VITAL ENERGi

CASE STUDY

University of Northampton

BIOMASS ENERGY CENTRE & DISTRICT HEATING NETWORK

PROJECT OVERVIEW

The University of Northampton are developing the new £330m Waterside Campus, which will provide state-of-the-art academic facilities for 15,000 students, residential facilities for 1,000 students and sports facilities.

The project is located on a 58 acre, former brown field site, which previously housed a power station and cosmetic factory and the project is credited with bringing the derelict site back to life and kick-starting the Northampton Enterprise Zone.

As this is a brand new campus it provides the opportunity for Vital to work in partnership with the University and their architects to deliver a modern, comprehensive, energy infrastructure package which combines CHP, Biomass and traditional gas boilers. This will deliver a resilient, efficient system which will generate massive carbon savings... a key driver for the University.

VITAL SOLUTION

The University of Northampton's commitment to quality through all stages of the procurement, design and construction process was evident from the very beginnings of the tendering process, which was scored on a 30% price and 70% quality weighting, ensuring high standards of value for money are embedded from the outset.

The project timescales were determined by an innovative procurement strategy which began with an OJEU notice leading to prequalification. The next step was a 12 week preconstruction services agreement which led into a 12 month construction programme. This process yielded several benefits including a 30% reduction on project timescales, a smaller building footprint and meeting the challenging "heat on" date.

PROJECT SUMMARY:

CLIENT
Mace

PROJECT
University of Northampton Biomass/ District Heating Project

TIMESCALE:
Apr 16-July 17 (Plus 2 year O&M contract to 2019)

CONTRACT VALUE:
£6.5 million

THE BENEFITS:

- 1,000 tonnes of CO2 reduction per annum, raising to 2,200 per annum in phase 2
- 20% reduced energy centre footprint
- Improved biomass delivery system
- Challenging deadlines met, keeping overall programme on schedule.
- 30% reduction of installation timescale.

A series of 8 full height metal clad 'blades' have created a saw-tooth profile along the north elevation.

"We are delighted to have the opportunity to develop the University's commitment to its sustainability agenda and environmental infrastructure has been a key factor in the planning and construction of the Waterside Campus. By working with Vital Energi we have a sustainable, future proof heating network which will service the campus well."

BOB GRIGGS, PROJECT DIRECTOR FOR THE UNIVERSITY OF NORTHAMPTON

We secured two separate contracts on the Northampton University Development, with the first one being a £1.2 million, 35-week project to deliver the multi-utility network. This was made up of a 1.6km, Logstor Twin Pipe district heating network which would distribute heat and hot water around the campus and also high voltage cabling, cold water and gas pipework.

Vital Energi designed the 1,600m district heating network in keeping with the University's long-term energy strategy. This saw the pipework sized so that it can meet the future needs of the campus and the layout was designed to facilitate the easy connection of future, planned buildings.

Evolving the Design

Our solution reduced the energy centre floor plan by 20% and created an alternative, improved layout for the plant and equipment. The biomass energy centre provides heating and hot water for the academic, residential, and sports buildings and the designers left space for an additional boiler and a Combined Heat & Power engine which will be installed when the increased demand warrants it.

The layout of the new equipment over two levels has been designed to maximise efficient use of space and to ensure the ability to carry out maintenance in the safest, most efficient way. A 1MW biomass boiler, three 4MW gas boilers, one 120m3 thermal storage vessel and associated plant equipment are located on the ground floor.

Besnik Bijo, Senior Architect with MCW Architects explains, "While the building function is essentially utilitarian and technical, the external envelope has been developed to create a visually strong elevation to the campus, celebrating the University's commitment to sustainability."

Given the flue's prominence, a 12m high LED screen and University signage has been incorporated into the cladding to create a landmark feature for the campus and the town. This screen can communicate messages ranging from weather forecasts and local football scores to messages about University events and directions on open days.

Creating Architectural Excellence

We worked very closely with the architects and structural engineers with regards to the flue tower as the tolerances were particularly tight and the architectural features, including the lighting and 27m2 LED screen made the project more complex than a traditional energy centre.

The system utilises wood chip to fuel the biomass boiler and gas for the boilers. This combination provides heating and hot water for all the buildings and student residencies on the site and saves over 1,000 tonnes of CO2 per year in the short term, rising to 2,200 tons a year following the introduction of a Combined Heat & Power Engine in phase 2.

By collaborating closely with the main contractor, the Project Manager Mace and the architects, this partnership resulted an energy solution which is capable of evolving and meeting the University's needs for years to come.