

Energy crops are plants grown to provide fuel for heating and electricity generation and are able to deliver high yields from relatively small areas.

These crops could fit into the footprint of an existing golf course, providing a sustainable, low carbon and low cost energy source and diversifying the habitat available for wildlife.

Much of the cost of establishing energy crops could be offset through grant funding under the Energy Crops Scheme and the recently launched Renewable Heating Incentive could turn energy crops into cash crops for golf clubs.

The Energy Crops Scheme

The Energy Crops Scheme is a Government funded scheme, available through Natural England, which provides funding for establishing energy crops. The funding literature and website is mainly aimed at farm owners but Natural England does provide funding to other land users and have provided funding to golf clubs under the scheme. The Energy Crops Scheme is open to new applicants until 2013.

Grant funding covers the cost of establishing either miscanthus or short rotation coppice (SRC), either 50% funding for 'actual' costs i.e. the cost of materials and contractors and/or 'on-farm' costs, i.e. use of a golf club's own labour and machinery. Funding can cover ground preparation, fencing, purchase of planting stock, planting, weed control and first year cutback of trees.

A few points to bear in mind:

- The grant is available in England only and land must be registered with the Rural Land Registry in order to receive funding (land not currently registered can be registered).

- The overall area of land available for planting must be over three hectares and individual planting blocks must be at least 0.5 hectare in size. Planting can be phased over three years.

- There must be a buffer zone of unplanted land alongside public rights of way, residential housing and utilities infrastructure. These areas of open ground may also be included within the grant funding.

- Applications are subject to an environmental assessment, including a site visit, and golf clubs would need to sign a five-year agreement with Natural England.



Money grow o

Kelly Harmer examines energy of great benefit, and offer signi

can n trees

crops and looks at how they could be
significant financial savings, to golf clubs

The Renewable Heat Incentive

The Renewable Heat Incentive (RHI) is a new payment scheme announced by the Government in March 2011.

Under the RHI, golf clubs could earn an income of up to 7.6 pence for every kWh of heat produced by renewable methods, including the burning of sustainably sourced wood fuel and miscanthus.

This income is index linked (i.e. will increase with inflation) and is guaranteed for 20 years.

The money payable through the RHI should help to offset the establishment costs of growing energy crops in the first few years of the scheme and making buying wood fuel competitive with fossil fuels in terms of cost.

Biomass under the RHI:

- The RHI is available in England, Scotland and Wales.
- Ofgem will administer the RHI scheme and will deal with applications, accreditation of installations, incentive payments and monitoring compliance.
- Payments vary depending on the size of biomass boilers and are tiered so that the first units of energy generated each year will receive higher payments than subsequent units.

Boilers and installers must be certified under the Microgeneration Certification Scheme (MCS).

- Any business which installed a biomass boiler after July 15, 2009 will be eligible for the RHI. Boilers installed before this date will not be eligible.

Short rotation coppice

The crop

Short rotation coppice (SRC) is an established traditional method of harvesting biomass energy over short timescales.

All broadleaf native tree species will coppice well but willow and poplar have the highest biomass yields.

Willow, poplar, ash, silver birch, and sweet chestnut species are all eligible for grant funding under the Energy Crops Scheme.

Trees in SRC are densely planted at around 15,000 cuttings per hectare and are planted using specialist machinery that cuts the tree rods, inserts them into the soil and firms the soil in one pass. Rods are planted in spring and trees can reach four metres in height in the first year of growth.

New plantings are cut to just above ground level in winter to encourage the growth of multiple stems. Harvesting begins after four years of growth using modified mowers/reapers and harvests can be repeated every three years. Harvested rods need to be dried and chipped to feed into wood chip boilers. The same tree stools can be harvested for 20 – 30 years without any need for replanting.

Herbicide should be applied to the land in the autumn before planting and may need to be applied after each harvest. Organic fertiliser will need to be applied to the soil before planting. Fertiliser is not recommended in the first year of growth but may be required each year to replace nutrients in the soil. Application of fertiliser can be difficult, given the dense planting in the coppice.

