a material and design specification that is aligned with Building Regulation standards and includes numerous efficiency measures designed to reduce heat losses and minimise energy demand, including:

- ✓ High performance u - values;
- ✓ Reduced thermal bridge heat losses; and,
- ✓ Low design air permeability target.

This 'fabric led' approach to minimising energy demand and associated carbon dioxide emissions through the performance of the thermal envelope is aligned with the first principle of the energy hierarchy, which states that reduction in energy demand should be achieved initially by energy efficiency.

### Second Principle

100% low energy and LED lighting provision and sophisticated control systems for the space and water heating will boost the operational efficiency of the dwellings as per the second principle of the Energy Hierarchy.



### Third Principle

PV arrays will be installed on the roofs of the proposed houses as per the third principle of the Energy Hierarchy.

### Fourth Principle

The space and water heating demand of the scheme will be met by the combi boiler systems. This will ensure that fossil fuels consumed for heating purposes will be burnt cleanly and efficiently.



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## 6. CONCLUSION

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This Energy Strategy has reviewed the energy performance of the proposed residential development off New Street, Littleborough against national and local planning policies. The conclusions that can be drawn from the review are as per the following:

- In line with adopted **Local Plan Policies SD1, G1 and G2**, the energy strategy includes an **enhanced material specification**, well beyond the regulatory compliance, combined with efficient servicing. The focus of this development is on reducing the demand for energy, by limiting heat losses through the building fabric;
- The scheme will integrate highly efficient mechanical and electrical systems, including **efficient gas boilers** for both water and space heating, **low energy lighting** and **time and temperature controls**;
- Indicative SAP calculations have been completed and demonstrate that the proposed development **will secure compliance with Building Regulations Part L Volume 1 (2021)**; and,
- The proposed scheme has been demonstrated to be **aligned with the energy efficiency requirements stipulated within the Local Plan**.

The proposals reviewed within this statement for the Land to the West of New Street residential development, Littleborough, will deliver a highly energy efficient and cost-effective scheme, providing a quality development, that accords with the guidance provided within the aforementioned adopted planning policies.

