



POLICY STATEMENT

September 2011

RENEWABLE ENERGY

What is renewable energy?

Renewable energy is the term used to describe those energy flows that occur naturally and repeatedly in the environment, e.g. from the sun, the wind and the oceans, and from plants and the fall of water.

Why do we need to exploit renewable energy?

Burning of fossil fuels (coal, gas and oil) and other factors are increasing the concentration of carbon dioxide and other “greenhouse gases” in the earth's atmosphere. At the same time, changes in the Earth's average temperature, increased glacier melting, rising sea levels and other undesirable climate change effects are being observed. Fossil fuels are also a finite resource and there are concerns about security of supplies in the longer term. It is irrelevant whether the unwanted changes being observed are natural or man made. What is important is that the precautionary principle is applied.

The UK is responsible for 3% of global “greenhouse gas” emissions even though it only has 1% of the world's population.

UK energy industries are the largest single contributors to UK greenhouse gas emissions, responsible for over a third (54 million tonnes) of the total carbon dioxide emitted to the atmosphere in the UK. Currently, around 80% of the UK's electricity supply is generated from coal, gas or oil fired power stations. Most of the remainder is generated from nuclear power which, while not contributing to greenhouse gas emissions, has its own unresolved challenges surrounding waste disposal.

Using alternative and renewable sources of energy will contribute to cutting carbon dioxide emissions, and provide a portion of a more diverse energy supply for the future.

What is the Government's position?

In 2001, the UK Government formally signed up to the Kyoto Protocol. It is thus legally bound to reduce greenhouse gas emissions to 12.5% below 1990 levels by 2008-2012, while the government's Climate Change Programme of 2000 seeks to reduce emissions to 20% below 1990 levels by 2010.

In its 2003 White Paper *Our Energy Future – creating a low carbon economy*, the Government pledged to cut carbon dioxide emissions by 60 % by 2050. It also set an 'aspirational' target that by 2020 20% of the UK's electricity requirements should be met by renewable energy, achieved via intermediate targets of 5% by 2005 and 10% by 2010. This would be encouraged through the Renewables Obligation (introduced in 2002) which calls on all licensed electricity suppliers to supply a specified and growing proportion of their electricity sales from a choice of eligible renewable sources, and provides financial incentives for them to do so.

In April 2009 the UK signed up to the EU Renewable Energy Directive which includes a UK target of 15% from renewables by 2020, the equivalent of a 7 fold increase in UK renewable energy consumption from 2008. In July 2009 the Government published a Renewable Energy Strategy indicating how this ambitious goal was to be achieved. It envisages that by 2020 over 30% of our electricity will come from renewables (up from 5.5%), 12% of our heat (up from a negligible contribution today) and 10% of our road and rail transport energy (up from 2.6%).

The Planning Context

A more favourable planning regime to encourage renewable energy projects was introduced in 2004 with the publication of PPS 22 *Renewable Energy*. PPS 22 contains the following key principles for regional bodies and local authorities in planning for renewable energy:

1. Renewable energy developments should be capable of being accommodated throughout England in locations where the technology is viable and environmental, economic, and social impacts can be addressed satisfactorily.
2. Regional spatial strategies and local development documents should contain policies designed to promote and encourage, rather than restrict, the development of renewable energy resources. Regional planning bodies and local planning authorities should recognise the full range of renewable energy sources, their differing characteristics, locational requirements and the potential for exploiting them subject to appropriate environmental safeguards.
3. At the local level, planning authorities should set out the criteria that will be applied in assessing applications for planning permission for renewable energy projects. Planning policies that rule out or place constraints on the development of all, or specific types of, renewable energy technologies should not be included in regional spatial strategies or local development documents without sufficient reasoned justification. The Government may intervene in the plan making process where it considers that the constraints being proposed by local authorities are too great or have been poorly justified.
4. The wider environmental and economic benefits of all proposals for renewable energy projects, whatever their scale, are material considerations that should be given significant weight in determining whether proposals should be granted planning permission.

5. Regional planning bodies and local planning authorities should not make assumptions about the technical and commercial feasibility of renewable energy projects (e.g. identifying generalised locations for development based on mean wind speeds). Technological change can mean that sites currently excluded as locations for particular types of renewable energy development may in future be suitable.

6. Small-scale projects can provide a limited but valuable contribution to overall outputs of renewable energy and to meeting energy needs both locally and nationally. Planning authorities should not therefore reject planning applications simply because the level of output is small.

