



Council of the Isles of Scilly

A Sustainable Energy Strategy for the Isles of Scilly

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Planning & Development

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Introduction

The Council of the Isles of Scilly was awarded 'Beacon' status in 2005/6 by the Government for its approach to sustainable energy issues.

Today we, like many other communities, recognise that energy impacts on everything we do: domestically, environmentally and economically. The subject is also very much at the centre of the global climate change debate.

Moreover, how energy is generated and used is becoming an increasingly important concern locally, nationally and around the world.

Here on Scilly there are uncertainties, for instance, over the resilience of our own power supply. Areas like our Islands that are predominantly rural and have a comparatively modest demand for electricity are always prone to be among the first affected by any power shortages in the West Country and beyond.

Since the 1980s we have relied on a 33 kV cable laid on the seabed to link us with the mainland and the national grid. It is always potentially at risk from passing trawlers and even from storm damage.

Because of our exposed location on the extreme periphery of the European landmass, Scilly also needs to pay particular attention in the years ahead to just how much impact unnecessary emission of greenhouse gases is likely to have on rising sea-levels and the frequency of extreme weather events, including tidal surges.

Along with our Chief Executive I have signed, on behalf of the Council, the Nottingham Declaration on Climate Change which among

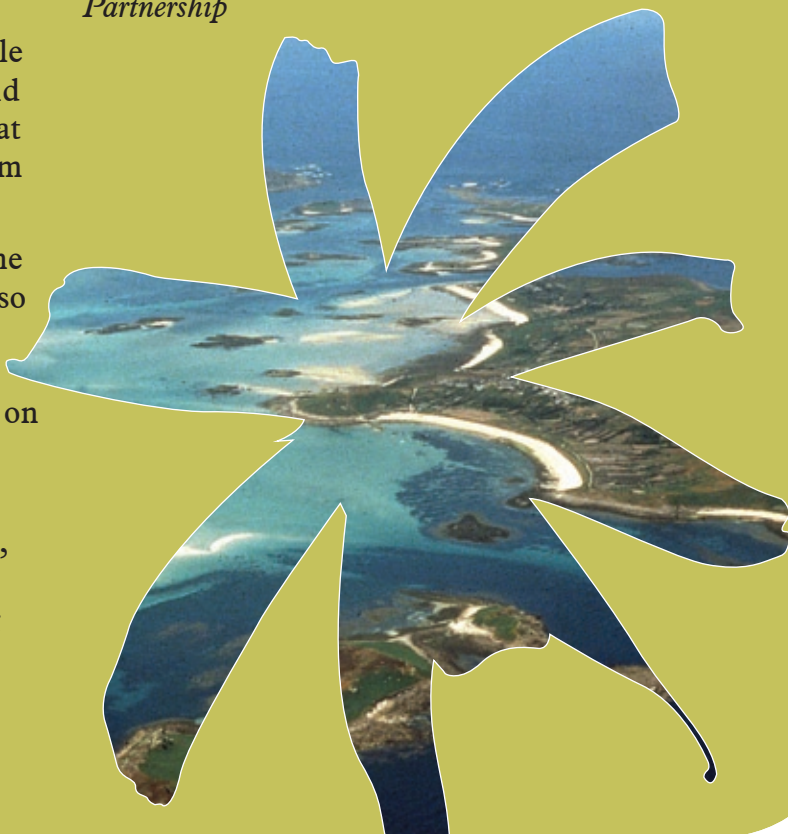
other things commits this Authority to prepare a plan in conjunction with the community to assess and address the potential impact of Global Warming on the Islands.

By spelling out a way forward locally that improves the quality and sustainability of our energy resources, while at the same time contributing to national Climate Change and Renewable Energy targets, the Isles of Scilly Sustainable Energy Strategy will help bring us a range of long-term benefits.

Benefits not just associated with a cleaner environment, but also more generally in terms of an improved quality of life.

Councillor Mrs Christine Savill

*Chairman of the Council of the Isles of Scilly and
Chairman of the Isles of Scilly Local Strategic
Partnership*



1. Overview for the Islands

1.1 A strategy and action plan for Scilly

...that creates a sustainable energy future

This strategy and action plan aims to create a sustainable energy future for the Isles of Scilly. It takes a holistic approach to meeting the Islands' energy needs. It integrates actions designed to minimise energy demand, increase energy efficiency and promote the use of renewable energy sources. Its goal is a more sustainable community for the Islands, a secure power supply and a visible contribution to the UK's target of lowering carbon emissions.

The implementation of the actions in this strategy will entail:

- putting the Isles of Scilly on the path to developing its first renewable energy supply and, as a result, to lowering the Islands' dependence on the mainland energy cable and the generator on St Mary's.
- promoting the Isles of Scilly as a 'beacon' of sustainability by helping cut carbon emissions from energy use in all sectors and making a local contribution to the global effort to reduce potential risks from climate change.
- providing access for all to the basic energy services required to have a good quality of life at an affordable price and reduce the number of households that cannot afford to keep warm at reasonable cost.



- aiding Cornwall and the Islands to reach their target of doubling current renewable electricity generating capacity to more than 93 MW by 2010 and so retaining locally a greater part of the county's annual energy bill.

This strategy and action plan aims to place the Islands at the forefront of sustainable energy development.

...to be delivered through partnership

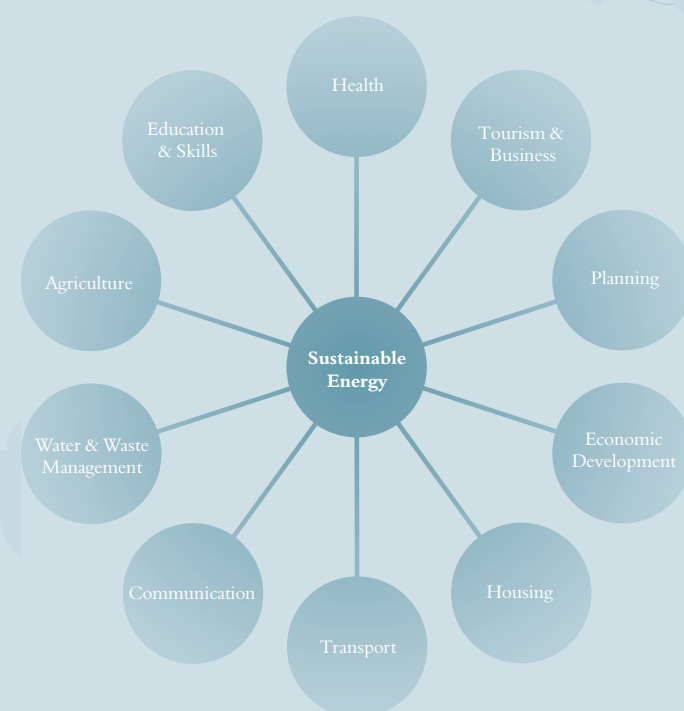
The Council of the Isles of Scilly is seen as the main catalyst and deliverer of this strategy and action plan. It will be monitored by the Isles of Scilly Local Strategic Partnership in conjunction with the Cornwall Sustainable Energy Partnership (CSEP). The LSP consists of representatives from the Council, Public Sector Organisations, Local Businesses and Voluntary Groups as well as the community at large. It meets in public. The intention is that everyone with an interest in the Islands will have a role in implementing this strategy and enjoying the benefits it delivers.

...that is a living document

This strategy and action plan is a 'living' document. It will need to evolve in response both to changes in the energy world and in circumstances on Scilly. The LSP will monitor its implementation. The strategy will be revised every two years.

¹ *Renewable Energy: a strategy for Cornwall 2002-2010 (REOC 2002). According to Renewable Energy Office for Cornwall, 98% of the county's estimated annual energy bill of £579 Million leaves the local economy.*

Fig 1. Embedding Sustainable Energy into Island Development



...that draws on and links to the work of others

This strategy and action plan both draws and links to previous work undertaken by CSEP, the Renewable Energy Office for Cornwall (REOC) and others. It also connects with a range of strategies at a local, regional and national level.

...that is part of a strong base

Cornwall with the Islands has been a standard-bearer for sustainable energy development within the UK. It already achieves nearly 50 MW of electricity from renewable sources. It produces around 2.5% of the UK's present renewable electricity installed capacity. It is intended that

the Isles of Scilly Sustainable Energy Strategy will add its own valuable contribution to this target of a further 44.5 MW of new capacity by 2010.

...that provides a vision for the future

This strategy and action plan sets out a vision for the Isles of Scilly up to 2010 and then up to 2020. It illustrates possibilities and actions for energy sustainability for the community on the Islands and the local economy, while embracing the need to respect an exceptional environment. More fundamentally, the small scale of the Islands and their isolation from the mainland provide a unique opportunity to create a self-sufficient and sustainable community in the generation and the use of energy.

1.2 Vision for Sustainable Energy on Scilly 2007-2010

During the course of 2007/8, the Council of the Isles of Scilly in consultation with the South West Regional Development Agency (SWRDA), the Cornwall Sustainable Energy Partnership (CSEP), the Combined Universities in Cornwall and the University of Plymouth, intend to set up one or more pilot projects to determine the best-fit energy network for the Islands. The Council will be responsible for the initial tendering process as well as strategic decision making.

2 Excluding large scale hydro and mass-burn incineration.

Overall management responsibility for the project(s), including identifying funding sources, will be shared jointly with the successful marine technology companies and Western Power Distribution (WPD). The project(s) will serve to identify and develop marine options for the diversification of existing local energy systems.

A sustainable energy approach will be at the heart of sustainable development on the Islands. It will link with other initiatives to provide a future that is strong and sustainable for Scilly.

Energy sustainability for the Islands will be driven by:

- the need to cut carbon emissions.
- the need to diversify the economy by harnessing potential opportunities offered by Scilly for entering the developing sustainable energy sector
- the desire to protect the quality and distinctiveness of the Islands' exceptional environment.

Specifically, this period is likely to see:

- the setting up of pilot projects at one or more locations around the Islands involving wave and/or tidal power installations so as to assess their potential contribution to the local energy market and their impact on the marine environment
- a positive contribution to Cornwall and the Islands' target of 93 MW of installed renewable electricity generating capacity by 2010, through development of such projects (compatible with the quality of the Islands' environment)
- improving energy efficiency in existing

homes with the aim of reducing fuel poverty.

- through the planning and building control process, promotion of energy efficiency measures, with an emphasis on 'affordable warmth' and integration of small scale, low and zero carbon technologies into new buildings. This could include ground source and air source heat pumps, solar water heating, photovoltaic, micro Combined Heat and Power and micro wind turbines. Such technologies would also be used to tackle fuel poverty in 'hard-to-heat' homes.
- energy efficiency drives for local businesses through provision of comprehensive advice and support services on environmental management.
- promotion of measures that encourage the use of low or zero carbon fuels, car sharing, community transport schemes and that favour cycling and walking in preference to reliance on motor vehicles.

