

DRAFT

Renewable Energy & Energy Efficiency in New Developments

Draft for public consultation

supplementary planning guidance

**SPG^{BH}
note 16**

What is an SPG?

A Supplementary Planning Guidance Note (SPG) is one of the material considerations that can be taken into account when determining a planning application. It is intended to provide helpful guidance for the developer, consistent with the provisions of the Local Plan. This SPG Note is one of a series produced Brighton & Hove Council and it is to be read in conjunction with the Brighton and Hove Local Plan. Each SPG note has been subject to a period of consultation and Council Approval.

Making Comments

This draft SPG has been published for consultation, the consultation period will run from the **12 November 2003 until 24 December 2003**. If you would like to comment on the draft SPG you should make them in writing to the Head of Planning Strategy no later than the **24 December 2003**.

You can either send them by post to:

The Head of Planning Strategy,
Town Hall,
Norton Road,
Hove, BN3 3BQ

Or

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1.0 Introduction

1.1 This SPG provides guidance on the technologies available and how developers and householders can use renewable energy within new developments as well as providing guidance on achieving energy efficiency within schemes. It should be read in conjunction with Brighton & Hove Local Plan policies SU2 and SU17.

1.2 Energy efficiency and renewable energy are becoming increasingly important in the design and development of buildings, as the arguments for reducing our energy use are becoming widely accepted. If we do not address the issues causing climate change such as carbon dioxide (CO₂) emissions, the long term effects on society and the world's environment could be serious. The location of Brighton & Hove on the coast will place the city increasingly at threat from rising sea levels and the associated problems of extreme weather conditions. In considering the use of energy in the design of buildings we can help to reduce the level of CO₂ emissions released into the atmosphere.

1.3 The 1997 Kyoto Protocol on climate change set internationally agreed and binding targets for the reduction of greenhouse gases for the period up to 2012. The target for the United Kingdom is to reduce our emissions by 12.5% below the 1990 levels. In addition to the main Kyoto target the Government has also set a domestic target to reduce CO₂ emissions by 20% below the 1990 levels by 2010.

1.4 The principle of reducing our dependence on unsustainable energy sources such as fossil fuels forms a fundamental theme within the Government Energy White Paper. This has been developed further in regional planning policy through the South East England Regional Assembly's published proposed alterations to RPG9 in May 2003.

1.5 The Government's Energy White Paper sets a target to reduce carbon dioxide emissions by 60% by 2050. In order to achieve this target, the way buildings are designed and the supply of energy will need to change.

1.6 Developing sustainable energy use within developments has many advantages outside the acknowledged environmental ones these include;

- A reduction in the running costs of buildings
- A reduction in the number of cases of fuel poverty
- An improvement in the internal conditions of buildings through better ventilation and natural daylight
- Increasing the profile of a development
- Improving the marketability of a development

There are many examples of incorporating renewable energy and energy efficiency into developments of all kinds throughout the UK. Examples include the Beddington Zero Energy Development (BedZED) in Sutton, The Millennium Village and Sainsbury's supermarket in Greenwich, as well as large scale public buildings such as the Greater London Authority's City Hall and Brighton & Hove Central Library.

2.0 Policy Context

2.1 National Policy

2.2 National planning policy on renewable energy is set out in Planning Policy Guidance Note 22 —Renewable Energy (1993) and its Annex on Photovoltaics (2002). This guidance states that

“Renewable energy is not the only solution to limiting emissions of greenhouse gases. On the demand side, energy efficiency can also make a substantial impact on reducing our demand for energy. The Government is taking measures to encourage the exploitation of these potential savings.” (Paragraph 7)

“In planning for the use of land by energy – generating installations, the Government’s general aims are:

- (a) To ensure that society’s needs for energy are satisfied, consistent with protecting the local and global environment;
- (b) To ensure that any environmental damage or loss of amenity caused by energy supply and ancillary activities is minimised; and
- (c) To prevent unnecessary sterilisation of energy resources.” (Paragraph 20)

“ Planning authorities should also bear in mind that investment in renewable energy development can make an important contribution to the national economy, and can help to meet our international commitments on limiting greenhouse gas emissions.” (Paragraph 23)

