

Heat metering expertise helps food producer to comply with regulations

Yelo benefits from consultancy and metering for new CHP plant



Yelo's production facility in Warwickshire processes UK-grown, farm-assured rapeseed for vegetable oil and animal feed. The company supports UK farmers by providing a home market for their crop, encouraging increased rapeseed acreage as part of normal crop rotation. Yelo's aim is to contribute to improved UK food security, reduced imports and reduced food miles. Yelo is a member of the RCMA Group.

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Carlo Matos
Operations Director
Yelo



ORC unit



CHP plant

The challenge In 2016–17, a biomass-fuelled combined heat and power (CHP) plant was constructed to provide energy to Yelo's rapeseed processing facility near Stratford-upon-Avon in Warwickshire. By using UK-sourced arboricultural arisings ("arbs") to fuel the biomass CHP plant, Yelo can produce vegetable oil and animal feed with a very low carbon footprint. The core rapeseed process uses large-scale mechanical pressing, rather than a hexane solvent extraction method, furthering the plant's green credentials.

Endress+Hauser was commissioned by the project developers to provide consultancy services surrounding the Renewable Heat Incentive (RHI), a government environmental programme that provides financial support to increase the deployment of renewable heat systems by businesses. Due to Endress+Hauser's expertise in heat metering, it was also asked to provide metering, data acquisition solutions and software.

The solution The CHP plant comprises an 11.4 MW biomass thermal oil

heater providing heat to a Turboden Organic Rankine Cycle (ORC) unit. The thermal oil heat is measured with an Endress+Hauser Prowirl 200 Vortex flowmeter in combination with an RH33 heat calculator. A hot water supply from the ORC condenser system to the processing plant is metered with an Endress+Hauser Promag 50 flowmeter plus an RH33. After passing through the ORC unit, the rejected thermal oil is passed through a heat recovery steam generator, providing 7 bar saturated steam to the process. This is metered with a combination of Prowirl and Promag technologies in conjunction with RH33 heat calculators. An RSG45 data manager calculates the heat produced in the biomass boiler during two different modes of operation: one when the system is running as a full CHP plant and one when the ORC system is shut down and the plant is configured as a standalone biomass heat source.

As well as providing RHI-compliant metering for the CHP plant, Endress+Hauser produced an Independent Report on Metering Arrangement (IRMA), the Ofgem

report required for RHI accreditation. This requires the assessment of all heat losses from external piping, schematics detailing the meter and plant arrangement and the determination of an eligible heat output payment formula. “Our metering regime was not straightforward and Endress+Hauser brought both a deep knowledge of the Ofgem metering requirements and a technical understanding of our scheme,” remarked Yelo’s Operations Director Carlo Matos.

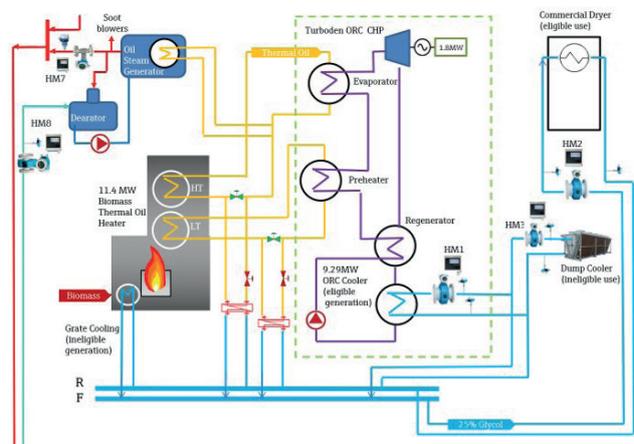
Heat and electricity metering data is now collected from a gateway and processed using a cloud-based data management and reporting platform. This platform provides all the data for monthly Ofgem reporting and tracks RO power and RHI heat revenue. After helping Yelo to achieve RHI accreditation, Endress+Hauser now provides a service contract to maintain and check the performance of the meters, which is an obligation under the RHI regulations.

The benefits As experts in heat metering, Endress+Hauser is the ideal partner for biomass CHP projects. As well as having an in-depth understanding of the regulations and an unrivalled instrumentation portfolio, the company has a proven track record of delivering consultancy services that help companies to save energy, reduce costs and improve their environmental credentials.

Carlo concludes, “We now have a world-class energy reporting system that takes all the stress out of the myriad of reporting requirements, both to shareholders and to Ofgem.”



Heat metering



Schematic showing CHP metering

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