1.3 Vision for Sustainable Energy on Scilly 2010-2020

The drive towards implementation of a 'best-fit' energy network for the Islands will continue in tandem with the pursuit of energy efficiency measures.

The goal is to achieve over time a zero net carbon balance for Scilly. Sufficient reduction in the carbon emissions 'footprint' for the Islands will

make room for the possibility of a local carbon emission trading scheme.

This could lead to significant economic benefits for Scilly as excess production of electricity (most likely from offshore renewables) is 'exported' to the national grid as part of the Islands' 'renewables obligation'. This model was sketched out for the Council and Duchy of Cornwall three years ago by the CSEP, Orecon Ltd, a business affiliate of the University of Plymouth and ESD, a Bath-based firm. It illustrated how surplus energy from waves might be stored on the Islands for 'sale' and onward transmission to the mainland.

More recently the Wave Hub project has taken these and similar ideas off the drawing board, ready to test their economic potential less than 40 miles from Scilly.

Other economic benefits could also flow from the possible exploitation of bio-energy crops including SRC (short rotational coppicing), miscanthus or willow. The Duchy of Cornwall's draft corporate sustainability strategy takes a detailed look at growing and marketing such crops.

The vision for residents and organizations alike on Scilly should be to minimise energy requirements and then meet most energy needs from renewable resources. Building design, the type of energy sources used for generating electricity and heat plus the choice of fuel for transport will all play a part in helping to achieve such a vision.

1.4 Guiding principles

This sustainable energy strategy adheres to and is guided by the principles of sustainable development.

It will deliver local benefits by:

- developing the ability of the Islands to meet their own energy needs, so lowering dependence on the mainland link and the power station on St Mary's for back-up supply.
- creating new opportunities for Island employment, widening the local skills base and developing career opportunities.
- creating new opportunities to diversify the economy by implementing projects that respect the quality, character, diversity and local distinctiveness of the Islands' natural and built environment.
- assessing the most sustainable approaches to minimising and managing waste and, where feasible, recovering energy from residual waste.

It will meet local needs by:

- re-cycling profits, where generated, into the local economy from energy developments and supplies by taking a community stake in such developments.
- reducing the risk of fuel poverty through improvements in thermal efficiency of homes and by facilitating the reduction of heating costs in 'hard-to-heat' homes.
- reducing the constraints on the capacity



and security of the electricity supply of the Islands' imposed by their geographical position.

- ensuring that, wherever feasible, sustainable energy developments add to (rather than detract from) the interest and image of tourism on the Islands.
- providing alternative transport fuels from renewable resources to power vehicles.

It will seek to integrate sustainable energy approaches into all areas where change is happening by:

- incorporating them in all new housing, employment, retail or leisure developments through the Local Plan and the Local Design Guide.
- incorporating them in all public sector projects, including those funded by the European Union through Convergence or other channels.

It will look to the future and develop local capacity by:

- piloting new technologies and systems on the Islands.
- expanding the range of businesses involved in sustainable energy activities and their markets.
- involving local people in decision-making and in the planning and development process, consistent with the principles set out above.

It will seek to work in accordance with regional and national objectives, strategies and targets.

1.5 Aims and Objectives

Through the development of this Sustainable Energy Strategy it is envisaged that future energy needs for Scilly will be met with no compromise to the quality of life or the environmental benefits enjoyed now or later by either Island residents or visitors.

This strategy also seeks to address the implications of global climate change for the Islands, given associated predictions of a long-term rise in mean sea-levels and an increase in frequency of extreme weather conditions.

The Stern Review on the Economics of Climate Change (Oct 2006) together with the Intergovernmental Panel on Climate Change report (IPCC, Feb 2007) have served not just to highlight the effects of global warming but also the economic costs of ignoring this issue.

The alleviation of fuel poverty locally should be seen as a first, small step on Scilly in helping to combat the threat of climate change as well as promoting in its own right a healthier community throughout the Islands.

The objectives of this element of the strategy are:

- to prioritize activities that explicitly curb local reliance on fossil fuels.
- to ensure that the issue of sustainable energy is incorporated into all relevant plans, policies and strategies for existing and new initiatives.
- to stimulate energy savings that will result

in a reduction in carbon emissions for the domestic, public and business sectors and more specifically assist Cornwall and the Islands reach their targeted reduction of some 94,000 tonnes of carbon per year from a 1990 base by 2010³

- to reduce fuel poverty and its associated health risks.
- to implement a renewable energy network adding to Cornwall's target of at least 46 - 61 MW of new renewable electricity capacity by 2010.
- to promote the use of renewable energy in new buildings and to power vehicles.

1.6 Fit with National Policy

Following its decision to sign and ratify the Kyoto Protocol, the Government has set out the following national targets:

- the UK Renewables Obligation requires energy suppliers to deliver 10% of their electricity supplies through renewable energy resources by 2010.

- the UK's obligation to reduce its greenhouse gas emissions by 12.5% below 1990 levels by 2010 has been extended to 20%.
- Government Planning Policy Statement 22 promotes renewable energy projects, including micro initiatives, within new buildings
- the Home Energy Conservation Act seeks to improve the energy efficiency of the current housing stock by 30% by 2011 from a 1996 base.
- Part L Building Regulations set out the design levels that a house should achieve, including Target CO2 Emissions Rate, heating and lighting requirements and insulation levels.
- The Government's 2006 Energy Review focuses on the importance of reducing greenhouse gas emissions and securing clean and safe energy for the future.

This strategy will aid in the achievement of these goals, whilst setting its own targets for renewable energy generation, energy efficiency and carbon dioxide reduction.

³ This figure represents Cornwall's contribution on a pro-rata population basis to the overall UK national target for reduction in carbon emissions.

⁴ The policy sets no levels for the amount of heat it envisages being supplied through renewable energy initiatives

2. Energy on Scilly

2.1 Background

Since 2004 the Council of the Isles of Scilly has been working with the Cornwall Sustainable Energy Partnership (CSEP) to establish sustainable energy requirements for the Islands and create a local Sustainable Energy Strategy. The Council decided at its annual meeting in May that year to begin work with CSEP on the strategy. Its decision followed a public consultation exercise and a presentation to Councillors and the Duchy in the Town Hall of the potential for deriving energy from wave power around the Islands.

In 2005, the Council, under the aegis of the CSEP and jointly with County Hall at Truro and all six District Councils in Cornwall, achieved Beacon status for its partnership approach to sustainable energy issues. This is the first time anywhere in Britain that a Beacon award has gone to a partnership venture involving different councils. Since then, to help maintain impetus across Local Government boundaries, a Sustainable Energy Forum has started meeting on a quarterly basis. Councillors from Scilly and on the mainland share good practice and keep abreast of regional and national initiatives as well as those in each other's areas.

In 2006, the Council signed up to the Nottingham Declaration which commits the Authority to a number of initiatives, including the pursuit of opportunities on the Islands for development of renewable energy generation and the production of a climate change plan by 2010.



2.2 Sustainable Energy

The Council of the Isles of Scilly and the Local Strategic Partnership are both committed to sustainable development which encompasses the concept of sustainable energy for the Islands.

This concept involves:

- improving energy efficiency.
- reducing energy demand
- generating renewable energy
- boosting efficiency of generation and conversion where it is still necessary to generate energy from fossil fuels

These four principles of sustainable energy provide a holistic approach to meeting the energy needs of Scilly and delivering an energy system for the future. These principles should also play an important part in protecting the environmental, social and economic fabric of the islands.

Reducing energy demand is identified in the Government’s Energy White Paper as “the cheapest, cleanest and safest way of addressing our energy policy objectives”. Improving energy efficiency fills an environmental, economic and social role through helping to reduce carbon emissions whilst also serving to eliminate fuel poverty and delivering fuel savings to households.

Installation of a renewable energy generation facility for Scilly productive enough to meet the needs of both local community and visitors will take some time to deliver. Back in 2004 Orecon Ltd offered Councilors and the Duchy

a first glimpse of how oil-rig technology might support a local wave energy project. In August 2006 the Managing Director of one of the marine technology companies involved with the Wave Hub offered his support to Council and Duchy representatives for a spin-off scheme in the Islands.

For the medium term at least, though, it will continue to be necessary to deliver much of the Islands’ energy requirement through the use of fossil fuels. However, as long as this is still the case, it should be delivered in the cleanest way possible.

The need to implement these principles across all elements of domestic and working life on the Islands is at the heart of this document’s action plan.

2.3 Scilly’s Energy System

Current electricity requirements for the Isles of Scilly are met by the mainland cable connection. This was installed in 1988 by SWEB with the expectation that it would provide mains electricity to the Islands for up to 40 years.

However, as the cable was laid directly on the seabed rather than being buried, there is a risk that its operational life could be curtailed by damage sustained from passing trawlers or storms. The decision to replace the cable in 2028 (or sooner if damage or deterioration does occur) now rests with Western Power Distribution. It is not entirely clear just how viable a proposition a commercial undertaking would consider

automatic replacement to be and this is an issue the Council needs to explore further with Western Power.

Scilly is also served by the power station on St Mary’s. It is one of very few generating facilities presently operating west of Hinckley Point nuclear power plant in Somerset. It comes on stream during times of “black out” on the cable or when called on to provide additional supply for the mainland. It uses diesel-powered generators.

These generators have an installed capacity of 5.7 MW. They are capable of meeting the demand of Island homes and businesses, which at present peaks at 4MW. But as this power is generated by burning fossil fuels, long-term reliance on this facility as the main source of power for Scilly would run completely counter to what this strategy is seeking to achieve. However, there is no sense in insisting dogmatically on shutting down the station. In terms of security of supply, not just for Scilly but the mainland as well, its role should be maintained.

The generating capacity available to the Islands along the mainland cable amounts to some 7.5MW. Given the development constraints existing on Scilly, growth in demand for power is not anticipated to lift the present level of 4MW sufficiently to threaten capacity.

Energy Use in the Domestic Environment

Energy supply to Scilly is restricted by the Islands’ peripheral location. This prevents the local population having access to certain sources of supply readily available to most of the mainland. It consequently



leads to a greater use of supplies that have lower energy efficiency.

In the 2001 census, it emerged that 40% of homes on Scilly had no central heating. This compared with a national figure of 8.5% and a figure of 18% for Cornwall. The statistics underlined the high-level of fossil fuel usage for heating on the Islands and the accentuated cost incurred by residents in having to pay for the importation of such products from the mainland (see table 1).

