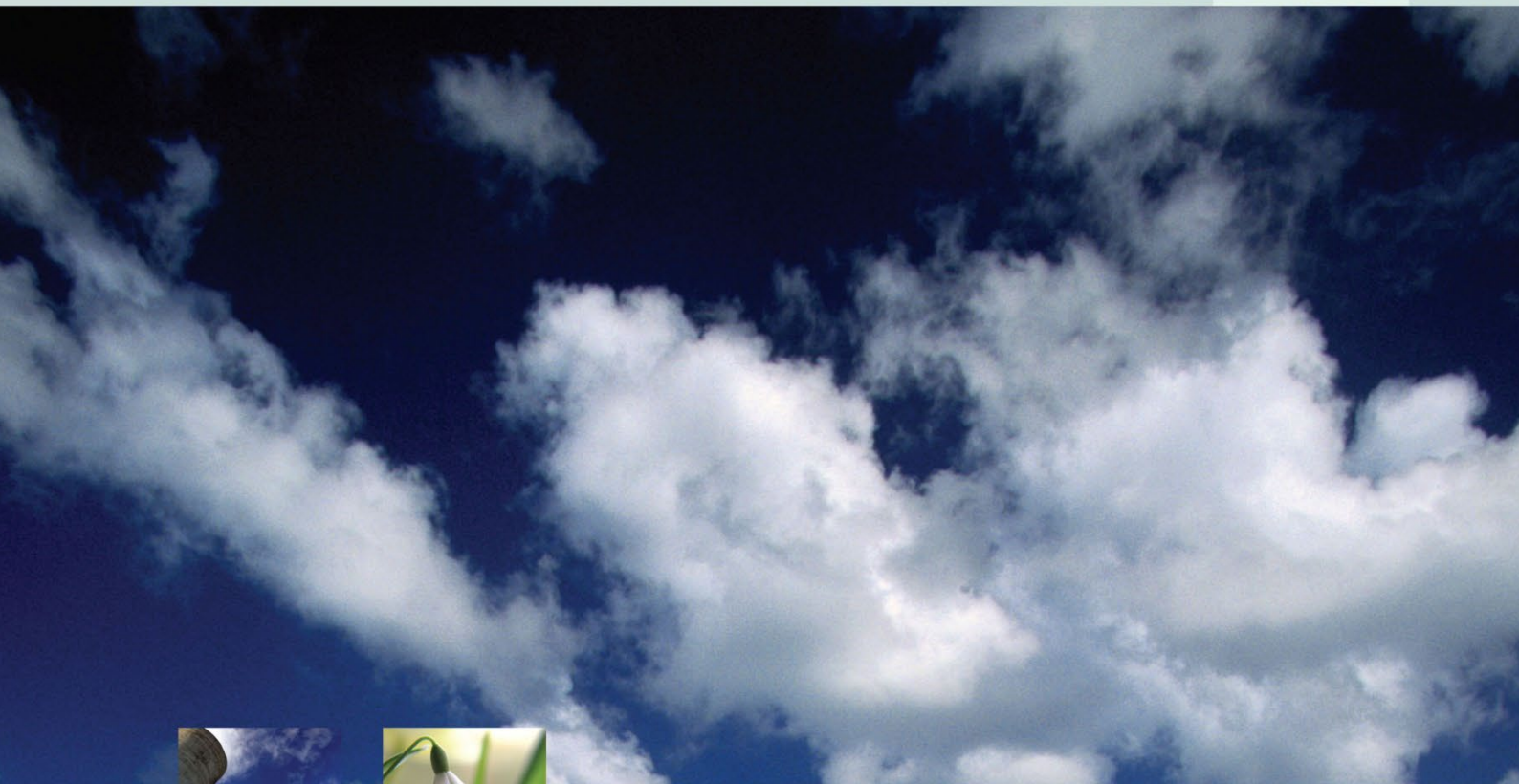


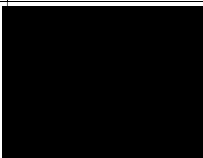
Energy Statement

Land at London Road, Devizes, SN10 2JG

Prepared for:
Highgrove Group (Reading) Limited on behalf of PRZM Real Estate and Aldi Stores Ltd

Date:
February 2026

Project Issue Number:
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1. EXECUTIVE SUMMARY

Sol Environment Ltd ('Sol' hereafter) were engaged by Highgrove Group (Reading) Limited on behalf of PRZM Real Estate and Aldi Stores Ltd ('the Applicant' hereafter) to undertake an assessment of energy use and produce an energy strategy for the proposed new Aldi Foodstore with associated car parking, access, and landscaping on land at London Road, Devizes.

This report has been prepared by Sol Environment Ltd in cooperation with the applicant and in accordance with the following policies and guidance:

- National Planning Policy Framework (Published 2024)
- Building Regulations Part L 2021 (Published 2022)
- Wiltshire Core Strategy (adopted January 2015)

1.1 Energy Strategy Summary

The energy assessment and subsequent strategy has been prepared such that it is aligned with the Energy Hierarchy, with particular focus on sustainable building design (reduction of energy consumption at source), provision of energy efficiency measures, and the installation of building-integrated low and zero carbon (LZC) technologies.

Table 1.1: Proposed Building Design Values

Building Fabric Performance Values		Building Services & Renewable/LZC Technologies	
Walls	0.26 W/m ² K	Heating/Cooling	Air Source Heat Pump System (421% Efficiency)
Roof	0.16 W/m ² K	Lighting	100% LED
Floor	0.16 W/m ² K	Hot Water	Instantaneous Electric DHW (100% efficiency)
Glazing	1.4 W/m ² K	Building Management	BMS with automated controls and monitoring
Doors	1.4 W/m ² K	Renewable/LZC Technology	144kWp roof mounted PV array
Vehicle Access Doors	1.3 W/m ² K		
Air Permeability	5m ³ /(hr.m ²)		'Freeheat' Refrigeration Heat Recovery system

The conclusion of the energy strategy is that, based on planning stage calculations and implementation of the Energy Hierarchy, the proposed development achieves a significant reduction in CO₂ emissions when compared with a Building Regulations Part L (2021) compliant development, hence meeting the requirements of Wiltshire Core Strategy. Compliance with Core Policy 41 requires a Sustainable Energy Strategy to be submitted alongside the planning application to outline the low-carbon strategy and achievement of BREEAM Excellent, which has been determined following an energy modelling exercise.

Where detailed designs are yet to be developed for the Drive Thru unit and EV charging hub (where applicable) on the site to be applied for in Outline, measures are recommended in line with notional Building Regulations Part L

(2021) standards in order to demonstrate compliance with policy requirements. A detailed energy strategy will be developed and provided at the reserved matters stage to confirm compliance.

A summary of the savings in energy and CO₂ emissions based on the energy modelling outcomes for the Aldi Foodstore is detailed in the table below.

Table 1.2: Energy Assessment Results (Aldi Foodstore Only)

Scenario	Energy Demand (kWh / year)	Energy saving achieved (%)	Regulated CO ₂ Emissions (kgCO ₂ / year)	Saving achieved in CO ₂ emissions (%)
2021 Part L Compliant Benchmark Building	117,942	-	10,847	-
Be Lean (improved building fabric and M&E services)	96,802	18	8,881	18
Be Clean	96,802	-	8,881	-
Be Green (addition of RHR system & 144kWp PV array)	-57,792	160	-4,628	152
Total Savings in Energy and Emissions	175,734	149	15,475	143

2. INTRODUCTION

2.1 Background

Sol Environment Ltd ('Sol' hereafter) was engaged by the Applicant to undertake an assessment of energy use and produce an energy strategy for the proposed new Aldi Foodstore with associated car parking, access, and landscaping on land at London Road, Devizes.

This Energy Statement has been formulated to provide a sustainable energy solution for the proposed development in support of a full planning application, and to detail recommendations to improve energy efficiency and reduce carbon emissions.

Proprietary energy demand calculations for the proposed development have been undertaken by Charlie Macknight using approved SBEM modelling software. Charlie is a CIBSE Low Carbon Consultant (Design) and CIBSE Non-Domestic Energy Assessor with over 4 years' experience in undertaking energy assessments and designs of low and zero carbon solutions in the commercial buildings sector, and is employed by Sol Environment i.e., is not professionally connected to a single LZC technology or manufacturer. Part L of the current Building Regulations (2021) has been used as the minimum benchmark standard for this assessment in terms of Primary energy use and regulated carbon emissions associated with heating, lighting, and ventilation.

2.2 Proposed Development

The proposed development shall incorporate the construction of a new Aldi Foodstore (GIA 1,787m²), with associated car parking, access, and landscaping, which shall be applied for in Full Detail, as well as the construction of a new Drive Thru unit and EV charging hub, which shall be applied for in Outline. comprises a new Aldi Foodstore with associated car parking, access, and landscaping.

A site plan showing the proposed development is provided overleaf.