2.3 The Annex to PPG 22 published in 2002 states that:

“ A positive, strategic approach to planning for renewable energy is essential to help deliver the Government’s targets and goals for

renewable energy and climate change, which are central to achieving sustainable development. Photovoltaic (or PV) technology can play a small part in delivering these targets.” (Paragraph 1)

2.4 PPG 3: Housing (2000) advocates careful design in housing developments incorporating consideration for energy efficiency it states:

“The Government attaches particular importance to the 'greening' of residential environments. Greening initiatives can enhance quality, assist the permeability of land for storm drainage and contribute to biodiversity. Well designed layouts can also contribute to the energy efficiency of new housing.” (Paragraph 52)

“New housing development of whatever scale should not be viewed in isolation. Considerations of design and layout must be informed by the wider context, having regard not just to any immediate neighbouring buildings but the townscape and landscape of the wider locality. The local pattern of streets and spaces, building traditions, materials and ecology should all help to determine the character and identity of a development, recognising that new building technologies are capable of delivering acceptable built forms and may be more efficient. Local planning authorities should adopt policies which:

- create places and spaces with the needs of people in mind, which are attractive, have their own distinctive identity but respect and enhance local character;
- promote designs and layouts which are safe and take account of public health, crime prevention and community safety considerations;
- focus on the quality of the places and living environments being created and give priority to the needs of pedestrians rather than the movement and parking of vehicles;

- avoid inflexible planning standards and reduce road widths, traffic speeds and promote safer environments for pedestrians; and
- promote the energy efficiency of new housing where possible.” (Paragraph 56)

2.5 Regional Policy (RPG9) 2001

RPG9 states that ‘Improved energy efficiency should be a key component of all types of development. The focus of this guidance on urban renaissance does offer scope for improving energy efficiency as part of urban renewal and redevelopment. An increasing demand for energy efficient design and appliances could also have economic and social advantages such as the development of new markets and products and cost savings for residents.’ (Paragraph 10.23)

RPG9 policy INFA4 states that:

“In planning the future development of the region and activities within it, priority should be given to energy conservation and to maximising the use of renewable energy sources as an alternative to fossil fuels”

Proposed Alterations to RPG9 (May 2003)

In order to meet the national targets for CO₂ the proposed alterations state that:

“Local authorities should use design briefs and / or supplementary planning guidance to promote development design for energy efficiency and renewable energy including:

- i. Attainment of high energy efficiency ratings in all new development, where appropriate, through the use of best practice guidance such as Building Research Establishment Environmental Assessment

Method (BREEAM) and National Home Energy Rating (NHER);

- ii. Incorporation of renewable energy sources including, in particular, passive solar design, solar water heating, photovoltaics, ground source heat pumps and in larger scale development, wind and biomass generated energy;
- iii. Assessment of a development’s energy demand and measures to provide a proportion of this from renewable sources.” (Policy EN2)

And that;

“Local authorities should collaborate and engage with communities, the renewable energy industry and other stakeholders on a sub-regional basis to assist in the achievement of the targets through:

- i. Undertaking more detailed assessments of local potential;
- ii. Encouraging small scale community-based schemes;
- iii. Encouraging development of local supply chains, especially for biomass;
- iv. Raising awareness, ownership and understanding of renewable energy.” (Policy EN5)

2.6 The proposed alterations also set targets for the South East region as a whole and sub-regional targets.

The minimum regional targets for renewable energy and energy efficiency production set out as part of policy EN4 are

Year / Timescale	Installed Capacity (MW)	% Electricity Generation Capacity
2010	620	5.5
2016	895	8.0
2026	1750	16.0

2.7 Sub-regional Targets (Policy EN5)

Sub-Region	2010 Renewable Energy Target (MW)	2016 Renewable Energy Target (MW)
East & West Sussex	57	68

It is important to note that once the Planning and Compensation Bill currently progressing through parliament is enacted the policies within RPG9 will be translated in to the Regional Spatial Strategy for the South East. The policies contained within the Spatial Strategy will have more influence at the local level than is currently the case under the present planning system. This supplementary guidance will be reviewed to take account of these changes once the Spatial Strategy has been produced.

2.8 East Sussex and Brighton & Hove Structure Plan Policy

2.8.1 The East Sussex and Brighton & Hove Structure Plan seeks to encourage sustainability and energy conservation policy through policy EN27 which states that;

“The conservation of energy will be

sought within development proposals by seeking the highest practicable degree of energy efficiency through appropriate location which reduces the need to travel by motorised vehicle, orientation, design, layout, use of recycled building materials, landscaping to provide effective shelter and, where appropriate, connection to a combined heat and power system.”

