GROUNDBREAKING ON-FARM CHP POULTRY BURNING SYSTEM

THE CLIENT:

Germany Farms, a family run poultry business based across two large sites in rural Nottinghamshire - Muskham Wood, home to 16 poultry sheds and Model Farm housing a further 12 sheds.

THE PROJECT:

Previously heated by LPG and incurring a hefty annual fuel bill of £182,000, the old shed heating system has been replaced with a new system at Muskham Wood.

The project kicked off back in the spring of 2015 and the build has taken almost 12 months to complete. Chris Germany, Partner at Germany Farms commented: "Over the last few years the poultry industry has seen substantial numbers of farmers switching to renewable heating as they realise the benefits that biomass brings for both their birds and their back pocket. However I'm proud to say that this is no ordinary biomass heating project". Chris made the bold decision to install a biomass CHP system that is capable of burning not just wood chip but the poultry litter created by the 500,000 chickens at the site - providing heat for the sheds and power for exporting back to the grid. Now fully operational the site is reaping the financial and environmental benefits of this pioneering development with a significantly improved crop performance since moving to the new system. The C&H team is now replicating this successful system at Model Farm.

"There are biomass CHP systems installed, there are chicken litter systems installed and there are large district heating systems run on biomass but this is the first project in the UK to truly combine these technologies, delivering a highly effective solution."

Ed Caldecott,
Director at C&H Biomass

"This installation takes renewable heating to a whole new level. The change in EU legislation allowing us to burn our poultry litter as a fuel is a massive step forward for the poultry industry and I expect to see many more farms adopt this approach."

Chris Germany,
Partner at Germany Farms

COST SAVINGS:

In addition to eliminating their fuel costs completely, the system installed at Germany Farms will generate a healthy income – it not only qualifies for support from the Renewables Obligation (ROC's) for electrical output but also for the CHP Renewable Heat Incentive (RHI) tariff for heat generated.

- **Fuel saving:** £182,000 per year
- **ROC income:** £49,000 per year
- **RHI Income:** delivers a payback of 5 years

TECHNOLOGY INSTALLED:

The technology installed at Germany Farms is imposing and at this site size really does matter. Equipped with a substantial fuel store and a giant buffer tank, this system has been built to ensure that the site can be completely self-sustained, fueling its entire energy needs with biomass.

Boiler - 2 MW Uniconfort biomass boiler plus ancillary LPG gas burner. Capable of running on chicken litter produced at the site, the boiler will produce high temperature hot water at 150°C providing all heat required for the on-site poultry sheds.

Fuel Store - Incorporated into the plant room at Muskham wood is a massive, purpose-built fuel store capable of holding up to 1321m^3 of fuel (lasting to the end of a chicken cycle/every 37 days) and designed to operate with either wood chip or chicken litter. Two adjacent top loaders cleverly circulate the fuel and feed the boiler.

Buffer - A giant 240,000l buffer tank can be found alongside the plant room and measuring an impressive 20m in length it has been designed to maximise RHI income; acting as thermal store to provide heat in case of breakdown and providing a stable heat load for optimum boiler operation.

Remote Monitoring - A state of the art control system fully integrates the CHP, boiler, thermal store and district heating optimizing heat supply and maximizing RHI income. The site is fully operated by C&H Biomass who have full access to monitor the plants performance and the ability to adjust the system remotely if required.

CHP - General Electric Clean - Cycle 2 ORC engine with an electrial output of 125kW. Heat from the boiler goes to the ORC unit to generate electricity - this is used to power the entire site, with any excess power sold back to the grid. The waste heat from the ORC is used to heat the sheds.