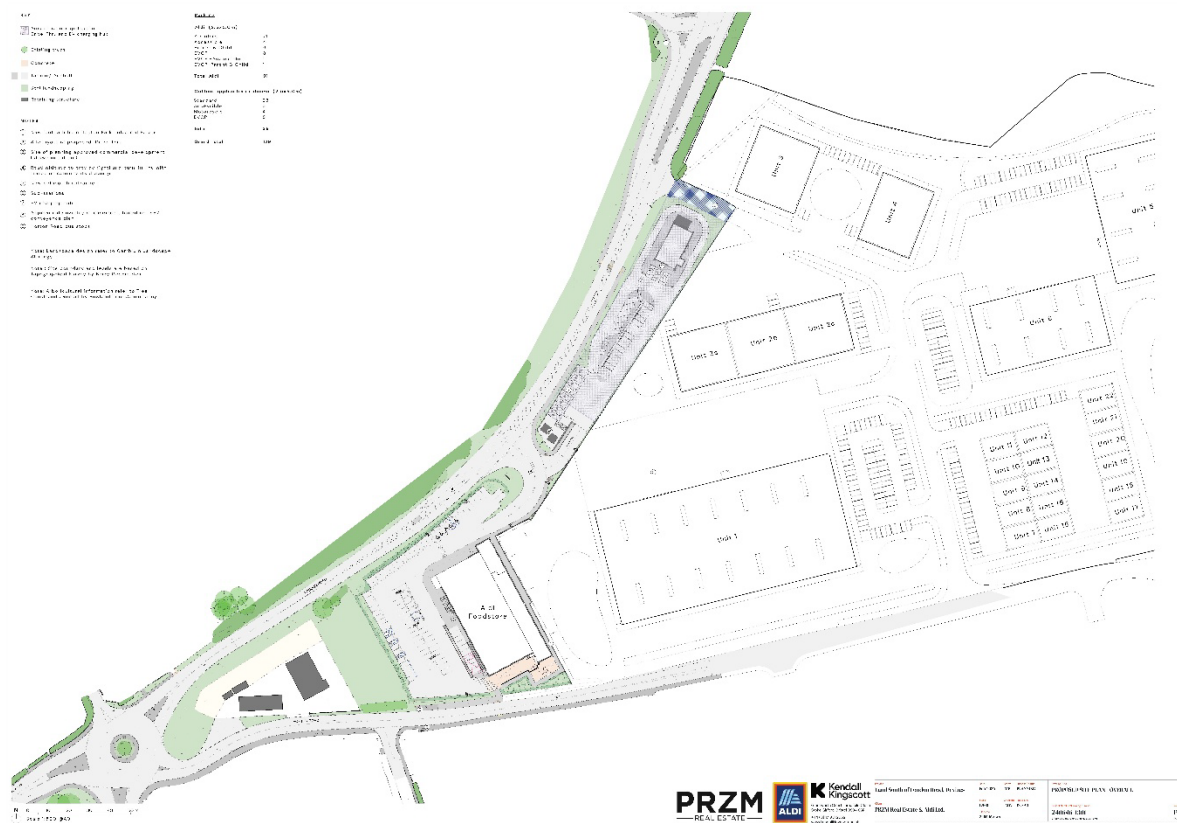


Fig 2.1: Proposed Site Plan prepared by Kendall Kingscott

3. POLICY

This energy statement has been prepared for the development to show how the proposed scheme is compliant with the current relevant national and local policies and guidance as detailed within this section. Where relevant, these policies have informed the Energy Statement and subsequent strategy.

3.1 National Policy

The following policies at a national level are considered to be relevant to the development.

3.1.1 National Planning Policy Framework (December 2024)

The National Planning Policy Framework ('NPPF') sets out the Government's planning policies for England and how they are expected to be applied. It sets out a framework that aims to achieve sustainable development throughout the planning system with three overarching objectives – economic, social and environmental.

At the heart of the NPPF is a 'presumption in favour of sustainable development', which requires Local Authorities as part of any plan-making or decision-making, to provide clear guidance on how the presumption should be applied locally.

The NPPF sets out how to deliver sustainable development under 17 subheadings. Subheading 14 of the NPPF outlines how the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

3.1.2 Building Regulations Part L (2021)

Part L of the Building Regulations in England sets the standards for the energy performance of new and existing buildings and includes the specification of both minimum (benchmark) and notional (best practice) performance standards relating to building fabric, HVAC, and lighting.

The previous Building Regulations Part L (2013) was updated in July 2022 following the Future Building Standards consultation document published by the government in January 2021. This document set out the changes to regulations as a step towards the aim to deliver Zero Carbon ready buildings.

Local planning policies typically refer to Part L standards in order to set a minimum percentage improvement beyond the Part L benchmark in relation to carbon emissions. The recent changes to Part L require all new (non-residential) developments to produce around 27% less carbon emissions than was previously acceptable by Part L 2013 minimum standards. Additionally, a new metric must now be achieved related to Primary Energy Rate (TPER), measured in kWh/m²/year.

3.2 Local & Regional Policy

Local policies include the Wiltshire Core Strategy, adopted January 2015.

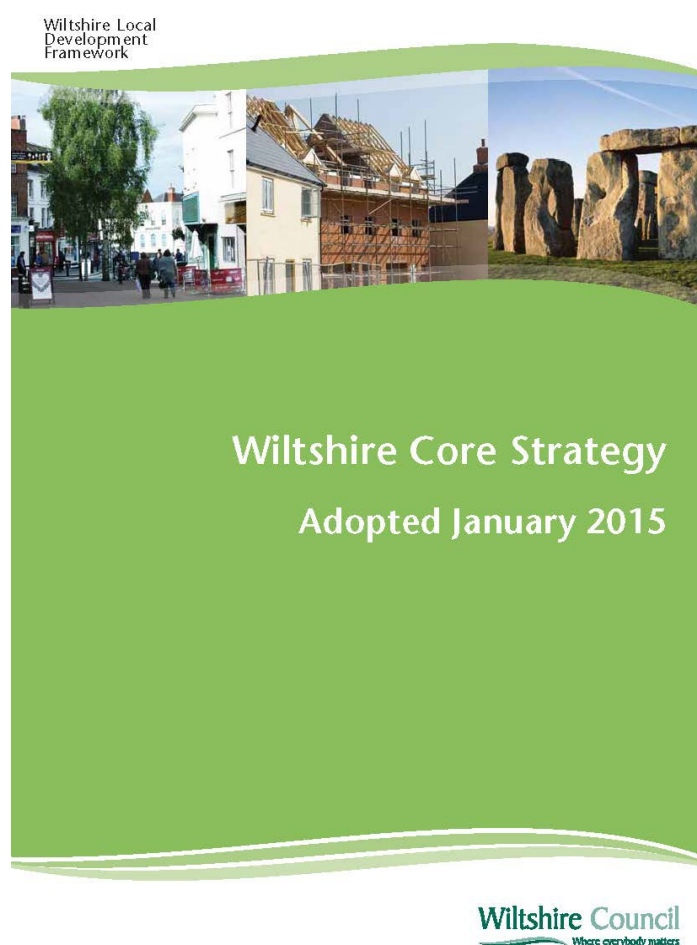


Fig 3.1: Local Plan Cover Sheet

3.2.1 Wiltshire Core Strategy (adopted January 2025)

Core Policy 41 - Sustainable construction and low-carbon energy

Climate change adaptation

New development, building conversions, refurbishments and extensions will be encouraged to incorporate design measures to reduce energy demand. Development will be well insulated and designed to take advantage of natural light and heat from the sun and use natural air movement for ventilation, whilst maximising cooling in the summer.

Sustainable construction

New homes (excluding extensions and conversions) will be required to achieve at least Level 4 (in full) of the Code for Sustainable Homes⁸⁶. Conversions of property to residential use will not be permitted unless BREEAM's Homes "Very Good" standards are achieved. All non-residential development will be required to achieve the relevant BREEAM "Very Good" standards, rising to the relevant BREEAM "Excellent" standards from 2019.

Existing buildings

Retrofitting measures to improve the energy performance of existing buildings will be encouraged in accordance with the following hierarchy:

- i. Reduce energy consumption through energy efficiency measures
- ii. Use renewable or low-carbon energy from a local/district source
- iii. Use building-integrated renewable or low-carbon technologies.

Opportunities should be sought to facilitate carbon reduction through retrofitting at whole street or neighbourhood scales to reduce individual costs, improve viability and support coordinated programmes for improvement.

Renewable and low-carbon energy

All proposals for major development will be required to submit a Sustainable Energy Strategy alongside the planning application outlining the low-carbon strategy for the proposal.

In all cases, including those listed above, proposals relating to historic buildings listed buildings and buildings within conservation areas and world heritage sites should ensure that appropriate sensitive approaches and materials are used. Safeguarding of the significance of heritage assets should be in accordance with appropriate national policy and established best practise.

In all cases the impact of these requirements on the viability of development will be taken into consideration.

3.3 Policy Review

A summary of the policy drivers relevant to energy use and carbon emissions for the proposed development are as follows:

- Achievement of BREEAM Excellent
- Sustainable Energy Strategy to outline the low carbon strategy

This report shall demonstrate compliance with the above policy requirements, where feasible. A Sustainable Design Statement and BREEAM Pre-Assessment report will be submitted with the planning application to cover the relevant policy requirements.

As part of the BREEAM Assessment, a Life Cycle Assessment is being undertaken to establish the embodied carbon of the proposed development. In order to establish Whole Life Cycle Carbon emissions, detailed embodied carbon and advanced energy modelling is required, which are not able to be conducted until detailed designs have been developed during RIBA Stage 4. Therefore, a Whole Life Cycle Carbon Assessment has not been prepared to support this application. Additionally, as part of the BREEAM assessment, the design team is required to provide building users with a technical and non-technical guide to ensure the building's systems are operated effectively and efficiently. The building user guide will therefore not be included within this report.

