



Engineering
Services Design

Project	Ysgol Yr Hafod
Report	Sustainability & Energy Statement
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Client	



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Document Revision Sheet

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INTRODUCTION

This statement outlines the key sustainability features and proposed energy targets the newly developed Ysgol Yr Hafod in Johnstown, Wrexham. The project involves an extension to the existing school and refurbishment of the existing building.

The project will be designed and built to exceed National and Local Planning Policy in addition to the requirements of Approved Document L2A: 2014. The building will also achieve BREEAM Good status.

An integrated approach will be taken to provide a sustainable and energy efficient building with a focus on using passive design measures where possible.

NATIONAL PLANNING POLICY

The Welsh Assembly Government's (WAG) commitment to reducing greenhouse gas emissions, maintaining existing carbon stores and ensuring effective adaptation is set out in 'Environment Strategy for Wales' (2006) and the related Action Plan summarises the impacts of climate change. It is estimated that almost half of the UK's carbon emissions comes from energy use in buildings. It is also understood that the aspiration of WAG for all buildings built from 2011 onwards to be zero carbon where practicable.

The overarching policy for planning in Wales is 'Planning Policy Wales 2002 (PPW)'. Since its publication, a number of Ministerial Interim Planning Policy statements have been published which replaces the advice given in specific sections of PPW.

Of particular relevance to Sustainability Planning Guidance are:

- MIPPS 01/2008: Planning for Good Design

- MIPPS 01/2009: Planning for Sustainable Buildings 13

The National Planning Policy Framework (NPPF) requires local plans to plan positively to deliver renewable and low carbon technology developments. This is to help tackle climate change and address the environmental role of planning as set out in the NPPF. This is to help to meet the UK's legally binding target to reduce carbon emissions to Net Zero on 1990 levels by 2050. It is estimated that almost half of the UK's carbon emissions comes from energy use in buildings.

The National Planning Policy Guidance (NPPG) provides further clarity, stating that policies should be set to promote renewable and low carbon technologies, and these should be based on evidence that considers the opportunities for different types of technologies, the possible opportunities for district heat networks and consideration of the landscape impacts of these technologies.

LOCAL PLANNING POLICY

Wrexham Council are currently preparing a Local Development Plan which will replace the Unitary Development Plan (UDP) although this is still currently undergoing consultation. It is therefore proposed to meet the key requirements of the UDP as outlined below:

General Development Principles (GDP1)

"Ensure the safety and amenity of the public and safeguard the environment from the adverse effects of pollution of water, land or air, hazards from industry and quarrying, and associated noise, odour or vibration arising from development."

"In addition to the specific land use or locational policies of the Plan, all development proposals must satisfy certain general requirements, the regulation of which is a key function of the planning system (e.g.

drainage/liability to flood, stability, natural hazard, energy efficiency, materials and design, etc.). Many of these matters are the responsibility of statutory organisations that are automatically consulted on development proposals”.

Renewable Energy Policy (PS12)

“Proposals for the generation of energy from renewable sources will be supported provided that the wider environmental benefits are not outweighed by any detrimental impacts of the proposed development (including any electricity transmission facilities needed) on the landscape, public safety, and the local environment.”

We understand therefore that there is no strict planning policy pertaining to carbon reduction or installation of renewable energy technology other than the requirements to achieve both BREEAM ‘Good’ and Part L2A/B compliance.

PART L COMPLIANCE

The new extension shall be designed and constructed to achieve Part L2A 2014 compliance. The existing building will be refurbished to meet the requirements of Part L2B. Building fabric shall be designed to meet these requirements, with building services systems meeting the requirements of the Non Domestic Building Services Compliance Guide. The new extension will be modelled in SBEM to demonstrate compliance with L2A.

