



**fairwood**  
**energy**

Energy performance certificates  
SAP calculations  
Code for Sustainable Homes  
SBEM calculations  
Air tightness testing  
Low carbon building consultants

**Report Reference:** FE0812002  
**Site Registration:** 003358-120803-50-1104  
**Site Name:** New Dwelling  
**Assessor Number:** STRO003358  
**Company:** Fairwood Energy  
**Assessor:** Lloyd Jones



#### Site Details

Site Name: New Dwelling  
 Site Registration: 003358-120803-50-1104  
 Site Address: Welford Farm  
 Port Road  
 Rhoose  
 City/Town: Barry  
 County: Vale of Glamorgan  
 Postcode: CF62 3BT  
 No. of Dwellings: 1  
 No. of Dwelling Types: 1  
 Planning Authority: Vale of Glamorgan Council  
 Funding Body:

#### Assessor Details

Company: Fairwood Energy  
 Assessor Name: Lloyd Jones  
 Cert Number: STRO003358  
 Address: The Estate Office, Prenteg  
 Heol Smyrna  
 Llangain  
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 County: Carmarthenshire  
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#### Client Details

Company: Jeff White Motors  
 Contact Name: Jeff White  
 Job Title:  
 Email:  
 Tel:  
 Address: 211 Ninian Park Road  
  
 City/Town: Cardiff  
 County: Cardiff  
 Postcode: CF11 6NY

#### Architect Details

Company: Nigel Arnold Architect  
 Contact Name: Nigel Arnold  
 Job Title:  
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 5 Penarth Head Lane  
  
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 County: Vale of Glamorgan  
 Postcode: CF64 1BB

#### Developer Details

Company: Jeff White Motors  
 Contact Name: Jeff White  
 Job Title:  
 Email:  
 Tel:  
 Address: 211 Ninian Park Road  
  
 City/Town: Cardiff  
 County: Cardiff  
 Postcode: CF11 6NY

Dwelling ID	Plot No.	Address	Social Unit
1	1	New Dwelling at Welford Farm	No

**Development Summary & Ratings**

Dwelling ID	Dwelling Type	Description	Level	Score
1	Detached House	Detached House	5	84.83

**Deviations from Standard**

No deviations from standard

### Score Sheet for New Dwelling

Dwelling ID	ENE									WAT		MAT			SUR		WAS			POL		HEA				MAN				ECO					Summary	
	1	2	3	4	5	6	7	8	9	1	2	1	2	3	1	2	1	2	3	1	2	1	2	3	4	1	2	3	4	1	2	3	4	5	Score	Level
1	9	7	2	1	2	2	2	2	1	5	1	9	0	0	2	2	4	3	1	1	2	3	4	1	4	3	1	2	2	1	1	1	2	0	84.83	5