4. METHODOLOGY

4.1 The Energy Hierarchy

The Energy Hierarchy adopts a set of principles to guide design development and decisions regarding energy, balanced with the need to optimise environmental and economic benefits. The Hierarchy, which is a widely accepted approach amongst many Local & County Councils, seeks to ensure that development incorporate energy efficiency through the approach outlined in Figure 4.1.



Fig 4.1: The Energy Hierarchy

It is considered that the Energy Hierarchy principles for carbon reduction form the most appropriate approach from both a practical and financial perspective. The industry is broadly in agreement that energy efficiency and low carbon technologies have the greatest impact in offsetting CO₂ emissions. Therefore, it is logical to encourage enhanced mitigation through energy efficiency and low carbon technologies in the first instance, as opposed to applying renewables as a first option at a significantly greater cost.

4.1.1 Be Lean

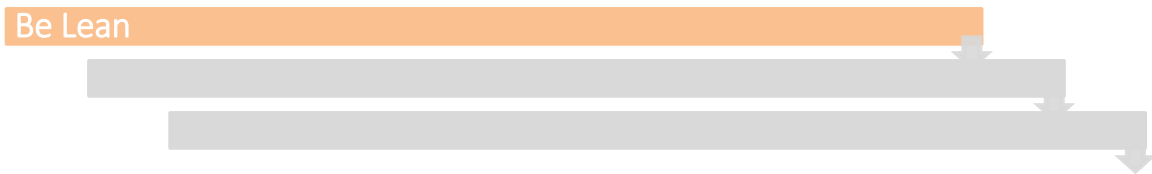


Fig 4.2: The Energy Hierarchy – Be Lean

The first measure within the Energy Hierarchy is aimed at using less energy and managing energy demand during operation through enhanced building fabric and services performance, and the incorporation of flexibility measures.

It is stated within Part L of the 2021 Building Regulations that *‘measures to make the building energy efficient must be incorporated within the scheme design’*. Typically, passive design and energy efficiency measures can ensure Building Regulations minimum standards are achieved in new build projects.

Passive design measures manage internal heating through solar gain and as such, reduce heating and cooling loads. Therefore, buildings that are aligned in a north-south orientation are observed to maximise daylight and sunlight (i.e., solar gain), subsequently reducing energy consumption associated with excessive heating and lighting requirements.

4.1.2 Be Clean



Fig 4.3: The Energy Hierarchy – Be Clean

The 'Be Clean' stage of the Energy Hierarchy is aimed at ensuring an efficient and clean source of heat and power is supplied to developments, which typically relates to local sources on a decentralised network. This supports a more effective and efficient use of energy by reducing primary energy demand and minimising the amount of energy that is ultimately wasted within the network.

Most commonly, this step of the Energy Hierarchy can be achieved through installation of Combined Heat and Power (CHP) units or connection to a Decentralised Energy Network (DEN). CHP generates both heat and power efficiently and can be supplied to individual buildings or a network. A DEN is a way of distributing the heat energy generated from a range of sources and offers an efficient and competitive solution for heating buildings in urban areas with high heat density, providing the added benefit of enabling the use of secondary energy or waste heat sources.

4.1.3 Be Green

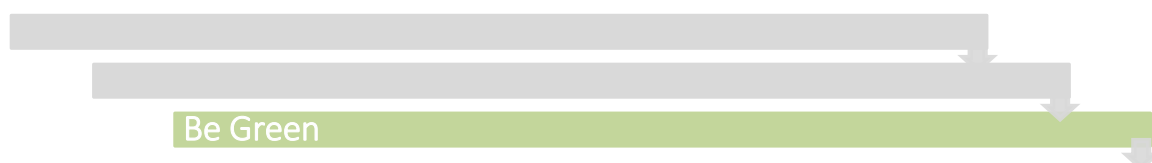


Fig 4.4: The Energy Hierarchy – Be Green

Once energy demand has been reduced as far as possible, the feasibility of on-site renewable energy generation should be considered. Priority should be given to renewable energy technologies with no polluting emissions i.e., electric heat pumps or Solar PV. Opportunities should be maximised for producing, storing, and using renewable energy on-site.

4.2 Energy Modelling

To determine compliance with policy requirements, a baseline modelling and assessment exercise was undertaken for the Aldi Foodstore using DesignBuilder SBEM modelling software. Proprietary energy demand calculations were prepared using Building Regulations Part L (2021) to define the minimum benchmark standard for the assessment for regulated energy and associated CO₂ emissions (heating, lighting, and ventilation).

Upon calculation of a baseline, a remodelling exercise was then performed to account for the various stages of the Energy Hierarchy and subsequently demonstrate a reduction in energy use and CO₂ emissions for the proposed development.

As the calculations are based on assumptions, figures are indicative only, and changes may occur during detailed design. This includes, but is not limited to, building air-tightness which will require verification through an air permeability test, the auxiliary load which may be significantly reduced when specification of items such as presence detection (PIR) sensors are finalised, and building services efficiencies and specifications.

It is not possible to conduct energy modelling for the areas of the site to be applied for in Outline, therefore recommendations have been made in line with notional Building Regulations Part L (2021) requirements, and informed by the energy strategy prepared for the Aldi Foodstore.

4.3 BREEAM

BREEAM is the world's first and leading sustainability assessment and certification scheme for the built environment. It is an international standard that is locally adapted, operated and applied to developments. Through its application, BREEAM recognises and reflects the value in higher performing assets and aims to inspire and empower change by rewarding and motivating sustainability across the life cycle of master-planning projects, infrastructure and buildings.

The proposed development will be assessed under the BREEAM UK New Construction V6 scheme with a targeted rating of BREEAM 'Excellent'. In order to achieve this rating, the design team will be required to meet a number of credits across all 9 categories (Management, Health and Wellbeing, Energy, etc.). This report will outline features and measures that have been considered and implemented within the design in order to achieve credits under ENE01 and ENE04, under the Energy category as set out below.

4.3.1 ENE01 - Reduction of energy use and carbon emissions

The aim of this assessment issue is to minimise operational energy demand, primary energy consumption and CO₂ emissions. This issue is split into 2 parts: Energy performance (9 credits) and Prediction of operation energy consumption (4 credits). This energy statement will cover the first part of this issue, Energy Performance, outlining the number of credits achievable by the proposed development at design stage.

In order to determine the number of credits achievable by the development the Energy Performance Ratio (EPR) is calculated within BREEAM projects and compared with the BREEAM benchmarks for corresponding credits. The higher the EPR the more credits the development can achieve up to 8 credits. The 9th credit is awarded when the EPR is greater than 0.9 and net zero regulated CO₂-eq emissions is achieved.

4.3.2 ENE04 – Low Carbon Design

This issue aims to encourage the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimise reliance on active building services systems. The assessment criteria is split into two parts: Passive Design (two credits) and Low Carbon Technologies (1 credit). Section 5.2 of this report will highlight features and measures used within the development which demonstrate compliance with the criteria.

In order to achieve Passive Design credits, analysis of the development must be undertaken during concept design stage to identify opportunities for implementation within the design. This report includes a Passive Design Analysis, and has been developed in support of the planning application, and therefore lies within RIBA Stage 2 (Concept Design Stage). Passive design measures implemented within the development must reduce the total heating, cooling,

mechanical ventilation, lighting loads and energy consumption of the development. As a minimum, the passive design analysis should cover:

1. Site location
2. Site weather
3. Microclimate
4. Building layout
5. Building orientation
6. Building form
7. Building fabric
8. Thermal mass or other fabric thermal storage
9. Building occupancy type
10. Daylighting strategy
11. Ventilation strategy
12. Adaptation to climate change.

A second credit can be achieved if a Free Cooling Analysis is conducted. The free cooling analysis should demonstrate consideration of appropriate technologies from the following:

1. Night-time cooling (which could include the use of a high exposed thermal mass)
2. Ground coupled air cooling
3. Displacement ventilation (not linked to any active cooling system)
4. Ground water cooling
5. Surface water cooling
6. Evaporative cooling, direct or indirect
7. Desiccant dehumidification and evaporative cooling, using waste heat
8. Absorption cooling, using waste heat
9. The building does not require any significant form of active cooling or mechanical ventilation (i.e. naturally ventilated).