Table 1: Households without central heating in Cornwall 2001

	Total Households	Without CH	% Without CH
Caradon	33,829	5,871	17
Carrick	38,598	6,818	18
Kerrier	39,478	6,823	17
N Cornwall	34,353	5,304	15
Penwith	28,080	6,937	25
Restormel	40,476	7,443	18
Cornwall	214,814	39,196	18
IOS	881	356	40

Within the Council of the Isles of Scilly’s own housing stock, there is an issue with energy efficiency. But measures are already well under way, as part of the Decent Homes plan, to address the situation. Properties should always be adequately insulated. Heat needs to be prevented from escaping through ill-fitting windows and doors. Energy efficient lighting and the use of A-rated appliances are other ways in which the domestic consumer can contribute to improving

energy efficiency standards.

Under the Home Energy Conservation Act (HECA), data is being collected from all local authorities to show progress in improving energy efficiency in existing housing stocks. Nationally, the objective from a 1996 base was to achieve a 30% improvement in energy efficiency by 2006. The Council is still evaluating the improvement of island housing energy efficiency. In March 2005 the HECA improvement figure for the Isles of Scilly was 17.5%

How prevalent fuel poverty is today on Scilly is unclear although factors that make fuel poverty a ‘likelihood’ are well-known. They include moderate levels of energy efficiency, comparatively little central heating and low incomes and/or part-time employment. As far as the Islands are concerned there is also the high cost of bringing in fuel from the mainland.

Ekos Consulting’s Isles of Scilly Baseline Report, commissioned by the Isles of Scilly Partnership in 2000 and entitled “On the Edge,” recognized that the Islands’ employment opportunities are dominated by low income and part-time jobs. Low incomes plus a high level of homes lacking central heating, a suspicion of generally poor domestic energy efficiency and the high price of all fuels compared to the mainland (except from electricity) all indicated a high “likelihood” of fuel poverty on Scilly. However, in March 2007, under the Decent Homes plan, 43 Council dwellings were fitted with cavity-wall insulation and 69 with new loft insulation. The task of double-glazing windows, doors and fascias is scheduled for completion by March 2008.

Improvements in domestic energy efficiency (Until March 2005)

District Council (DC)	% Improvement
Caradon	19.7
Carrick	24.6
Kerrier	23.8
N Cornwall	25.9
Penwith	14.9
Restormel	13.2
IOS	17.5

Source: Home Energy Conservation Act 1995 Ninth Progress Report (2006) for the period 1 April 2004 to 31 March 2005, for each district.

Energy Use in the Business Environment

EKOS “On the Edge” identified the three main business sectors on the Islands as 1. Distribution, Hotels and Restaurants (Tourism), 2. Public Administration, Education and Health (Public Sector) and 3. Transport and Communications. These three sectors alone, according to the report, account for 86% of employment and 67% of the total amount of employment sites.

The Isles of Scilly economy is supported primarily by a high-volume and predominantly seasonal tourism industry. It is a huge consumer of the Islands’ energy supply. With an annual influx of some 100,000 visitors compared to a resident population of around 2,000, tourism’s impact on the local energy system is self-evident. It is equally undeniable that the benefits of the tourism industry are essential to sustaining the current way of life on Scilly and any marked decline in this

industry would have a destabilising effect on the Islands’ economy.

The public sector on the Islands comprises chiefly the Council of the Isles of Scilly, including Five Islands’ School and the airport, together with the local Health Centre and Hospital. It constitutes more than 20% of the Islands’ employment and is a high end-user of energy with the incinerator on St Mary’s burning between 9,000 and 14,000 litres of oil per week.

Energy Use in Transport

Transport by air and sea from the Isles of Scilly to the mainland uses large amounts of fossil fuel. Inter-island tripper boats, off-island launches and the new generation of jet boats between them carrying visitors, freight and residents in and around the Islands are also heavy consumers.

But a successful conclusion to the Route Partnership project, replacing the existing two boats linking Scilly to the mainland with a modern dual-purpose vessel, should help reduce carbon emissions.

Road-based transport on the off-islands uses only modest amounts of fuel, mainly associated with farming and the collection of freight from quays. Road vehicles are in growing evidence on St Mary’s. Scilly has what by any standards is a comparatively unpolluted atmospheric environment, but exemption from MOT testing produces a level of exhaust emissions that is increasingly noticeable to visitors and residents.

Cycling and walking are popular modes of travel for both residents and holiday-makers. Buses shuttle between the airport and Hugh Town and a community service circles St Mary’s in summer.

There are private hire vehicles but public transport as such barely exists.

2.4 Sustainability Initiatives on Scilly

The Council of the Isles of Scilly has acknowledged defects in its housing stock but has been steadily implementing measures to improve energy efficiency by replacing defective doors and windows with high-specification, double-glazed equivalents. Work has already been completed now on 90% of the Council’s 108 properties.

The Council continues working in partnership with Community Energy Plus to secure funding for loft and cavity wall insulation where required in its properties. A recent problem with a communal heating and hot water system at Rookery Flats on St Mary’s has given the Council the opportunity of installing individual Economy-7 heating and hot water facilities. This has markedly improved energy efficiency in the building.

Cornwall Rural Housing Association has designed six new dwellings specifically with sustainability in mind at Ennor Close in Old Town. This development incorporates micro-renewable energy generation plus a range of measures to ensure high energy efficiency and low energy usage. These measures relate to:

- Orientation of building – where practicable, each dwelling has been orientated to achieve best possible solar gain for the main habitable rooms, helping to place a lower burden on use of non-sustainable fuels for heat and light.
- Insulation – each home includes high

standards of insulation and draught proofing to allow high retention of heat generated.

- Solar Water Heating - each property incorporates a simple solar water heating panel on the roof plumbed to augment the central heating and domestic hot water supply.
- Ground Source Heat Pumps – installation of ground source heat pumps for each dwelling allows for exploitation of natural temperature differences below ground. The heat pump amplifies temperature and distributes heat around the dwelling through an under floor heating loop.
- Rainwater Harvesting – each dwelling allows for rainwater collection. Stored in an underground tank, it can be used in washing machines and for flushing toilets.

These buildings are setting the trend for future development on the Islands, in accordance with the policies set out in the Local Plan and the principles

contained within the Isles of Scilly Design Guide. Similar-sized proposals on St Mary's for Hugh Town⁵ and on Duchy of Cornwall-tenanted land at Normandy are following suit. Tresco Estate has also been encouraged to introduce sustainable energy features into its new Abbey Farm holiday and staff accommodation development at New Grimsby.

In 2005 the Duchy produced its own draft corporate sustainability strategy to which the Land Steward on Scilly contributed. Among other things, it signs up the Duchy locally to supporting sustainable energy policies as they develop. The Land Steward is conducting a sustainability audit on the Islands for the Duchy and he is expected to implement a wide-ranging sustainable operating plan for the management of the estate, including energy use.

It should not be forgotten that the Islands' Health Centre pioneered the use of ground source heat pumps on Scilly back in 1997.

⁵ Devon and Cornwall Housing Association's development at Branksea was ready for occupation in April 2007.

3. Driving Forces on the Islands

Four main driving forces will provide the momentum for addressing sustainable energy issues on the Islands:

- cutting Carbon Emissions and achieving Renewable Energy Targets
- Sustainable Economic Development
- creating Sustainable Communities
- sustaining the Landscape, Environment and Tourism

3.1 Cutting Carbon Emissions and Achieving Renewable Energy Targets

There is a growing consensus today that the burning of fossil fuels constitutes the prime cause of growing levels of greenhouse gases in the atmosphere.

These increases are viewed by many as already having a measurable impact on the global climate. Two years ago in Science magazine Sir David King, the Government's Chief Scientific Officer wrote: *"In my view, climate change is the most severe problem we are facing today, more serious even than the threat of terrorism."*

The full extent of any impact associated with climate change remains unknown. But it is thought likely to include an increased frequency of extreme weather events, a rise in relative sea levels, increased risks of floods and marked changes in temperature.

In the IPCC's first major report in five years published in February 2007, the worldwide scientific body put the projected probable bounds of average global temperature rise by 2100 as between 1.8 and 4.0°C. Its estimate of sea level rise was placed as anywhere between 28 and 43cm⁶.

Such changes would have a seriously detrimental effect on the economic life and social activities of this community, as well as causing significant deterioration to the Islands' environment. Consequently, it is increasingly important that Scilly should be seeking to minimise greenhouse gas emissions by championing the need for energy efficiency and the use of low and zero carbon technologies.

In 2003, the Government published its Energy White Paper Our Energy Future – creating a low carbon economy. From a 1990 base it advocated a 60% reduction in UK carbon emissions by 2050. It put forward four ways of moving towards a low-carbon economy – carbon trading, energy efficiency, low-carbon generation using primarily renewable energy and CHP (combined heat and power) and low-carbon transport.

According to the White Paper, a combination of carbon trading and carbon and energy taxes would see renewable energy sources becoming

⁶ Not all scientists agree with the IPCC. Some think that the climate models are inherently unreliable. Others think that physical processes such as cosmic rays are a much bigger influence on global warming than carbon emissions. Such scientists are comparatively few in number. The IPCC represents the consensus.

increasingly more economic, to exploit. However, the document anticipates the major contribution towards its 2050 target coming through energy efficiency measures as they represent “the cheapest, cleanest and safest way of addressing our energy policy objectives”. Cornwall has set a figure for reducing its annual carbon dioxide levels based on the calculation that the county has 0.85% of the UK’s national population. Its contribution is therefore some 94,000 tonnes per year. Based on this same methodology, Scilly should be seeking to achieve an annual carbon saving of some 400 tonnes from a 1990 baseline by 2010 and between 680-840 by 2020.

Table 3: Annual carbon savings required (thousands of tonnes of carbon)

Sector	By 2010		Additional savings by 2020			
	UK	C'wall	IOS	UK	C'wall	IOS
Domestic	5,000	42.5	0.18	4,000-6,000	34-51	0.14-0.22
Public/business	6,000	51	0.22	4,000-6,000	34-51	0.14-0.22

Derived from UK figures in the Energy White Paper (DTI 2003).
Cornish figures from CSEP Sustainable Energy Strategy for Cornwall

3.2 Sustainable Economic Development

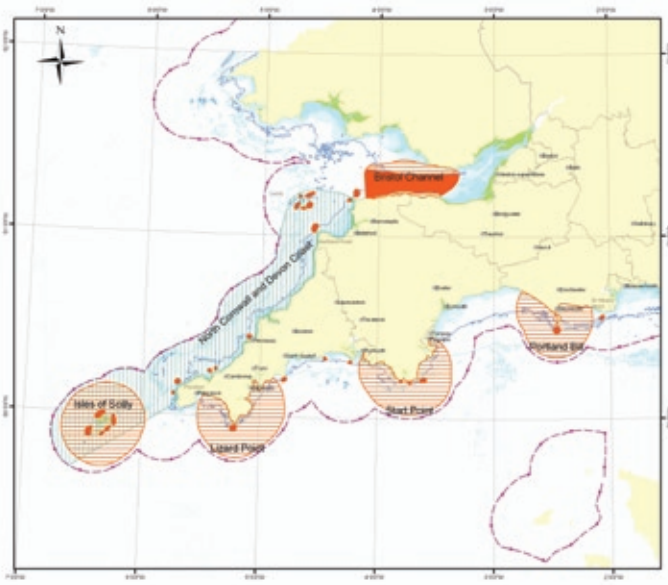
Sustainable energy has the potential to become an integral driving force for the Islands’ economy. Links with national policy on rural development coupled with the Isles of Scilly’s Convergence status within the European Union and the need to diversify the local economy could all pave the way for development of small scale, sustainable energy-based businesses. Potential for diversification and/or efficiencies in existing businesses and generation of new businesses provides a significant economic development opportunity.