Summary Score Sheet  
 Dwelling Type: Detached House

Dwelling ID: 1

			Score Assessment				
	Credit Score	Credits Available	Sub Total	Credits Available	%	Weighting Factor	Points Score
<b>Energy &amp; CO2 Emissions</b>							
ENE 1 Dwelling Emission Rate	9	10	28	31	90.32	36.4	32.88
ENE 2 Fabric Energy Efficiency	7	9					
ENE 3 Energy Display Device	2	2					
ENE 4 Drying Space	1	1					
ENE 5 Energy Labelled White Goods	2	2					
ENE 6 External Lighting	2	2					
ENE 7 Low or Zero Carbon Energy Technologies	2	2					
ENE 8 Cycle Storage	2	2					
ENE 9 Home Office	1	1					
<b>Water</b>							
WAT 1 Internal Water Use	5	5	6	6	100	9	9
WAT 2 External Water Use	1	1					
<b>Materials</b>							
MAT 1 Environmental Impact of Materials	9	15	9	24	37.5	7.2	2.7
MAT 2 Responsible Sourcing (Basic Building Elements)	0	6					
MAT 3 Responsible Sourcing (Finishing Elements)	0	3					
<b>Surface Water Run-off</b>							
SUR 1 Management of Surface Water Run-Off from Site	2	2	4	4	100	2.2	2.2
SUR 2 Flood Risk	2	2					
<b>Waste</b>							
WAS 1 Household Waste Storage and Recycling Facilities	4	4	8	8	100	6.4	6.4
WAS 2 Construction Site Waste Management	3	3					
WAS 3 Composting	1	1					
<b>Pollution</b>							
POL 1 Global Warming Potential of Insulants	1	1	3	4	75	2.8	2.1
POL 2 NOx Emissions	2	3					
<b>Health &amp; Wellbeing</b>							
HEA 1 Daylighting	3	3	12	12	100	14	14
HEA 2 Sound Insulation	4	4					
HEA 3 Private Space	1	1					
HEA 4 Lifetime Homes	4	4					
<b>Management</b>							
MAN 1 Home User Guide	3	3	8	9	88.89	10	8.89
MAN 2 Considerate Constructors Scheme	1	2					
MAN 3 Construction Site Impacts	2	2					
MAN 4 Security	2	2					
<b>Ecology</b>							
ECO 1 Ecological Value of Site	1	1	5	9	55.56	12	6.67
ECO 2 Ecological Enhancement	1	1					
ECO 3 Protection of Ecological Features	1	1					
ECO 4 Change of Ecological Value of Site	2	4					
ECO 5 Building Footprint	0	2					
			Level Achieved: 5		Total Points Scored: 84.83		

**Evidence for ENE 1 (Dwelling Emission Rate) - Detached House**

Improvement above Part L Building Regulations 2010. 9 credits allocated

**Assumptions for ENE 1**

Minimum 9 credits required to achieve compliance with Code Level 5.

At pre-assessment it is assumed that dwelling will achieve minimum 100% improvement in DER over TER. This will involve a significant commitment to achieving industry best practice insulation levels throughout building fabric together with high levels of air tightness and significant provision of on site renewables.

**Evidence for ENE 2 (Fabric Energy Efficiency) - Detached House**

Detached  
7 credits allocated

**Assumptions for ENE 2**

Minimum 7 credits required to achieve compliance with Code Level 5.

At pre-assessment it is assumed that dwelling will achieve minimum 100% improvement in DER over TER. This will involve a significant commitment to achieving industry best practice insulation levels throughout building fabric together with high levels of air tightness and significant provision of on site renewables.

**Evidence for ENE 3 (Energy Display Device) - Detached House**

Correctly specified display device showing current primary heating fuel consumption data.  
Correctly specified display device showing current consumption data.

**Assumptions for ENE 3****Evidence for ENE 4 (Drying Space) - Detached House**

Compliant external drying space

**Assumptions for ENE 4****Evidence for ENE 5 (Energy Labelled White Goods) - Detached House**

A+ rated fridge & freezers or fridge/freezer  
A rated washing machine and dishwasher AND B rated washer-dryers & tumblers dryers, or EU energy efficiency labelling scheme leaflet where washing machines and/or dishwashers not provided

**Assumptions for ENE 5****Evidence for ENE 6 (External Lighting) - Detached House**

Compliant space lighting  
Compliant security lighting

**Assumptions for ENE 6****Evidence for ENE 7 (Low or Zero Carbon Energy Technologies) - Detached House**

Contribution of low or zero carbon technologies greater than or equal to 15%

**Assumptions for ENE 7**

Significant commitment to provision of on site renewables assumed to include solar PV, solar thermal and biomass where appropriate.

**Evidence for ENE 8 (Cycle Storage) - Detached House**

4 bedrooms or more - Storage for 4 cycles per dwelling

**Assumptions for ENE 8**

## Evidence for ENE 9 (Home Office) - Detached House

Compliant home office

## Assumptions for ENE 9

## Evidence for WAT 1 (Internal Water Use) - Detached House

Internal water use less than or equal to 80 litres per person per day

To achieve required low level of water useage, it is anticipated that rainwater and greywater harvesting will be utilised.

## Assumptions for WAT 1

## Evidence for WAT 2 (External Water Use) - Detached House

Compliant individual rainwater collection system

## Assumptions for WAT 2

To achieve required low level of water useage, it is anticipated that rainwater and greywater harvesting will be utilised.