7. Local planning authorities, regional stakeholders and Local Strategic Partnerships should foster community involvement in renewable energy projects and seek to promote knowledge of and greater acceptance by the public of prospective renewable energy developments that are appropriately located. Developers of renewable energy projects should engage in active consultation and discussion with local communities at an early stage in the planning process, and before any planning application is formally submitted.

8. Development proposals should demonstrate any environmental, economic and social benefits as well as how any environmental and social impacts have been minimised through careful consideration of location, scale, design and other measures.

These planning policies need to be read alongside the policies in *PPS 7 Sustainable Development in Rural Areas*. These make it clear that planning authorities should continue to ensure that the quality and character of the countryside is protected, particularly in designated areas such as AONBs where the conservation of the natural beauty of the landscape should be given special weight in planning policies and development control.

Regional Targets

RPG 10 (Regional Planning Guidance for the South West) published in 2001 translates the Government's national targets and looks to the supply of a minimum of 11-15% of electricity production from renewable sources by 2010 in the south west. The sub-regional target for Gloucestershire is 40 – 50 megawatts.

The Challenge for CPRE

There will be more renewable energy projects in Gloucestershire. CPRE needs to engage in the debate and to do so positively.

The appendix to this paper reviews the main renewable energy technologies available and their impact on the countryside.

CPRE should recognise the desirable potential of producing more energy from renewable sources, but that from some technologies there are significant negative impacts on the environment and a poor cost versus benefit balance. CPRE will wish to oppose developments where the environmental dis-benefits clearly outweigh the benefits of renewable energy. This will be a matter of careful judgement.

At the same time, we should press for greater efforts in energy conservation, as a first priority.

CPRE Gloucestershire Branch Position

RENEWABLE ENERGY

This position statement relates to the production of electricity or heat from renewable sources. It does not address biofuels for transport, and only generically does it address the methods available for minimising energy use.

Reducing energy use

CPRE fully recognises the desirability of meeting a higher proportion of our energy needs from renewable sources, but as a first priority greater effort must be put into reducing energy use and increasing the conservation of energy.

In the UK, one quarter of all carbon dioxide emissions come from energy used to heat and light houses, and power household appliances. We support public awareness campaigns to encourage energy conservation in the home. Reducing the energy wasted in houses can have a direct beneficial effect on the environment as well as saving consumers money. The same holds true of commercial and industrial facilities and activities.

All companies and public authorities should be set ambitious targets for reducing energy use.

Energy conservation measures should be widely promoted in buildings, for example through careful design and orientation of new buildings to maximise solar gain in the winter and minimise it in the summer, by the use of construction materials with good thermal efficiency, and through better insulation.

Developers should be encouraged to produce sustainability audits, and lifetime carbon emissions from developments should be considered within the planning process.

Options for generating energy from renewable resources

A range of technologies can be exploited to generate energy from renewable resources. We are concerned that undue emphasis is being placed on generating energy from onshore wind.

All renewable energy supply systems should be removed at the end of their useful life, as should all associated infrastructure equipment such as buildings, cabling, transformers and switchgear, and this should be a condition of any planning consent.

Large wind turbines can be difficult to accommodate in the landscape and should not be permitted in nationally designated landscapes such as AONBs or where they would harm the setting of nationally designated landscapes.

Promoted by individual small business and local communities and designed to produce electricity for local use, small wind turbines can be more readily assimilated into the landscape.

At present, with care, solar photovoltaic and solar thermal applications can be installed with only limited visual impact and should be encouraged. However, this may not hold true when larger commercial size facilities become available. Like large wind farms they may prove difficult to accommodate in the landscape and if this proves to be the case they should not be permitted in nationally designated landscapes such as AONBs or where they would harm the setting of nationally designated landscapes.

Small-scale hydro applications would be welcome, particularly where they can contribute to regeneration initiatives and be designed and constructed to fit in with the landscape.

Low environmental impact ground source and air source heat pumps should be encouraged in new construction.

Greater generation of energy from biomass would also be welcome for its contribution to farm diversification (*e.g.* short rotation coppice and *Miscanthus*) and as a means to develop new markets for low grade timber and forest residues with benefits for woodland management and conservation.

Wider adoption of anaerobic digestion to produce biogas should be encouraged for its contribution both to energy generation and the treatment of agricultural and other waste.

