1 DEMONSTRATION FARM

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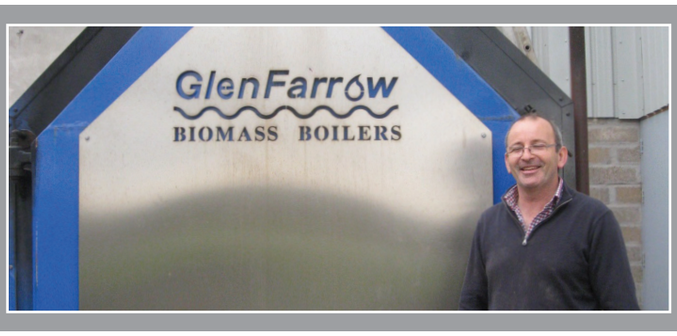
Balring Farm Biomass Project



Balring Farm,
Mintlaw,
Peterhead,
AB42 4JN
Farmer – Hamish Watson

There are currently two biomass boilers operating on the farm rated at 400kW and 200kW, with a further biomass gasification boiler rated at 150kW planned for installation in early 2014.

Background

Balring Farm extends to 325 hectares of arable land and comprises 400 acres of winter barley, 200 acres of spring barley, 100 acres of wheat, and 100 acres of rapeseed. The farm also supports 100 suckler cows and Mr Watson recently purchased a 100 acre wood which is located approximately 2 miles from Balring Farm.

400kW log-fired biomass boiler

The larger of the two existing boilers on the farm is a 400kW Glenfarrow log-fired biomass boiler. This boiler is directly linked to a tray type grain dryer which dries both grain grown on the farm and also wood chip fuel that is used for the smaller 200kW woodchip fired boiler. Grain is dried over a six to seven week period in August and September.

The boiler was installed in August 2011 for a capital cost of £29,000. It was connected to the existing grain dryer by making a hole in the wall of the dryer shed and connecting the boiler via a wet plumbing system to a radiator situated inside the dryer, the heat from which is then drawn through the dryer using a fan.

The boiler is log-fuelled and is manually loaded on a six-hourly basis with bundles of logs using the farm forklift. Felling and hauling timber on the farm costs between £12 and £14 per green tonne. Taking into account the standing value of the timber the cost of wood as a fuel is approximately £60 per dry tonne.

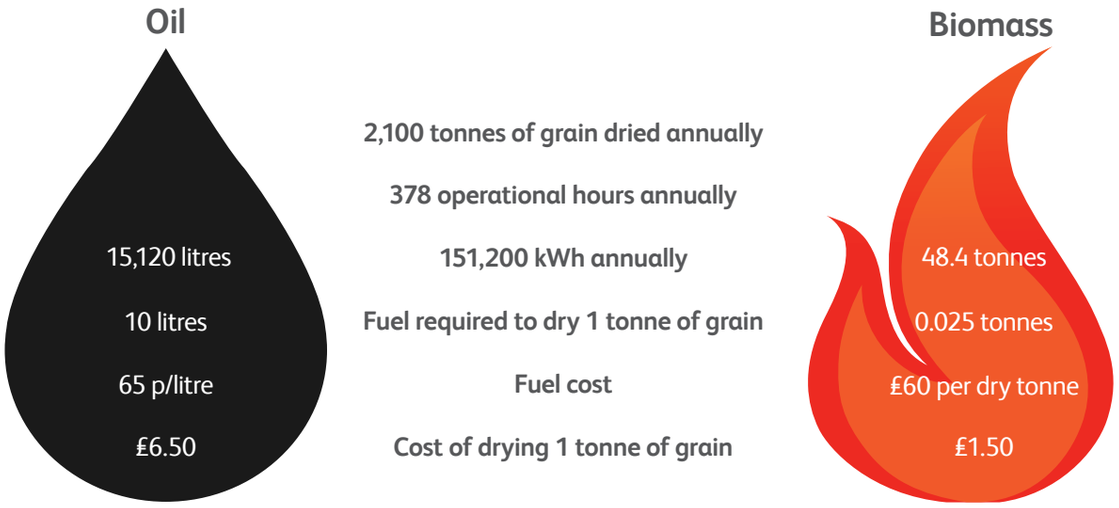
This installation receives Renewable Heat Incentive tariff payments at 5.6 pence per kWh and are index linked. The subsidy was originally secured in July 2011 and is thought to be the first grain dryer in the UK to receive the RHI. Tariff payments in the first year of subsidy support totalled £12,500.

Previously Mr Watson was drying grain using an oil fuelled boiler and spending approximately £15,000 on oil annually. With the biomass boiler in place he now expects a payback in 2 to 3 years.

SMITHSGORE
The Scottish Government

Cost comparison of grain dryer fuel options

The graphic below illustrates some financial details related to the costs of grain drying. The fuel saving per tonne of grain dried is £5 when biomass fuel is used in place of oil. Annually this amounts to fuel savings of £10,500. RHI payments are made at 5.6p/kWh, with payments amounting annually to £8,467.



Air Quality Standards – new air quality requirements mean that any future biomass installations will require an RHI emissions certificate or an environmental permit to show that the boiler can comply with emissions limits for NOx and particulate matter. DECC has estimated that capital costs for some installations might now be 20% to 25% higher due to boiler modifications required in order to meet the emissions limits

200kW biomass boiler

The second boiler on the farm is a 200kW Froling wood chip fuelled biomass boiler. This boiler is used to heat 3 houses, a workshop building and the farm power washer, and also provides top up heat for the grain dryer.

The boiler was installed in June 2013 for a £100,000 capital cost which included a cost of £12,000 for the district heat distribution pipe network. Although the cost of this boiler is significantly higher than for the Glenfarrow boiler, the boiler has the advantage of an automatic fuel feed and ash removal which results in reduced operational commitments and ease of use. In addition this boiler is more efficient and as a result has lower emissions to air which means that it will meet the new air quality standards.

The boiler receives the RHI subsidy at a tariff rate of 8.6 pence per kWh. Since installation in June, the boiler has produced approximately 140,000kWh of heat up to October which equates to RHI payments of approximately £12,000. In addition, extra income is earned by fuel sales made to two tenanted cottages on the farm.

Chipping of logs is carried out by an external contractor who processes 150-200 tonnes of woodchip at a time at a cost of between £10 and £12 per tonne. This chip is often damp and so the tray dryer is used to dry the fuel to the desired moisture content of 30%.

> “Biomass has revolutionised the way in which the farm operates - providing cheap heat for drying grain, wood chip and heating buildings”
>
> *Hamish Watson*