## Evidence for MAT 1 (Environmental Impact of Materials) - Detached House

Mandatory requirements met: At least 3 elements rated A+ to D, 9 credits scored

## Assumptions for MAT 1

## Evidence for MAT 2 (Responsible Sourcing (Basic Building Elements)) - Detached House

Zero credits or credits not sought

## Assumptions for MAT 2

## Evidence for MAT 3 (Responsible Sourcing (Finishing Elements)) - Detached House

Zero credits or credits not sought

## Assumptions for MAT 3

## Evidence for SUR 1 (Management of Surface Water Run-Off from Site) - Detached House

Mandatory Met: Peak rate of run-off and annual volume of run-off is no greater for the developed than for the pre-development. The system has also been designed for local drainage system failure.

No discharge to watercourse(s) for rainfall depth up to 5mm.

Run-off from all hard surfaces shall receive an appropriate level of treatment (as per the SudS manual) to minimise risk of pollution.

## Assumptions for SUR 1

## Evidence for SUR 2 (Flood Risk) - Detached House

Low flood risk - zone 1

## Assumptions for SUR 2

## Evidence for WAS 1 (Household Waste Storage and Recycling Facilities) - Detached House

Mandatory requirements met: Adequate storage of household waste with accessibility in line with checklist WAS 1. Local authority collection: After collection sorting with appropriate internal storage of recyclable materials

## Assumptions for WAS 1



**Evidence for WAS 2 (Construction Site Waste Management) - Detached House**

Compliant site waste management plan containing benchmarks, procedures and commitments for the minimizing and diverting 80% waste from landfill in line with the criteria and with Checklist WAS 2a, 2b & 2c

**Assumptions for WAS 2**

**Evidence for WAS 3 (Composting) - Detached House**

Individual composting facility/facilities

**Assumptions for WAS 3**

**Evidence for POL 1 (Global Warming Potential of Insulants) - Detached House**

All insulants have a GWP of less than 5

**Assumptions for POL 1**

**Evidence for POL 2 (NOx Emissions) - Detached House**

Class 5 boiler

**Assumptions for POL 2**

**Evidence for HEA 1 (Daylighting) - Detached House**

Kitchen: Average daylight factor of at least 2%  
Living room: Average daylight factor of at least 1.5%  
Dining room: Average daylight factor of at least 1.5%  
Home office: Average daylight factor of at least 1.5%  
All rooms (kitchen, living, dining and where applicable the home office) have 80% of the working plane with direct light from the sky

**Assumptions for HEA 1**

**Evidence for HEA 2 (Sound Insulation) - Detached House**

Detached property

**Assumptions for HEA 2**

**Evidence for HEA 3 (Private Space) - Detached House**

Individual private space provided

**Assumptions for HEA 3**

**Evidence for HEA 4 (Lifetime Homes) - Detached House**

All criteria of Lifetime Homes in line with all 16 principals of Lifetime Homes

**Assumptions for HEA 4**

**Evidence for MAN 1 (Home User Guide) - Detached House**

All criteria inline with checklist MAN 1 Part 1 - Operational Issues will be met  
All criteria inline with checklist MAN 1 Part 2 - Site and Surroundings will be met

**Assumptions for MAN 1**

**Evidence for MAN 2 (Considerate Constructors Scheme) - Detached House**

Considerate constructors scheme: Best practise only, a score of between 24 and 31.5 and at least a score of 3 in every section

**Assumptions for MAN 2**

**Evidence for MAN 3 (Construction Site Impacts) - Detached House**

Monitor, report and set targets for CO2 production or energy use from site activities  
Monitor, report and set targets for water consumption from site activities  
Adopt best practise policies in respects to air (dust) pollution from site activities  
Adopt best practise policies in respects to water (ground and surface) pollution

**Assumptions for MAN 3**

**Evidence for MAN 4 (Security) - Detached House**

Secure by design section 2 compliant

**Assumptions for MAN 4**

**Evidence for ECO 1 (Ecological Value of Site) - Detached House**

Construction zone site has been identified as low ecological value by a suitably qualified ecologist, all land outside the construction zone, but in the development site will remain undisturbed