The evidence base which underpins the second review of Strategy and Action, the Economic Development Strategy for Cornwall and the Isles of Scilly (Cornwall and the Isles of Scilly Economic Forum 2007) reports that “Cornwall and the Isles of Scilly has a major opportunity to contribute to development of a number of regionally important exporting sectors.” The report identifies environmental technologies and tourism as likely to make a “substantial” contribution.

Cornwall’s burgeoning environmental technology clusters include organisations specialising in renewable energy, pollution monitoring, waste management and earth sciences. An opportunity exists here for the Isles of Scilly to become a key player within this economic arena. Outputs from these sectors vary from ground source heat pumps to consultancy advice on renewable energy technologies in the UK and overseas.



Fig 2: South West Possible Marine Energy Resource Areas



Taken from Seapower SW Review, Metoc Report No: 1220 sponsored by South West of England Regional Development Agency, January 2004.

According to the Renewables Advisory Board, as a guideline figure, 10 full-time jobs can be sustained for each megawatt (MW) of installed renewable capacity. Current demand for electricity on the Islands stands at 4 MW, so successful renewable energy generation could be expected to create something like 40 highly-skilled jobs.

Nationally, the Renewable Power Industry Employment and Skills Survey Report 2003 anticipates a 250% employment increase in the UK Renewable Energy Industry by 2010.

Identifying specific skill requirements is hard. Nevertheless, local skills shortages will need to be addressed in terms of sustainable energy and

In 2004 the South West Regional Development Agency-sponsored study Seapower South West Review acknowledged the waters around Scilly as an excellent marine-based, sustainable energy resource. It highlighted potential for both wave and tidal power-based technologies and this was reinforced by Orecon Ltd’s study which, using oil-rig technology, postulated anchoring devices beyond the Western Rocks to generate power from the sea.

In 2006 the potential for such development was vividly illustrated by SWRDA selecting a trio of wave energy devices to set up the world’s first experimental ‘wave farm’ 10 miles off of the northern coast of the Penwith peninsula. These devices will be plugged into the £28 million Wave Hub (an electrical ‘socket’ on the sea bed) and linked to the national grid by a cable as early as 2008. This process currently allows up to four different manufacturers to carry out testing of their machinery and equipment before going into commercial production.

Given that environmental technology is today’s fastest growing business sector, then exploitation of renewable energy generation could stimulate a specialist and developing local industry which would provide greater job diversity for current and future generations of islanders.

related services if this island-based development strategy is to meet its objectives.

Where possible, the life-long learning programme and other educational initiatives will need to target the resident population and bridge any skills shortages.

Additional training may be possible through the Energy Saving Trust and from Camborne School of Mines at the Combined University in Cornwall. Further opportunities beckon for the Islands through research and development. Scilly also offers an ideal test bed for wave and tidal power devices and micro-scale community energy network projects. Such approaches could help sustain the local community whereas importing skills would merely add to existing housing problems and place additional demands on the Islands' fragile infrastructure.

3.3 Creating Sustainable Communities

Creating a sustainable community is a core element of the Community Strategy for the Isles of Scilly. Sustainable energy development is a key component in helping to create a sustainable community on Scilly. It reflects how close the link needs to be between the resilience and health of the Islands as a community and its economy and environment.

Eradicating Fuel Poverty & Improving the Housing Stock

According to the latest Office of National Statistics' estimate nearly 92% of homes nationally have central heating. On Scilly, the figure is just under 60%. This discrepancy is partly a reflection of typically mild winters on the Islands and the high percentage of seasonal holiday lets within the local accommodation stock.

However, it is also an indicator of the significant number of homes that may be affected by 'fuel poverty, a term that denotes an inability of households to meet heating needs because of the fuel costs involved⁷.

The Islands' population relies heavily on coal, oil and bottled gas as well as electricity for heating. These energy supplies have all tended to cost more than mains gas and the chances of gas ever being piped to Scilly are probably nil.

With levels of insulation on the Islands generally regarded in some sectors as not of a high standard and a housing stock much of which has solid walls, the assumption is that current heat loss from local homes is likely to be quite substantial⁸. Taken together these factors further

⁷ Information from the Office of National Statistics based on the 2001 census. Households in fuel poverty are those where 10% or more of income is spent on heating bills.

⁸ Implementation locally since 2006 of the Government's Decent Homes Standard has brought significant improvements to levels of insulation in the Council's housing stock.

suggest that a number of households are going to be at risk of fuel poverty. Moreover, this risk is unlikely to diminish completely since fossil fuels over time will be coming increasingly vulnerable to price rises. These rises are projected to occur more quickly now that UK resources of gas and oil are in decline and the need to import fossil fuels, often from politically unstable nations, grows.

The 2003 Energy White paper places a high emphasis on tackling fuel poverty: *"The UK Fuel Poverty Strategy... sets out policies for ending fuel poverty in vulnerable households in England – older households, families with children and householders who are disabled or have a long-term illness – by 2010."*

The quality of the housing stock on the Isles of Scilly currently leaves room for improvement in energy efficiency. Many buildings are also capable of having their energy demand reduced. Improving the quality of the housing stock should be seen as important not only on sustainable energy grounds but also in terms of improving health and social inclusion. Previous work in Cornwall has shown clear health and social benefits can be derived from insulation and heating improvements. The UK government's present assumption is that 50% of the national reduction in greenhouse gas emissions will come from energy efficiency measures.

Small-scale renewable technologies such as ground source heat pumps and solar water heating, photo-voltaic panels and micro-wind can all be part of cost effective solutions for the problem of 'hard to heat homes,' certainly where improving thermal insulation of walls is difficult

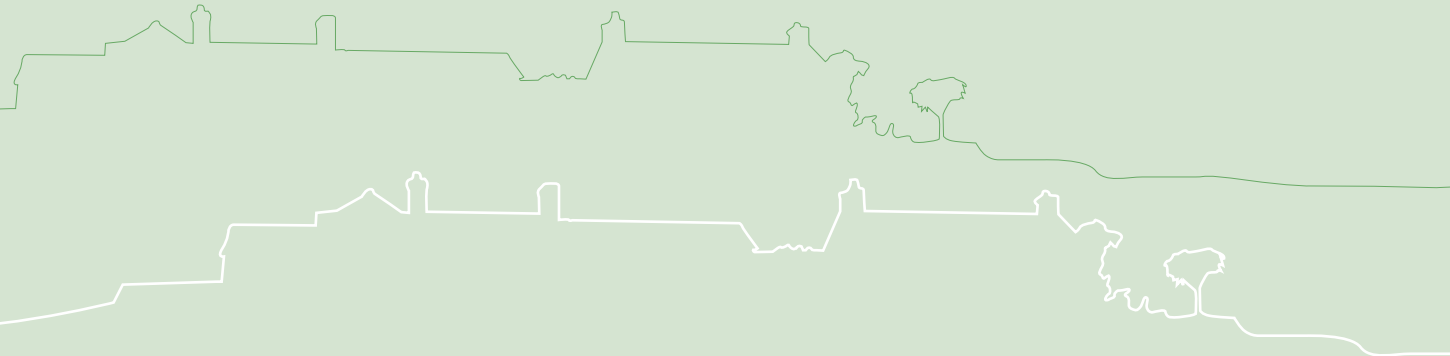
and expensive. They also have an important role to play in providing heat and power in areas with no access to gas and can achieve significant cost and carbon savings over the use of available heating fuels such as oil, coal and grid electricity. Both the Local Plan and the Isles of Scilly Design Guide encourage the use of renewable technologies in new buildings. Ground source heat pumps have already been incorporated in the Health Centre and new affordable homes at Old Town and Branksea on St Mary's. They will also be a feature of the Normandy development due for completion early in 2008.

New Development on the Islands

Large scale development is not envisaged within the Isles of Scilly Local Plan. Nevertheless any new development will add to energy demand, carbon dioxide emissions and the energy costs of the Isles of Scilly. Future development on the Islands is therefore being required to take a more holistic approach in terms of its construction, design and future use, with the overall aim of achieving zero net carbon emissions.

The 2003 Energy White Paper says that *"New homes will be designed to need very little energy and will perhaps even achieve zero carbon emissions"*. This zero emission standard can be delivered practically through a combination of minimising energy demand, high levels of energy efficiency and some on-site use of renewable energy technologies.

Price should not be seen as a constraint to achieving these standards since the cost of integrating both renewable energy technology and energy efficiency measures is cheaper in new development than in



‘retro-fitting’ existing households. The price of installing renewable technology will certainly add to the cost of putting up new buildings. But initially increased costs need to be considered in terms of the lifetime costs of buildings, including savings made on energy bills. Table 4 shows savings that could be achieved, for instance, by using ground source heat pumps instead of other heating systems in a small, well-insulated house with an annual space and water thermal energy requirement of 12,500 kWh⁹.

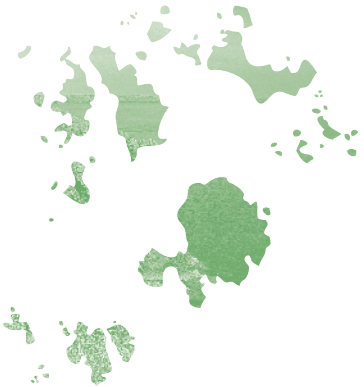
The Isles of Scilly Local Plan, the Design Guide and the new Part L Building Regulations together require higher energy efficiency standards and the integration of renewable energy generation, where appropriate, for all new developments. Such an approach is consistent with the Government’s Planning Policy Statement 22 and European Directive 2002/91/EC – ‘Energy Performance in Buildings.’ This directive requires member states to put in place measures to ensure that common, minimum energy performance requirements for buildings are set. It also stipulates that, where new buildings have a floor area in excess of 1000 sq metres, the technical, environmental and economic feasibility of sustainable energy supplies have been taken into account before construction starts. This would apply, for instance, to any substantial new community building on Scilly.