SUSTAINABILITY STRATEGY

To achieve the Planning and Building Regulations targets it is proposed to follow the Energy Hierarchy approach. The Energy Hierarchy Approach that will be followed in this context is described below:

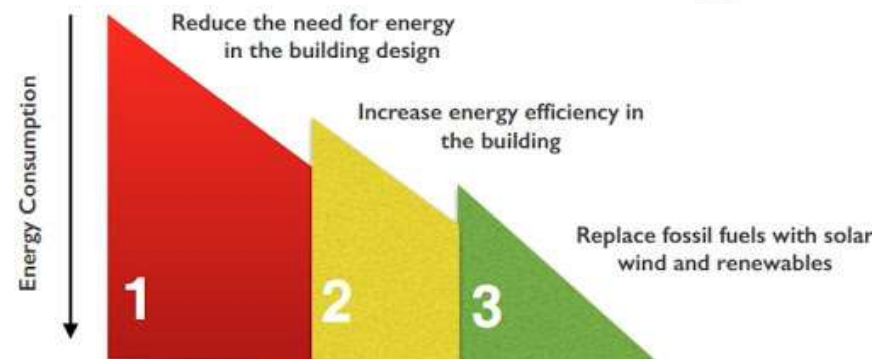


Figure 1: Sustainable Design and the Energy Hierarchy Approach

The following sections below detail the proposed specific approach to integrated sustainable building design for the scheme outlining the strategy for following each of the stages indicated in the figure above.

STEP 1 – REDUCE BUILDING ENERGY DEMAND

The first stage of the sustainable design and the Energy Hierarchy approach is to limit the buildings energy demand through a ‘fabric first’ approach which will ensure an integrated approach to sustainability is provided. The key features undertaken to reduce demand are as follows:

- Low Building Air Permeability with a minimum 50% improvement upon the minimum Building Regulations 2014 requirements.
- High performance building fabric with façade and fenestration with 36-57% improvement upon the minimum Building Regulations 2014 requirements.
- High performance fenestration in terms of solar control and day lighting with low emissivity (low-e) glass and high light transmittance value in order that the scheme can maximise daylight benefits throughout the year without increased risk of overheating,

- Strategic location of glazing upon the facade and roofing together with integrated solar shading,
- Maximising the potential where practicable for natural ventilation within the building, so as to further reduce the need and energy consumption of the building through operation of fans and other mechanical ventilation,
- Utilising the maximum amount of daylight to limit the energy consumption through lighting.

The table below summarises the key enhancements proposed for the building as part of an integrated sustainable approach to the design:

Table 1: Building Fabric and Fenestration Approximate Improvements

Building Element	Building Regulations Limiting U- Values*	Proposed U-Values	% Improvement above Building Regulations
Walls	0.35 W/m ² K	0.15W/m ² K	57%
Floor	0.25 W/m ² K	0.15 W/m ² K	40%
Roof	0.25 W/m ² K	0.15W/m ² K	40%
Glazing / Roof lights and Doors	2.2 W/m ² K	1.4 W/m ² K	36%
Infiltration	10 m ³ /h @ 50 Pa	5 m ³ /h @ 50 Pa	50%

*Building Regulations Part L 2014

STEP 2 – MAXIMISING ENERGY EFFICIENCY

The second stage of the sustainable design and the Energy Hierarchy approach is to incorporate energy efficient systems into the building's design. The new extension will incorporate the following energy efficient

technologies and measures to meet this requirement:

- New LED lighting and automatic controls,
- Inclusion of daylight dimming controls to all spaces with direct access to daylight.
- Variable speed pumping.
- Natural ventilation with heat recovery, utilising low energy fans / motors.
- Inclusion of a summer bypass to the mechanical ventilation heat recovery units
- Incorporation of a BMS control system.

All new services will be designed to achieve the standards set out within the Non Domestic Building Services Guide as a minimum.

STEP 3 – LOW ZERO CARBON TECHNOLOGY

The third stage of the Energy Hierarchy aims to replace fossil fuels with renewable or low / zero carbon technologies.

Although Wrexham Council do not have a strict policy for the reduction of carbon or installation of renewable energy technology it is proposed to install a small photovoltaic (PV) array to meet the requirements of both Part L2A: 2014 (for the new extension) and BREEAM Very Good.

The full size of the PV array will be confirmed following the production of detailed design calculations.

SUMMARY

Although there are no strict planning requirements to incorporate low / zero carbon technology / renewable energy systems it is recognised that in order to meet the Client's aspirations the new building must significantly better the current minimum standards in addition to meeting

the BREEAM 'Good' criteria.

The solutions proposed are expected to provide a low energy / carbon School which importantly not only considers the immediate benefits but considers future performance.

Further design calculations will be submitted following the completion of the design demonstrating compliance with the above.