2.9 2nd deposit draft Brighton & Hove Local Plan Policy

2.9.1 The Brighton & Hove Local Plan seeks to promote sustainable development and the sustainable use of energy through Policies SU2 and SU17 which state;

SU2 – “Planning permission will be granted for proposals which demonstrate a high standard of efficiency in the use of energy, water and materials provided that they are otherwise in accordance with the other policies of the development plan. Proposals will be required to demonstrate how the following factors have been integrated into their siting, layout and design:

- a) Measures that seek to reduce fuel use and greenhouse gas emissions;
- b) The incorporation / use or the facilitation of the use of renewable energy resources;
- c) Measures that seek to reduce water consumption;
- d) Measures that enable the development to use greywater and rainwater; and,
- e) Use of materials and methods to minimise overall energy and / or raw material inputs.

When considering these factors, particular regard should be given to the following:

- i. Daylight / sunlight;
- ii. Orientation;
- iii. Building form;
- iv. Materials;
- v. The use of natural ventilation;
- vi. Fenestration;
- vii. Landscaping;

- viii. Provision of space within each planning unit and general facilities for refuse, waste recycling and composting; and,
- ix. Suitable space for occupier and visitor cycle parking.

an Attractive City. By promoting best practice of renewable energy and energy efficiency in new developments, while maximising those buildings using energy efficiency measures.

Planning permission will not be granted for proposals that have not taken into account efficiency in the use of energy, water and materials and incorporated the measures suitable to the proposal.”

SUI7 – “planning permission for power generation installations based on energy from renewable resources will be permitted provided that the proposal will not have a significant detrimental impact on:

- a) The environment
- b) The amenities of nearby occupiers
- c) The general character of the area
- d) The aims of the other policies in the development plan.”

2.10 Other Brighton and Hove City Council Strategies

2.10.1 Brighton & Hove City Council Sustainability Strategy (2002)

Objective 3 of the Council’s Sustainability Strategy Energy Action Plan is to:

“Establish sustainable use of energy in buildings and operations in the business, retail and industrial sectors, and in the wider public and voluntary sectors.”

To achieve this objective the Council will establish sustainable energy use in all new development by providing information, advice and support to developers, architects, businesses and other organisations to achieve sustainable energy use in new development.

2.10.2 Brighton & Hove Community Strategy

This SPG will help to achieve the community strategy’s theme of creating

3.0 Designing for Sustainable Energy Use (General Principles)

- 3.1 The planning system provides a means of promoting sustainable energy use and standards of energy efficiency that go beyond the statutory minimum required by the amended Part L of the Building Regulations. Securing high standards of energy efficiency and use in development will help to achieve the aims of national, regional, and local plan policies, as well as contributing to Brighton and Hove's Community Strategy and Sustainability Strategy.
- 3.2 Better design of developments can dramatically cut the energy consumption and the CO₂ emissions of developments. There are a variety of methods and technologies available, by choosing the most appropriate technology for a development, energy efficient measures and renewable energy sources can be incorporated into any style and type of building resulting in high levels of energy conservation. Therefore applicants will be expected to demonstrate that energy efficient measures have been incorporated in the design of a building, including insulation measures that can help retain heat. Buildings should not only be designed for energy efficiency but wherever appropriate should incorporate elements of renewable energy.



The Sainsbury's supermarket in Greenwich is a good example of how more than one technology combined with good design can be used to achieve a substantial reduction in energy cost.

- 3.3 Policy SU2 of the second deposit draft local plan requires developers to demonstrate that they have considered the efficiency of their proposals in regard to the siting, layout and design of a scheme. As stated within the Local Plan (paragraph 2.16) applicants will be expected to have taken into account the Building Research Establishments Energy Assessment Methodology (BREEAM) or EcoHomes rating within their proposals. Further information on the BREEAM assessment or EcoHomes rating can be obtained from the BRE website¹. In incorporating the principles of energy efficiency into the design of schemes there are general principles that can be applied depending on the constraints of a particular site.

What is BREEAM?

BREEAM gives an environmental impact rating for buildings, it stands for **B**uilding **R**esearch **E**stablishment **E**nvironmental **A**ssessment **M**ethod.