Table 4: Potential savings achieved in 100 m2 house using Ground Source Heat Pumps

	Annual fuel cost	Annual CO2	Annual savings using GSHP	
	£	Tonnes	£ Saved pa	Tonnes of CO2
Ground source heat pump [Econ 7]	215	1.6	0	0
Gas Condensing	300	2.9	85	1.3
LPG (bulk) non-condensing	500	4.3	285	2.7
Oil non-condensing	300	4.4	85	2.8
Electric panel + storage heaters [Econ 7]	510	6.5	295	4.9
House coal (closed stove + back boiler)	380	6.6	165	5
Smokeless (closed stove + back boiler)	515	7.5	300	5.9

Source: Powergen October 2003

9 Data from GeoScience Ltd



Transport on Scilly

Transport use on the Islands is multi-faceted. People travel regularly to, from and between the Islands. By comparison “on-island” transport is more limited in scope.

Boat, plane and helicopter act as conduits to mainland services as well as supporting tourism, the Islands’ predominant economic input. They also sustain the vital freight link. Inter-Island transport supports the tourism industry but provides an essential means for off-islanders to access goods and services from St Mary’s.

By safeguarding the sea link to the islands, the Route Partnership project, which embraces Cornwall County Council, Penwith District, the Duchy of Cornwall, and British International as well as the Steamship Company and the Council of the Isles of Scilly, will ensure that there is a continued alternative to air transport. A combined passenger and freight vessel, by virtue of its more modern engine design, will increase the carbon efficiency of sea transport. Its arrival is scheduled for 2010/11.

Scilly has a relatively low volume of on-island motorized transport. Public transport, except on St Mary’s, is non-existent. But vehicle traffic on the Islands, especially St Mary’s, is increasing at a fast pace. According to the Office of National Statistics, in 2001, 435 cars and vans were registered in Hugh Town; in 2005 this had risen to 619, a 42% increase in just five years. The same source indicated that there were still 46% of households on St Mary’s without a vehicle but that 14% had two or more.

Scilly’s modest scale provides good opportunities

for promoting alternative forms of fuel and transport for on-Island travel. Bicycles, for instance, are a common form of personal transport and attempts to increase their usage amongst islanders should be encouraged. Electric vehicles already offer a novel local transport option on St Agnes and Tresco and their short range is not such an obstacle to use on Scilly as it can be elsewhere. Clearly, they are an environmental gain in terms of emissions, with the potential for being carbon neutral too if recharged from a renewable energy resource. Other options could include switching to low carbon fuels, such as liquid petroleum gas (LPG), to reduce the Islands’ carbon footprint or to renewable fuels such as bio-diesel, as a substitute for conventional diesel or even to waste cooking oils from hotels and restaurants.

This strategy also aims to reduce the pull of car travel through the introduction of ‘travel plans’ that promote car pooling or sharing. These plans could include the provision of cycling-friendly facilities at work, including changing and/or shower facilities and secure parking arrangements. Travel plans can also be linked to reducing the need to travel by increasing use of Information Communication Technology (ICT):

- to provide access to services and information
- to enable employees, students and others to work from home
- to help people communicate without the need to be all at the same location.

Video-conferencing is an important tool in this regard.

3.4 Sustaining the Landscape, Environment and Tourism

The driving force here is the importance of conserving, and where possible enhancing, the character and quality of the landscape, heritage and biodiversity of the Islands. Scilly's unique environmental characteristics add value to the quality of life for its residents and to its reputation as a tourist destination. The strategy's emphasis is on seeking to meet the energy needs of the Islands without impacting on their character and distinctiveness and therefore the success of tourism, the crucial economic input.

Landscape and Environment

The Isles of Scilly's environmental distinctiveness has long been recognised as exceptional by both visitors and residents alike. In recent times this recognition was formalised when the Islands were designated an Area of Outstanding Natural Beauty, a Conservation Area and a Heritage Coast. The Islands contain many other designations including 27 Sites of Scientific Interest, 236 Scheduled Ancient Monuments (incorporating 909 separate items) and 128 listed buildings (4 Grade I & 8 Grade II). Furthermore, the Islands' wildlife is protected under the EU Habitats and Birds Directives as a RAMSAR site and Special Area of Conservation.

The importance of conserving the quality and character of much of Scilly's environment and landscape means that any renewable energy development must not have an adverse impact. Sensitivity of the environment and landscape to renewable energy development will be a key factor

in assessing the suitability of any project.

Although the Islands have so many important designations, this does not mean that they should be used in a way that prevents development of any renewable energy resource. The Government's Planning Policy Statement 22 acknowledges the need to consider such developments but emphasises that *"small-scale developments should be permitted within areas such as National Parks, Areas of Outstanding Natural Beauty and Heritage Coasts provided that there is no serious environmental detriment to the area concerned."*

However PPS 22 also argues that *"in planning areas with national designations... planning permission for renewable energy projects should only be granted where it can be demonstrated that the objectives of designation of the area will not be compromised by the development, and any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by the environmental, social and economic benefits."*

This strategy for Scilly recognises that a balance has to be struck between helping to protect the environment in global terms by meeting the Islands' energy needs more sustainably and helping to conserve and enhance the local environment. Consequently, a close working relationship with a range of organisations including Natural England, English Heritage, the Isles of Scilly Wildlife Trust as well as the local community will be required on Scilly. A partnership approach will be the way of identifying small-scale pilot projects that demonstrate how and where sustainable energy initiatives may be appropriate within landscape areas recognised as being of special environmental value.

In this context, it is much easier to see how wave or tidal projects will be satisfactorily accommodated

within Scilly's environmental designations compared, say, to on or off-shore wind power schemes, unless the latter can be introduced on a strictly "micro" basis and demonstrated to sit unobtrusively within the Islands' landscape and seascape.

Tourism

Tourism is fundamental to the way of life on the Isles of Scilly. At least 85% of the Islands economic input stems directly from this sector. In 2004, visitor numbers topped 125,000. The bulk of this tourist trade takes place between April and October with many accommodation providers closing in the autumn and winter months. Such a pattern triggers high levels of energy use throughout the summer months and a much smaller requirement in winter. This means that the typical energy drop in the summer experienced in most communities is not replicated on Scilly.

The aim of the Sustainable Energy Strategy is to encourage the tourism industry to adopt active measures that will help mitigate visitor impact

on the Islands' energy demand. This could be accomplished either by limiting expansion to the shoulder periods or diverting some of the summer trade towards the off peak. Moves towards a green tourism product for Scilly should be adopted with recognition of those establishments that develop green tourism plans and sign up to the Green Tourism Business Scheme. With more awareness of environmental issues generally, consumers are growing increasingly sophisticated in their choices and as a consequence could be drawn to the Islands as a 'champion' of sustainable solutions. The development of eco-holidays should be particularly encouraged, notably where they exhibit eco-design, energy efficiency and low and zero carbon technologies in existing or planned stock.

As previously emphasised, it will be important to consider the impact any potential renewable energy development may have on the environment. A negative impact is going to harm the local economy given that the quality of the environment is such a key attraction for visitors.

4. Energy Targets for Scilly

4.1 A Range of Sustainable Energy Targets

The aims and objectives of this strategy highlight the sustainable energy priorities for the Isles of Scilly over the next 15 years. This strategy sets targets for both the short and long term to ensure



actions are taken to help make Scilly sustainable. The targets are intended to complement other local, regional and national objectives relating to sustainable development and sustainable energy. The tables below show the major national, regional and county targets along with those for the Isles of Scilly. They also show the actions that will help deliver those targets. More specific actions are identified within the actions section of this document.

Table 5: Current targets and objectives related to sustainable energy

Targets	National	Regional	County	IOS
Fuel poverty	Ending fuel poverty in vulnerable households in England by 2010 ¹ Aim that as far as reasonably practicable no household in Britain should be living in fuel poverty by 2016-182.	Region to deliver national government targets.	Increase take up of energy efficiency measures in deprived households in west Cornwall to 4,650 households (2003-2006) ⁴	Reduction in fuel poverty in line with government targets through series of measures to improve energy efficiency in Housing Association, Duchy of Cornwall and Local Authority households by 2016 Achievement of HECA objectives by 2010
Cutting carbon emissions	20% reduction by 2010 ⁵ To put ourselves on path to cut UK's carbon dioxide emissions by 60% by about 2050 with real progress by 2020 ²	National target applies See targets for specific areas below	National target applies See targets for specific areas below	680 – 840 Carbon Emissions saved by 2020



Targets	National	Regional	County	IOS
Energy efficiency and carbon saving in public and business sectors	6MtC by 2010 ⁵ By 2020, further 4-6 MtC can be delivered annually from business and public sectors ² .	Promote efficient use of affordable energy whilst reducing energy demand ³	CSEP target to stimulate savings of 60,750 tC in all sectors by 2010 ⁹ 51 tC by 2010 and additional 34-51 tC by 2020	Energy efficiency survey of public sector buildings by 2008 prior to setting targets to produce an energy savings programme by 2010.
Energy efficiency in domestic sector	5MtC by 2010 ⁵ By 2020, further 4-6MtC of annual savings can come from improved energy efficiency in households ² . Ensure that all social housing is of a decent standard by 2010. ⁶	Achieve cuts in Carbon emissions within domestic sector of 30% from 1990 baseline by 2020 and by at least 60% by 2050.	CSEP target to stimulate savings of 60,750 tC in all sectors by 2010 ⁹ 42.5 tC by 2010 and an additional 34-51 tC by 2020	HECA Objectives and improvements to heating sources by 2010
Renewable energy (electricity)	10% of UK's electricity from renewable energy sources by 2010 with aspiration to double this by 2020 ²	11-15% of region's electricity from renewable energy sources by 2010 ⁷	93-108 MW renewable electricity capacity in Cornwall by 2010 ⁸	Persuading 10% local businesses and 50% public sector bodies to acquire energy from green suppliers by 2010. Pilot project(s) work to identify best fit hybrid energy system for Islands focusing on development of marine-based renewable energy source between 2008-2010.

Targets	National	Regional	County	IOS
Renewable energy (heat)		No specific target – should be included in a Regional Energy Strategy	REOC Renewable Energy Strategy 609 GWh of heat / fuel by 2010	All new housing development to be at least carbon neutral by 2016. Existing housing, where feasible, to include heating requirements from micro renewable generation by 2020.
CHP	10GWe of Good Quality CHP capacity being installed by 2010 ² .	National Target applies –regional target should be included in Regional Energy Strategy	National Target applies	Incorporating generation of heat, if feasible, from incinerator on St Mary’s into planned new build school by 2010.
Transport				Completion of Route Partnership Project by 2010/11, securing lowest feasible carbon emissions options for freight/ passenger transport to and from the Isles of Scilly
Climate Change	All Local Authorities in England and Wales to sign Nottingham Declaration.		National Targets Apply	Nottingham Declaration signed. Produce plan to assess and address impacts of Climate Change by 2010.

