



S W REGIONAL
WOODFUEL
FRAMEWORK 2005

CONTENTS

04

POLICY CONTEXT

06

THE RESOURCE

08

A FRAMEWORK FOR ACTION

09-10

CASE STUDIES

11

REGIONAL CONTACTS

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WOODFUEL...

A clean renewable energy source that makes a substantial contribution to the UK's renewable energy targets and makes an impact on climate change...



Provides an alternative or new market for wood, giving owners an incentive to bring neglected woodlands back into sustainable management, encouraging wildlife and providing many other benefits...



Using modern automatic controls, woodfuel energy systems are programmable, clean and efficient. Tried and tested technology, much of it from Europe, has been developed to meet a variety of energy needs...



The Aims of this Framework

- To highlight the potential of wood as a modern and renewable fuel for heat.
- To develop the use of woodfuel to make a significant contribution to the demand for renewable energy and reduce carbon dioxide emissions.
- To increase the sustainable management of woodlands through the promotion and use of woodfuel, increasing direct links between communities and local woodlands, to bring environmental, economic and social benefits.

The purpose of this Framework is to provide a focus for all those interested in developing the potential of woodfuel in the South West. It is recognised that woodfuel can supply constant green renewable energy and at the same time encourage the sustainable management of our region's woodlands. Using low value wood as fuel improves the economic viability of forestry operations and can provide the impetus for bringing our many unmanaged woodlands back into management. Managed woodlands will enhance and protect wildlife, create a diverse landscape and bring opportunities for leisure and recreation.



This framework is the result of a partnership between SWRDA, the Countryside Agency and the Forestry Commission. It has drawn on a study commissioned from Renewable Heat and Power Ltd in 2003 by the three funding partners.

National Policy

The **UK Energy White Paper**¹ places renewable energy at the heart of the Government's energy policy and their approach to climate change. For the first time it makes reducing carbon emissions a central plank of energy policy. It reinforces the importance of the national target for 10% of the UK's electricity to come from renewable sources by 2010, and sets out to double this by 2020.

Biomass, which includes woodfuel, is seen as the next most important source of renewable energy to wind. The White Paper also formalises the role of Regional Development Agencies and Government Offices in strategic planning, investment and enabling community participation in moving to a low carbon economy. This change in policy has led to a significant interest at both the national and regional level in the potential for woodfuel to contribute to national, regional and local targets for renewable energy.

The Department of Trade and Industry and the Carbon Trust in their **Renewables Innovation Review**² identify the importance of biomass in meeting carbon reduction targets and identify an advantage of biomass over wind, wave and solar in its continuity without reliance on the weather. They see the importance of initially focussing on smaller scale heat applications, using readily available local supplies of wood as a low risk start to establishing a fuel supply, which could perhaps later be extended to energy crops. The Regions are seen as having a key role in the implementation of programmes, such as the development of biomass fuel chains and heat market establishment.

The South West has a major opportunity to concentrate on the development of smaller-scale local heat installations, particularly in rural areas where there is a readily available fuel supply and woodfuel can compete with heating oil and LPG.

In October 2004 the Government launched the **Biomass Task Force** to assist the Government and the biomass industry in optimising the contribution of biomass energy to renewable energy targets and to sustainable farming and forestry and rural objectives. The Task Force is due to publish its final report in October 2005.

1 DTI (2003) *Our Energy Future - Creating a low carbon economy*. CMS761. The Stationery Office. www.dti.gov.uk

2 DTI and the Carbon Trust (2004) *Renewables Innovation Review*. The Stationery Office. www.dti.gov.uk

South West Renewables Policy

A **Renewable Energy Strategy for the South West**³ was published in April 2003 as the region's response to the Energy White Paper's challenge to deliver national targets. Its aim is to promote and increase the size of the South West renewable energy industry and establish a track record for the region. Focussing primarily on renewable electricity, in line with national policy, it also highlights the potential for renewable energy fuels for both heat and transport in the South West.

The Strategy identifies three areas where a regional focus is required:

- Deploying renewable energy on the ground.
- Developing skills and awareness.
- Building the South West renewable energy industry.

Specific actions directly relevant to woodfuel are as follows:

1. Accelerate dissemination of renewable energy technologies.
2. Ensure that renewable heat receives sufficient regional support.
3. Stimulate the development of regional and local markets in woodfuel.
4. Develop greater understanding of the relationship between renewable energy development and the landscape character and environment of the South West.
5. Engage the farming community with the positive potential for involvement in renewable energy schemes.

