

UK largest dairy uses CHP to achieve zero carbon strategy.



Edina UK Ltd supplies innovative natural gas and biogas CHP (combined heat and power) technology as part of Arla Food's long-term growth and environmental strategy to develop the world's first zero carbon milk processing facility.

Key benefits

- Reduce CO₂ emissions by 5,200 tonnes per year
- Achieves zero waste to landfill
- CHP plant runs on a mixture of natural gas and biogas



Arla Foods Ltd production facility is the most environmentally friendly dairy in the world. The ambitious £150million project uses cutting edge renewable energy and CHP technology to create a zero carbon vision.

Situated at Aston Clinton, Aylesbury, the 6.5 hectare production facility is capable of producing 1 billion litres of milk per year and utilises the very best in energy saving and water recycling techniques.

Throughout the design stages, the potential impact of the dairy on the environment was evaluated and the best available construction techniques, advanced process technologies and cutting edge renewable energy opportunities were implemented.

CHP offered an ideal solution as most of the heat is used in other

processes such like pasteurisation, homogenisation, and cleaning circuits.

Engineering, IT and facilities services company, NG Bailey, awarded Edina the contract to supply, install and maintain two MWM TCG 2020 V20 gas engines capable of generating an electrical output of 2MW each and 1.9MW thermal output.

The MWM engines are fuelled by natural gas but with added biogas, produced from the anaerobic digestion of some of the processes waste product.

Edina designed and supplied the natural gas and biogas integration system which allows the generators to operate on natural gas only, or natural gas, with the inclusion of a proportion of biogas. The gas mix is around 90% natural gas with the remaining 10% biogas.

Performance monitoring and sampling of the digestate has proven positive with options of further waste processing being considered.

The main innovative feature is the natural gas and biogas mixing chamber (pictured below).



Biogas is produced on site via Arla Food's anaerobic digester, which treats the sites influent. There is sufficient biogas to produce approximately 400kWe, which represents roughly 10% of the total CHP load (4MWe).

The biogas mixing chamber maximises the amount of biogas being burnt and minimises the amount of natural gas being imported from the National Grid against the sites electrical load.

The biogas mixing system can also accommodate a single engines operation and as such deliver 20% of the fuel requirements in the event of low electrical loads at site.

In addition, the CHP is designed to work in Island Mode Operation, in the event of a power outage at site, the CHP is configured to hold all essential loads until site power is re-established. Edina worked closely with the client to finalise a solution via their load shedding electrical infrastructure.

Regional benefits

It is anticipated that the new site will create over 700 new jobs and attract the recruitment of 90 Apprentices, delivering approximately £20million in wages, much of which will support and encourage growth in the local and regional economy.

The new site has been tipped to become a beacon for inward investment and a showcase of sustainable development helping to reinforce a burgeoning environmental hub in the county.

A visitor's centre will also be developed to encourage local schools, community groups and businesses to learn more about sustainability.

Commissioned in September 2013, the dairy is the most technological advanced and efficient of its kind and achieves zero waste to landfill.

This 'mega dairy' sets a new benchmark in environmental standards on a global scale.

Recognising innovation

This CHP project at Arla Foods also won the 'Industrial and Commercial' category award at the 2015 Association of Decentralised Energy Awards ceremony.

The judges commented "We chose this entry because it demonstrated a strong and integrated approach to on-site sustainability. The thinking behind what happens on site and how the waste is used to generate energy is very clever. It clearly shows the types of innovation that we need for the future."

About Edina

Edina is a leading supplier, installer and maintenance provider for energy efficient CHP (combined heat and power) solutions for natural gas and biogas applications, providing complete turnkey and containerised plant and control panel systems manufactured in-house.

Edina is the sole distributor in the UK and Ireland for leading efficiency MWM manufactured gas engines, world renowned for achieving maximum electrical and thermal efficiency, low operating and servicing costs and high reliability and availability.

With over 30 years' experience in providing flexible power generation solutions, Edina works closely with its customers to understand and meet their requirements, from initial contact to long term maintenance support.

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