1.DTI and Defra and the Devolved Administrations 2001 *UK Fuel Poverty Strategy*

2. DTI 2003 Energy White Paper: *Our energy future – creating a low carbon economy*

3.Sustainability South West 2001 *A Sustainable Future for the South West*

4.Cornwall County Council and CSEP 2003 *Draft Public Service Agreement*

5.DETR 2000 *Climate Change Programme*

6.DETR 2000 *Quality and Choice: a decent house for all - the way forward for housing.*

7.ODPM Regional Planning Guidance for the South West of England

8.ReVision 2010 – Provisional Target for Cornwall

9. CSEP Business Plan Nov 2001



4.2 The Final Aim

It is anticipated that ‘macro’ scale renewable energy development will certainly reach the Islands but perhaps only in the mid to longer term. When such a development is fully operational it will be expected to produce sufficient clean energy supplies to meet all of Scilly’s energy needs with enough left over to ‘export’ to the mainland.

However, it is important that, in the meantime, measures that concentrate on the reduction of carbon emissions, fuel poverty and fossil fuel consumption, along with improving energy efficiency, are implemented. They will provide the basis on which a local clean energy supply can provide maximum benefits for the Islands once resources from wave or tidal power do come on stream. The whole process should be viewed as an integrated approach to developing the best possible energy system for the Isles of Scilly.



5. Action Plan

5.1 The context for action

The need for action identified within this strategy is prompted first and foremost by fossil fuel depletion and the issue of climate change. Implicit in such action is the recognition that these two global concerns offer an opportunity to improve the environment, social well-being and economy of the Isles of Scilly. However, the character of the local environment requires that any action must be in keeping with the scale and character of the Islands and should enhance rather than detract from its qualities.

5.2 Renewable Energy, Clean Technology and Security of Supply

In view of the Islands' detachment from the mainland and in the context of the UK's renewable energy targets, a unique opportunity exists to exploit renewable resources and make Scilly self-sufficient in energy and a 'champion' of sustainable living.

A range of renewable energy generation techniques is available, on a variety of scales, some of which could clearly meet the energy requirements of the Islands. A potential source of local energy has already been the subject of preliminary investigation in response to the Wave Hub Project in Cornwall. On Scilly

itself, Orecon Ltd and more recently Ocean Power Technology have taken the first tentative steps towards demonstrating to Council and the community the potential for a marine renewables' future for the Islands.

The Carbon Trust, which advises businesses, industry and the Government on methods of reducing greenhouse gas emissions, says that exploiting wave and tidal power around South West England could contribute hugely towards the provision of up to 20% of the UK's present electricity needs.

The South West Regional Development Agency (SWRDA) sponsored study 'Sea-power South West Review' has identified the waters around the Isles of Scilly as an excellent marine-based sustainable energy resource, with the potential to take advantage of both wave and tidal-based technologies. At present, these marine renewable energy technologies are still in the development stage. But there are real hopes that the Wave Hub project will signal their emergence as a reliable and viable energy source.

SWRDA, which has already committed more than £20 million to the Wave Hub project as a part of its strategy to develop environmentally clean technologies, is currently seeking a private sector partner to operate and jointly own the Hub. At least one of the pilot projects on Scilly should be progressed in harness with and as a practical implementation of developments at the Hub.

A separate, land-based source of energy on Scilly may come from the use of biomass, with potential generation of heat and power from the incinerator on St Mary's. Combined Heat and Power (CHP), although it is not technically

a renewable source of energy, is seen as clean technology. Fuel for this process would come from the biodegradable element of municipal, commercial, industrial as well as sewage sludge-based waste. The by-product of incinerators is heat and this can be used to generate power.

Any power generated from Scilly's incinerator (at Moorwell) would not be sufficient on its own to meet the needs of the Islands as a whole. It is more likely to be a part of a series of different generation measures. In spite of recent initiatives to reduce, reuse and recycle waste, because of Scilly's size and peripheral location, incineration is unlikely to be abandoned for the foreseeable future. As a result, a local incinerator that maximizes the disposal of Scilly's waste will certainly also represent a potentially significant and sustainable option for heat and/or power generation. The prospect of substantial Government funding between now and 2010 to build a replacement for the local school provides an potential opportunity to introduce CHP linkage into a crucial new piece of island infrastructure.

Another possible land-based power option for Scilly is the production of energy crops like miscanthus or willow. They could help farms diversify and improve their economic viability, although their cultivation would be required to compliment the character of the landscape. The Duchy of Cornwall's draft corporate sustainability document acknowledges the potential of energy crops either for use in domestic heating systems or for mass burn.

On a more modest level, the Local Plan and the Isles of Scilly Design Guide both endorse incorporation of micro-scale renewable

generation in new developments. Retro-fitting of renewable technologies to existing properties, where appropriate, is also encouraged. These actions together with energy saving initiatives will contribute to a reduction in the demand for energy supplied from non-renewable sources.

Renewable Energy Actions

Action 1

Baseline Energy Survey for Isles of Scilly quantifying energy use in business, domestic, public and transport sectors.

Action 2

Development of Isles of Scilly's first renewable energy resource through one or more pilot projects to identify best-fit solution for Islands' long-term energy needs.

Action 3

Inclusion of micro-scale renewable energy generation in all new developments on Isles of Scilly and where appropriate in existing premises too.

Action 4

Promotion, through locally based information campaigns, of benefits of renewable energy in delivering sustainable communities.

Project 1: Best-Fit Energy Solution for the Isles of Scilly

As an early development phase, the Best-Fit Energy Solution for Scilly will identify a way in which the Islands can use their natural energy resources to produce energy in a renewable and sustainable manner. One or more pilot projects will form the first stage of a scheme that seeks to deliver the energy requirements of the Islands locally, with future stages producing the new energy network itself.

The scheme will be administered by the Council, utilising as appropriate the expertise of SWRDA, CSEP, the Combined University in Cornwall (CUC), University of Plymouth (UoP) and Cornwall Enterprise, Cornwall County Council's business arm and others as appropriate. The scheme's main initial focus will be to secure funding for this work in consultation with Western Power Distribution and in partnership with companies that have a track-record of product involvement and innovation in the technology of marine renewables.

5.3 Energy Efficiency in the Business and Public Sectors

EC Directive 2002/91/EC (Energy Performance of Buildings) requires all EU Member States to set energy performance requirements for new

and existing buildings. This measure makes it imperative that any new building, or the renovation of an existing one, meets defined standards. Religious, temporary or certain scheduled buildings are exempted.

Generally, improvement of energy efficiency within public and private sectors should be seen in terms of best value. Lack of good energy efficiency within premises can lead to unnecessary costs and poor working environments for both businesses and public sector organisations. Research suggests that businesses within the UK may typically be wasting as much as 30% of their energy usage. Yet simply switching standard bulbs for low energy replacements saves £6.50 a year per bulb.

The Carbon Trust, a Government-funded environmental group, has identified that "a 20% saving in energy consumption – realistically achievable by most businesses – can have the same positive effect as a 5% increase in sales". Lowering office temperatures by one degree centigrade, according to the Trust, reduces a typical business's heating bill by up to 8% while if each worker in the country switches off their computer every night it would save enough energy over a year to make more than 21,000 cups of tea. Such reductions in energy can also result in further savings since the amount of climate change levy paid by firms is directly related to the amount of units of energy they use. Looking at energy consumption and efficiency in this context shows that being environmentally aware can and does make sound financial sense.

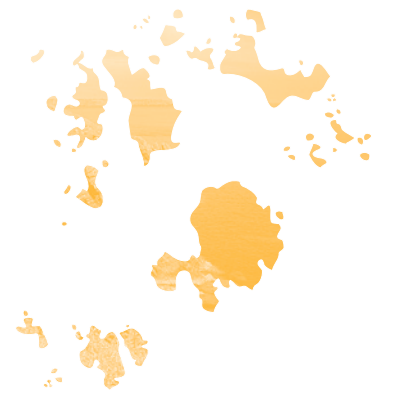
A simple way for public and private sector alike to reduce carbon emissions foot-prints is for them to develop green procurement plans. At the

basic level this means switching energy supplies or tariffs from 'standard' to 'green'. A green tariff usually involves energy supplied to a business or public sector organisation being matched by the energy provider to an equal amount of energy from renewable or 'green' sources. Some energy companies' green tariffs will use investment from customers to install new capacity; others however only buy in green energy and don't install their own capacity.

Companies procuring a green energy tariff may be put off when analysing their investment on a cost per unit basis. However, once the Climate Change Levy (which does not apply to "green" energy) has been taken into account, a real saving may be achievable.

Looked at in terms of best value with regard to national policy on reducing carbon emissions, such a change becomes more realistic. This is clearly true if the change is made as a first step in an energy management programme that entails checking all aspects of an organisation's energy efficiency plans. The latter may include the use of A-rated appliances, of timed lights in offices, car-pooling and/or car-sharing and sourcing products locally (to cut down on transportation energy used in delivery) where at all feasible.

Finally, improvements in public and business milieus should even be seen as encouraging the delivery of additional positive effects - improved productivity from staff perhaps or better healing environments for hospitals and health care establishments or enhanced educational performance by school children.



Energy Efficiency in the Business and Public Sector Actions

Action 5

Promotion and development of green procurement policies and adoption of green energy tariffs by Council and other business and public sector organisations.

Action 6

Development of a signpost service, linking to partners and experts in sustainable energy sector, for advice on Sustainable Energy.

Action 7

Support for sustainable measures through application of planning policies as set out in the Local Plan and Design Guide that augment Part L of the Building Regulations.

Action 8

Embrace partnership working to promote green tourism and more eco-friendly Green Tourism holiday experience.

Project 2: Green Tourism

The Isles of Scilly AONB is seeking to build interest in Green Tourism within the Islands in partnership with the Tourist Board, Island Tourism, South West Tourism and Cornwall Sustainable Tourism Project (CoaST). The aim is to enlist up to 50 local businesses in a Green Tourism Business initiative. During 2007 it will entail linking with South West Tourism's Action of the Year – Energy Efficiency - and encourage the Islands to develop an agenda which aims to make Scilly a green tourism destination.

5.4 Energy Efficiency & Fuel Poverty in the Domestic Sector

Energy efficiency and fuel poverty in the domestic sector are key issues on the Isles of Scilly. Homes on the Islands suffer from the effects of fuel poverty or poor energy efficiency. Although it constitutes a significant opportunity to reduce carbon emissions, tackling fuel poverty and improving energy efficiency within the domestic sector should also be seen in a social context. A baseline study will investigate fuel poverty on the Islands as part of the work in Action 9. This will inform a database and action plan of those at risk of fuel poverty.