We support the idea in principle of harnessing the unique tidal power of the Severn Estuary to generate renewable electricity. It is a matter for the current Government sponsored studies to determine whether this can be done economically. However it is not only a question of economics: the Severn Estuary is unique in terms of its ecology and landscape. Any project will cause some changes but it is essential that a balance is struck between economics and maintaining sufficient of what makes the environment special. Because this balance is not maintained we oppose the largest of the possible projects (the Cardiff-Weston Barrage) and support continued investigation of newer technology which is likely to be less environmentally damaging. In considering the alternatives, the effects of onshore facilities on the landscape - both locally and from a distance - must be assessed.

Likewise, irrespective of cost versus benefit considerations, any renewable energy project, large or small, should be assessed against its impact on the landscape and built environment, and rejected if there are significant environmental dis-benefits from the individual proposal or from the cumulative impact of proposals.

What is an acceptable size, in terms of visual impact, will be influenced by the nature of the local landscape.

Planning for Renewable Energy

Local Development Documents (LDDs) should contain policies to encourage uptake of appropriate renewable energy technologies. Targets should be set for a proportion of on site renewable energy generation in all major developments.

We support the use of landscape character studies and assessments to help determine the capacity of landscapes to accommodate renewable energy systems and their supporting infrastructures (e.g. wind turbine installations, solar cell arrays, and biomass plantations).

Updated December 2009

CPRE Gloucestershire Policy Statements are regularly reviewed and updated as necessary. They should be read as a set

APPENDIX

What renewable energy technologies are available, and what are their implications for the countryside?

The following table reviews the main technologies currently available.

Technology		Environmental impact
<p>Solar Photovoltaic (PV) PV panels convert sunlight directly into electricity. The amount of electricity generated is dependent upon the panel's energy conversion efficiency, and proportional to the size of the panel and the intensity of the light. They can either be stand alone units or grid connected to export any surplus electricity. Panels are normally roof mounted, facing the sun but may be free standing.</p>	<p>Costs are high but are expected to fall as the technology is taken up more widely and cheaper types of unit become commercially available.</p>	<p>Roof mounted panels may be damaging to the built environment and must be sited with care. There may be particular problems in conservation areas and with listed buildings. Commercial buildings and structures such as leisure facilities, swimming pools and petrol station canopies may provide good opportunities for use of this technology. Large commercial arrays could become a significant challenge to the landscape.</p>
<p>Solar Thermal Solar thermal installations use the sun's heat to heat water. A heating fluid is warmed by the sun's infra red rays, and then pumped through a heat exchange coil in a hot water tank. There are two main types of heating surface - flat-plate and evacuated-tube. As with PV, for domestic and small scale commercial use the system would usually be roof mounted, inclined towards the sun in a south facing direction. The heat output is dependent upon the panel's energy conversion efficiency, and proportional to the amount of infra red energy absorbed by the unit.</p>	<p>This technology is well established and in summer can often provide all the hot water needed. However, solar-thermal systems need a conventional water heater - powered by gas or electricity - to provide back up for the rest of the year.</p>	<p>Environmental considerations are essentially the same as for PV systems.</p>
<p>Wind turbines Wind turbines come in various</p>	<p>The technology is well</p>	<p>For maximum efficiency, wind</p>

Technology		Environmental impact
<p>sizes. The amount of electricity generated largely depends on the size of the rotor, the height of the tower and the speed of the wind. They can only operate over a limited range of wind speeds, and their output varies exponentially over a significant proportion of that range. Small turbines at peak output capacity produce up to a few hundred watts of electricity: the biggest turbines presently installed, up to 3 megawatts. Large turbines tend to be promoted commercially to feed the national grid. They may be single (as at Nympsfield) or multiple (windfarms). Smaller turbines are often promoted by individual businesses (eg isolated farms) or by communities to meet local needs, although any surplus may be exported. Vertical axis turbines are also available but to date are less efficient.</p>	<p>established and larger and more efficient turbines are being developed. Wind energy currently makes the largest contribution to meeting renewable energy targets. However, wind energy is intermittent and cannot wholly substitute for conventional non-renewable generation sources. In most instances, annual output is no more than a quarter of theoretical peak rated output.</p>	<p>turbines require exposed sites. In Gloucestershire the Cotswolds scarp and Severn estuary are likely to meet that requirement and could be targeted for commercial development. Large turbines are difficult to accommodate in the landscape and should be firmly resisted within the Cotswolds AONB and in locations where the setting of the AONB would be harmed. Sites on the estuary might prove more acceptable, particularly at industrialised locations such as the former Berkeley Power Station site. Small scale turbines to serve individual businesses or communities may be more readily assimilated into the landscape. Each proposal should be considered on its merits.</p>
<p>Small scale hydro Small hydropower plants are available, producing outputs from a few kilowatts to several megawatts. The technology is simple: moving water drives a turbine to produce electricity. Similar power output can be generated from large volumes of water falling a short distance (low head) or smaller volumes of water falling a longer distance (high head). Typically, in a low head system river water will be diverted at a weir and fed directly into a turbine. These are the most frequent applications.</p>	<p>The technology is well proven and easy to install where sites are suitable. Generation will normally be continuous.</p>	<p>The main environmental impact is the weir. Potential schemes are likely to be found within the built environment, such as at former mill locations.</p>
<p>Tidal This also uses moving water to drive a turbine, but instead of using a head of water it relies on</p>	<p>Still mainly experimental, but a few commercial size</p>	<p>It is predicted that river estuary schemes will have the greatest on-shore environmental impact.</p>

