Bio-energy Business Development - Angus Biofuels, Scotland

Summary

Angus Biofuels is a new business development associated with existing building and farming enterprises. The objective is to establish a new bio-energy business offering renewable energy heating to building operators in the county of Angus and neighbouring regions in Scotland. The recent progress has been to establish a range of heating installations and business contacts as the first development phase. This is based on acquiring operating and fuel procurement experience and establishing demonstration installations. To date four bio-energy heating installations are operating - or near to completion - three using pellets and the fourth, when completed, is to use grain. The installations to date comprise an office, a nursery school, a retail warehouse and an equipment store/workshop. Some of this progress is a direct result of participation in a Biomass Partnerships study tour in March 2006.

End-user area	Target Audience	Technical
√ **New buildings**	√ **Households**	√ Heating
√ **Refurbishment of buildings**	√ **Property owners**	Cooling
	√ **Decision makers**	CHP
	√ **Local and regional authorities**	√ District Heating
	Utilities	√ Biomass
	ESCOs	
	√ Other	

Context

Angus Biofuels is a new-start bio-energy SME which has been created to serve the emerging market for renewable energy heating in domestic and non-domestic buildings. Angus Biofuels has been active in participating in the Biomass Partnership project in Scotland as part of its initial development phase.

The company is closely allied with an established building business and associated farming enterprises. There are clear potential synergies between new-build projects (to a high energy efficient specification) and the need for an environmentally responsible and sustainable form of heating. Demonstration installations to date include new-build and retrofit projects.

- Demonstration installations are located in the Angus town of Forfar in Scotland
- Several imported boiler designs have been installed to gain installation and operating experience
- High-specification wood-pellets have been imported; locally sourced grain will also be used
- Plans for a wood-chip production facility are well-advanced; a chipper has been purchased
- The recent installations provide heating for a nursery school, office, retail warehouse and workshop
- A development plan has been prepared for further, larger installations in 2007
- The installations provide valuable experience of installing and operating, prior to promoting sales in future

Objectives

There are two short-term objectives of these initial bio-energy installations:

(1) to acquire installing and operating experience of different systems with pellets and grain as fuels; a larger wood-chip installation is planned for 2007

(2) to create demonstration installations for potential customers to see in future

Process

There is an emerging market for bio-energy for heating in Scotland. This market is growing slowly, but there are clear indications of progress and increasing awareness among householders and building operators. As a new venture into this market, Angus Biofuels has set about gaining experience of these heating systems, which are unfamiliar in Scotland. In addition, these initial installations also act as demonstrations for possible new customers.

To date two Calimax *Twist 80/20 Pellet Stoves* from Germany have been installed; one *Janfire NH Burner and Pellet Boiler* from Sweden; and one boiler with *Sonnys Stoker burner* for grain, also from Sweden. A stock of brown pellets from *Norsk Pellets Vestmarka* has been imported as the basis for the present and future installations.

Figure 1 – Janfire pellet boiler at a nursery school

The initial installations serve a variety of building types. In future the opportunity will arise for selling renewable energy heating on a bio-energy services basis, where building users will buy heat and the operation of the heating systems will remain with Angus Biofuels. The target audience for these and future demonstration installations include office managers, local authority building operators, social housing providers, commercial building operators and others.

The development plan is being implemented and a range of bio-energy heating solutions will become available in 2007. Angus Biofuels will offer bio-energy heating as a retrofit option but also in various new-build projects.

To date, a main learning point has been the need to specify high-quality wood-pellets and to avoid poor quality pellets which disintegrate leaving a high proportion of fines. At one of the pellet boiler installations, there is to be further work done to improve the time controls in order to optimise boiler operations and match the occupancy needs of the building.

Financial resources and partners

To date, all the business development and demonstration installations have been self-funded by Angus Biofuels. As an indication, the wood-pellet boiler which heats the nursery school (270m^2 floor area) had a capital cost of 22,400€ (£15,000). This has available capacity to heat a further proposed adjacent office development (of 250m^2 floor area). The burner is rated at 25kW, but the current usage at the nursery school requires the minimum output of 9kW. The nursery school has been built to a highly energy efficient design to minimise running costs and related greenhouse gas emissions.

New larger projects are planned for 2007, but these will be conditional on securing capital grant assistance.

Results

The installations reported here are very new, with only two months of operating experience to date (Dec.'06). Much progress has been made since the Biomass Partnerships study visit to Western Sweden in March 2006. Preliminary appraisals indicate that wood-pellets are competitive with oil-fired heating, but more expensive than natural gas – but, of course, wood-pellets offer renewable energy heating.

In addition to the demonstration installations completed to date, there are further detailed plans for local wood-fuel production as wood-chips from forestry sources and from sawmill co-products. The existing initial installations provide demonstrations of bio-energy heating in practice and experience of operating and installing. The original objectives of these installations have been achieved.

Lessons learned and repeatability

The market for bio-energy heating in Scotland is still under-developed and the progress made by Angus Biofuels is based on collaboration and partnership, taking advantage of opportunities to learn from the experience of established markets in partner countries. The objective is to replicate the best practice from other established EU countries. The synergies between developing new-buildings to a high energy efficiency specification and providing sustainable energy heating from renewable sources create opportunities for demonstration installations and subsequent replication.

The need for demonstration installations is paramount. These provide experience for the new bio-energy SME and provide confidence to the potential customers: they can see the systems working and they can have confidence that the bio-energy SME has the necessary installation and operating experience.

Angus Biofuels has learnt the importance of procuring high-quality wood-pellets, in order to avoid wastage due to disintegration and high fines losses.

Figure 2 – loading pellets in a Calimax 10kW boiler

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Details of equipment used in the Angus Biofuels' installations are available at the following websites:

Janfire	*http://www.janfire.com/eng/products/index.htm*
Calimax	*http://www.calimax.com/*
Sonnys	*http://www.sonnys.se/Engelska.htm*
Norsk Pellets	*http://www.norskpellets.com/index.html*
importer	*http://www.nuergy.com*

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