The Low and Zero Carbon technologies (LZC) credits can be achieved when a feasibility study is undertaken on the development before end of concept design stage. This report includes an LZC Feasibility Study, and has been developed in support of the planning application, and therefore lies within RIBA Stage 2 (Concept Design Stage). The outcomes of this study should influence the chosen LZC technologies strategy for the development and indicate a reduction in regulated carbon emissions. A compliant LZC feasibility study for BREEAM must ensure the following minimum requirements are covered:

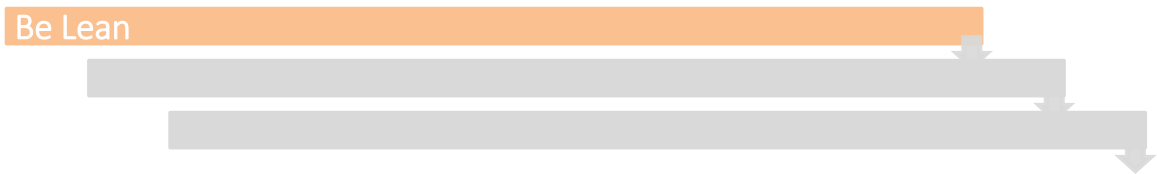
1. Energy generated from LZC energy source per year
2. Carbon dioxide savings from LZC energy source per year
3. Life cycle cost of the potential specification, accounting for payback
4. Local planning criteria, including land use and noise
5. Feasibility of exporting heat or electricity from the system
6. Any available grants
7. All technologies appropriate to the site and energy demand of the development
8. Reasons for excluding other technologies

9. If appropriate:
 - a. The building is connected to an existing local community CHP system or
 - b. the building is connected to an existing source of waste heat or power OR
 - c. a building or site CHP system is specified with the potential to export excess heat or power via a local community energy scheme or
 - d. a source of waste heat or power is specified with the potential to export excess heat or power via a local community energy scheme
10. Energy storage.

5. RESULTS

5.1 The Energy Hierarchy

5.1.1 Be Lean



The measures in this section are prioritised to ensure that energy demand is reduced through enhanced building fabric and services performance, and the incorporation of flexibility measures.

In summary, the Aldi Foodstore will be designed to utilise a well-insulated and air tight building fabric, high efficient internal lighting, limit excessive solar gains through massing and location of internal facilities, and use an Air Source Heat Pump system for heating & cooling to achieve a CO₂ emissions reduction of **18%**, therefore demonstrating compliance with Core Policy 41 of the Wiltshire Core Strategy as per the policy review in section 3.3 of this report.

An integrated building management and monitoring system will be installed to ensure that operational energy data is readily available and building systems control is automated, aiming to eliminate the performance gap of the development and conserve energy use.

It is recommended that the units on the site to be applied for in Outline also follow the design strategies detailed within this section.

Table 5.1 below details the ‘Be Lean’ design strategies for the proposed development associated with this stage of the energy hierarchy

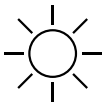
Table 5.1: Passive Design Measures and Energy Efficiency	
Site Features 	Site Location The site is located on London Road, Devizes, Wiltshire. Site Weather To ensure accuracy of energy modelling, the weather location file for <u>SWINDON</u> has been used in accordance with convention 2.04 SBEM Weather Locations of the ‘Non-Domestic Conventions for England & Wales Issue 7.1’ Microclimate There are no considerations with regards to microclimate (such as significant overshadowing or large waterbodies) that would prevent any passive design measures from being implemented.

Table 5.1: Passive Design Measures and Energy Efficiency

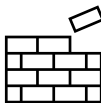
Passive Design Principles 	Building Form Aldi Foodstores typically follow a standardised design, and although the general building form is predetermined as a result, there are still a number of benefits of this design. The large amount of glazing around the retail area on the western facades is protected by a large, fixed canopy to provide shading from excessive solar gains, while maximising natural light levels. Building Layout The layout of the building shall provide some minor benefits in relation to the solar orientation of internal facilities. Longer term occupied building areas including welfare spaces are located to the east of the building with some glazing assisting solar gain. All areas of the site subject to refrigeration are inset, so as to avoid unwanted (and detrimental) solar heating. Minimising Overshadowing Where no restrictions apply due to internal site layout, areas that do not require conditioning or mechanical heating shall be located to the north of the building. Therefore, maximising the utilisation of solar gain with minimal overshadowing and subsequently lowering residual energy consumption. Building Orientation Where orientation provides favourable conditions and no physical restrictions are provided by surrounding buildings, the glazing ratios within the development shall be designed such that the potential for solar gain is maximised.																										
Building Fabric 	Fabric Performance Consideration will be given to design the envelopes of the development to utilise materials that not only provide high insulation values, but also have high thermal mass. The Part L notional fabric values and proposed fabric values for the Aldi Foodstore are summarised below: U-Values – New Building Fabric Elements <table><tr><th rowspan="2">Component</th><th colspan="2">U-Value (W/m²k)</th></tr><tr><th>Part L Limiting Value</th><th>Proposed Value</th></tr><tr><td>Walls</td><td>0.26</td><td>0.26</td></tr><tr><td>Roof</td><td>0.18</td><td>0.16</td></tr><tr><td>Floor</td><td>0.18</td><td>0.16</td></tr><tr><td>Doors</td><td>1.6</td><td>1.4</td></tr><tr><td>Windows</td><td>1.6</td><td>1.4</td></tr><tr><td>High Use Entrance Doors</td><td>1.6</td><td>1.3</td></tr><tr><td>Vehicle Access Doors</td><td>1.3</td><td>1.3</td></tr></table> Air Permeability The elements of the building shall endeavour not to exceed a maximum air permeability of 5m³/(hr.m²)*, which can be achieved through the following measures:	Component	U-Value (W/m²k)		Part L Limiting Value	Proposed Value	Walls	0.26	0.26	Roof	0.18	0.16	Floor	0.18	0.16	Doors	1.6	1.4	Windows	1.6	1.4	High Use Entrance Doors	1.6	1.3	Vehicle Access Doors	1.3	1.3
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High Use Entrance Doors	1.6	1.3																									
Vehicle Access Doors	1.3	1.3																									

Table 5.1: Passive Design Measures and Energy Efficiency

	• Adequate sealing between openings/windows and panels • Adequate sealing of ceiling-to-wall joints • Provision of a continuous air barrier over ceiling areas and adequate sealing of service ducts and penetrations • High specification openings • Where a brick/block construction is specified, the application of wet plastering / parging / dry lining will be required. <i>*Part L limiting Air Permeability rate is 8m³/(hr.m²)</i> Thermal Bridging A thermal bridge (sometimes referred to as cold bridge) is an area of construction which has higher heat transfer than the surrounding materials. It typically occurs where there is a break in insulation, less insulation or insulation is penetrated by an element or material with higher thermal conductivity (such as a metal cladding bracket). Where these thermal bridges occur, there is additional heat loss from the fabric resulting in increased heating requirements and in some cases result in surface condensation. Careful and simplified construction details are required to ensure the junctions do not create unnecessary heat loss paths. Thermal bridges are potentially one of the main sources of unquantified thermal losses in low energy buildings. Accredited construction details will therefore be followed in order to minimise the impact of thermal bridges. Thermal Mass High thermal mass can help to moderate indoor temperature fluctuations by absorbing heat during the day to release when temperatures drop. This works vice versa to absorb cold during the night for release the next day to cool the internal space. The proposed development will benefit from the effects of thermal mass from the concrete floor slab, which is exposed in some areas of the development.
Building Use Characteristics 	Occupancy The high footfall expected for the proposed development has resulted in some design measures to improve energy efficiency. An entrance lobby with double doors is to be provided which reduces heat losses or gains through frequently used doors and acts as a buffer zone without the need for mechanical ventilation systems. Intermittent-use building areas will conserve energy with PIR and occupancy sensing controls, linked to lighting and ventilation systems. A building management system (BMS) shall be fitted and integrated with AMR energy display devices for the provision of half hourly energy consumption data. The BMS will also provide simple and automated control of building systems including lighting, heating, and ventilation, in order to minimise excessive energy use and reduce the performance gap.

Table 5.1: Passive Design Measures and Energy Efficiency

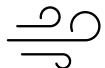
Daylight and Lighting 	Daylighting Designs shall ensure a balance between the potential for excessive solar gain and the benefit of transmittance of natural light through openings. Low-emissivity glazing shall be considered to limit solar gain without reducing the amount of natural light entering the development, thus reducing the reliance on artificial lighting systems. Solar Gain The large, fixed canopy around the retail area glazing on the western elevation will protect the building from excessive solar gains. Internal Lighting Specifying highly efficient lighting systems throughout will reduce energy consumption at source and reduce the heat output from luminaires, which as a result, will lower energy use associated with cooling systems. Lighting controls such as presence detection and daylighting sensors will limit unnecessary use and shall at least be provided in zones with intermittent use characteristics. Internal lighting for the new building shall achieve the initial luminous efficacy as detailed in the table below: <table><tr><th rowspan="2">Lighting</th><th colspan="2">Luminous Efficiency (Lumens / Circuit Watt)</th></tr><tr><th>Part L Notional Value</th><th>Proposed Value</th></tr><tr><td>General</td><td>95</td><td>110*</td></tr><tr><td>Display</td><td>80</td><td>110</td></tr></table> <i>*Note: the retail area specification is 139 lumens/circuit Watt.</i>	Lighting	Luminous Efficiency (Lumens / Circuit Watt)		Part L Notional Value	Proposed Value	General	95	110*	Display	80	110
Lighting	Luminous Efficiency (Lumens / Circuit Watt)											
	Part L Notional Value	Proposed Value										
General	95	110*										
Display	80	110										
Ventilation 	Natural Ventilation Natural ventilation strategies tend to use significantly less energy than mechanical ventilation systems, however due to the depth of the building’s footprint, it is unlikely to provide an effective solution and would likely compromise internal air quality and thermal comfort. Mechanical Ventilation To maintain good indoor air quality while supporting energy efficiency, mechanical ventilation systems will be specified in line with Part L 2021 requirements, using high efficiency fans and low specific fan powers. The manager’s office and retail area will benefit from a balanced mechanical supply and extract system. WCs and other staff facilities will use mechanical extract only linked to occupancy sensing, to keep energy use down with only intermittent use of these spaces.											