BREEAM assesses the performance of buildings in regard to, Energy Use, Health and Well Being, Pollution, Transport, Land Use, Ecology, Materials and Water. The building is awarded credits based on the level of performance and an overall score is given which, is then translated into a rating of :

PASS, GOOD, VERY GOOD, EXCELLENT

- 3.4 It is accepted that other assessment methods are available other than BREEAM and EcoHomes. Such as the Housing Energy Efficiency Best Practice programmes Energy Efficiency Standards. However all developments should aim to achieve a benchmark BREEAM / EcoHomes rating of "very good" or an equivalent if using an alternative method.

¹ www.bre.co.uk

What is EcoHomes?

EcoHomes is the equivalent to BREEAM for homes and flats, the assessment is also carried out by the Building Research Establishment (BRE).

EcoHomes assesses the performance of residential buildings in regard to, Energy Use, Health and Well Being, Pollution, Transport, Land Use, Ecology, Materials and Water. The building is awarded credits based on the level of performance and an overall score is given which, is then translated into a rating of:

PASS, GOOD, VERY GOOD, EXCELLENT

3.5 Layout and Orientation

Site layout is one of the most important aspects of designing a scheme that will utilise renewable energy sources and achieve a high level of energy efficiency. Developments should aim to achieve the most energy efficient layout obtainable within a site, to achieve a layout that can incorporate energy efficient design and reduce CO₂.

3.6 The best use of the features of a site to take advantage of natural daylight and solar energy will be expected where it is feasible. Taking advantage of natural slopes will allow for the greater use of energy from the sun. Where it is not possible for developments to fulfil other policies of the local plan such as QD3 'Design efficient and effective use of sites', applicants will be expected to use other efficiency measures / technologies in their scheme as set out in this guidance.

3.7 As required by policy SU2 the orientation of a building should be considered as part of the formulation and design of a development to maximise the energy efficiency of a building and to enable the use of renewable energy as part of developments. In certain schemes it may be necessary to maximise the benefits of solar gain and it is recommended that buildings should be

orientated with the longest face within 30 degrees of south.²

3.8 However, there may be a need to address issues of too much solar gain in the office environment, where the use of Information Technology will generate heat it may be necessary to site a building facing north as in the case of City Hall, London. This will reduce the risk of overheating the building and therefore require less energy to be used in cooling the building. In each case it will be important to assess the proposed use of the building and its location to ascertain the best orientation of the building. This has been achieved in the BedZED development where the work units are sited on the ground floor facing north specifically for this reason.

3.9 Overshadowing

Consideration should be given to the effects of overshadowing and steps should be taken to minimise this. Reducing the amount of overshadowing will help to maximise the potential for solar gain in a development and adjoining sites. The BedZED community in Sutton provides a good example of how the problems of overshadowing can be overcome. The principles that can be applied are:

- Siting garages away from Southern elevations
- Site taller buildings to the north
- Trees and other landscaping measures should be planted so as not to reduce solar gain.

3.10 Microclimate

The microclimate of a site will be able to influence the amount of energy that can be lost through heat loss. As in the Sainsbury's (Greenwich) example the design of the scheme involved building mounds of earth along the building's sides and its rear to prevent heat loss and gain. These areas were landscaped

² DoE General Information leaflet 25 (1997)

to add to the character and environmental benefits of the development. These principles can be applied with buildings to protect against wind and act as shelters.

3.11 Listed Buildings and Conservation Areas

Any proposal that affects a listed building or conservation area will be expected to utilise energy efficiency measures that are appropriate to the area or building concerned. Measures that adversely affect the setting of a listed building, the building itself or a conservation area will not be supported. All proposals affecting a listed building will be expected to conform to policies HE1 and HE3 of the Local Plan.

- 3.12 In Conservation Areas the siting and location of any renewable energy facilities or energy efficiency measures (such as double glazing) will be expected to accord to policy HE6 of the local plan. For further information on incorporating renewable energy and efficiency in conservation areas or listed buildings applicants should contact the conservation team who will be able to give relevant advice.

Further Guidance and Advice

In assessing a proposal against the sustainable energy objectives of national and regional guidance regard should be had to the sustainability checklist produced by SEEDA as an assessment tool. In respect of local guidance and policy regard should also be had to the Brighton and Hove Sustainability Checklist once published.

