Renewable Energy & Energy Efficiency

Planning guide for householders and small businesses

Lewes District Council

What this document sets out to do...

... to help residents, small businesses and builders by providing guidance on planning issues in relation to small scale renewable energy and energy efficiency.

...and why

Under the Kyoto Protocol the UK is aiming to reduce the production of greenhouse gases. The Kyoto Protocol has called for a 12.5% reduction worldwide between 2008-2012. It is vital that if this is to be achieved energy needs to be used more efficiently and the proportion of energy generated from renewable sources needs to be increased.

Government Guidance in Planning Policy Statement 22: Planning for Renewable Energy encourages appropriate renewable energy schemes. The document explains that planning authorities should include renewable energy policies in their plans. This is done through the emerging Local Development Framework.

Policy ST31 in the current adopted Local Plan* states that: “planning permission for renewable energy schemes will be granted provided they do not have a detrimental impact on the Area of Natural Beauty or Conservation Areas, they have an acceptable impact on the wider landscape and protect feature and the areas of natural, cultural, historical and archaeological interest.”

Lewes District Council wants to encourage renewable energy and energy efficiency because together they help reduce the need for energy from oil, coal and gas - the carbon dioxide gas emissions from which are causing sudden and drastic climate change.

This document sets out examples of renewable energy technologies that are available, planning issues that need to be considered if the works require planning permission and also the grants available to you.

Lewes District Council funds its own grant scheme to subsidise and encourage the installation of renewable energy systems in domestic properties. This is in addition to any Government or other grants available. Please see page 15 for more details.

Through its Energy Policy the Council is committed to meeting 10 percent of the District’s electricity requirement by 2010 from renewable sources; and 20 percent by 2020.

*The Lewes District Local Plan is available to view on the Council’s website at www.lewes.gov.uk , at public libraries and the planning office at Southover House, Southover Road, Lewes.

First things first -
make your building energy efficient!

All good renewable energy system installers agree – to save CO2, and money, the most effective way is to make your building more energy efficient. Here is a quick checklist of things to look at:

Increase insulation - householders can obtain low-cost cavity wall and loft insulation from energy suppliers, which are obliged by the government to achieve energy savings. If the building has solid walls, it may be worth installing external or internal thermal cladding when the building requires decoration (note that cladding in a listed building or in a conservation area will almost certainly require planning consent). Loft insulation should go over the joists to be most effective.

Switch to low energy lighting - in most buildings, lighting accounts for between 10 percent and 15 percent of the electricity bill. Some energy efficient lighting can save up to ten times its initial purchase price over its lifetime and a large range of types is available, including spot lamps, candle lamps and coloured lamps. Large fluorescent tubes can be replaced with smaller diameter tubes which are more efficient.

Improve ventilation - If you have extractor fans, do they have heat exchangers? Heat exchangers transfer the heat from the extracted air to the incoming fresh air, instead of being wasted.

Increase draught-proofing - Make sure heat is not being lost because of gaps around doors, floorboards, skirting boards and windows.

Buy better appliances – If you are buying a new household appliance, ask for an "A" efficiency rating one. Make sure appliances such as televisions or laptop computers are fully turned off (not on stand-by or charging) when not in use.

Control your heating – when your boiler needs replacing, make sure it is an "A" rated model, and not too large for your heating needs. Controls ensure the heating comes on only when you need it.

For free, independent advice on the various energy efficiency grant schemes or subsidies available to Lewes residents, please see the contact details on the back page.

Front cover shows solar panels on a detached house roof (photo Southern Solar)

Renewable Energy for houses & other buildings

This section sets out:

- **which technologies are generally available today**
- **when they are considered to be permitted development**
- **when they are likely to require planning permission under the various circumstances.**

If you are still unsure whether you need planning permission after reading this booklet, please write to Planning Services with details of your proposal (contact details on back page). They cannot give you an answer straight away over the telephone as they need to make detailed checks on the history of the site to see if permission is required. See back page for contact details.

In 2004 Norman Baker MP for Lewes "launched" the new solar PV panels at Ringmer School, East Sussex (photo Lewes DC)

Where the installation affects the appearance of a building (such as a solar panel on the roof), it would greatly help the planning officers to come to a decision if an image was presented of how the installation would look. A reputable installer should be able to provide you with drawings or photographs of a similar installation.

All installations are subject to Part L of Building Regulations.

Planning Issues - General

The kind of issues council planning departments are concerned about with any new development are:

☐ How are the neighbours affected, if at all? Issues such as intrusive noise, visual impact, over-shadowing and long-term extra traffic movements will need to be investigated.

☐ Is the building in a Conservation Area or is it a listed building? Issues such as visual impact and whether it is "out of character" either with the area or the building will need to be investigated.