Table 5.1: Passive Design Measures and Energy Efficiency

	Where feasible, passive design principles such as zoning, thermal mass, and strategic window placement will support natural or hybrid ventilation.
Space Heating 	Heating System The development will be serviced by an Air Source Heat Pump (ASHP) system, selected for high efficiency characteristics and the use of electricity to deliver a lower carbon heat than fossil fuel alternatives. The ASHP will feed an underfloor heating system, offering improved thermal comfort through radiant heat while allowing for lower operating temperatures. The system is specified with a COP of at least 4.0. Passive building design measures following the energy hierarchy, including good thermal insulation, appropriate glazing ratios, exposed thermal mass, and air tightness, will ensure that heating demand is reduced.
Domestic Hot Water 	Domestic Hot Water Due to the low water demand of the development, point of use electric water heaters with a COP of 100% have been selected. A system of this type is able to deliver hot water directly without suffering energy losses associated with centralised hot water storage or distribution pipework.
Cooling 	Cooling Hierarchy The cooling hierarchy guides the design process to ensure that cooling demand is addressed in the most energy-efficient way. The hierarchy prioritises passive and low-energy measures before resorting to mechanical or active systems, summarised as follows: • Minimise internal heat generation (i.e. reduce the demand for cooling) • Reduce the heat entering the building in summer • Manage heat within the building • Passive ventilation • Mechanical ventilation • Active cooling systems (Include use of FCU's / Comfort cooling) In accordance with this hierarchy, the proposed development incorporates several passive design features to reduce the need for active cooling: • A high thermal mass concrete floor slab is used to absorb and store excess internal heat during the day when the store is occupied, helping to reduce cooling loads. • A fixed canopy over the retail area glazing on the western facades significantly limits solar gain, particularly in the summer months. • Glazing is specified with lower solar transmission to balance daylight and heat gain. • Efficient LED lighting is specified to limit heat gains. • Waste heat from the store's refrigerated cases is recovered for use in the store's heating system, preventing unwanted internal heat build-up.

Table 5.1: Passive Design Measures and Energy Efficiency

	Cooling System Residual cooling demands are able to be met using the building's ASHP system. Cooling is also delivered via an underfloor cooling network, supporting thermal comfort in areas with high heat gains. The system operates with a high COP of 4.6, ensuring energy efficiency.
Adaptation to Climate Change >>>	Overheating Risk The store's fixed canopy around the entrance lobby and retail area glazing shall support in reducing solar gains and the risk of overheating. Heating and cooling to the building's internal spaces is zoned to allow for greater control and prevent unnecessary operation in underused areas of the building. Optimising Solar Gains The entrance lobby to the store on the south-west elevation will allow for beneficial solar gains during winter-months, and is protected during summer-months with a large, fixed canopy. Thermal Mass The building's design features a concrete floor slab which is exposed in the majority of building areas to provide the benefits of thermal mass. Blockwork walls are also used for wall build ups to help moderate internal temperatures. Building Adaptability The building's services feature modular design and will be installed in an external plant compound, allowing systems to be easily upgraded in the future if required to respond to the needs of climate change. The building's cladding system on the external walls and roof is designed to support the building's heating and cooling systems to maintain indoor thermal comfort, and can be easily removed and adapted in the future if the building is altered for different uses. A PV array has been specified on the roof and is sized appropriately for the current needs of the development. This system has the potential to be upgraded in the future if necessary to benefit from technology improvements or higher building energy demand from higher cooling needs.

Following implementation of the strategy detailed in Table 5.1 above for the proposed Aldi Foodstore, savings in carbon emissions are shown in a graphical representation of the emissions reduction associated with the first stage of the Energy Hierarchy is provided in Figure 5.1 below. As it is not yet possible to conduct an energy modelling exercise for the units on site to be applied for in Outline, it is not yet known the predicted savings in energy use and carbon emissions through applying the measures outlined above

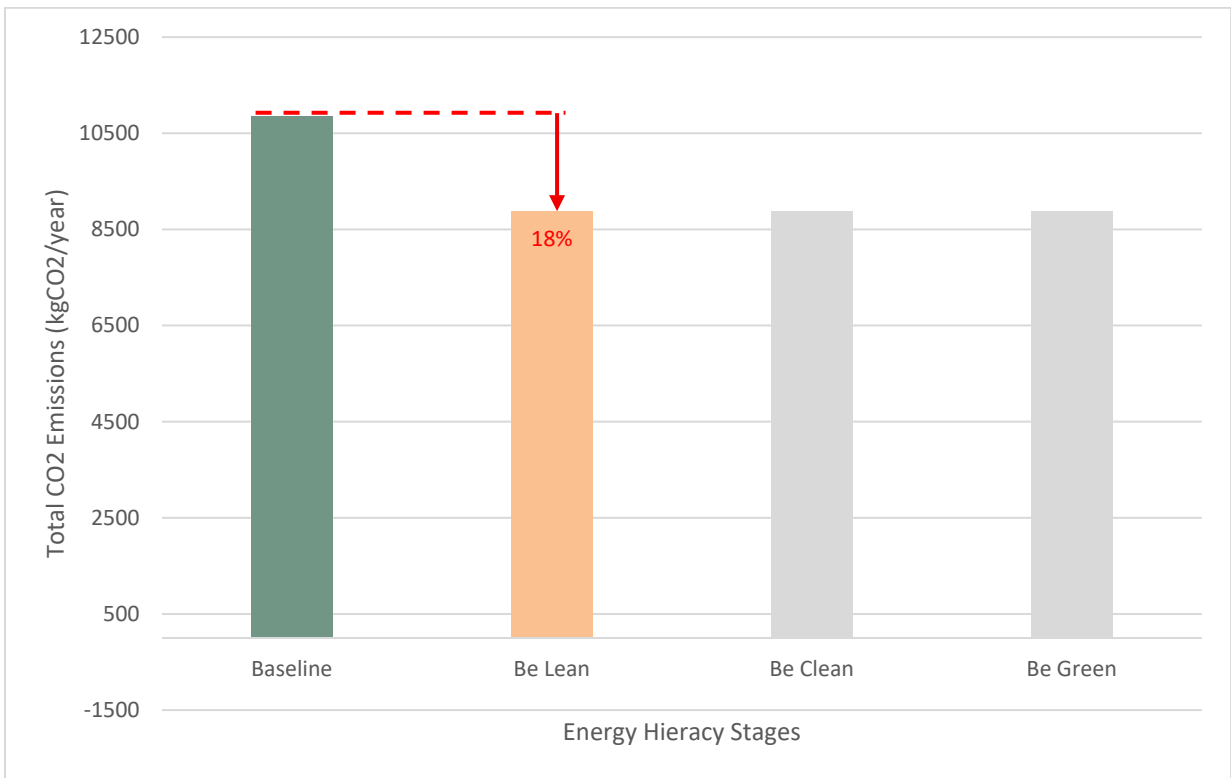
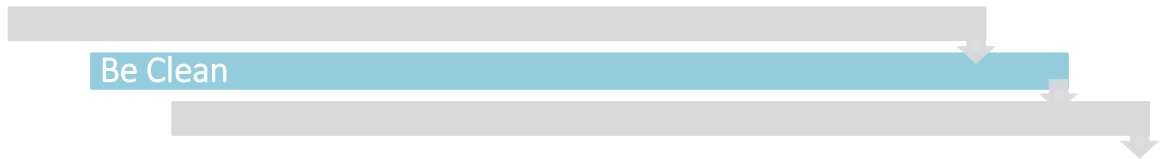


Fig 5.1: Be Lean CO₂ emissions reduction.

5.1.2 Be Clean



The feasibility of incorporating clean infrastructure and energy supply measures into the proposed development has been reviewed to determine if measures can be implemented to lead to potential savings in CO₂ emissions.

The results of the feasibility assessment are detailed in Table 5.2 below.

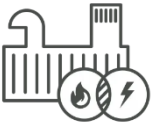
Table 5.2: Clean Energy Infrastructure Measures	
 Combined Heat and Power	Combined Heat and Power (CHP) comprises the combination of the generation of electricity for general consumption, with the recovery of exhausted heat energy (otherwise emitted from power stations/generators as waste heat) which can be used to provide heating for domestic and industrial processes. CHP plants are typically 75% - 80% efficient, significantly more than a typical oil/gas fired power station (35% - 45% efficient), even when used in combination with fossil fuels such as gas and diesel. In addition, transmission losses (typically 5% when consuming grid electricity) are minimised by on-site generation and, as such, gas-fired CHP presents an opportunity to deliver cleaner energy than is available from the National Grid.

Table 5.2: Clean Energy Infrastructure Measures

	Feasibility for this development The specification of CHP would lead to a reliance on non-renewable fuel sources as the sites limited footprint is unlikely to allow for suitable storage of biofuels. As such, CHP has been discounted from the assessment.
 Decentralised Energy Networks	Decentralised Energy Networks (DEN) are networks where energy is generated off the main grid, closer to the site of energy consumption. This can include energy from waste plants, combined heat and power, district heating and cooling, and geothermal, biomass, or solar energy. Feasibility for this development The latest heat network maps confirm there are not any decentralised energy networks in proximity to the site, nor are there any planned networks to support this application. Therefore, Decentralised Energy Networks are not a feasible source of clean energy for the development.