The City Council will be happy to discuss energy efficient measures and proposals incorporating renewable energy in regard to this guidance. If you require further information and advice on the technologies available and how they can be combined to develop low energy buildings then please contact us on the numbers given at the back of this guidance.

4.0 Solar Energy

4.1 Solar energy is suited to providing energy solutions in the urban context. Solar energy can be used on different scales in many types of development. There are three main ways of using solar energy these are:

- Passive Solar Energy
- Solar Water Heating
- Photovoltaic (PV)

4.2 Passive Solar Energy

The principle of passive solar design is to optimise the amount of energy that can be derived from the sun. This can be achieved through the careful design and orientation of a building or a whole development.

The key principles to apply in the design of schemes using passive solar energy are based on heating, lighting and ventilation. Normally developments that use passive solar energy will incorporate large glazed areas facing south to allow for better daylighting and heat gain from the sun. Rooms such as toilets and kitchens that generally require less heating or generate their own heat can be located on the north side of the building, thus retaining the benefits for the rooms in general occupation.

4.3 It is important to note that the use of passive solar design will need to be supported by sufficient forms of natural ventilation so as to conform to Building Regulations. In office developments fitting opening windows or vents in buildings or incorporating an atrium to create a heat stack can achieve this. This will not only provide good natural ventilation but can also provide a more sustainable solution to air cooling than air conditioning systems which are expensive to run and contribute to CO₂ emissions.

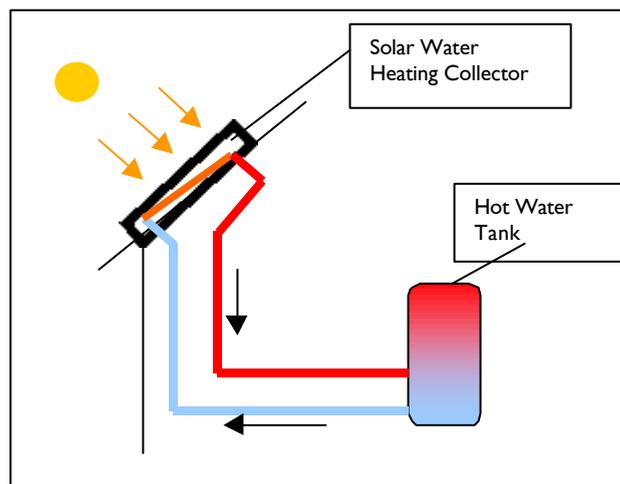


City Hall, Southwark, is a good example of a building that incorporates the principles of natural ventilation to reduce cooling costs in office developments.

4.4 Active Solar Heating

Active Solar Heating is currently best suited to heating systems that do not require direct sunlight such as domestic hot water systems. The advantages of using active solar heating are those commonly given to renewable energy technologies as previously stated. However as this technology requires a solar panel to be installed (normally on the roof) it may be considered unsuitable in certain locations such as conservation areas and on listed buildings. With proper siting and in consultation with the relevant service many of these concerns can be overcome as the technology evolves.

The illustration shows how a typical active solar system works.



4.5 There are three main types of solar panels (collectors) that can be used in commercial or residential developments. These are

- Evacuated Tubes
- Selective surfaced flat plate
- Non-selective surfaced flat plate

Evacuated Tubes, are a series of vacuumed glass tubes, (normally installed in groups of ten). They work by heating the water as it passes through the tube. The advantages of evacuated tubes are that they can be rotated to get the most heat from the sun during the day.

Flat plate solar and Non-selective flat plate panels work on the same principle as evacuated tubes. However, they are unable to rotate to get the best energy from the sun during the day.

4.6 **Photovoltaics**

Photovoltaic (PV) cells convert solar radiation into electricity. This technology was first used to power satellites but is increasingly being used to meet electricity requirements and is commonly used to power watches, calculators as well as in developments. There are two main types of PV that can be used as part of a development. These are:

- stand - alone systems for remote power generation; and
- building-integrated and building-attached (retrofit) systems connected to local networks.

4.7 **Stand - alone PV systems** are used to provide power for street lighting, parking meters normally in remote locations. These systems rely on a battery to store up energy and an electronic controller to manage the energy.

