

Leading Animal Nutrition Multinational United Kingdom

CS03A-V2.0 | FOOD & BEVERAGE | EUK

PROJECT BENEFITS

- £126,500 energy saving in 12 months (payback of 2.5 years)
- £2 million predicted savings over product lifecycle
- 800kW recovered from 5MW biomass boiler
- 32% annual energy reduction
- 660 tonnes CO₂ saved each year
- 20% reduction in NO_x and SO₂ including up to 90% of emission particle matter (PM) removed



Maximise Fuel Use and Site Life Through Heat Recovery and Steam Trap Efficiency

With demand for healthy and sustainable food high on the global agenda, aquaculture, as a means of increasing food resources responsibly, is a growing sector. As a leading supplier of feed and nutrition for farmed fish, the processing site consistently looks for ways to maintain and improve production at its facilities worldwide.

With the location's boiler up to capacity, the site was faced with the prospect of decommissioning the existing plant. In addition to investing in a new energy centre the downtime caused would affect production and have a significant cost implication.

In response, the multinational company enlisted the expertise of Thermal Energy International which, after a detailed site survey, recommended installing a heat recovery system to recycle heat normally lost through the stack or exhaust. This system would see waste heat recovered from the site's biomass boiler's exhaust used to preheat the boiler makeup water and dryer inlet air. This reduced the load on the boiler, extending the life of the energy centre.

Direct Technology, Direct Savings

Thermal Energy designed and installed its proprietary FLU-ACE® direct contact condensing heat recovery technology on the site's 5MW biomass boiler. By cooling the exhaust gas to below its dew point, the FLU-ACE® captures high levels of evaporated water present in the flue gas as a result of burning the biomass hydrocarbon fuel.

Moisture produced as a result of burning the biomass hydrocarbon fuel needed to be converted into sensible heat. Only by using a condensing heat recovery system could the valuable energy in the latent heat be captured.

FLU-ACE® HEAT RECOVERY SYSTEM

- The FLU-ACE® is a direct contact condensing heat recovery system that recycles the heat normally lost through the boiler flue gas exhaust
- Implementation of the technology typically reduces energy consumption by 10% to 20%
- Average payback ranges from two to four years

“In addition to the fuel savings, our biomass boiler is now running more efficiently – extending the life of our energy centre and improving its resilience.”

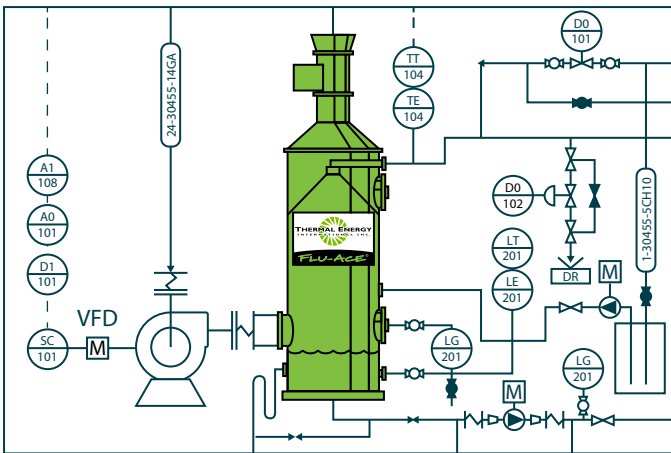
- Regional Manufacturing Director

Specialist Design and Deployment

Given the nature of the boiler's exhaust stream, the unit was specially developed to cope with particles and pollutants which allowed it to operate with minimal maintenance. As a result, the project achieved the removal of up to 90% of PM including PM2.5 and approximately 20% reduction in NO_x and SO₂.

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Taking just four months to complete, the project included an initial survey, site visits, manufacturing and final commissioning. To date, the project has not only increased the resilience of the site's energy centre, it has also improved system efficiency by up to 32%. This equates to an energy saving of more than £126,500 a year.

With predicted lifecycle fuel savings of over £2 million, payback is expected to be no more than two and a half years. As a result of its reduced energy consumption, the plant has also reduced its carbon footprint. Each year, a total of 660 tonnes of CO₂ will be saved contributing towards the business's wider sustainability targets.

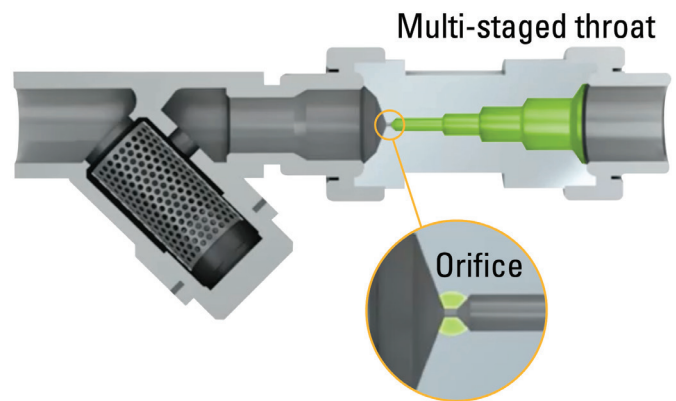
Steam System Efficiencies

With steam used throughout the site to pellet and extrude the feed, Thermal Energy also addressed the site's inefficient mechanical steam traps.

Due to their moving parts, mechanical traps experience an average annual failure rate of between 5-10%. Inefficient steam trapping not only wastes valuable energy, it also leads to production downtime due to maintenance requirements.

Thermal Energy surveyed the site and installed 38 GEM™ Traps. These traps use engineered orifice and multi-staged throat technology to discharge condensate without the need for mechanical parts. With nothing to break or wear the steam trap maintenance burden is reduced. Each GEM™ Trap is also sized specifically for the application, meaning they deliver improved efficiency with no live steam loss.

The GEM™ Traps installed at the facility provide an annual fuel and maintenance saving of £26,714 and steam savings of over 860 tonnes a year. The reduction in CO₂ from the site is the equivalent to removing 54 cars from the road every year (173 tonnes).



GEM STEAM TRAPS

- GEM™ Steam Traps are the most efficient and reliable steam traps on the market
- With no moving parts to break or fail, GEM™ technology is a permanent, low maintenance steam trapping solution
- Implementation of the technology typically reduces steam costs by 10% to 20%
- Average payback ranges from one to two years

“I recommend the FLU-ACE® heat recovery solution based on quality of workmanship and great communication between TEI and my team. The implementation, installation, and commissioning process were carried out smoothly, with no disruption to our production.”

- Regional Manufacturing Director