**Assumptions for ECO 1**

**Evidence for ECO 2 (Ecological Enhancement) - Detached House**

Key recommendations and 30% additional recommendations by a suitably qualified ecologist

**Assumptions for ECO 2**

**Evidence for ECO 3 (Protection of Ecological Features) - Detached House**

Land of low ecological value as identified under ECO 1

**Assumptions for ECO 3**

**Evidence for ECO 4 (Change of Ecological Value of Site) - Detached House**

Neutral: Greater than -3 and less than or equal to +3

**Assumptions for ECO 4**

**Evidence for ECO 5 (Building Footprint) - Detached House**

Credit not sought

**Assumptions for ECO 5**

Assessor Declaration

I Lloyd Jones, can confirm that I have compiled this report to the best of my ability, I have based all findings on the information that is referenced within this report, and that this report is appropriate for the registered site.

To the best of my knowledge all the information contained within this report is correct and accurate. I have within my possession all the reference material that relates to this report, which is available for inspection by the client, the clients representative or Stroma Certification for Quality Assurance monitoring.

Signed:



Lloyd Jones  
Fairwood Energy  
03 August 2012

## Information about Code for Sustainable Homes

The Code for Sustainable Homes (the Code) is an environmental assessment method for rating and certifying the performance of new homes. It is a national standard for use in the design and construction of new homes with a view to encouraging continuous improvement in sustainable home building. The Code is based on EcoHomes®.

It was launched in December 2006 with the publication of 'Code for Sustainable Homes: A stepchange in sustainable home building practice' (Communities and Local Government, 2006), and became operational in England from April 2007.

The Code for Sustainable Homes covers nine categories of sustainable design. Each category includes a number of environmental issues. Each issue is a source of impact on the environment which can be assessed against a performance target and awarded one or more credits. Performance targets are more demanding than the minimum standards needed to satisfy Building Regulations or other legislation. They represent good or best practice, are technically feasible, and can be delivered by the building industry. The issues and categories are as follows:

- Energy & CO2 Emissions
  - Dwelling Emission Rate
  - Building Fabric
  - Internal Lighting
  - Drying Space
  - Energy Labelled White Goods
  - External Lighting
  - Low or Zero Carbon Technologies
  - Cycle Storage
  - Home Office
- Water
  - Internal Water Use
  - External Water Use
- Materials
  - Environmental Impact of Materials
  - Responsible Sourcing of Materials - Basic Building Elements
  - Responsible Sourcing of Materials - Finishing Elements
- Surface Water Run-off
  - Management of Surface Water Run-off from the Development
  - Flood Risk
- Waste
  - Storage of Non-Recyclable Waste and Recyclable Household Waste
  - Construction Site Waste Management
  - Composting
- Pollution
  - Global Warming Potential of Insulants
  - NOx Emissions

- Health & Wellbeing
  - Daylighting
  - Sound Insulation
  - Private Space
  - Lifetime Homes
- Management
  - Home User Guide
  - Considerate Constructors Scheme
  - Construction Site Impacts
  - Security
- Ecology
  - Ecological Value of Site
  - Ecological Enhancement
  - Protection of Ecological Features
  - Change in Ecological Value of Site
  - Building Footprint

The Code assigns one or more performance requirements (assessment criteria) to all of the above environmental issues. When each performance requirement is achieved a credit is awarded (with the exception of the four mandatory requirements which have no associated credits). The total number of credits available to a category is the sum of credits available for all the issues within it.

Mandatory minimum performance standards are set for some issues. For four of these, a single mandatory requirement is set which must be met, whatever Code level rating is sought. Credits are not awarded for these issues. Confirmation that the performance requirements are met for all four is a minimum entry requirement for achieving a level 1 rating. The four un-credited issues are:

- Environmental Impacts of Materials
- Management of Surface Water Run-off from Developments
- Storage of Non-Recyclable Waste and Recyclable Household Waste
- Construction Site Waste Management

If the mandatory minimum performance standard is met for the four un-credited issues, four further mandatory issues need to be considered. These are agreed to be such important issues that separate Government policies are being pursued to mitigate their effects. For two of these, credits are awarded for every level of achievement recognised within the Code, and minimum mandatory standards increase with increasing rating levels.

