

# WHY WE NEED ENERGY CROPS IN THE SOUTH WEST

## POSITION PAPER



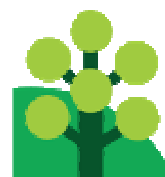
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## WHY WE NEED ENERGY CROPS IN THE SOUTH WEST

### POSITION PAPER

The South West (SW) of England is a leading light in the UK's drive to produce more of our electricity, heating and transport fuels from renewable energy resources. The region has excellent resources for wind, wave, tidal, biogas and solar energy and is also the number one English region in biomass heat installations.

However, like the rest of the UK the SW has been slow to embrace woody energy crops as a potential woodfuel resource. This position paper and the accompanying report outline why growing woody energy crops such as short rotation coppice (SRC) and miscanthus in the SW is essential to continue the upward trend in biomass heat installations, boost the economy and provide additional environmental benefits to the region.

There are around 800-900 hectares of energy crops planted in the SW but much of this is currently without a market as a result of several proposed projects failing to get planning consent or financial backing. Nevertheless, the Government is committed to producing 15% of our total energy and 12% of our heat from renewable resources by 2020. These are very tough targets and to achieve them will require significant uptake in all renewable technologies.

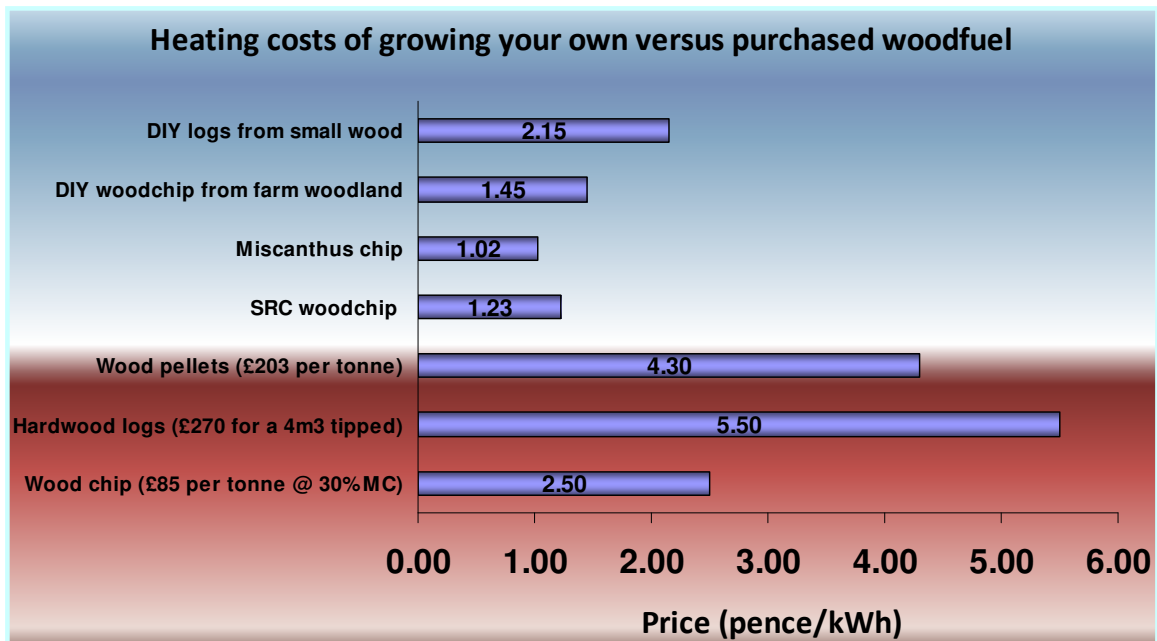
### TO MEET OUR ENERGY NEEDS

- **Planting just 3.5% of SW agricultural land (65,595 hectares) with energy crops could produce 616,595 oven dry tonnes of woodfuel per year**
- **Equivalent to 37.5% of the SW renewable heat target**

**Woody energy crops can provide a rapid source of sustainable woodfuel and enable excellent land use resource efficiency**

Energy crops can produce a very high output from a relatively small area. Our calculations suggest that it is possible to produce 37.5% of the renewable heat target from just 3.5% of the agricultural land (65,595 hectares). This is based on achievable average yields of 9.4 oven dry tonnes per hectare per year and assumes best practice on good agricultural land.