The **Delivery Plan for a Sustainable Farming and Food Industry in South West England**⁴ recognises that woodlands and forests are a key component of the rural economy, landscape and biodiversity of the region and their importance as a potential source of renewable energy. This Woodfuel Framework document is referred to in the Delivery Plan and reflects the objectives and outcomes for the promotion and development of renewable energy and more general benefits of woodlands and forests.

REvision 2020⁵, published in June 2005, recommends ambitious new targets for renewable electricity, renewable heat and on-site generation. Building on the work of **REvision 2010**⁶ the report shows how the South West could supply 20% of its electricity needs by 2020 in line with national aspirations. For the first time a renewable heat target of 500MW is proposed, suggesting that half of this could come from woodfuel heating. The report outlines the issues that will need to be addressed if these targets are to be achieved in this timescale.

The **Regional Woodland and Forestry Framework**⁷ reflects the interest in wood energy and the potential for woodfuel to contribute to renewable energy supplies in the South West. It sees success being measured by installed capacity with three main activities identified:

1. Better learning and knowledge transfer within the region between owners and woodfuel entrepreneurs.
2. Better knowledge and understanding of the potential for woodfuel.
3. Increased installed capacity.



³ RegenSW (2003) *A Renewable Energy Strategy for the South West*. www.regensw.co.uk ⁴ GOSW and SWRDA (2004) *Making a Difference - The Delivery Plan for a Sustainable Farming and Food Industry in the South West*. www.gosw.gov.uk or www.southwestrda.org.uk

⁵ GOSW and SWRDA (2005) *REvision 2010: Establishing County/Sub-Regional Targets For Renewable Electricity Development to 2010*. www.gosw.gov.uk or www.southwestrda.org.uk

⁶ GOSW and SWRDA (2004) *REvision 2020: South West Renewable Electricity, Heat and On Site Generation targets for 2020*. www.gosw.gov.uk or www.southwestrda.org.uk

⁷ GOSW and SWRDA (2005) *SW Woodland and Regional Framework*. www.gosw.gov.uk or www.southwestrda.org.uk

What is woodfuel?

This Framework concentrates on woodfuel from existing trees and woodlands and the various sawmill products available from downstream processing. An important additional contribution to building capacity in the sector will be from the use of re-processed clean waste wood which would otherwise have been destined for landfill. Whilst there is also considerable potential for obtaining woodfuel from short rotation crops the principal aim of this Framework is to highlight the benefits of renewable heat and energy from woodfuel to the sustainable management of our woodlands.

Woodfuel is potentially 'carbon neutral' and is a renewable resource. Trees lock up carbon as they grow, releasing it when the wood is used as a fuel. When woodfuel replaces fossil fuels such as oil and gas, much less carbon dioxide permanently remains in the atmosphere – it is locked up again by the growth of new trees. Currently it is not possible to eliminate totally all use of fossil fuels as some will be needed to process and transport wood for fuel. However this is considered acceptable in the context of overall emissions reduction and can be minimised further by reducing transport distance through local sourcing of woodfuel.



The Opportunity in the South West

The South West is well positioned for developing a woodfuel industry, particularly for smaller-scale local heat production. It has:

- a considerable woodland area (8.7%⁸) – much of which is not actively managed
- a favourable climate for growing trees
- a considerable number of wood heat installations
- regional expertise in wood energy
- an active woodland sector with a skilled workforce
- significant areas of the South West are not on the natural gas grid and are reliant upon heating oil or LPG. Woodfuel could be a cheaper alternative and is better for the environment.



The Resource in the South West

Growth in the use of woodfuel for renewable energy is dependent on the available resource, its location and price. A recent report⁹ estimates there is sufficient total wood biomass resource from trees and woodlands in the region to provide up to 200,000¹⁰ oven dry tonnes (odt¹¹) per year of varying types of woodfuel. At 20 KJ/kg 200,000odt could produce over 4 million gigajoules of heat, enough for 50 to 60,000¹² homes. Existing traditional timber markets would continue to be supplied. The availability varies across the region and woodfuel supplies will need to be assessed for individual installations.

The map opposite shows there are a number of woodfired boiler installations operating already. If we can continue to increase significantly this installed capacity, using demonstration exemplars and by developing clusters of interest, we will be able to ensure that a thriving woodfuel industry achieves its full economic and environmental potential.