☐ How is the green environment affected? Issues such as whether any trees will need to be removed (to enable a roof nounted wind turbine to operate effectively for example) may need examination.

The kind of planning issues more likely to arise depends very much on the type of renewable technology used. These are covered in more detail at the end of each section.

Solar Power

As well as converting solar radiation into electricity using photovoltaic cells (PV), energy from the sun can also be harnessed to provide hot water.

Solar Hot Water systems

Solar Hot Water systems are among the most cost-effective renewable energy systems that can be installed on buildings, and several thousand systems have been installed in the UK over the last twenty years. A well-designed system should provide over half of a household's annual hot water needs, with the peak time being between May and September. In the winter months the warm water collected may have to be fully heated up to the required temperature by a conventional boiler. Solar hot water does not generally provide space heating.

Two main types of solar hot water collector are available in the UK: flat plate and evacuated tube. In both systems, water or an antifreeze mixture travels through the collector, picking up heat which is then passed through a copper coil in the hot water tank.

The solar hot water collector, together with the glazing and insulation are generally mounted in a box usually coloured grey or black. For an average household installation, some 4 or 5m2 of flat plate collector, or some 3m2 of evacuated tube are required. Typically, this would be mounted on a southerly facing roof pitch, or more rarely on a freestanding tilted frame on the ground, or a flat roof. Some systems use photovoltaics (PV) to provide power for the system pump. In this case, a separate small PV module, typically 20cm by 40cm will be mounted adjacent to the solar hot water collector.

This solar hot water panel (on side roof) is installed on a house in a conservation area (photo ECSC)

A very large array of evacuated tube solar heaters installed on the flat roof of a large multi-occupied building in a conservation area (photo ECSC)

Collectors rarely project more than 120mm above the existing roofline. Connecting pipework is normally run from the back of the collector directly through to the roof void, and is not normally visible from the exterior of the building. For best performance, solar water heating collectors generally need to be at an angle of 30-40 degrees, facing due south. In practical terms, this is not always possible on existing buildings, and some degree of flexibility is acceptable although this will be at the expense of best performance. To function satisfactorily collectors can be at between 10 and 60 degrees, facing from east to west (i.e. within 90 degrees of due south).

Collectors are becoming available that can be incorporated into a new or existing roof in much the same way as Velux-type roof windows. Although roof mounted collectors are the most common, collectors can also be mounted on the sides of buildings, or on freestanding support structures on the ground. The latter is particularly common in the case of swimming pool heaters.

While evacuated tubes or flat plates on the roof of an adjacent low building (such as a garage or pool house), or on a low ground mounted frame can be used, Solar hot water collectors for **swimming pools** can be a simple system consisting of a mat of a black rubberised material flat on the ground close to the swimming pool. This will have an area of about half that of the surface area of the pool to be effective.

Solar Photovoltaic systems

Solar PV systems convert daylight into electricity. The most common comprises a number of semiconductor cells interconnected to form a solar panel or module. Most PV panels are dark in colour, and have low reflective properties.

A number of modules are usually connected together in an array to produce the required output, the area of which can vary from a few square metres to several hundred square metres. A typical array on a domestic dwelling would be 9 to 18m2, and would produce 1 to 2 kW peak output. In grid-connected solar PV systems any surplus electricity not being consumed within the building can be exported to the local distribution network with the agreement of the network operator and an electricity supplier.

Other forms of solar PV technology are becoming more common in the UK, such as solar PV tiles, which can be integrated into new buildings or refurbishments with conventional roofing tiles or slates. To the untrained eye, they are virtually indistinguishable from conventional roofing materials.

A large array of solar PV panels on a doctors medical centre in Woking, Surrey (photo ECSC)

For best performance, **PV modules** need to be at an angle of 20-40 degrees, and facing south. As with solar thermal, this is not always possible on existing buildings. To function well, PV installations need to be at between 10 and 60 degrees, and facing from east to west (i.e. within 90 degrees of due south). Connections between individual panels are made either in the support structure, or inside the roof void, and are rarely visible from the exterior of the building.

Although roof mounted PV is the most common, modules can also be mounted on the sides of buildings, or on freestanding support structures on the ground. Other examples of building integrated PV include external sun shading of windows (brise-solaires) and glass atrium roofs.

Planning issues for solar panels (all types)

☐ Solar power is particularly well suited to the urban environment and is clean and silent in operation.

☐ On pitched roofs of permanent buildings, solar panels are normally permitted development (with the exceptions below) when they are permanently fixed to a roof and follow the roof line, and do not protrude more than 100 mm above the line of the roof.

☐ On flat roofs, solar panels are normally permitted development when they are fixed permanently to a roof and are not visible from street level.

☐ Solar panels permanently fixed and parallel to exterior walls and protruding less than 100 mm are normally permitted development. In steel-framed commercial buildings, solar PV panels incorporated as part of the external walls are encouraged as an alternative to decorative cladding.

