

Byretown Farm

Biomass Batch Boiler



*Byretown Farm,
Lanark,
ML11 9TG
Farmer – Alan Trainer*

The biomass batch boiler is a 185kW rated model fabricated by Dragon Heat. The installation of the boiler was completed in March 2013 for a total capital cost of approximately £35,000. The boiler unit itself cost £13,000.

Background

Byretown Farm is a tenanted dairy and livestock farm extending to 400 acres. The farm has 300 head of cattle, 180 of which are milking cows while the remaining 120 head are young stock. There are also approximately 100 acres of spring barley grown on the farm.

The Boiler

Alan Trainer has recently installed a biomass boiler which currently supplies both the farmhouse building and dairy processes with heat and hot water. Space heating for the dairy parlour is planned to be added in to the system by May 2014.

The boiler has a side-opening front door and is manually loaded with fuel on a once-daily basis, using a tractor with a forklift attachment to lift a pallet of logs directly into the boiler. Once the boiler is started and brought up to heat, it is normally run for approximately four hours per day in what is known as a batch process, rather than being run at a lower intensity over a longer period.

The boiler heats water which is stored in a 9,000 litre accumulator (or buffer) tank which is located directly behind the boiler. Hot water from the accumulator tank is then circulated to the farmhouse heating system and to the dairy parlour through a 10 metre run of highly insulated underground pipework which minimises heat losses.

Fuel Management

Fallen timber collected from around the farm is currently used as the primary fuel. Timber is also made available by some neighbouring farms on the condition that Alan removes it from where it has fallen. The timber is gathered, cut into five foot lengths and stacked to season undercover for at least 12 months or until sufficiently dry (approximately 30% MC). Once dried, lengths of timber are split in half by a nearby farmer with a splitter attachment mounted on a 360 digger at a cost of £30 per hour. This year 20 tonnes of timber were split in 10 hours at a cost of £300, which equates to a splitting cost of £15 per tonne. It is difficult to accurately assess the total costs of the woodfuel used, but assuming that logging and haulage costs might amount to £15 per dry tonne and that the timber

has no value because it is fallen wood, the total cost could then amount to £30 per tonne. This compares favourably to buying in logs from a supplier such as the Forestry Commission which could cost in the region of £40 per tonne.

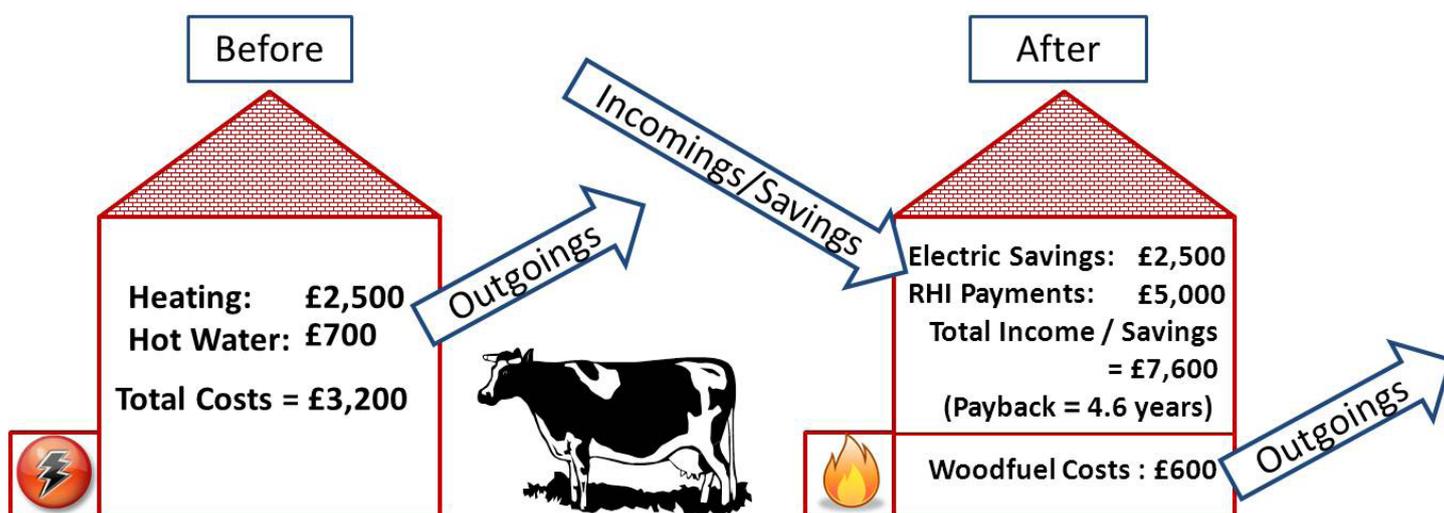
As well as timber in the form of logs, this boiler is also capable of burning straw bales and coppiced timber such as willow and poplar.

Financial Details

The total cost of the installation was approximately £35,000 with the cost of the boiler itself being £13,000. The pipework, pumps, heat meters, heat exchangers, installation and plumbing work account for the remainder of the cost.

This installation receives Renewable Heat Incentive tariff payments which were originally secured in August 2013. Tier 1 payments currently stand at 8.6 pence per kWh and tier 2 payments at 2.2 pence per kWh; both are index linked. The reduced running times due to the batch process feed mean that all RHI payments are currently made at the higher tier one value of 8.6 pence per kWh. RHI tariff payments in the first year of subsidy support are expected to total at least £5,000.

Previously Alan was spending approximately £2,500 annually on heating the farmhouse building alone using electric white meter heating and even then this was not achieving comfortable temperatures in the building. Hot water for the farmhouse and dairy process was costing an additional £700 annually. The cost of wood fuel for the log boiler amounts to approximately £600 annually.



With the biomass boiler in place Alan is now making overall savings of £2,600, and expects a payback in approximately 5 years. Electric immersion heaters are in place to provide back-up heat to the accumulator tank in case of biomass boiler breakdown. All routine maintenance is carried out by Alan himself which further reduces costs.

Planning & Building Warrants

The boiler installation required both building warrants and planning permission due to the location of the farm within the boundaries of the New Lanark World Heritage Site. Alan Trainer undertook the planning and building warrant applications himself, producing all necessary drawings and supporting information. Planning permission was gained in January 2013, and the building warrant in October 2013.

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A payback of 5 years for the boiler is not to be sniffed at!

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Alan Trainer, February 2014