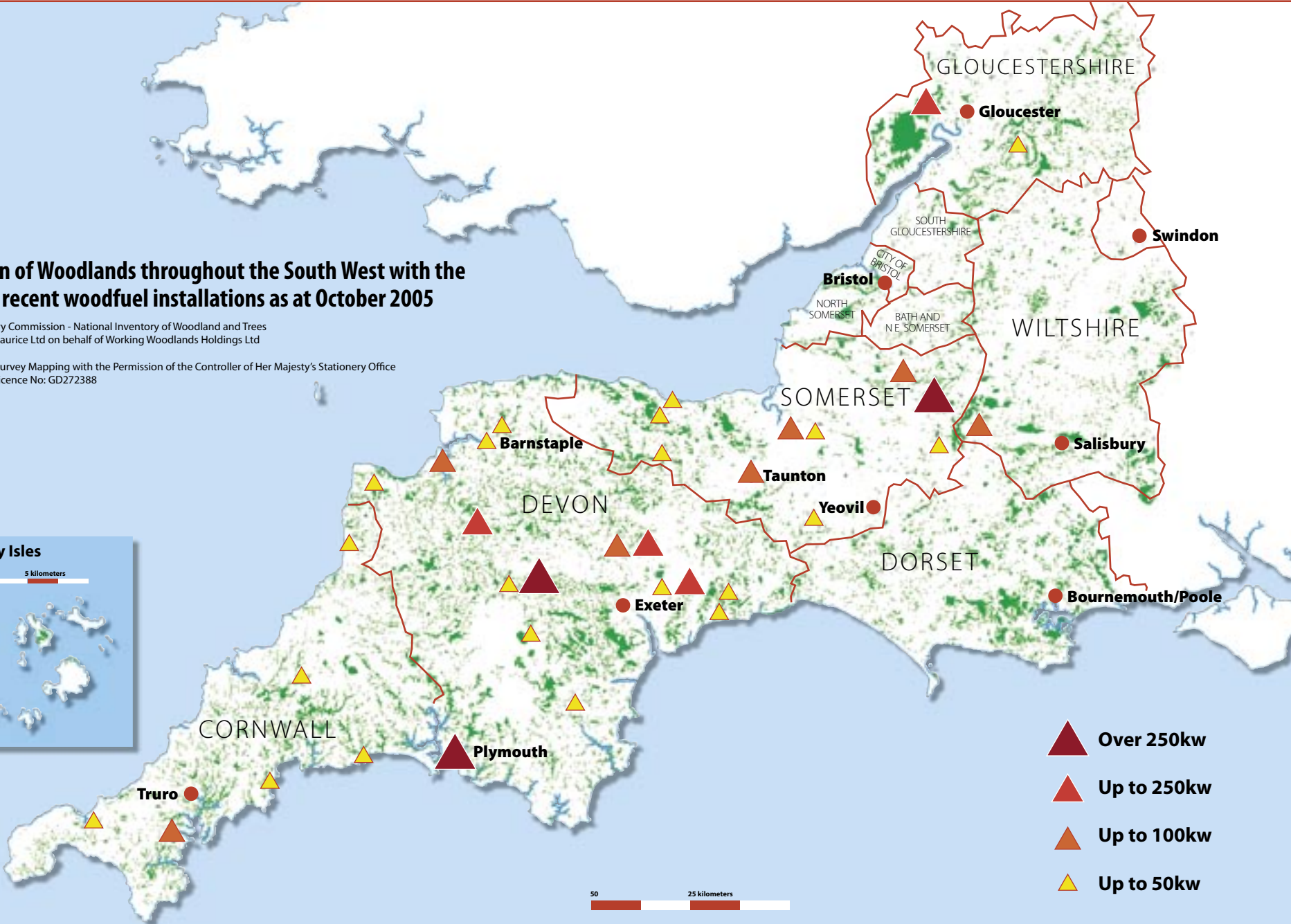
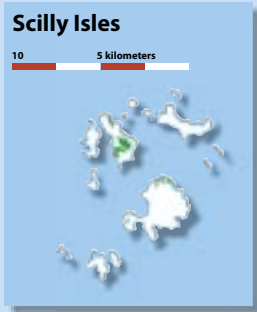






⁸ Forestry Commission National Inventory of Woodlands (2002) ⁹ Woodfuel Resource in Britain – Helen McKay (2003) ¹⁰ Of this 200,000 odt, some 122,000 odt is from existing woodlands, over 2 hectares, in the form of small roundwood, stem tips and branches, with a further 51,000 odt arboricultural arisings and 27,000 odt products from the sawmilling industry in the form of chips, sawdust and bark. It is assumed that logs over 14cm in diameter will continue to be used by traditional existing timber markets. ¹¹ odt = oven dry tonnes. Woodfuel would never be delivered at this moisture content. The measure is used as a baseline to compare fuels of different moisture content ¹² Based on a heat requirement of 70-80 Gigajoule per average 1960/70's 3-4 bedroom house. Modern energy efficient design and insulation will reduce this requirement.

