



Case Study Fact Sheets © Biofutures Ltd

The example case studies presented here demonstrate how sustainable design and renewable energy systems can be used effectively to meet the aspirations of both client and planning authority, particularly in areas of environmental sensitivity. They also demonstrate how the needs of the client can be met and more sustainable futures delivered and long-term value – demonstrating that good design is good business. The examples illustrate individual residential new build, retrofit and a large-scale project.

Our latest large scheme involves 3 x 100Kw wood pellet boilers for a larger residential RSL scheme of 44 units plus communal areas. This energy centre will also include PV's, solar thermal panels and is in essence a district heating system.

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Fact Sheet | Llandeilo, Carmarthenshire



In this project the client had an interesting problem having bought a derelict stone barn in the middle of a marsh on the dark side of a wood. It had planning permission to demolish and rebuild as a bungalow. Consensus needed to be drawn in order to marry the planning requirement for a barn style building with the client's aspirations for sustainable, contemporary rural design on the client side.

The solution was to produce a design based on the best energy conserving aspects of vernacular design using the natural topography for shelter, and re-using materials, while employing today's energy conservation including orientation for passive solar gain and insulation. The contour-hugging plan shrugs off the weather and is reflected internally as attractive split levels. The "green" theme of the project has also been applied to the building materials which are either reclaimed or drawn from sustainable local supplies. The property illustrates that highly energy-efficient dwellings do not need to be "exhibitionist". The example shows that they can be designed to reflect local vernacular traditions and can contribute positively to a locality.

Property has been fitted with Biotech PZ8RL 15 kW Biomass boilers and a solar system having first investigated and dismissing a ground source heat pump. There have been considerable savings on annual running costs compared to the original oil boilers fitted in the house.

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Fact Sheet | Bethlehem, Llandeilo, Carmarthenshire



The development is a small residential scheme of three dwellings in the village of Bethlehem, near Llandeilo. The site is located on the very edge of the Brecon Beacons National Park and lies in an outstanding landscape setting.

The development by a small development company has created a well-designed and highly sustainable development. The design quality of recent developments in Bethlehem has generally been mediocre and of a suburban character. This scheme sets new standards of development in the area, both in terms of design and sustainability. The existing local vernacular consists of buildings with simple, orthogonal floor plates and rendered walls set below slate roofs.

This proposal is intended to reflect this character, while also creating highly energy efficient houses that exploit the solar orientation with large south facing windows. In order to maximise heat retention, north facing windows are reduced. The houses are very well insulated timber framed structure using Warmcell insulation and special insulated internal wall and ceiling panels. The Design Commission commended the scheme for Wales as a good example of modern, contextually appropriate development within a rural settlement.

Each units has the rear section of the garage designed as a plant room and is equipped with the smallest 2-9 kW Biotech Toplight Biomass boilers that supplies space heating (under floor) and DHW in the winter months and in the summer the solar water heating will provide an excess of hot water. With PV technology advancing, costs reducing and new feed in tariffs then the house could become "carbon zero" very easily following the fitting of a PV array.

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Fact Sheet | Golden Grove, Carmarthen, Carmarthenshire



This retrofit sought to provide this historic estate managers house with a total space heating and DHW solution to the property. Constructed in the late 1800's the house is of solid wall construction with traditional timber sash windows. The owner was looking for a green solution to heating the property. The availability of an adjacent outbuilding provided the ideal opportunity to facilitate the installation of a 5 ton silo and Biotech biomass wood pellet system which is connected to the house by means of below ground insulated pipes.

The pellet silo is filled from the delivery lorry by means of a blower and the pellets are feed into the boiler itself by the boiler vacuum system. Manual feed systems are available if space is a limitation but given the demand at this property it was concluded that a silo was the most sensible and cost affective solution. The system is also fitted with a twin coil cylinder that will enable the owner to fit a solar thermal system at some future date.

A 15kW Biotech Toplight Biomass boilers will provide space heating and DHW.

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Fact Sheet | Gwalia Housing, Llanybydder, Carmarthenshire

The latest large scheme involves 3 x Biotech 100Kw wood pellet boilers running in "cascade mode" for a significant residential RSL scheme of 44 units plus communal areas. This energy centre will also include PV's, solar thermal panels and is in essence a district heating system. The boilers use a single-phase electrical supply; have fully automated pellet feed, ash cleaning and heat exchanger cleaning. The boilers have BCL modems providing SMS messages to maintenance staff and the boilers functioning can be interrogated via SMS text messaging. With 96% efficiency the boilers provide a low cost space heating and hot water supply to the facility. Boilers linked to 5000 Lit buffer tank.



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