A study by the Cornwall and the Isles of Scilly Health Authority in 1995/96 investigated the effects of housing conditions on children suffering from asthma. The results showed that when children's living conditions improved their asthma symptoms were dramatically reduced too and they took less time off school. Separate investigation has shown that improved living conditions can also have an impact on the number of post-natal depression cases and even the incidence of crime.

Energy Efficiency and Fuel Poverty Actions

Action 9

Development of database and action plan to identify and treat those households at risk of Fuel Poverty.

Action 10

Development of energy reduction and energy efficiency programme to improve energy efficiency in public and private sector homes with emphasis on those homes which are 'fuel poor'.

Project 3: Energy Efficiency on the Isles of Scilly

The Council's Housing Department, working with Community Energy Plus (CEP), has secured a funding package within its Decent Homes plan for installing cavity wall and loft insulation where appropriate in the Council's housing stock. In addition, the Council is continuing to have defective windows and doors within its dwellings replaced; 90% of this work is complete. The Council has commissioned structural surveys of its flats on St Mary's, which also focus in detail on energy issues.

5.5 Energy Efficiency in Transport

Transport considerations for the Isles of Scilly are unlike almost any other similar-sized community in the UK. Moreover, with alternative aviation and marine fuels either still in development or presently uneconomic for transport operators, it is difficult to contemplate achieving carbon savings immediately on services that provide links to the mainland or between the Islands.

The proliferation of jet boats in Scilly has helped to revolutionize inter-islands transport. But, along with the "Star of Life" water ambulance, such vessels have been accused of being noisy and fuel hungry.

By 2010/11 the Route Partnership with its replacement of the present twin-ship system for the Penzance/St Mary's link by one modern, dual-purpose vessel should deliver significant savings to the local economy. By safeguarding the sea route, it will also ensure against unsustainable reliance on air transport for freight and passengers.

The local focus within the Islands needs to concentrate on walking and cycling, already popular modes of transport on Scilly, both for access to the workplace and in leisure time. Actions within this strategy will seek to encourage and enhance their use and, where feasible, promote them over car transport. This may present some practical difficulties in overcoming entrenched attitudes. A survey for the Isles of Scilly Transport Strategy showed that out of a total of 342 respondents 55% would not consider using a bicycle.

Even if there was less traffic on the roads, the same survey indicated that the majority of residents would still not be inclined to walk. However, the attitude was more positive with regard to the use of small electric -powered cars or other vehicles. Only 23% from 360 respondents dismissed the idea for Scilly

Meanwhile, in Cornwall, various local authorities have taken a lead in pioneering the use of bio-diesel in their vehicles. Any opportunities to follow this example should be followed on Scilly. More home-working and use of video-

conferencing to cut down on journeys to the mainland can be contemplated.

Transport Actions

Action 11

Develop alternatives to transport by offering ICT connections, including facility to work from home or use video-conferencing, as alternative to meetings on mainland.

Action 12

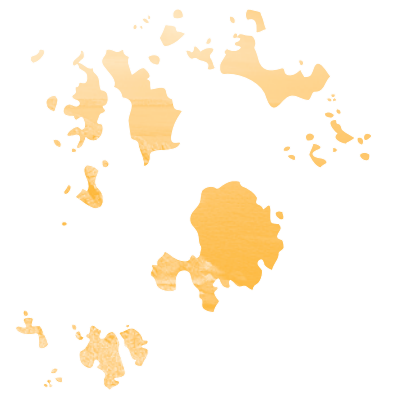
Promote use of electric vehicles powered by renewable energy or clean fuels, such as bio-diesel.

Action 13

Encourage walking and cycling as alternatives to using cars, through promotional campaigns and provision of facilities such as secure parking and changing facilities at the workplace.

Action 14

Promote car-pooling and/or car-sharing to cut down emissions created by people travelling on similar or identical routes.



Action 15

Fulfill the Route Partnership pledge to safeguard the sea-link with mainland by swapping present two-ship system for a single, modern, dual-purpose and more carbon-efficient option.

Action 16

Study into the use of waste cooking oil from restaurants and hotels and how it may be used as an alternative fuel for powering Island vehicles.

Project 4: The Route Partnership, Safeguarding the Sea Link

A sea link is vital to the economic and environmental sustainability of the Islands. The Route Partnership is a public/private partnership comprising the Council of the Isles of Scilly, Penwith District Council, Cornwall County Council, the Duchy of Cornwall, the Isles of Scilly Steamship Company and British International. It is working to secure funding to upgrade the out-dated quays at both St Mary's and Penzance and provide a new replacement vessel for Scillonian III and Gry Maritha which are nearing the end of their economic lives. A bid for funding has received conditional approval from the Department for Transport. One of the anticipated benefits of this project will be to minimize carbon emissions by the provision of a more modern boat ensuring a continued alternative to air transport.

5.6 Monitoring and Review

This strategy and action plan should be seen as a living document. It will require monitoring, reviewing and updating in the light of new technological developments, changing economic circumstances and Government energy policy.

It is therefore proposed that the strategy should, following its consultation period in 2006 and its publication in 2007, be delivered by the Council of the Isles of Scilly and monitored by the Local Strategic Partnership. The strategy should be reviewed following on from the baseline energy survey and revised priorities and actions put in place where appropriate. It should be monitored subsequently on a bi-annual basis.

Table 6 sets out the actions to implement the strategy with suggested timeframes and milestones. This covers the period to 2020. The key partners are suggestions of organisations that the Council may link with, where it is beneficial to do so, in order to deliver the actions. As this strategy is a living document the actions below may be modified or added to in response to changes in technology and policy. All actions are priorities. However, some have been designated high priority.

5.7 Actions Summary: Timeframes and Milestones

Table 6: Actions summary – timeframes and milestones

Actions	Suggested key partners	Timeframe	Milestones / Targets	Priority
Renewable Energy Actions				
1. Baseline Energy Survey and renewable resource assessment	CIOS, CUC	2007-2009	Published Studies	High
2. Renewable Energy pilot projects to find best fit solution for Isles of Scilly's energy needs.	CSEP,CUC, Cornwall Enterprise, WPD, CIOS, DoC.	2008 – 2010	Development of pilot project(s)	High
3. Inclusion of micro-scale renewable energy technologies in all new developments on Scilly and encouragement of retro-fitting where appropriate.	CIOS, Energy Technology Consultants, DoC, (HAs, contractors).	2007 – 2020		High
4. Promotion of benefits of renewable energy in delivering sustainable communities.	AONB, LSP, CIOS, CEP, DoC.	2007 – 2020		Medium
Energy Efficiency in the Public and Business Sector Actions				
5. Green procurement policy and green energy tariffs for business and public sector.	LSP, CIOS, DoC, and local businesses& groups.	2007 – 2010	Adoption of Green Procurement plan and energy tariff for key Island organisations	High
6. Development of 'signpost' service for advice on sustainable energy	CIOS	2007 – 2010		Medium





Actions	Suggested key partners	Timeframe	Milestones / Targets	Priority
7. Planning policy to promote sustainability in the Local Plan and the Design Guide	CIOS	2007 – 2020	By December 2007 Review current advice and support by April 2008 implement findings of review	High
8. Engagement with local tourism businesses to promote green tourism initiatives and more eco-friendly holiday experience	AONB, LSP, CIOS, DoC, IOSTA,	2007-2010	Green Tourism Strategy and Action Plan.	High
<i>Energy Efficiency and Fuel Poverty in the Domestic Sector</i>				
9. Development of database and action plan to identify and treat households at risk of fuel poverty	CIOS, DoC, LSP, RSLs.	2007 – 2009		Medium
10. Development of energy reduction and energy efficiency programme including home insulation.	CIOS, LSP, CSEP, CEP, DoC.	2007-2008	All Council Properties, where appropriate, to have cavity wall and loft insulation installed by April 2008.	High
11. Energy efficiency leaflet for measures to reduce energy use and improve energy efficiency.	AONB, CIOS, CEP, CSEP, LSP, DoC.	2007 - 2008	Distribution of leaflet to all homes and businesses	High

Actions	Suggested key partners	Timeframe	Milestones / Targets	Priority
<i>Alternative Transport & Transport Considerations – Actions</i>				
12. Develop alternatives to transport by offering ICT connections, with facility to work from home and to allow video conferencing.	CIOS, LSP, DoC, CSEP, CEP, local businesses, community groups etc.	2010		Medium
13. Promote use of vehicles powered by renewable or clean fuels, such as bio-diesel.	CIOS, CSEP, CEP, LSP	2007 – 2020	Infrastructure for use of bio-fuels.	Medium
14. Promote walking and cycling and provision for facilities such as secure parking and changing facilities.	CIOS, DoC, Local Business, LSP,	2007 – 2010	Improvement of current facilities for cyclists and walkers	Medium
15. Promote car pooling and car sharing.	Local business, CIOS, DoC	2007 - 2020		Low
16. Fulfill Route Partnership pledge to safeguard sea link.	Route Partnership	2007 – 2011		High

6.1 Overview

The nature of energy use and abuse is such that any decisive measures will require co-operation across and beyond Scilly, involving individuals and groups from public, private, voluntary and community organizations. The Council of the Isles of Scilly will seek to establish and maintain partnerships with organizations over a range of sectors.

6.2 Partnership

This strategy will be delivered through the Council of the Isles of Scilly. It will be monitored by the Local Strategic Partnership (LSP), working in close liaison with Cornwall Sustainable Energy Partnership (CSEP), local businesses and members of the voluntary and community sectors.

It is anticipated that the LSP will fulfill its role in part by establishing Sub-groups to assess more technical work and individual projects.

The Isles of Scilly Local Strategic Partnership comprises representatives of the following:

- Devon and Cornwall Police Authority: tbc
- School Council: tbc
- Island Tourism: Juliet May
- Councillors : Mrs Christine Savill (Chairman) and Julia Day
- Childrens’ Services: David Pearson
- Five Islands School: Andrew Penman or Tim Guthrie
- Health Service: Dr Toby Dalton
- Trenoweth Research Station/Mainland Marketing: Andrew May
- Duchy of Cornwall: Colin Sturmer
- Planning and Economic Development: Craig Dryden

- Housing: Ian Hamilton
- Adult Services: Christine Gravestock
- Voluntary Sector: Beryl Read
- Community Safety: William Thomas
- Isles of Scilly Wildlife Trust: tbc

Cornwall Sustainable Energy Partnership (CSEP) is an award-winning consortium of 72 partners, including Local Authorities, Health Sector organizations, business representatives, the renewable energy sector, energy suppliers, the Combined Universities in Cornwall (including Camborne School of Mines), the Eden Project, community groups and voluntary organizations from across Cornwall and the Isles of Scilly.

6.3 Funding Opportunities

With no new projects being approved under Objective 1, it is unlikely that any Objective 1 funding will be available to help in the immediate delivery of some of the proposed actions.