There are therefore no savings in carbon emissions attributable to this stage of the Energy Hierarchy, as detailed in figure 5.2 below. It is expected the units to be applied for in Outline will also be unable to apply either CHP or DHN technologies, and the change in emissions applied at this stage of the Energy Hierarchy is likely to be consistent with the proposed Aldi Foodstore.

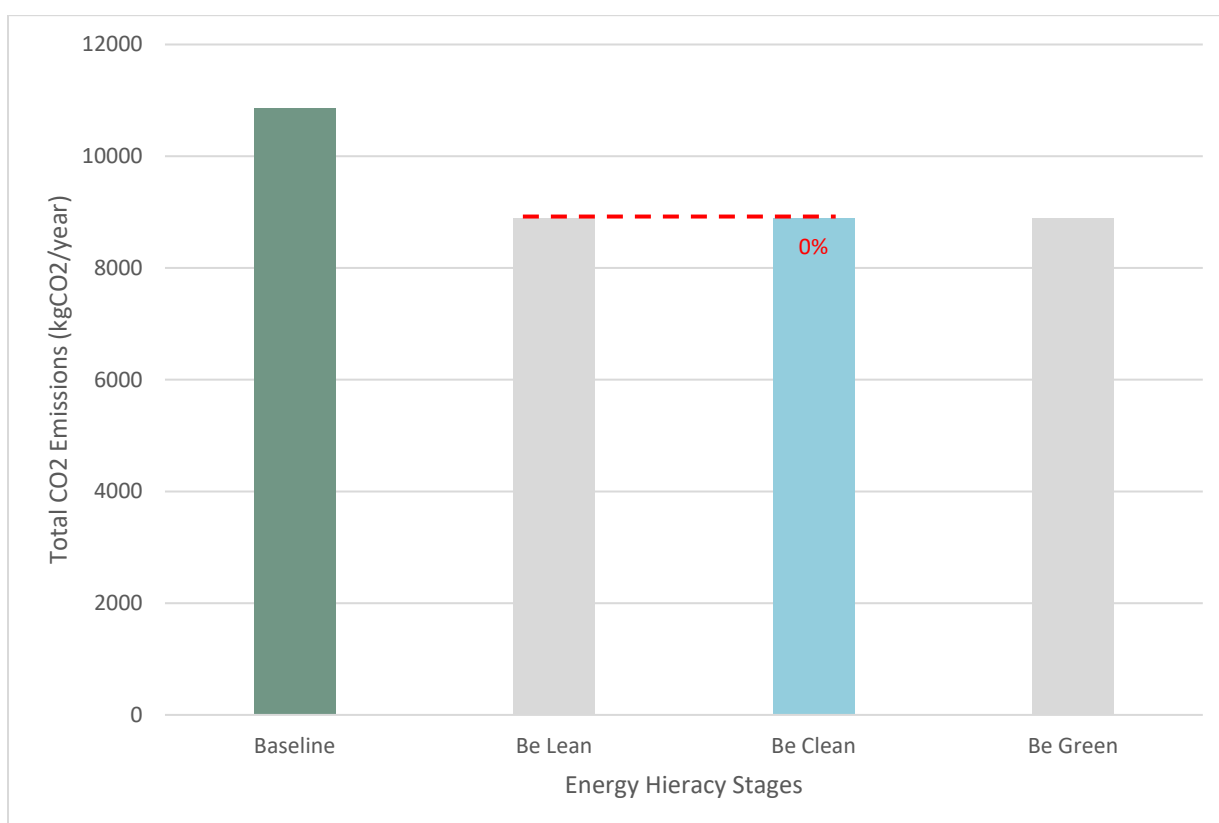
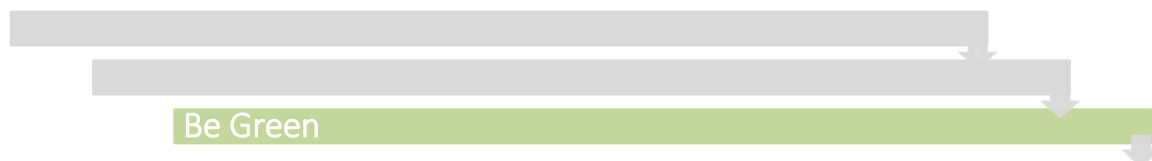


Fig 5.2: Be Clean CO₂ emissions reduction.

5.1.3 Be Green



A high-level feasibility study has been conducted to ascertain the viability of appropriate renewable and low zero carbon technologies based on the proposed developments energy demand, location, and features of the site including ground conditions and provision of space.

Where measures are proposed for the Aldi Foodstore, it is recommended that this approach is also followed for the units to be applied for in Outline depending on scale and sizing requirements following a detailed energy modelling approach to be conducted as part of the Reserved Matters application.

Table 5.3: Renewable and LZC Feasibility Study

 Solar Thermal Heating / Hot Water	Solar thermal panels are typically used in order to provide supplementary heat for the purposes of space heating or domestic hot water (DHW). These systems consist of solar collectors, a pump, a control unit, connecting pipes, hot water tank, and a conventional heat source (gas / oil fired boiler). The collectors are usually mounted on the roof and provide heat to a fluid circulated between the collectors and a water storage tank. The efficiency of solar collector panels depends on a number of factors, including the type of collector, correct installation, location, and orientation. Installing solar thermal heating panels could reduce energy consumption and carbon impacts through significant reductions in gas / oil supply. A well-designed system should satisfy 70-80% of the hot water demand in the summer and 20-30% in the winter. Typically, solar collectors would produce approximately 5-600kWh/m² of hot water. Evacuated tube systems are about 30% more efficient but have a corresponding increased capital outlay. A collector area of 4-5m² will normally save approximately 230Kg of CO₂ emissions per year.
	Feasibility for this development The provision of supplementary DHW heating via the installation of a solar thermal system is not considered suitable for this development due to the very limited domestic hot water requirement.
 Ground Source Heat Pumps	Ground Source Heat Pumps (GSHPs) operate by the removal of residual heat from the ground by using various 'loops' containing water and glycol fluid mix. Heat from the ground is absorbed into this fluid and is pumped through a heat exchanger in the heat pump. Low grade heat passes through a compressor and is concentrated into a higher temperature gas capable of heating water for DHW and central heating systems.

Table 5.3: Renewable and LZC Feasibility Study

	There are a number of configurations for GSHP systems. A vertical collector system is considered to be the most appropriate in the context of the proposed development given the large scale of the system and limited area available for horizontal collectors. Vertical collectors can be between 15 – 180m deep and minimum spacing between adjacent boreholes should be maintained at 5 – 15m to prevent thermal interference. The heat yielded from GSHPs is relatively small (collecting approximately 14 – 20Wth per metre of collector loop), therefore the adequacy of the accompanying heat exchanger is vital in ensuring greater heat transfer (although more efficient exchangers have a significantly larger capital cost). The performance of a GSHP system is entirely dependent on the appropriateness of the ground condition (i.e., depth of soil cover, the type of soil or rock, ground temperature, and thermal conductivity), which would be established subject to a ground survey. ‘Reversible’ heat pump systems are also available that give the potential for the provision of space cooling if required. Groundwater can also be used to cool buildings where a suitable source exists, abstraction and discharge permissions can be obtained from the Environment Agency and test bores are favourable. Feasibility for this development Installation of GSHPs as a supplementary heating system for the building is not considered to be feasible due to the significant amount of groundworks required for this development.
 Air Source Heat Pumps	Air Source Heat Pumps (ASHPs) absorb heat from ambient air in order to provide heat for the purposes of space heating and domestic hot water. ASHPs work on a similar principal to a fridge, extracting heat from the inside. An evaporator coil mounted outside absorbs heat; a compressor unit then drives refrigerant through the heat pump and compresses it to the right level to suit the heat distribution system. A heat exchanger then transfer the heat from the refrigerant for use, which can be provided in two forms depending on the type of system: • Air to air – produces warm air which is circulated by a network of ducts and fans • Air to water – uses heat to warm water which is circulated as it would be in a conventional boiler system using heat emitters. Heat pumps heat water to a lower temperature than a standard boiler system, and are therefore better suited to underfloor systems over radiator systems due to the greater surface area required to distribute the heat effectively. The efficiency of ASHPs is measures by a Coefficient of Performance (CoP) i.e., the amount of heat produced compared to the amount of electricity needed for them to operate. ASHPs have a relatively low heat yield compared with traditional boilers, therefore buildings must be well insulated and draught-proofed to ensure that the heating system is effective.