Distribution of Woodlands throughout the South West with the location of recent woodfuel installations as at October 2005

Sources: Forestry Commission - National Inventory of Woodland and Trees
Bow Maurice Ltd on behalf of Working Woodlands Holdings Ltd

Based on Ordnance Survey Mapping with the Permission of the Controller of Her Majesty's Stationery Office
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-  Over 250kw
-  Up to 250kw
-  Up to 100kw
-  Up to 50kw

A Framework for Action in the South West

AIMS	OBJECTIVES
<p>1: To highlight the potential of wood as a modern and renewable fuel for heat.</p>	<p>1.1: Establish a regional woodfuel co-ordination group of key stakeholders and practitioners to promote the Framework's Aims and Objectives and to encourage and co-ordinate the resulting activity.</p> <p>1.2: Ensure woodfuel information is widely and publicly available. This will include the development of County exemplars as demonstration sites and case studies available on the Internet and in printed form.</p> <p>1.3: Encourage seminars and events across the Region which promote woodfuel.</p> <p>1.4: Promote the use of protocols and best practice for installation, fuel procurement and sustainable woodland management.</p> <p>1.5: Understand the current usage of woodfuel in the Region and monitor installed capacity.</p>
<p>2: Develop a woodfuel industry in the South West that will make a significant contribution to the demand for renewable energy and reduce carbon dioxide emissions.</p>	<p>2.1: Encourage Central Government and Regional Bodies to support the emerging woodfuel industry in the SW, through targeted funding programmes and other support mechanisms.</p> <p>2.2: Encourage the targeting of promotion and resources to enable the development of clusters of expertise and activity.</p> <p>2.3: Encourage boiler replacement with wood fired boilers, particularly in community and public sector owned buildings.</p> <p>2.4: Promote existing incentives and explore new pump-priming incentives to support infrastructure through regional policies, e.g. The Regional Woodland and Forestry Framework.</p> <p>2.5: Encourage the development of appropriate technical skills and accreditation in the wood energy industry.</p>
<p>3: To increase the sustainable management of woodlands through the promotion and use of woodfuel, increasing direct links between communities and local woodlands, to bring environmental, economic and social benefits.</p>	<p>3.1: Develop a region wide woodfuel supply chain infrastructure to ensure local supply of appropriate quality fuel to support the growing installed capacity.</p> <p>3.2: Increase the awareness of policy makers to the additional benefits of woodfuel use to stimulate sustainable woodland management.</p> <p>3.3: Encourage the development of local community based woodfuel initiatives which contribute to the local economy, environment and landscape.</p> <p>3.4: Support the use of management planning to encourage the management of all woodlands to expand the available woodfuel resource. Encourage management sympathetic to the landscape character of the area, enhancing local biodiversity and providing opportunities for public enjoyment.</p>

Review and monitoring of delivery with annual reporting to the Woodfuel Co-ordination Group as appropriate.

Case Studies

Grascott Farm, Devon

Woodfuel heating enables the growing of high quality sawn logs

A 150 kW woodchip heating system was installed in existing farm buildings at Grascott Farm in 2003. The system currently heats a large farmhouse and holiday cottage and will shortly also be heating a further holiday cottage renovation, outbuildings and a swimming pool. Heat is distributed via an underground heat main forming a mini district heating system.

The boiler currently running at up to 30% capacity uses 80 m³ of woodchips at 20-25% moisture content or some 30 tonnes of roundwood annually (22.5 oven dry tonnes odt), when at full capacity this could rise to 75 odt. Fuel costs are a third of the alternative cost of oil. Thinning operations in the farm's 12 hectares of existing woodland, previously uneconomic, can now be carried out with the lower quality produce going to fuel the boiler, and 70 hectares of new woodland planting will provide further thinnings from an early age. This active woodland management is seen as an investment to improve timber quality, with the potential to produce high quality Douglas fir sawlogs. It also benefits wildlife and the amenity of the owner's family and the holiday let tenants.