☐ Solar panels installed on buildings in conservation areas are permitted development. However, solar panels fixed to a listed building require *Listed Building Consent* because the siting of the installation may alter the character or appearance of the building. For this reason the fitting of solar panels to front roof slopes or other prominent roofs or exterior walls seen from the street is unlikely to be acceptable to the Council where planning permission or listed building consent is needed. However, installation of panels in concealed valley roofs or roofs hidden behind parapet walls, on rear facing roofs and walls not visible from the street may be acceptable. Where roof slates need replacing it may be acceptable to use grey solar photovoltaic slates.

☐ Planning permission is not required for solar panels on temporary buildings in car parks, gardens or in parkland.

Biomass

Biomass or wood burning systems differ from other renewable energy sources because they release carbon dioxide (CO2) when they are burnt. This is equal to the carbon absorbed when the tree was growing, so the process is essentially carbon neutral.

In order for biomass to be a truly renewable energy source, the fuel must come from a sustainable source (it is replanted) and should be used close to where it has been grown. Even allowing for emissions of CO2 in planting, harvesting, processing and transporting the fuel, replacing fossil fuel energy with wood will typically reduce net CO2 emissions by over 90 percent.

Although no more CO2 is emitted than originally absorbed, the combustion process itself can be extremely inefficient if not properly controlled. Burning logs in open fires can mean that up to 85 percent of the heat generated is lost to atmosphere. Modern wood burning stoves and boilers can achieve efficiencies of 80 to 90 percent.

Wood burning stoves and boilers are available in any size, depending on whether heat is required for one room or the whole building and its hot water needs.

Wood fuel is available for delivery in pellet or chip form, and some types of appliances can be fed automatically from an external hopper or store. Most systems for home or commercial buildings use commercially available wood-pellets or wood-chips for the fuel.

The innovative BedZed estate in Sutton (pictured here being built) is heated by a biomass boiler (photo ECSC)

Planning Issues - biomass

- Planning permission for Biomass energy installations is not normally required, if the installation is located within an existing building.

- In selecting appliances that burn the fuel cleanly, adequate provision must be made to install a suitable flue or adapt an existing chimney to regulations. However, the external flue may require planning permission. Issues such as emissions of smell, noise and air pollution will be considered when determining such an application.

- Storage space for the wood fuel can be a major issue when specifying or designing a system for a domestic application. In some automated handling systems, the store (the hopper) needs to be adjacent to the boiler .
  Where large loads are required, provision will need to be made for the delivery vehicle to unload directly into the store.

- Generation of combined heat and electric power (CHP) by using biomass from a sustainable source or waste product is encouraged by Lewes DC, especially if the site is not connected to the gas network.

Stand-alone small PV and wind systems

Lewes DC supports PV and wind power used to provide off-grid power for road signage lighting and parking meters, especially in remote locations.

Wind Power

Wind turbines use rotor blades similar to the propeller of an aeroplane* . If the diameter of the rotor is doubled, the power output from the turbine is quadrupled at a given wind speed.

New designs of small-scale roof mounted turbines should have rubber mounting brackets designed to stop vibrations passing from turbine to building. Turbine noise is minimised by the design.

A small turbine (such as the one in the photo on the facing page) will generate up to 4,000kWh per year (although this will vary according to the wind resource at the site) providing a net financial benefit of up to £440 per year at current electricity prices. This amounts to a saving of approximately 1.6 tonnes CO2 per year.

Turbines can be connected to the electricity grid via a meter so that the energy generated is offset directly against the building's electricity consumption. Assistance will be needed from the building's conventional electricity supplier in order to meet relevant electrical connection requirements.

*There are some vertical axis turbine designs, but these are rare, as they tend to be less efficient.

Wind turbines can be built in residential areas. This turbine, with a solar PV panel, is part of a supermarket sign in Kingston Upon Thames (photo ECSC)

Planning Issues - wind turbines

☐ Small wind turbines often need planning permission and can be acceptable where they do not impact greatly on the amenity of neighbouring property and accord with the other policies of the Council's development plan. Factors to be considered in deciding whether the amenity of neighbours are affected include noise, and visual impact. If these factors are not present the presumption should be in favour of approval. For example, turbine gearbox noise and blade noise have been substantially reduced in recent models and may not be noticeable on neighbouring properties above the natural wind noise.

☐ Wind turbines in conservation areas or fixed to a listed building would be carefully assessed in terms of the character and appearance of the building or area.

☐ Large scale wind turbines can have a major visual impact in the landscape. Any application should contain information explaining the likely noise and visual impact of the proposal.

☐ Any permission for wind turbines sited in green-field sites may be subject to conditions which require the future decommissioning of turbines in twenty-five years time and the return of the ground to its previous appearance.