The two issues with increasing mandatory minimum standards are:

- Dwelling Emission Rate
- Indoor Water Use

For one issue a mandatory requirement at Level 5 or 6:

- Fabric Energy Efficiency

The final issue with a mandatory requirement for Level 6 of the Code is:

- Lifetime Homes

Further credits are available on a free-choice or tradable basis from other issues so that the developer may choose how to add performance credits (converted through weighting to percentage points) achieve the rating which they are aiming for.

The environmental impact categories within the Code are not of equal importance. Their relative value is conveyed by applying a consensus-based environmental weighting factor (see details below) to the sum of all the raw credit scores in a category, resulting in a score expressed as percentage points. The points for each category add up to 100.

The weighting factors used in the Code have been derived from extensive studies involving a wide range of stakeholders who were asked to rank (in order of importance) a range of environmental impacts. Stakeholders included international experts and industry representatives.

It is also important to note that achieving a high performance in one category of environmental impact can sometimes result in a lower level of performance for another. For instance, if biomass is used to meet heating demands, credits will be available for performance in respect of energy supplied from a renewable source, but credits cannot be awarded for low NOX emission. It is therefore impossible to achieve a total percentage points score of 100.

The Code uses a rating system of one to six stars. A star is awarded for each level achieved. Where an assessment has taken place by where no rating is achieved, the certificate states that zero stars have been awarded:

Code Levels	Total Points Score (Equal to or Greater Than)
Level 1 ★☆☆☆☆	36 Points
Level 2 ★★☆☆☆	48 Points
Level 3 ★★★☆☆	57 Points
Level 4 ★★★★☆	68 Points
Level 5 ★★★★★	84 Points
Level 6 ★★★★★★	90 Points

Formal assessment of dwellings using the Code for Sustainable Homes may only be carried out using Certified assessors, who are qualified 'competent persons' for the purpose of carrying out Code assessments.

### Energy & CO2 Emissions

**ENE 1:**Dwelling Emission Rate

**Available Credits:**10

**Aim:**To limit CO2 emissions arising from the operation of a dwelling and its services in line with current policy on the future direction of regulations.

**ENE 2:**Fabric Energy Efficiency

**Available Credits:**9

**Aim:**To improve fabric energy efficiency performance thus future-proofing reductions in CO2 for the life of the dwelling.

**ENE 3:**Energy Display Device

**Available Credits:**2

**Aim:**To promote the specification of equipment to display energy consumption data, thus empowering dwelling occupants to reduce energy use.

**ENE 4:**Drying Space

**Available Credits:**1

**Aim:**To promote a reduced energy means of drying clothes.

**ENE 5:**Energy Labelled White Goods

**Available Credits:**2

**Aim:**To promote the provision or purchase of energy efficient white goods, thus reducing the CO2 emissions from appliance use in the dwelling.

**ENE 6:**External Lighting

**Available Credits:**2

**Aim:**To promote the provision of energy efficient external lighting, thus reducing CO2 emissions associated with the dwelling.

**ENE 7:**Low or Zero Carbon Technologies

**Available Credits:**2

**Aim:**To limit CO2 emissions and running costs arising from the operation of a dwelling and its services by encouraging the specification of low and zero carbon energy sources to supply a significant proportion of energy demand.

**ENE 8:**Cycle Storage

**Available Credits:**2

**Aim:**To promote the wider use of bicycles as transport by providing adequate and secure cycle storage facilities, thus reducing the need for short car journeys and the associated CO2 emissions.

**ENE 9:**Home Office

**Available Credits:**1

**Aim:**To promote working from home by providing occupants with the necessary space and services thus reducing the need to commute.

### Water

**WAT 1:**Indoor Water Use

**Available Credits:**5

**Aim:**To reduce the consumption of potable water in the home from all sources, including borehole well water, through the use of water efficient fittings, appliances and water recycling systems.