Loyton Hall, Somerset

Locally sourced woodfuel heats a rural hotel

Initially installed with a 40kW wood boiler in 2000, a shooting lodge, hotel and conference centre redevelopment completed in November 2003 needed a 250kW fully automatic boiler to supply heat and hot water for guests. The new boiler, initially fuelled with slabwood offcuts from a sawmill, will consume 125 odt of wood chip annually from local, currently unmanaged, woodlands, at approximately half the cost of heating oil. Currently fuel is processed off-site and is delivered in a 25 cubic metre trailer, which is reversed up to the chip store and tipped straight in. The operation takes around 15 minutes with the minimum of disturbance, much like an oil tanker delivery.



Case Studies continued

The Charterhouse Centre, Blagdon, Somerset State of the art wood heating for popular Mendips educational centre

State of the art wood heating has come to the Mendips with the installation of a 55 kW automatic boiler in the Charterhouse Centre, Blagdon. Installed by Econergy Ltd with funding from Somerset County Council and Clearskies, the computerised boiler burns 25 tonnes of renewable fuel and produces 45,000 kw of energy. CO2 output has been reduced by an estimated 15 tonnes per year. The boiler is 92% efficient and needs de-ashing only once a month.

The centre is home to the Mendips AONB team and provides educational and outdoor activities to approximately 44 children and adults per week. The centre is very fortunate in being a mile from a large wood recycling centre called Mendip Wood Shavings. A very clean and uniform specification of wood shred from discarded pallets and demolition wood has been produced. And at 10-15% moisture content and prices of £35-45 tonnes delivered, the centre is running on a cheap and local fuel source.

The boiler cost just over £14,000 to supply, install and commission. One lesson learned was the need to allow for mechanical handling and storage of the fuel by constructing a bunker and vehicle access.

The centre was a finalist in the National RICS Award for regeneration and sustainability. It has a green roof, wind turbine and in addition to the woodfuel, uses Western Red Cedar from Stourhead in Wiltshire as cladding.



County Hall, Worcester Woodfuel provides green heat and offsets carbon dioxide for public buildings

In May 2002 a 700kW fully automated woodchip fuelled boiler was installed at County Hall, Worcester. The system is the largest of its kind in the UK to be fuelled by woodchips from local woodlands. The system is owned and operated by an Energy Supply company who sell heat to the Council through a ten-year service contract.

The system provides base-load heating to the building during the heating season and delivers around 1 million kWh of renewable heat each year, avoiding some 550 tonnes of carbon dioxide emissions from conventional fossil fuelled systems. At full output the boiler can achieve 85% efficiency on fuel at 45% moisture content (MC), although is capable of using chips at 60% MC.

Around 600 tonnes of woodfuel per year are sourced from local forestry operations, providing employment and ensuring active woodland management. Fuel is delivered to the site in two modified 35m3 hook-lift storage bins with moving floors which push the wood chips onto the boiler supply auger



For Information on Grants

Woodland creation and management: **English Woodland Grant Scheme - Forestry Commission** www.forestry.gov.uk

Woodfuel supply chain: **Bio-energy Infrastructure Grant – Defra** www.defra.gov.uk

Boiler installation: **Clear skies – Buildings Research Establishment** www.clear-skies.org

Regional Contacts

Forestry Commission, South West England Conservancy, Mamhead Castle, Mamhead, Nr Exeter, EX6 8HD.
Tel: 01626 890666 fc.sweng.cons@forestry.gsi.gov.uk www.forestry.gov.uk

South West Regional Development Agency, Sterling House, Dix's Field, Exeter, EX1 1QA.
Tel: 01392 214747 enquiries@southwestrda.org.uk www.southwestrda.org.uk

The Countryside Agency, 2nd Floor, 11-15 Dix's Field, Exeter EX1 1QA.
Tel: 01392 477150 info.southwest@countryside.gov.uk www.countryside.gov.uk

RegenSW - Renewable Energy Agency for the South West
Sterling House, Dix's Field, Exeter EX1 1QA. Tel: 01392 229394. admin@regensw.co.uk www.regensw.co.uk

Defra, www.defra.gov.uk

Buildings Research Establishment, www.bre.co.uk

South West Wood Fuels Limited, SCC Highways Depot, Station Road, Brushford, Dulverton, Somerset TA22 9AD. Tel: 01398 324558 info@swwf.info www.swwf.info

Community Renewables Initiative, www.countryside.gov.uk

There are two Community Renewables Initiative Support Teams in the region:
Devon and Cornwall - Devon Association for Renewable Energy
Tel: 01837 892 00, E-mail: cri@devondare.org

Gloucestershire, South Gloucestershire and Wiltshire - Severn Wye Energy Agency,
Tel: 01594 545 366, E-mail: cri@swea.co.uk





WORKING TOGETHER

