

THE UNIVERSITY OF YORK BIOMASS, CHP, MULTI-UTILITY

Contract Value: **£16 million**
Client: **The University of York**
Timescale: **2009 to 2012**

- > The Biomass Energy Centre is highly-efficient and revenue generating as it is eligible for Renewable Heat Incentive (RHI) payments
- > The biomass boiler will contribute around 7,000,000kWhrs of thermal energy to the overall University demand per year
- > Aids energy security for the long term
- > Reduced maintenance costs for community heating schemes compared with systems using individual boilers
- > Flexible, re-locatable solution that met the needs of the client and the future phased requirements of the development
- > Improved risk-transfer with Vital Energi responsible for co-ordinating all services

> Introduction

Vital Energi is helping to reduce The University of York's energy costs and CO2 emissions with the installation of a low carbon biomass and CHP-fuelled community heating system. We are designing, supplying and installing the state-of-the-art system as part of the University's £750 million expansion programme which is upgrading its existing Heslington West campus and creating a brand new Heslington East campus to double the University's campus size. The University's expansion programme has been divided into four phases which include multiple contracts. Two of these phases have been put out to tender and Vital Energi has successfully secured four of the energy services contracts for both phases, worth around £16 million, by demonstrating our competitiveness, good quality installations, ability to meet customer requirements and expertise in sustainable energy. For Phase 1, Vital Energi installed a new multi-utility infrastructure corridor which will be extended during all four phases of the project to connect to new buildings as they are constructed. During Phase 2 we extended the multi-utility corridor and designed, supplied and installed two new CHP engines and one biomass boiler. We have also been awarded the contract to operate and maintain the CHP engines and biomass boiler for the next five years and manage the biomass fuel purchase process on behalf of the University. Its new energy system will enable the University of York to generate heat and power more efficiently, fulfil its expanding energy requirements and meet its target to use 10 per cent renewable energy to power its campus. This target is included in the University's renewable energy strategy which has been developed to help it cut 43 per cent of its carbon dioxide emissions by 2020 to meet the requirements of the Higher Education Funding Council for England (HEFCE).



“The biomass boiler was manufactured off-site and was installed within a two day period. Vital Energi completed all the preparation work in advance and this was one of the smoothest installations to be completed at the University. We have a very good working relationship with Vital Energi and this was demonstrated perfectly during this operation.”

Roger Hartshorn, Environment and Energy Manager, The University of York

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> The Brief

The University of York has put renewable energy at the heart of its campus expansion plans. It investigated a number of alternative energy technologies and opted for a combination of CHP and biomass heating as providing the greatest opportunity to reduce carbon emissions. The biomass boiler will help the University meet its commitment to provide at least 10 per cent of the energy requirements of its new campus through renewable sources. Eventually it aims to make biomass boilers an integral element of the district heating system across the entire campus. The first phase of Heslington East and the Ron Cooke Hub building, which sits at the heart of the campus development, received Gold Awards at the Royal Institute of Architects (RIBA) Northern Network Awards 2011 in Newcastle.

> The Solution

Vital Energi used its specialist expertise to design the University's sustainable energy system to provide ultimate flexibility so that it can accommodate future changes to the legislative landscape and to incentive and funding schemes for sustainable energy.

The biomass boiler was specifically designed to meet expected criteria for the new Renewable Heat Incentive (RHI) scheme, which was under consultation at the start of the project, in order to maximise revenues for the University. Work to upgrade the University of York's existing Heslington West campus and construct the new Heslington East campus has been divided into four phases. Vital Energi has won energy services contracts for two of the four phases, with the final two phases of expansion yet to be tendered.

Phase 1 comprised the installation of a multi-utility corridor from the existing Heslington West boiler house to the new Heslington East campus. This work included the installation of around 2km of district heating pipes, telecoms and fibre optic networks and a high voltage cable ring. It also included the supply and installation of high voltage and low voltage equipment into two electrical substations and pipe-work modifications to the existing Heslington West boiler house. Phase 1 was completed in December 2009.

Vital Energi won the contract for Phase 1 of the project by demonstrating our competitiveness, ability to meet customer requirements, good quality installations and expertise in sustainable energy. Our partnership with Scottish & Southern Energy (SSE) Electrical helped us secure the contract for installation of the multi-utility corridor.

Phase 2 was essentially an extension of Phase 1 with an increased scope of works and also included the supply and installation of two gas-fired Combined Heat and Power (CHP) engines and a biomass boiler. The extension of the multi-utility corridor was completed in September 2012, the biomass boiler was installed in October 2012 and the CHP engines were completed in December 2012. In Phase 2 of the project, Vital Energi installed multi-utility infrastructure to the new Langwith College buildings and the Yorkshire sports village including district heating mains, gas infrastructure; site-wide water mains; site-wide high voltage and low voltage cable installations; site-wide fibre optics; site-wide telecoms and a foul drainage system. In addition, we constructed three electrical substations, one temporary high voltage substation and one water booster station.

This phase of work also includes the replacement of one of the University's three old and inefficient boilers, currently housed in the University's existing energy centre on the Heslington West campus, with two new gas-fired 1.5MW Combined Heat and Power engines and the installation of a containerised 850kW biomass boiler on a separate site close to the Heslington East campus car park. This will contribute around 7,000,000kWhrs of thermal energy to the overall University demand per year and is capable of operating on both woodchip and wood pellet fuel types which can be locally-sourced. Sustainably sourced biomass fuels processed within 25 miles of the point of use are currently regarded as being 'carbon neutral'.

The biomass boiler has been designed to be re-locatable so that over time it can be moved into the redeveloped central energy centre on the Heslington West campus. It will inject hot water into the district heating network to support the primary supply from the Heslington West central energy centre. Vital Energi has also been awarded the contract to operate and maintain the CHP engines and biomass boiler for five years and has taken on the additional responsibility of managing biomass fuel procurement on behalf of the University.

> Conclusion

The University of York marked one of the first multi-utility projects that Vital Energi implemented. It highlighted our ability to provide clients with the risk-transfer benefits of having one contractor responsible for co-ordinating all the services. We have developed a close working relationship with The University of York over the four years that we have been assisting it with the achievement of its ambitious expansion plans and continue to be its preferred partner in relation to the creation of its low carbon campus.