Particular benefits can be achieved when farmers grow and use their own energy crops for heating their farm buildings. Miscanthus and SRC can be produced for less than 1.5 pence per kilowatt hour (kWh). By replacing oil heating (which costs around 6p/kWh) with energy crop derived woodfuel could provide growers with a gross return of £2,000-£2,500 ha/yr. A wheat crop yielding 8.35 tonnes/ha and a grain price of £140/tonne would achieve a gross margin of £673/ha.



#### Tredethick Farm Cottages

Tim Reed of Tredethick Farm Cottages in Lostwithiel, Cornwall has recently received full accreditation from Ofgem to receive rebates from the Renewable Heat Incentive (RHI). The project involves the district heating of eight holiday lets, a farmhouse and a swimming pool with a 199 kilowatt Eta biomass boiler fuelled with miscanthus. The project, installed by Fair Energy based in Exeter is one of the first in the UK to be approved using an energy crop as a fuel.

The district heating scheme requires around 340,000 kilowatt hours (kWh) of heating per year which will be provided from growing 5.7 hectares of miscanthus. The Tredethick project will be completely self sufficient from 2015 onwards. The field growing the miscanthus is adjacent to the barn containing the boiler. As a result, when harvested the miscanthus chip need only be moved 420 metres from the furthest point. Find out more at: [www.crops4energy.co.uk/miscanthus-grower-gets-rhi-approval](http://www.crops4energy.co.uk/miscanthus-grower-gets-rhi-approval)



The Government's Renewable Heat Incentive (RHI) is likely to bring about a surge in demand for woodfuel. End users such as local authorities should be encouraged to approach local farmers directly to grow energy crops on their behalf. A typical primary school may need 3-4 ha of energy crops whilst an elderly peoples' home may require around 10 ha. This would mean that the farmer has a long term market and the end user has a reliable and secure local supply. As the supply is local to the end user, the latter will be largely insulated against future price rises brought about by higher transport fuel costs.

## TO HELP COMBAT CLIMATE CHANGE

- **Using energy crops for heating reduces greenhouse gas emissions (GHG) by reducing our reliance on fossil fuels**
- **Energy crops store carbon in the soil whilst they are growing**
- **Growing energy crops on 3.5% of SW agricultural land could offset 662,146 tonnes of GHGs**
- **Equivalent to 21% of the emissions from agricultural food production**

**Woody energy crops can help meet our climate change targets**

Energy crops are particularly useful at reducing greenhouse gas emissions. Mitigation is achieved by installing woodfuel boilers to reduce carbon emissions and the crops sequestering carbon in the soil. Growing 65,595 ha of energy crops in the SW could enable the mitigation of 475,200 tonnes of greenhouse gases from fossil fuel replacement and 186,946 tonnes from carbon sequestration. As a result, growing energy crops on 3.5% of agricultural land in the SW could offset 21% of the emissions from the agricultural sector.

## TO BOOST THE ECONOMY

- **Growing 65,595 ha of energy crops could lead to £768 million of investment in biomass boiler projects**
- **Using energy crops as fuel could save SW consumers £55 million/yr in fuel costs**
- **A thriving energy crops sector could create 3,745 jobs - equivalent to increasing the number of bioenergy jobs by 134%**

**Woody energy crops can help boost the SW economy**

Growing energy crops in the SW could also provide an enormous boost to the regional economy. Our analysis suggests that energy crops could stimulate £768 million of investment in biomass boiler projects, save consumers £55 million/yr in fuel costs and provide farmers with profits of £27.8 million/yr. In addition, a thriving energy crops sector could create 671 jobs in biomass production and 3,074 jobs in biomass utilisation. Growing energy crops on just 3.5% of SW agricultural land could therefore increase the number of biomass jobs in the region by 134%.

## TO IMPROVE WATER QUALITY AND PREVENT FLOODING

- **Energy crops provide barrier strips intercepting diffuse pollutants such as fertiliser and slurry before it reaches water courses**
- **Energy crops slow down run off and intercept sediment thus assisting flood prevention**

**Woody energy crops can improve water quality and prevent flooding**

Energy crops are multifunctional and could be strategically grown to help improve water quality and provide a low cost form of flood prevention. The SW has more livestock than any other region in the UK. As a result, SW farmers have to deal with around 14 million tonnes of slurry per year and face a major challenge in preventing pollution from their land. At present 39% of the SW is in Nitrate Vulnerable Zones (NVZs) and only one third of water bodies in the SW are classified as having 'good' status under the Water Framework Directive (WFD). Energy crops could provide an effective local measure for reducing nitrate pollution by providing useful barrier strips which intercept sediment and absorb nitrates from the water.