However, with the outline EU budget now agreed for 2007 to 2013, Cornwall and the Isles of Scilly will have access before long to Convergence funding. It is understood that this next phase of European funding will put environmental sustainability high on its agenda. The Rural Development Programme may also offer opportunities for work to be undertaken.

The Energy Savings Trust offers grants on behalf of the Department of Trade and Industry (the DTI¹⁰) for equipment and work that is

¹⁰ BERR, the Department for Business, Enterprise and Regulatory Reform took over the responsibilities of the DTI in July 2007.

directly related to solar photovoltaic systems. Also administered by the Energy Savings Trust is the Low Carbon Buildings Programme which provides grants for both small and large scale developments to incorporate renewable energy technologies within them. This funding is available to domestic, business and public sectors allowing for a whole range of developments to be covered.

Community Energy Plus (CEP) is a registered charity and ‘Profit Recycling’ company dedicated to reducing carbon dioxide emissions. It is organized into four teams;

- The Advice team operates Cornwall Energy Saving Advice Centre (CESAC) providing free and impartial advice to households.
- The Community Team works with community, voluntary and health organizations to develop domestic energy and community energy programmes.
- The Business Advice Team ‘provides a one-stop shop’ for environmental business support.

- The Policy Team seeks to influence the local and national debate. It operates the Cornwall Sustainable Energy Partnership.

SWRDA in partnership with four businesses – two English, one Australian and one Norwegian – has committed more than £20 million to the Wave Hub project. Other companies are expected to join Bristol’s Ocean Prospect Ltd, Ocean Power Technology from Warwick, Oceanlinx of New South Wales and Fred Olsen Ltd next year or later in location-testing their machines. Keying in one or more of Scilly’s pilot projects to the Wave Hub process may help facilitate funding opportunities from SWRDA.

In 2007 the number of organizations who can help with advice and funding for renewable energy projects, both at a macro and micro level whether for businesses, the public sector or individual households is proliferating. Some of the key organizations involved and their schemes are listed below:

Grant Provider	Grant Name	Description	End Date	Contact Details
Carbon Trust		Helping business and public sector to cut Carbon Emissions and capture commercial potential through Energy Surveys, Energy Helpline, Energy Loans, Design Advice, Free Events and Training.		
EST	Low Carbon Buildings Programme	Provides grants for domestic, business and public sectors for provision of micro generation	31/03/09	



Grant Provider	Grant Name	Description	End Date	Contact Details
EST	Transport Team	Funding is available for alternative refueling stations and electric charge points.		
EDF	Green Energy Fund	Funding to cover costs of installation of small scale renewable technology.		
Independent	Snug as a Bug	Home insulation scheme that provides discounts of up to £650 towards loft and cavity wall insulation	31/03/08	0845 607 6415 or visit www.instagroup.co.uk
EAGA	Warm Front	Warm Front grants are available to people who are on certain benefits and either own their home, or rent it from a private landlord. Not available to customers living in Council or Social housing	31/03/10	0191 247 2808 www.eaga.co.uk
Energy Providers	Energy Efficiency Commitment (EEC)	EEC 2005 - 2008 requires gas and electricity suppliers to deliver improvements in domestic energy efficiency. All domestic sector homes are eligible, although 50 per cent of EEC must be targeted at priority groups consisting of householders receiving certain benefits or tax credits. The amount of funding available is dependent on the supplier and therefore it is advisable to contact several suppliers in order to attain the best deal.	31/03/08	Contact Energy Suppliers



Grant Provider	Grant Name	Description	End Date	Contact Details
EnergySmart	EnergySmart Boiler Discount Scheme	Scheme designed to offer private residents, registered installers, Local Authorities and Housing Associations ability to obtain the most efficient A rated condensing boilers at discounted rates.		0845 230 3320 or visit http://www.energy-smart.org.uk/
EnergySmart	EnergySmart Solar Thermal Discount Scheme	Scheme is designed to offer private residents, registered installers, local authorities and housing associations the ability to obtain solar thermal systems at discounted rates.		0845 230 3320 or visit http://www.energy-smart.org.uk/solar.asp
Isles of Scilly AONB	Sustainable Development Fund	Scheme funded by the Department for Environment, Food and Rural Affairs (Defra) to supports sustainable development within National Parks and Areas of Outstanding Natural Beauty in England and Wales. Fund is open to any individual or organisation from public, private or voluntary sectors or a collective of these. Applicants can be located within or outside National Park or AONB boundaries.	31/03/08	01720 424314
Cornwall Switch		Offers range of advice and the ability to change to a green supplier either over the phone or online		0800 1088 333 or visit www.cornwall-switch.org

7. Glossary

Term	Description
Beacon Status/Beacon Council	Government's Beacon Council Scheme identifies 'excellent' Councils from which other authorities can learn 'best practice on service delivery'.
Bio-Diesel	Liquid Fuel derived from oil-bearing seeds that can be substituted for diesel oil in diesel engines.
Biomass	Biomass is the biodegradable fraction of products, waste and residues from agriculture (including plant and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste.
Carbon Emissions	Releases of carbon to the atmosphere as part of compounds that arise from man-made processes such as energy use or agriculture.
Carbon Emissions Footprint	Amount of carbon emissions generated by a country, region, town, business or individual. 'Footprint' is the sum total of all carbon emissions produced by any such entity.
Carbon Trading	System which provides a financial incentive for industrial companies and other organizations to reduce carbon emissions by permitting them to trade allowances set by Government for such emissions.
Climate Change	Change of climate, excluding natural variations, attributed directly or indirectly to human activity and which alters the composition of the global atmosphere, where climate is defined as the average weather pattern for a location.
Climate Change Levy	Tax on corporate energy use introduced by Government in 1999 aimed at reducing energy consumption; a flat rate charge that is paid per kWh of energy source used
Combined Heat and Power (CHP)	Plant that generates electricity but where waste heat is recovered and used to provide space, water and process heating. Commonly linked to district heating systems. CHP plant is more energy efficient than conventional generating plant, frequently achieving 80-90% efficiencies in energy conversion. CHP plants can be fired by fossil fuels like gas and oil or renewable fuels such as biomass.
Decent Homes Standard	A ten-year government target set with the aim of bringing all social housing up to "Decent Standards" by 2010.
Energy Crops	Crops, such as miscanthus, grown to provide energy.
Energy Efficiency	Difference between energy input and energy output, usually represented in percentage terms.
Energy from Waste (EfW)	Collective term for group of technologies that use waste to generate electricity and provide heat. Includes mass-burn incineration, anaerobic digestion and pyrolysis/ gasification

Term	Description
Fossil Fuels	Hydrocarbon fuel deposits, such as petroleum, coal or natural gas, derived from living matter of a previous geological time.
Fuel Poverty	Term applied to low-income households who have insufficient income to provide themselves with basic energy services such as heat and light. Fuel Poverty is usually defined in terms of those who spend more than 10% of net income on energy needs.
Gigawatt electricity (GWe)	Unit of Power - Represents the amount of GigaWatts (electricity)
Gigawatt hour (GWh)	Unit of Energy - 1 Gigawatt hour is equal to 1000 MWh or 1,000,000 kWh. Both are expressions of amount of power consumed over a period of 1 hour
Green Energy Tariff	Electricity generated from renewable resources. Many different types of tariff exist, some companies guaranteeing the delivery of a percentage of power requirements from renewable energy, others putting specified amount of money into renewable energy development.
Green House Gas (GHG)	Gases including carbon dioxide, methane and carbon monoxide that when liberated from non-renewable fuel resources contribute to the Greenhouse Effect and subsequent climate change.
Green Procurement Plan	Policy for purchasing goods that considers the production, life time use and disposal cost (both in financial and environmental terms) of goods, as well as their likely rate of consumption. Such an approach can lead to savings in costs as well as increases in efficiency and better environmental performance.
Ground/Air Source Heat Pumps (GSHP/ASHP)	Type of heat pump that uses the natural heat-storage ability of the earth and/or the groundwater to absorb and store heat energy from the sun so as to heat and/or cool a building. To use the stored energy, heat is extracted from the earth through a liquid medium (either groundwater or an anti-freeze solution) and is then pumped to a heat pump or heat exchanger.
Hard to Heat Homes	Homes where it is difficult to boost thermal retention, maybe as a consequence of an inability to improve or provide insulation and draft exclusion. Most often associated with homes that have solid walls, flat roofs and/or no access to gas.
Home Energy Conservation Act (HECA)	HECA requires all UK local authorities with housing responsibilities to prepare an energy conservation report identifying measures to improve significantly energy efficiency of all residential accommodation in their area and to report on progress in implementing the measures.

Term	Description
Insulation	Insulation involves placing any material that offers resistance to heat transmission in walls, ceilings or floors to reduce loss or gain of heat from outside sources.
Kyoto Protocol	The Kyoto Protocol in December 1997 set binding greenhouse gas emissions targets for countries signing and ratifying the agreement. Among gases included under the Protocol are methane, nitrous oxide, carbon dioxide, hydro-fluorocarbons (HFCs), per-fluorocarbons (PFCs) and sulphur hexafluoride.
Liquid Petroleum Gas (LPG)	Liquefied Petroleum Gas (LPG) is a mixture of low-boiling hydrocarbons which, at ambient temperatures and under moderate pressures, exist in a liquid state. LPG is a by-product from refining petrol and processing natural gas. Major components of LPG are propane, butane and propylene.
Macro Renewables	Large scale devices that generate energy from natural and renewable energy sources, including wind, wave, solar and geothermal.
Megawatt (MW)	Unit of Power denoting either the generating ability of an energy technology or the rating for an appliance.
Micro Renewables	Micro Renewables is a collective term for the group of energy generating technologies that can be used at a single site or household.
Miscanthus	Energy crop, commonly known as elephant grass
Photovoltaic	Energy conversion technology that converts solar (light) energy in to electricity typically constructed as a panel of cells and mounted on the roof of a building. May also be incorporated into roof tiles, wall cladding or glazing.
Renewable Energy	Energy provided by natural resources, including wind, water, geothermal and solar, which suffer no long term degradation or loss as a consequence of their use.
Renewables Obligation	Obligation on electricity companies to provide a target percentage of their supplies from renewable energy sources, with a 'buy-out' penalty for all units below that target. Suppliers can generate supplies themselves or buy Renewables Obligation Certificates (ROCs) from other renewable energy producers.
Short Rotational Coppice (SRC)	Energy crop which consists of densely planted, high-yielding varieties of poplar or willow. Sustainably managed SRC provides a source of renewable energy with virtually no net carbon emissions (i.e. no increase in atmospheric carbon).
Wave Hub	Device which provides an off-shore 'electrical socket' that can be used to bring electricity from wave power machines and tidal stream turbines to shore.

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