Table 5.3: Renewable and LDC Feasibility Study

	Due to the required electrical load of ASHPs, consideration must be given to the source of grid electricity when determining the potential carbon savings they can deliver. Therefore, the purchase of 'cleaner' grid electricity (i.e., renewable or CHP tariffs) results in increased carbon savings from ASHPs. ASHPs are often a more popular and technically/financially viable alternative to GSHPs due to lack of requirement for extensive excavation, requiring far less space and an easier installation. Feasibility for this development An ASHP system is considered the most feasible and appropriate option for LDC technology within the proposed development. All space heating requirements are considered to be able to be met through the use utilisation of an ASHP system.
 Refrigeration Heat Recovery	Due to the large number of refrigeration units in a typical supermarket there is a significant opportunity to recover and reuse heat that would typically be wasted. A Refrigeration Heat Recovery (RHR) scheme works in a similar way to Mechanical Ventilation Heat Recovery (MVHR) Systems by capturing heat normally rejected from the refrigeration units in order to provide heat for the purposes of space heating. The RHR scheme works by feeding into the heating flow and return pipework. During periods of low heating loads, the system can potentially meet the heating demand of the development. Feasibility for this development A RHR system is considered suitable for this development to recover waste heat from the store's refrigerated cases.
 Biomass Boilers	Biomass boilers replace conventionally powered boilers with an almost carbon neutral fuel (such as wood pellets). In addition, the installation and operation of a biomass boiler in new-build developments could yield significant revenue from the Renewable Heat Incentive, a government funded clean energy cashback scheme. Although many biomass burners will meet Clean Air Act requirements, combustion of woody biomass releases higher quantities of NOx compared to a comparable system fuelled by natural gas. As a consequence, many local authorities, particularly in urban areas have concerns about the potential impact on air quality that the widespread uptake of biomass boilers would have. When linked to a large-scale CHP unit, as opposed to being used for individual boilers, biomass is generally approved as a viable LDC technology.

Table 5.3: Renewable and LZC Feasibility Study

	Feasibility for this development The use of biomass is not considered feasible due to both air quality issues and the significant storage and handling areas given the sites limited footprint. Based on the latest available data map for Lewes, there are not currently any existing or proposed heat networks within the vicinity of the proposed development site to provide further support for this application.
 Photovoltaic Cells	Solar Photovoltaics (PVs) are solar panels which generate electricity through photon-to-electron energy transfer, which takes place in the dielectric materials that make up the cells. The cells comprise of layers of semi-conducting silicon material which, when illuminated by the sun, produces an electric field which generates an electrical current. PVs can generate electricity even on overcast days, as they require daylight rather than direct sunlight. This makes them viable even in the UK, although peak output is obtained at midday on a sunny summer's day. PVs offer a simple, proven solution to generating renewable electricity. Feasibility for this development Due to the large flat roof space available on the proposed development, it is considered suitable and feasible to install a monocrystalline array, totalling 144kWp.
 Micro Wind Turbines	Large wind turbines are an established means of capturing wind energy and converting it into usable electricity. Wind turbines come in various sizes depending on the location and electrical load of a particular site. A wind turbine usually consists of a nacelle containing a generator connected, sometimes via a gearbox, to a rotor consisting of three blades. Feasibility for this development Wind turbines are likely to have a significant visual impact on local environment, as well as health and safety implications for occupiers or site users on-site and on adjacent areas as a result of noise and light flicker. Local planning policy requires renewable technologies to be considerate of these impacts, and therefore wind turbines are not considered to be feasible.
 On-Site Battery Storage	Although not technically a form of renewable energy, housing banks of commercial-scale batteries on site could provide a significant financial saving on the store's energy bill as well as reducing the peak energy demand. The batteries, producing around 10MW of power per site, will charge when the National Grid has surplus power and deliver the stored power back to the National Grid at times of peak demand. In addition to grid balancing, battery storage can also be coupled with renewable energy generation such as wind or solar PV to store the energy generated when the sun is shining, or wind is blowing and allow the energy to be available for use when it is needed 24hrs a day all year round.

Table 5.3: Renewable and LZC Feasibility Study

	Battery storage is most beneficial when the development has uses at times when the grid's demand and renewable energy availability are both low.
	Feasibility for this development Due to the constrained site, installed on site battery storage was not considered a viable option. Furthermore, the store does not operate during hours when renewable provision or grid demand is likely to be low, and can also rely on it's own generated renewable energy from the PV array, which is expected to meet the store's energy requirements with any surplus sent back to the grid.

5.1.4 Feasibility Assessment Summary (Be Green)

Following the high-level feasibility study on 'be green and be clean' measures from the Energy Hierarchy scheme. It can be seen that the proposed Aldi Foodstore can benefit from the use of a 144kWp Solar PV array, and a RHR 'Freeheat' system to supplement the ASHP system.

Through implementation of the above LZC and renewable technologies, an estimated carbon equivalent emission saving of approximately 13.5 tonnes per annum is achievable, as demonstrated in Figure 5.3 below.

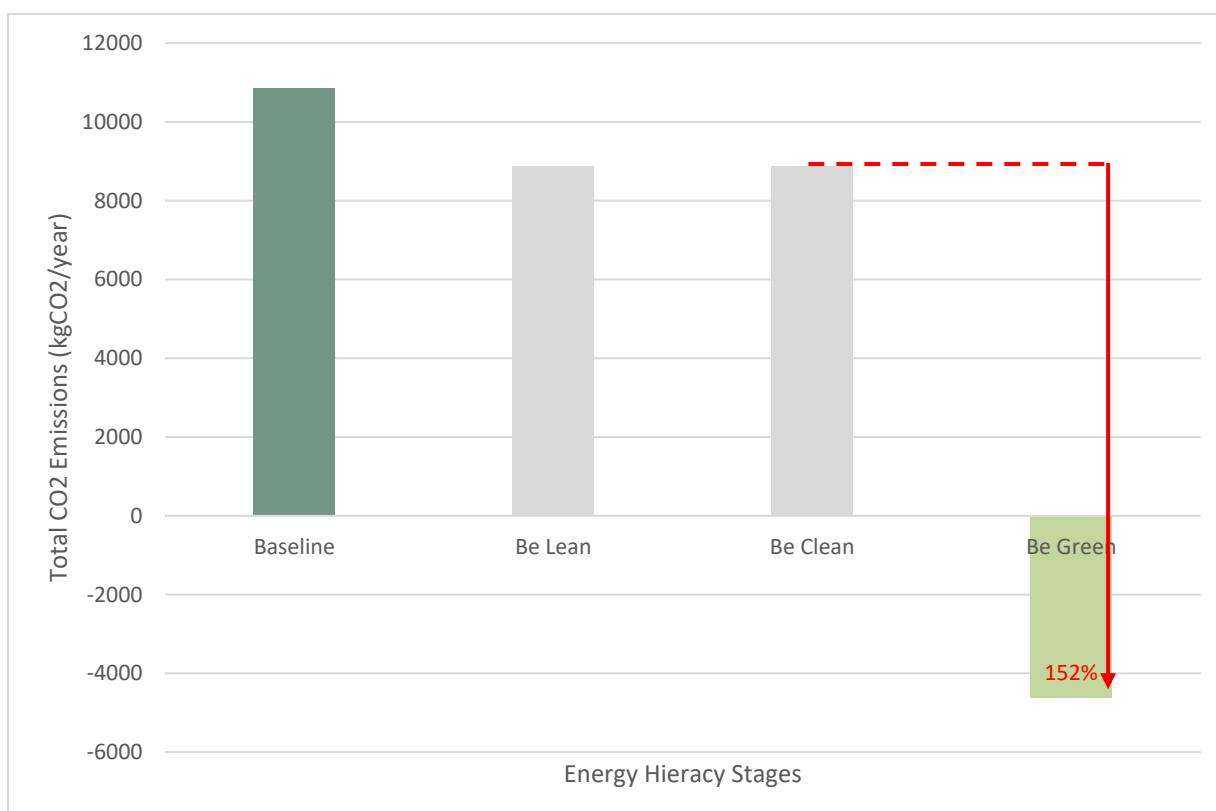


Fig 5.3: Be Green CO₂ emissions reduction.

5.2 Modelling Results

The conclusion of the energy strategy is that, based on planning stage calculations and implementation of the Energy Hierarchy, the proposed Aldi Foodstore achieves a significant reduction in CO₂ emissions when compared with a Building Regulations Part L (2021) compliant development, hence meeting the requirements of Core Policy 41 of the Wiltshire Core Strategy. Compliance with Core Policy 41 requires a Sustainable Energy Strategy to be submitted alongside the planning application to outline the low-carbon strategy and achievement of BREEAM Excellent, which has been determined following an energy modelling exercise.

A breakdown of the results of the Energy Assessment for the Aldi Foodstore in accordance with the Energy Hierarchy is provided in Table 5.4 below.

Scenario	Energy Demand (kWh / year)	Energy saving achieved (%)	Regulated CO ₂ Emissions (kgCO ₂ / year)	Saving achieved in CO ₂ emissions (%)
2021 Part L Compliant Benchmark Building	117,942	-	10,847	-
Be Lean Residual Scenario (improved building fabric and M&E services)	96,802	18	8,881	18
Be Clean	96,802	-	8,881	-
Be Green Renewable Scenario (Residual Scenario + RHR system & 144kWp PV array)	-57,792	160	-4,628	152
Total Savings in Energy and Emissions	175,734	149	15,475	143

The savings in CO₂ emissions across all stages of the energy hierarchy for the Aldi Foodstore are demonstrated in figure 5.4 below. It has not been possible to conduct an energy modelling exercise and predict energy and carbon emission savings for the units to be applied for in Outline. It is recommended this exercise is carried out as part of the Reserved Matters application.