Technology		Environmental impact
<p>tidal currents. It can involve the use of barrages (as at La Rance in France), lagoons, or underwater equivalents of wind turbines. Studies are on-going to see whether a barrage or lagoon scheme is worth pursuing for the Severn Estuary.</p>	<p>installations are in operation or are planned. The amount of power that can be generated is a function of the unit's installed capacity, the tidal range and state of the tide.</p>	
<p>Biomass Burning biomass is carbon dioxide neutral as the carbon dioxide produced from combustion is matched by the carbon dioxide adsorbed through photosynthesis in the next generation of the crop. Biomass includes wood and forest residues, and crops such as short rotation coppice and Miscanthus grown specially.</p>	<p>Efficient biomass boilers are now available for commercial, community and domestic use for heat and electricity. A £3.5 million UK-wide Bio-Energy Infrastructure Scheme has been introduced (October 2004) offering grants to help harvest, store, process and supply biomass for energy production.</p>	<p>For biomass projects, the crop or forest product has to be transported to the point of utilisation, with implications for traffic generation. Major generation plants should be located as close as possible to their sources of fuel. Biomass crops will have landscape implications.</p>
<p>Biogas Produced by the anaerobic digestion of animal and plant materials. The main product is methane gas that can either be burnt for heat or electricity generation. Biogas has the potential for both local use and grid supply.</p>	<p>Already used at sewage treatment facilities to generate power for the electrical plant, etc. Has considerable potential for expansion to make farms and waste treatment facilities more energy self-sufficient and even grid gas suppliers.</p>	<p>Large scale installations could have environmental impact implications on the landscape, but in the case of farms experience to date is that it should be fairly limited. There is also scope for avoiding the need for large slurry tanks, <i>etc.</i>, while still producing a post digestion product that can be used as fertiliser.</p>
<p>Landfill Gas Landfill gas is generated by the natural degradation of municipal waste. The gas can be drawn off and burnt to drive a turbine to generate electricity. The gas includes methane (c 50%) which is a potent greenhouse gas.</p>	<p>This technology is well established. The Hempsted landfill site generator produces 4.27MW of electricity and is currently the largest contributor to</p>	<p>Minimal.</p>

Technology		Environmental impact
	renewable energy production in the County. New projects are likely to be limited in number.	
<p>Ground Source Heat Pumps The earth, a few metres down, keeps a constant temperature of about 11°C. Ground source heat pumps extract heat via a closed pipe system filled with a mixture of water and antifreeze buried in the ground or laid at the bottom of a lake. The heat extracted is delivered in a concentrated form via a heat exchanger. The heat can be used in water or space heating. For every unit of electricity used to pump the heat, 3 – 4 units of heat are produced.</p>	<p>Ground source heat pumps can be installed anywhere, assuming suitable conditions. Installation is straightforward with new construction.</p>	<p>Environmental impacts are negligible, so long as sites are reinstated properly after installation.</p>
<p>Air source Heat Pumps Like a ground source heat pump, air source heat pumps have a motor powered by electricity that supplies more energy than it consumes. However, rather than concentrating energy taken from the ground they take it from the atmosphere. For every KW unit of energy purchased as electricity, around four units of heat are delivered.</p>	<p>Air source heat pumps are becoming an increasingly popular choice for home heating. They can be installed in new homes and just as easily retrofitted in renovation projects.</p>	<p>Environmental impacts are negligible, so long as sites are reinstated properly after installation.</p>