**WAT 2:**External Water Use

**Available Credits:**1

**Aim:**To promote the recycling of rainwater and reduce the amount of mains potable water used for external water uses.

### Materials

**MAT 1:**Environmental Impact of Materials

**Available Credits:**15

**Aim:**To specify materials with lower environmental impacts over their life-cycle.

**MAT 2:**Responsible Sourcing of Materials - Basic Building Elements

**Available Credits:**6

**Aim:**To promote the specification of responsibly sourced materials for the basic building elements.

**MAT 3:**Responsible Sourcing of Materials - Finishing Elements

**Available Credits:**3

**Aim:**To promote the specification of responsibly sourced materials for the finishing elements.

### Surface Water Run-off

**SUR 1:**Management of Surface Water Run-off from developments

**Available Credits:**2

**Aim:**To design surface water drainage for housing developments which avoid, reduce and delay the discharge of rainfall run-off to watercourses and public sewers using SuDS techniques. This will protect receiving waters from pollution and minimise the risk of flooding and other environmental damage in watercourses.

**SUR 2:**Flood Risk

**Available Credits:**2

**Aim:**To promote housing development in low flood risk areas, or to take measures to reduce the impact of flooding on houses built in areas with a medium or high risk of flooding.

### Waste

**WAS 1:**Storage of non-recyclable waste and recyclable household waste

**Available Credits:**4

**Aim:**To promote resource efficiency via the effective and appropriate management of construction site waste.

**WAS 2:**Construction Site Waste Management

**Available Credits:**3

**Aim:**To promote resource efficiency via the effective and appropriate management of construction site waste.

**WAS 3:**Composting

**Available Credits:**1

**Aim:**To promote the provision of compost facilities to reduce the amount of household waste sent to landfill.

### Pollution

**POL 1:**Global Warming Potential of Insulants

**Available Credits:**1

**Aim:**To promote the reduction of emissions of gases with high GWP associated with the manufacture, installation, use and disposal of foamed thermal and acoustic insulating materials.

**POL 2:**NOx Emissions

**Available Credits:**3

**Aim:**To promote the reduction of nitrogen oxide (NOX) emissions into the atmosphere.

### Health & Wellbeing

**HEA 1:**Daylighting

**Available Credits:**3

**Aim:**To promote good daylighting and thereby improve quality of life and reduce the need for energy to light the home.

**HEA 2:**Sound Insulation

**Available Credits:**4

**Aim:**To promote the provision of improved sound insulation to reduce the likelihood of noise complaints from neighbours.

**HEA 3:**Private Space

**Available Credits:**1

**Aim:**To improve quality of life by promoting the provision of an inclusive outdoor space which is at least partially private.

**HEA 4:**Lifetime Homes

**Available Credits:**4

**Aim:**To encourage the construction of homes that are accessible and easily adaptable to meet the changing needs of current and future occupants.



### Management

**MAN 1:**Home User Guide

**Available Credits:**3

**Aim:**To promote the provision of guidance enabling occupants to understand and operate their home efficiently and make the best use of local facilities.

**MAN 2:**Considerate Constructors Scheme

**Available Credits:**3

**Aim:**To promote the environmentally and socially considerate, and accountable management of construction sites.

**MAN 3:**Construction Site Impacts

**Available Credits:**2

**Aim:**To promote construction sites managed in a manner that mitigates environmental impacts.

**MAN 4:**Security

**Available Credits:**2

**Aim:**To promote the design of developments where people feel safe and secure- where crime and disorder, or the fear of crime, does not undermine quality of life or community cohesion.

### Ecology

**ECO 1:**Ecological value of site

**Available Credits:**1

**Aim:**To promote development on land that already has a limited value to wildlife, and discourage the development of ecologically valuable sites.

**ECO 2:**Ecological enhancement

**Available Credits:**1

**Aim:**To enhance the ecological value of a site.

**ECO 3:**Protection of ecological features

**Available Credits:**1

**Aim:**To promote the protection of existing ecological features from substantial damage during the clearing of the site and the completion of construction works.

**ECO 4:**Change in ecological value of site

**Available Credits:**4

**Aim:**To minimise reductions and promote an improvement in ecological value.

**ECO 5:**Building footprint

**Available Credits:**2

**Aim:**To promote the most efficient use of a building's footprint by ensuring that land and material use is optimised across the development.

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