Two of the top ten English local authorities most at risk of flooding are in the SW. The coppice nature of energy crops provides hydraulic roughness which enhances sediment retention and slows down the flow of flood water. They could therefore reduce the likelihood of floods downstream and increase the time available for issuing flood warnings. Using appropriately planted energy crops could provide a low cost option for areas that are too small to justify expensive flood defence measures.

A large body of research suggests that energy crops in general and SRC in particular can significantly increase biodiversity on farms. The crops and the surrounding headlands provide food and habitats for birds, butterflies and other invertebrates. Unfortunately, despite the benefits to wildlife there has been no incentive made available to energy crop growers through environmental schemes. Farmers are unlikely to plant large areas of energy crops unless the venture is economically attractive. An interim payment following crop establishment and before the first harvest would be highly beneficial as it would reduce the farmers risk and enable an improved cash flow in early years.

## TO INCREASE FARM BIODIVERSITY

- **At least 12 priority bird species covered by Biodiversity Action Plans are frequently found in and around energy crop plantations**
- **Field margins around energy crops encourage butterfly and other invertebrates**

**Woody energy crops can significantly increase biodiversity on farms**

The revision of the Common Agricultural Policy (CAP) offers an opportunity to stimulate energy crop plantings and reward growers for the biodiversity benefits of the crops by allowing them to be grown as part of ecological focus areas. This proposed measure suggests that farmers should set aside 7% of their land for the benefit of wildlife. If 50% of the potential ecological focus area in the SW was planted with energy crops then that would equal the 66,000 ha required.

### SUMMARY OF THE BENEFITS

The development of a thriving energy crops sector in the SW would bring a great many benefits to the region. These include:

- Helping to meet our energy needs
- Helping to meet climate change targets by offsetting GHG emissions from agricultural food production
- Creating assured local markets which insulate end users from future price rises and provide improved returns for growers
- Reducing the cost of heating, particularly in off gas areas
- Reducing the dependence on imported fuels thereby increasing security of supply and keeping revenue in the local economy
- Creating jobs in both the production and utilisation of biomass
- Potentially helping to reduce fuel poverty
- Improving water quality of watercourses and beaches
- Helping reduce the impact of flooding
- Increasing the biodiversity of farm land

Our analysis suggests that if 3.5% of the SW agricultural area (65,595 ha) was planted with energy crops the following deliverables could be realised:

- 2.64 TWh of energy per year equalling 37.5% of the renewable heat target

- 662,146 tonnes CO<sub>2</sub> equivalent saved each year equalling a 21% reduction in emissions from agriculture
- £768 million of investment stimulated in biomass boiler projects
- £55.4 million/yr saved in fuel costs by consumers
- £27.8 million/year farmer profit
- 3,745 renewable energy jobs equalling a 134% increase on the current number of jobs in the bioenergy sector

To help achieve this potential we suggest the following eight recommendations:

## ENERGY CROPS WISH LIST

- 1) **Retain the Energy Crops Scheme to provide establishment grants as well as annual payments to improve economics and cash flow in early years**
- 2) **Grant aid crop producers enabling them to multiply stocks with less financial risk and achieve greater economies of scale which ultimately lead to lower establishment costs**
- 3) **Public sector organisations should be encouraged to look at their own estates for opportunities for growing energy crops for their own use. Energy managers of public sector buildings that already have biomass boilers or plan to install them should be encouraged to begin a dialogue with local farmers with a view to setting up a long term supply partnership**
- 4) **Future Agri-environmental schemes should provide energy crop growers with annual payments that recognise the multifunctional benefits provided by these crops**
- 5) **Stakeholder groups should lobby the Government and the EU to allow energy crops to be planted as part of Ecological Focus Areas proposed under the CAP reform**
- 6) **A dedicated grant scheme for energy crops infrastructure and processing projects is required. Based on our findings, around £1.65 million of funding is required from 2013-2020. Grants for initial infrastructure projects should be up to 75% of the capital costs**
- 7) **Innovation grants should be made available for boiler manufacturers to look at ways to cost effectively reduce particulates and NOx emissions from energy crops**
- 8) **Improvements in the dissemination of information will help growers understand the crop option that is most suitable for their land, their storage options, their boiler or their end user. Growers guidelines need to be updated and standardised contractor briefs produced in order to encourage best practice**