

WOOD ENERGY

Introduction

Wood energy is produced from wood and/or wood by-products. It is a home-grown, renewable, sustainable, carbon-neutral and secure source of heat, electricity and even bio-fuel.

Ireland has excellent wood-growing conditions; growing and using wood as a source of energy will assist substantially in reducing the amount of imported fossil fuels, increasing our self-sufficiency and therefore

securing Ireland's long-term energy security.

Wood as a source of heat only (rather than the production of electricity) has the largest potential in Ireland. This is a proven technology with very high efficiency and is locally available. A growing number of hotels, schools and private homes are changing over to wood energy. Modern wood-fuelled heating systems offer the same level of comfort, convenience and reliability as oil or gas boiler systems.

The market

Farmers are in a good position to benefit, both as growers of energy wood and as users of cost-effective wood energy. As most planting over the last 25 years has been carried out by farmers, most pulpwood (i.e.,

energy wood) will be supplied by farmers in the coming years.

Wood fuel can be harvested locally, processed locally and provide a source of renewable heat locally. This is a win-win situation for the local farm forest grower, the consumer and the environment.

Support schemes and further advice

Contact your local Teagasc forestry development officer for independent, objective advice or visit www.teagasc.ie/forestry. Attractive establishment and support grants are available from the Forest Service, Department of Agriculture, Food and the Marine (DAFM). For further information, contact: 053-916 3400 or visit www.agriculture.gov.ie.

The Council for Forest Research and Development (CoFoRD) operates a wood energy advisory service on www.woodenergy.ie, and queries about the harvesting and supply chain sector of the wood energy industry can be submitted online. Queries about boilers, stoves, etc., can be directed to the Sustainable Energy Authority of Ireland (SEAI) on 01-808 2100 or visit www.seai.ie. The best source of advice is often from people who have already installed boilers themselves.

Wood fuel sources

Ireland's soil and climatic conditions are excellent for tree growth. Sawlog (large diameter wood of good quality) is and will remain for the foreseeable future the most profitable product that a farm forest can produce. Sawlog can be produced faster by thinning a forest. Large volumes of pulpwood (smaller diameter wood of lesser quality) are produced in early thinnings. This pulpwood can be sold into local energy wood markets, thus making early thinnings more financially viable, particularly in smaller plantations. Forest residues are at present not harvested and may provide another source of wood fuel. This however should only be considered if nutrient loss and soil damage caused by large harvesting machines can be avoided. Willow plantations also provide a sustainable supply of wood chip. Clean sawmill waste can also be used to generate energy, more and more sawmills are using this resource to generate heat and electricity on site. Contractors produce thousands of tonnes of wood chip every year from removing trees, hedges, etc., this could be used to generate heat or electricity if handled correctly. Wood waste such as wooden pallets, construction timber, fencing stakes, MDF, etc., must be avoided due to contamination with paint residues, glue, wood preservatives, plastics, etc.

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Quality control

To compete in the heating market, wood fuels and heating equipment need to offer a consistent, reliable, standardised quality. Wood heating technology or fuels that do not conform to the highest European standards can cause emission problems, and damage heating systems and the reputation of the wood heating industry. The quality, size and uniformity, moisture content, calorific value and level of impurities are very important issues. Potential buyers must verify the quality of the wood fuel offered for sale. The Wood Fuel Quality Assurance (WFQA) scheme for Ireland is an all-island scheme established to increase consumer confidence in wood fuel products sold in Ireland. To find out more, visit www.wfqa.org. There are many different makes of wood fuel boilers and stoves available, produced to different standards and with varying specifications. Build quality and fire safety are important issues and potential buyers should research all options carefully.

Wood fuel: options

An increasing number of farmers are providing firewood services to a rapidly expanding local market. A mechanical firewood processor can process large quantities of firewood by cutting and splitting logs into suitable lengths. Wood pellets are made from compressed sawdust in an industrial process. Pellets are more expensive but easy to handle and are mostly used to heat smaller houses and apartments. Wood chips can be produced and handled locally without additional processing costs. They are suitable for heating larger premises where space for storing is available. Once cut, the wood needs to dry out for at

least 12 months before chipping. Chipping green wood attracts lower prices and requires additional drying facilities. Chipping may take place either in the forest, at the roadside or at the final destination. Soil conditions, forest type, end user requirements, etc., will determine operations. Appropriate chipping machinery ranges in size from small, mobile chippers to huge industrial stationary chippers. Wood chips should only be stored once moisture content has dropped below 35%. Temporary storage (for a few weeks) can be provided on a clean base with a tarpaulin stretched across the top of the pile. More permanent storage solutions include underground tanks or container units. If long-term storage is necessary, logs should be stored in the round and chipped when required. Transportation can take place using a tractor/trailer combination, or in a curtain or bin lorry (i.e., detachable large container). Chips can also be delivered in large half-tonne bags. This makes wood chips a very economical, accessible and environmentally sound wood fuel option. Chips can be tipped into a bunker, delivered into a silo or stored in a dry shed.

Farm forest owners can get involved in wood chip fuel supply in a number of ways:

- they can opt to sell pulpwood to a chipping entrepreneur, or to a heat provider – in this case, the forest owner's only involvement is to sell timber for wood chip; and,
- they may also opt to get involved in the business of supplying wood chip directly to a boiler under contract from the installer. In this instance, the forest owner is paid in oven-dried tonnes (ODT) of wood chip supplied. The drier the wood chip, the more the wood chip supplier is paid.

Facts and figures

- 1,000 litres (L) of home-heating oil = two tonnes of good quality wood pellets = three tonnes of well-dried firewood = three to four tonnes of well-dried wood chips;
- 1,000L of home heating oil has a volume of about 1.5 cubic metres (m³) – wood pellets replacing 1,000L of oil will require double this storage space, firewood logs four times this volume, while wood chip will take up eight times the space;
- a large detached house (200m² = 2,150ft²) will need approximately six tonnes of wood pellets, nine tonnes of well-dried firewood or nine to 12 tonnes of well-dried wood chips per year;
- if you wish to be fully self-sufficient on a sustainable basis in central heating and hot water for an average-sized house, then you will need about three hectares of broadleaved coppice – these three hectares should give an annual production of about nine tonnes of well-dried firewood (the equivalent of about 3,000L of home heating oil); and,
- normally, five-kilowatts (boiler output) are required per 100m² of house floor area, dependent on insulation levels, etc.

In contrast to many other European countries, we are still in the early stages of wood energy development in Ireland. Anyone interested in wood energy should contact all the relevant agencies, as this sector is developing and changing rapidly.

Further information

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The following resources are also helpful:

- 🌐 www.wfqa.org
- 🌐 www.teagasc.ie/forestry
- 🌐 www.woodenergy.ie
- 🌐 www.seai.ie

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www.teagasc.ie/ruraldev

