INTRODUCING WOOD PELLET FUEL TO THE UK

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Executive Summary

Introduction

Wood Pellets are now a major fuel resource for heating in many parts of Europe as well as in the US and Canada. Wood pellet-fired heating also has the potential to make a significant contribution to the energy needs of the UK.

The wood pellet industry has been established in Scandinavia and North America for over 20 years and consequently wood pellet-fired appliances are now highly reliable, with many tens of thousands of systems in operation ranging in size from 10kW up to more than a MW.

Wood pellet boilers and roomheaters are highly automated. They have automatic ignition and are well suited to meet varying load demands. All pellet appliances have thermostatic controls or can be operated on a timer. This means that the level of convenience is equivalent to that of oil fired heating systems, but wood pellets have added environmental and local economic benefits. Because the rate of fuel feed and amount of combustion air are controlled precisely, pellet appliances achieve very high efficiencies (typically 90%+), comparable to that of an oil-fired system.

Wood pellets are compressed wood made usually from sawdust and shavings. However, they can potentially made from any biomass material (e.g. straw, forestry residues, specially grown energy crops etc.) and hence have the potential to be sourced from locally unused material, which can give considerable benefit to the local economy.

At the start of the project "Introducing Wood Pellet Fuel to the UK", the use of wood-fuel pellets was largely unknown in the UK. There was no fuel-pellet production capacity, nor any pellet appliances on the UK market to burn pellets. This project has addressed a wide range of technical and non-technical issues to help establish a wood pellet industry in the UK.

Aims and Objectives of the Project

The overall aim of the project was to help establish a wood pellet industry in the UK. This aim was achieved by:

- Reviewing the historic growth and current status of the wood pellet industry in other European countries and North America.
- Reviewing UK standards, legislation, and regulations and developing UK voluntary standards for biomass pellets and appliances.
- Identifying and quantifying markets for pellet heating in the UK.

- Organizing a series of workshops, seminars and other events to demonstrate pellet burning appliances in order to raise awareness of the technology.
- Carrying out trial pelletisation of a variety of biomass feedstocks available in the UK and helping to establish fuel pelletising facilities within the UK.
- Helping establish a number of demonstration installations of pellet-fired appliances.
- Undertaking a promotional campaign for wood pellet fuel.
- Compiling resource directories for pellet fuel and pellet burning appliances in the UK.

Summary of the Work Carried Out

The work programme was comprised of three phases:

Phase 1. Reviewing existing pellet markets, the potential market within the UK and the identification and engagement of interested parties in the UK.

A review of how the wood pellet industry became established in other European countries and in North America and the current status of those industries was carried out. Interested parties in the UK were identified and a Biomass Pellet network was established by British BioGen consisting of approximately 250 names of interested individuals. Standards, Legislation and Regulations effecting the production and use of wood pellet fuel in the UK and wood pellet appliances were reviewed. An overview of the potential markets for biomass pellet appliances in the UK was investigated. The first UK Seminar on Wood Pellet Fuel was held in Nottinghamshire in Sept 1999.

Phase 2. Identification of resources and potential heating sites and pelletisation trials

An assessment of biomass resources in the UK was undertaken which looked at the following potential feed-stocks; primary processing residues and secondary raw materials, recovered wood and biomass waste, forestry residues and energy crop products and straw. A more detailed resource survey was carried out in South Wales and the South West. A programme of identification and quantification of markets was carried out in South Wales and the South West. Pelletisation trials were carried out using a range of pelletisation equipment and a range of biomass feedstocks that are found in quantity in the UK.

Phase 3. Commercialisation of wood pellets, training and promotion campaign

Help was given on commercial considerations in terms of UK pellet production and installation of pellet-fired equipment. A number of training events were given to installers and service engineers on brand-specific pellet burning equipment. A series of events were held where wood pellet technology was explained and demonstrated and a promotional campaign was undertaken to raise general awareness of the use of wood pellet fuel.

Summary of the Main Results

This project has achieved all of the following:

- Development of UK voluntary standards for wood pellet fuel and combustion appliances.
- The first seminar dedicated to wood pellets in the UK was held with experts from Sweden, Austria, the US, Italy and the UK presenting papers. This attracted over 130 people from around the UK and a conference proceedings was published and widely disseminated.
- A database of about 250 individuals in the UK with an interest in wood pellet fuel has been compiled.
- Help was given in the establishment of a number of sources of UK manufactured wood fuel pellets including the construction of a 5tonne/hour pellet mill in South Wales.
- Pelletisation trials on equipment suitable for pellet production in the UK at a number of scales, using a wide variety of biomass materials available in the UK, have been undertaken including preliminary trials using a grass mill for the seasonal production of wood pellet fuel.
- Agreements have been made with a number of pellet stove and boiler manufacturers and UK companies to import equipment into the UK and a number of UK companies are currently developing pellet appliances.
- About a dozen pellet burning appliances are now operating in the UK with many planned to be installed over the next year.
- Six heating engineers have been trained in the general installation of wood pellet-fired appliances and in brand-specific appliances.
- An analysis has been made of the economics of wood pellet fuel in a UK context.
- A general resource assessment has been compiled for the UK and a detailed resource assessment for two specific regions of feedstocks for biomass pellets.
- A promotional campaign is underway, both for brand-specific equipment on a local level and generic promotion of the concept of heating with wood pellets at a national level.

- A centralized information service and website has been set up dealing with all aspects of promoting wood pellet fuel.
- Close links have been established with Trade Associations, "Pellet Clubs" and companies involved with pellet production or pellet appliance manufacture in Europe and North America.

Conclusions

The project "Introducing Wood Pellet Fuel to the UK" has been a success. There are now a number of groups either producing wood pellet fuel or planning to produce wood pellet fuel in the near future. These include a 1 tonne/hr pellet mill currently operating, a 5tonne/hour machine due to start production in towards the end of 2001 and a modified grass mill with capacity for about 6,000 tonnes of wood pellets per annum which has successful produced wood pellets.

There exists a large potential for a low cost feedstock of clean wood waste coming out of the waste sector. However, it is clear from pelletisation trials from this project and elsewhere that a critical issue in the acceptance of these materials is quality control procedures to ensure that there are no contaminates within the feedstock.

The lack of an organization in the UK with a specific remit to promote the use of wood pellet fuel at all levels will retard the expansion of the wood pellet industry in the UK. Most European countries now have a "Pellet Club" – a trade association for the wood pellet industry.

The current Building Regulations (Document J) have not taken account of the coming into being of a class of forced draft appliances of low output such as pellet fueled roomheaters. The present minimum recommended size of 125mm diameter for any solid fueled appliance is inappropriately oversized for most pellet stoves and also represents an unnecessary cost burden.

In general, the economics of wood pellet fuel in the UK look promising. Wood pellet fuel is competitive with oil and LPG in the UK at the time of writing although the higher capital cost of pellet-fired appliances compared to fossil fuel boilers is a major barrier to the expansion of the wood pellet industry in the UK.

The favourable fuel costs coupled to the environmental benefits of heating with wood fuel and the fact that the wood pellet industry could make a substantial contribution to the rural economy, would imply that an emerging wood pellet industry in the UK has a good chance of becoming a major renewable energy sector.