Yields

The yield will vary according to the tree species in the coppice but, in general, with good site conditions and management, a golf club might expect 7 – 12 oven dry tonnes (ODT) of wood fuel from a willow coppice per hectare per year. One tonne of SRC fuel produces an average of 18.6 GJ/t, 66 – 78 % of the energy provided by a tonne of coal.

Wildlife benefits

Native tree species such as willow, ash and silver birch will provide the greatest wildlife benefits, particularly for invertebrates.

Bird species such as bullfinch, willow warblers, reed bunting and song thrush have been noted during periods between harvests, while skylark, lapwing, yellow wagtail and snipe have been observed in the open habitat provided by newly planted and harvested coppice.

Local ground flora can develop in buffer zones surrounding coppice and beneath the trees between harvests.

Miscanthus

The crop

Miscanthus giganteus is a perennial grass native to Asia that has been grown for several years in the UK as an energy crop with good success. *Miscanthus* boasts rapid growth, low nutrient and maintenance requirements and high biomass yields and can be directly burned for heat or can be processed to produce ethanol.

Establishing and harvesting a

grass crop, rather than growing woodland coppice, may appeal to many greenkeepers but there are a few crucial differences.

Firstly, *Miscanthus giganteus* is a sterile hybrid and reproduces vegetatively. This means that it cannot be sown from seed and must be established from rhizome fragments, planted either using specialist machinery or using a potato planter.

Secondly, as the Latin name 'giganteus' suggests, miscanthus is a tall grass, reaching three to three-and-a-half metres in height.

It is cut once each year using a forage harvester and can be baled using conventional equipment.

Herbicide treatments are recommended before planting, and after the first year's growth of miscanthus. Following establishment in the second year, the dense canopy of the grasses in summer, and the leaf litter cover in winter, should prevent weed establishment. Nutrient requirements are also low as

relatively high, due to the need to plant as rhizomes but up to 50% of this cost could be recovered through grant funding.

Wildlife benefits

Miscanthus is a non-native grass but is a sterile hybrid which grows slowly through spreading rhizomes and is unlikely to spread far beyond the boundaries of planting.

The grass stands provide a similar habitat to large native grasses such as reed canary grass and common reed and can provide nesting habitat for reed birds such as reed bunting. Native ground flora cannot develop beneath the dense canopy of miscanthus but can establish in surrounding rides and buffer zones.

Sustainable woodland management

Many parkland and heathland courses have a significant existing

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woodland resource which could be sustainably managed through targeted felling and re-stocking to provide a supplementary fuel source for the golf club.

Using the trees as a fuel source would also give the club an economic incentive to manage their woodlands, improving the health, aesthetics and wildlife value of the woodlands on the course.

Harvesting the woodlands on the golf course would need to be carried out in accordance with a long term woodland management plan to ensure the trees are harvested sustainably: to guarantee that there will be future supply of wood and to minimise the impact of harvesting on the wildlife on the golf course.

Yields

Miscanthus can yield up to 14 ODT annually, which is higher than the average yield from short rotation coppice (max 12 ODT).

However, miscanthus produces relatively less energy per tonne of material 16.2 GJ/t compared with 18.6GJ/t for SRC willow (58 – 68 % of the energy provided by a tonne of coal). Establishment costs are

Only wood sourced in a genuinely sustainable manner will be eligible under the Renewable Heating Incentive.

Woodland management plans can also be submitted to the Forestry Commission to cover all intended felling over the lifetime of the management plan, rather than the club applying for consent for each individual felling operation on a case by case basis.





The early bird gets the worm...

Renewable Heat Incentive payments for new applicants to the scheme will decrease over time to promote early uptake, meaning that golf clubs who apply early will receive higher payments than those who wait.

Any golf club entering into the Renewable Heat Incentive scheme in 2011 will receive the highest payments available under the scheme, guaranteed for the next 20 years.

Establishing energy crops won't work for every club as there may not be enough space available for planting, but each

club could incorporate some element of biomass energy into their heating to take advantage of the Renewable Heating Incentive, either by carefully harvesting current woodland plantings or by buying in sustainably sourced wood from outside the golf course.



INSET ABOVE LEFT: Wall of miscanthus
 INSET ABOVE: Young willow catkins
 MAIN LEFT: Field corner of giant grass
 ALL IMAGES ON PAGES 32-33: ©iStockphoto.com/bigga_tom

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