Small scale Hydro-electric

Small scale hydro-electric power plants are encouraged, especially in former watermill sites.

Planning Issues - Hydro

Permission may be required from the Environment Agency as well as any need for planning permission from the Local Planning Authority. Permission may be subject to environmental assessment and reasonable measures taken to minimise the impact on wild-life.

Combined heat and electric power (CHP)

A CHP plant uses the waste heat generated during the production of electricity to provide heating or cooling for buildings. Fuel efficiency can be increased to up to 90 percent compared to 30-50 percent with separate heating and electricity generation.

To be viable economically CHP plants require a relatively large and constant demand for heat. Greatest efficiency is achieved when CHP is used to serve a number of local buildings of different uses as part of a community (or district) heating scheme and private wire scheme. Residential-only schemes are quite feasible and residents can benefit by lower heating/electricity costs and increased internal space through not having a gas boiler. Nevertheless, CHP will work most efficiently when supplying a mix of nearby residential and commercial buildings because of the diverse heating and electricity requirements throughout the day. Back up electricity supply is always available from the grid (and surplus electricity can be sold back to the grid).

The creation of CHP schemes is encouraged by Lewes DC, especially if the primary fuel used is from a renewable or sustainable source.

There are major town centre CHP schemes in Southampton and in Woking, whose powerstation is shown left (Photo ECSC)

Micro-CHP

Micro-CHP is a new system developed to provide central heating, water heating and electricity for individual houses. A micro-CHP unit replaces the traditional domestic boiler. Running on natural gas, a unit could efficiently use over 90 percent of the fuel energy resulting in a cleaner and more cost effective alternative to traditional electricity generation. The electricity generated can sold back to the grid or used in the home, reducing total electricity costs.

Grants available for Renewable Energy and Energy Efficiency

Renewable Energy - The Government funds various grant schemes to encourage the installation of renewable energy. These schemes change from time to time. Please see the contact details below or on the back page for advice on applying for these grants.

Lewes District Council funds its own grant scheme to subsidise and encourage the installation of renewable energy systems in buildings. This is in addition to any Government or other grants available. The following technologies may be funded:

- Small Wind Turbines
- Solar Water Heating Systems
- Ground Source Heat Pumps (GSHP's)
- Biomass fired boilers
- Pellet stoves or room-heaters
- Wood burning stoves (not available for mixed fuel appliances)

Please contact the **Council's Sustainability and Energy Officer** on **01273 474968** for further information and to check availability.

Energy Efficiency - the energy utilities (such as British Gas and EDF) are required by their regulator to deliver energy savings in existing houses. These measures are usually delivered by offering subsidised cavity wall and loft insulation at low-cost to the householder. For residents on certain state benefits, these measures can be free.

The Government is committed to ending "**fuel poverty**" where householders cannot afford to heat their home adequately. The Government has set up a scheme called **Warm Front** to install certain measures to householders living on certain state benefits. These free measures are usually gas central heating and cavity wall and loft insulation.

For local advice and information on renewable energy and energy efficiency such as technology prices, grants and subsidies please contact the Council's **Sustainability and Energy Officer on 01273 474968** or the Surrey and East Sussex Energy Efficiency Advice Centre on freephone 0800 512 012.

Renewable Energy & Energy Efficiency - Useful Addresses

■ **Planning and Building Control, Lewes District Council, Southover House, Southover Road, East Sussex BN7 1AB. Tel: 01273 471600. Fax: 01273 484452. Minicom: 01273 484488. planning@lewes.gov.uk.**

In particular, see Planning Information Leaflet DC6, which is available from council offices or can be downloaded from http://www.lewes.gov.uk/Files/plan_processplanapp.doc

■ Grants for a range of renewable energy installations are offered by Lewes District Council. Please contact the Council's Sustainability and Energy Officer on 01273 474968 (9am – 5pm weekdays) for further information.

■ **Lewes District Council offers free and independent local advice on renewable energy and energy efficiency. Please contact the Council's Sustainability and Energy Officer on 01273 474968 (9am – 5pm weekdays) for further information.**

■ Free independent advice on saving energy and on the various subsidised insulation schemes available can be obtained between 9 am and 5 pm weekdays from the Surrey and East Sussex Energy Efficiency Advice Centre, on freephone 0800 512 012.

■ **Advice on renewable energy and the various grant schemes available can be obtained from the Energy Conservation and Solar Centre. ECSC also provides support for renewable energy installers on a paid consultancy basis, please call 020 7922 1653.**

■ http://www.est.org.uk/myhome/ for online energy advice

■ **Environment Agency (permissions for hydro-electric installations) Enquiries: 08708 506 506**

Lewes District Council
www.lewes.gov.uk

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