Building - Integrated PV can be incorporated into most building types as cladding or tiling. There are many examples of the use of PV cells in the urban setting. However to get the best

performance from these systems the design and setting of schemes needs to be considered carefully. The orientation of the development and the location of PV panels will need to take account of the surrounding buildings to maximise the heat from the sun so as to minimise overshadowing.

5.0 **Combined Heat and Power (CHP)**

5.1 A Combined Heat and Power plant using bio – fuels such as wood will be considered to be a renewable energy source that will simultaneously generate and provide useable heat, power and hot water to a development. CHP can provide a secure and highly efficient method of generating electricity and heat at the point of use. This is due to the utilisation of heat from electricity generation and the avoidance of transmission losses because electricity is generated on site. CHP can result in efficiencies of 85%.

5.2 Regional guidance RPG9 supports the use of Combined Heat and Power (CHP) as part of local community heating schemes as they can increase energy savings to residents, as well as optimise reductions of carbon dioxide. This highly fuel efficient technology provides substantial cost savings as well as environmental benefits. In new build or redevelopment schemes it needs to be considered at the earliest stage of the development process because of the infrastructure required. In respect of energy savings achieved through alternative transport infrastructure and reduced travel, further details are included in chapter 9 of regional planning guidance (RPG9).

5.3 CHP schemes can also run on a number of fuel types such as gas or diesel fuel. However, these will only be considered as an alternative to CHP plants that run on renewable sources where the use of renewable sources will not be acceptable in a specific location. The technology of CHP is developing all the time and as this

evolves the size of the units are becoming smaller and are making it increasingly viable for the use of CHP in a number of schemes. The use of CHP will be expected to be incorporated within the design of large-scale developments within Brighton and Hove as advocated in paragraph 2.15 of the local plan.



The new Brighton Station development incorporates a CHP plant

5.4 The technology is now at a stage where it is possible to install a CHP unit into the home. This technology has been developed in New Zealand and is to be launched in the UK in 2003.

6.0 Wind Energy

6.1 Brighton and Hove as an urban area is unlikely to be suitable for large-scale wind turbines. However, there are examples of developments that have taken place in the urban environment that show that small turbines can be incorporated into developments in the urban area.

6.2 In accordance with policies SU2 and SU17 of the Local Plan Brighton and Hove Council will support the use of renewable energy technologies such as wind where they do not impact greatly on the amenity of adjoining buildings and accord with the other policies of the plan.

6.3 Small scale use of wind turbines often mean that the power generated will need to be combined with another source as generally the power will be insufficient to power a whole development. Schemes where such small-scale turbines have been used include The Ecology Centre at Mile End Park, Tower Hamlets, and the Sainsbury's supermarket, Greenwich.

6.4 In developing schemes that incorporate an element of wind power the impact on the surrounding environment will need to be assessed. In certain locations such as conservation areas wind turbines will not be encouraged.

7.0 Green Roofs

7.1 A Green Roof is a roof with vegetation growing on it. A green roof can range from being a roof with moss or grass growing on it to a fully fledged roof garden.

7.2 Green Roofs can help to improve the thermal performance of a building. They are widely acknowledged to help prevent heat loss in the winter and help keep buildings cool in the summer as planting on the roof will reduce the amount of solar radiation that can be absorbed by the roof's bare surface.

7.3 Not only do green roofs help to contribute to the energy efficiency of a buildings performance, they also provide benefits in the reduction of CO₂ in the atmosphere and add to the city's bio-diversity.

7.4 The city council will promote the use of green roofs in developments where they accord with the policies of the local plan. They have the potential to contribute to the greening of the city environment and to local bio-diversity. This will be of particular importance when considering the impact of brownfield sites to the bio-diversity of the city.

Further Information and Contacts

Brighton & Hove Council Contacts

Planning Strategy and Projects

Tel: (01273) 29 2354

Sustainability Team

Tel: (01273) 29 3332

Private Sector Housing

Tel: (01273) 29 3150

Further Information

The following internet sites provide useful information on renewable energy and energy efficiency.

Department of trade and industry

www.dti.gov.uk

Office of the Deputy Prime Minister

www.odpm.gov.uk

SEEDA Sustainability Checklist

www.sustainability-checklist.co.uk

Building Research Establishment

www.bre.co.uk

Energy savings trust

www.est.org.uk

The Centre for alternative Technology

www.cat.org.uk

The British Wind Energy Association

www.bwea.com