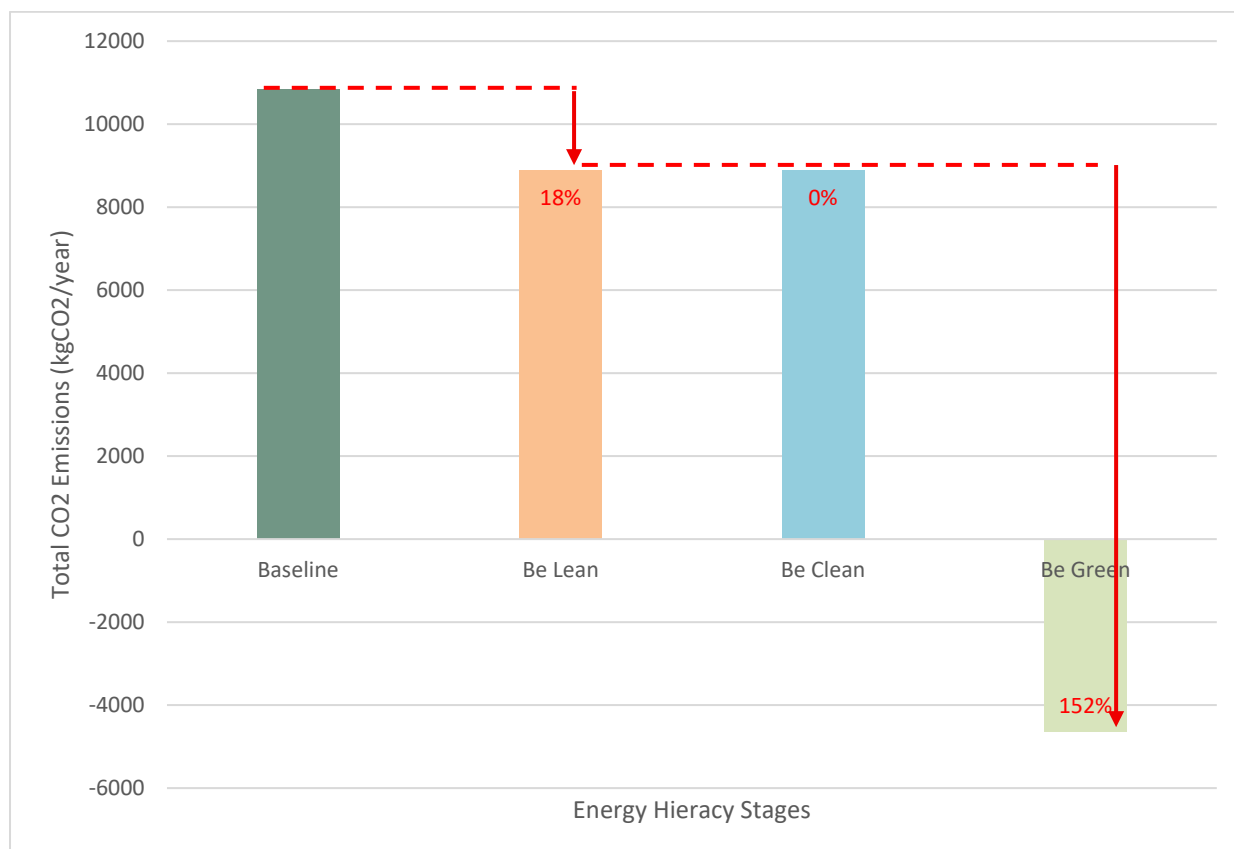


Fig 5.4: Energy Strategy CO₂ emissions reduction.

6. CONCLUSION

In conclusion the proposed Aldi Foodstore has utilised sustainable design measures in accordance with the Energy Hierarchy to reduce energy consumption and CO₂ emissions. The proposed development has achieved a total predicted energy consumption saving of 175,734kWh/annum and a predicted CO₂ emissions reduction of 15,475kgCO₂e/annum when compared to a Building Regulations Part L 2021 compliant development.

The CO₂ emissions saving, representing 143% over the Building Regulations Part L 2021 compliant development, has been achieved through the implementation of a well-insulated and airtight building fabric, high efficiency M&E systems, and the specification of renewable technologies (RHR & 144kWp PV). The savings demonstrated are in accordance with Core Policy 41 of the Wiltshire Core Strategy, requiring a the outline of proposed low-carbon technologies strategy.

6.1 BREEAM Compliance

The following sections shall provide a summary of this report in the context of the BREEAM scheme, against which the Aldi Foodstore will be assessed, under Ene 01 and Ene 04 criteria.

6.1.1 ENE01

An EPR_{NC} of 0.942 has been determined for this development based on the SBEM outputs, indicating 9 credits can be achieved, providing the outlined energy strategy is implemented within the as built development.

Energy modelling has been carried out by Charlie Macknight, who meets the BRE definition of an accredited energy assessor. DesignBuilder SBEM software has been used to determine the savings, which is an approved building energy calculation software.

A summary is provided in Table 6.1 below:

Table 6.1: Ene 01 - Prediction of Operational Energy Consumption Compliance		
EPR _{NC} calculated based on BRUKL or .inp file upload to BREEAM projects.	Y	EPR _{NC} of 0.942 equivalent to 9 BREEAM credits.
Energy modelling carried out using approved building energy calculation software	Y	DesignBuilder SBEM
Energy modelling undertaken by an accredited energy assessor?	Y	Charlie Macknight of Sol Environment has carried out all energy modelling and: • Holds a degree in Building Services Engineering. • Has over four years' experience in undertaking assessments and designs of low and zero carbon solutions in the commercial buildings sector and has undertaken formal training in <i>DesignBuilder</i> software. • Is a registered CIBSE Low Carbon Consultant (certification no. 206350) and non-domestic energy assessor.

6.1.2 ENE04 – Passive Design Analysis

This report has included a passive design analysis in Section 5.1 to establish measures appropriate to the development that can be used to minimise energy consumption and improve the energy efficiency of the development. Based on the energy modelling results, an estimated 18% saving in both energy use and carbon emissions is achievable providing the proposed passive design measures are installed.

Therefore, 1 credit can be achieved under Ene 04 (Passive Design Analysis). A summary is provided in Table 6.2 below:

Table 6.2: Ene 04 - Passive Design Analysis Compliance		
Passive design analysis undertaken during concept design stage?	Y	Passive design analysis contained within this report has been completed prior to the end of RIBA Stage 2.
BREEAM Passive design analysis minimum points covered?	Y	See Table 5.1
Calculations for savings in energy demand or CO ₂ -eq emissions carried out by a CIBSE member or an accredited energy assessor?	Y	Charlie Macknight of Sol Environment has carried out all energy modelling and: • Holds a degree in Building Services Engineering. • Has over four years' experience in undertaking assessments and designs of low and zero carbon solutions in the commercial buildings sector and has undertaken formal training in <i>DesignBuilder</i> software. • Is a registered CIBSE Low Carbon Consultant (certification no. 206350) and non-domestic energy assessor.

6.1.3 Ene 04 – LZC Technologies

A feasibility assessment to consider incorporating LZC and renewable technologies has been undertaken as per section 5.3 of this report and meets the BREEAM UK NC requirements. Therefore, 1 credit can be achieved under Ene 04 (LZC Feasibility). A summary is provided in Table 6.3 below:

Table 6.3: Ene 04 – LZC Technologies Compliance	
Topic	Response
Energy Generated from LZC Energy Source per year	154,593kWh
Carbon dioxide savings from LZC energy source per year	13,510kgCO ₂ e
Life cycle cost of the potential specification, accounting for payback	The combined RHR 'Freeheat' system and 144kWp PV array is predicted to save 154,593kWh per annum. Based on an average avoided electricity cost of £0.18/kWh, this equates to annual savings of £27,826. With a combined capital cost of approximately £200,000 (estimated figure), payback can be expected in 8-9 years.

Table 6.3: Ene 04 – LZC Technologies Compliance

Topic	Response
	In addition to this, lifecycle costs can be estimated at £1,500 per year, having little impact on the expected payback periods. The expected lifespans of both systems are 25-30 years assuming regular maintenance.
Local planning criteria, including land use and noise	There are no local planning requirements in relation to land use and noise of installing LZC systems. However, systems should generally be designed to avoid any potential visual or audible issues. Therefore, the PV array is considered not to have any impact due to being located on the store's roof. The RHR plant functions similarly to air-conditioning plant, and will be sited to the rear of the building.
Feasibility of exporting heat or electricity from the system	All heat recovered from the RHR system is expected to be used within the development, and as it has been determined there are no nearby or potential heat networks, it would not be feasible to export this. Any surplus electricity generated by the PV array will be exported to the national grid.
Any available grants	There are currently no available grants applicable to either of the proposed systems.
All technologies appropriate to the site and energy demand of the development	A feasibility study has been undertaken to review all technologies appropriate to the development – see Table 5.3
Reasons for excluding other technologies	A feasibility study has been undertaken to review all technologies appropriate to the development – see Table 5.3
The building is connected to an existing local community CHP system or the building is connected to an existing source of waste heat or power OR building or site CHP system is specified with the potential to export excess heat or power via a local community energy scheme OR a source of waste heat or power is specified with the potential to export excess heat or power via a local community energy scheme	As per Table 5.2, there are no opportunities for connection to any existing local community CHP system or heat network. An on-site Refrigeration Heat Recovery system has been specified.
Energy Storage	Energy generated by the PV array will be used on site or exported to the grid. Due to the constrained site,

Table 6.3: Ene 04 – LZC Technologies Compliance

Topic	Response
	battery storage is not feasible. Heat recovery from the refrigeration system is low grade and therefore not suitable for export.