

RIVERSIDE DENE, NEWCASTLE BIOMASS

Contract Value: **£1,653,848.00**
Client: **Newcastle City Council**
Timescale: **Jan 2010 - May 2010**

- A saving of 1,054 tonnes of CO2 per annum
- It is predicted to take less than eight years to pay the capital costs of the project back
- Alleviated fuel poverty by significantly reducing heat bills, for example bills in Cruddas Park are predicted to reduce from an average of £1008 to £600 per annum
- Helped the tower blocks achieve “Decent Homes” standards
- The increase in thermal warmth led to an improvement in tenants’ overall health and wellbeing

➤ Introduction

Vital Energi is significantly reducing the fuel poverty and carbon emissions of Newcastle’s Riverside Dene estate by delivering a green community scheme to its 1960s tower blocks. The six tower blocks on the Riverside Dene Estate (formally known as Cruddas Park) are located in one of the most deprived areas of North East England with many tenants experiencing fuel poverty. As part of a large scale redevelopment of the area Your Homes Newcastle (YHN), the Arms Length Management Organisation (ALMO) of Newcastle City Council, internally remodelled the blocks to create over 550 flats that achieved ‘Decent Homes Standards’.

➤ The Brief

This project was one of the first to be funded by the Homes and Communities Agency’s (HCA) Low Carbon Community Heating Scheme which aims to help neighbourhoods benefit from greener energy and lower utility bills. In order to meet the aims of the HCA as well as the criteria for ‘Decent Homes Standards’ the dwellings needed a much more efficient and affordable heating and hot water system.

➤ The Solution

Vital Energi’s sustainable solution consists of a highly efficient £1.7 million wood fuelled biomass community heating system which provides low carbon heat and hot water to the entire Riverside Dene estate from one energy centre.

Previously all of the tower blocks in Riverside Dene apart from Cruddas Park were heated by direct electricity and resident’s bills varied widely, ranging from £30 to £130 a month according to a study by the charity National Energy Action (NEA). Meanwhile residents of Cruddas Park paid a fixed charge that averaged £84 a month as part of their service bill, regardless of what energy they used as there were no facilities to measure the individual heating usage of each dwelling. Many commercial outlets, located in the mall on the ground floor of Cruddas Park, were also financially disadvantaged due to them paying a fixed heating rate in their overall service charge.

To overcome the disproportionate fuel bills and reduce the CO2 emissions of the previous heating system Biomass was chosen as the primary fuel source. Biomass has both environmental and financial benefits – it is a zero carbon fuel source and based on current prices Biomass fuel is currently 30–35% lower than the price of gas. Biomass also has more price stability than gas as it is a renewable fuel



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source that can be locally sourced. In comparison the price of gas is unlikely to stay at or below general price inflation because it is a world commodity that is sourced from a volatile international market. To fuel the biomass boiler Vital Energi's in-house design team created a bespoke fuel handling system which utilises the existing infrastructure of Cruddas Park. Coal bunkers that were located in the basement of the tower block were converted for wood pellet fuel storage, with a piping system installed that allows the biomass fuel to be fed directly into the bunkers from the biomass delivery vans. The fuel handling system then uses an automatic screw feed system which conveys the wood pellets from the bunkers to the biomass boiler. The fuel handling system is designed so that any increase or decrease in demand for hot water and heating on the boiler automatically changes the speed that the wood chip fuel is supplied to the boiler, ensuring that the biomass boiler can always perform to the required output.

The existing energy centre in Cruddas Park was also modified by Vital Energi who installed a zero carbon 750kW biomass boiler as the primary energy source. For periods of peak demand Vital Energi installed a new 1.5MW gas fired boiler and refurbished two existing 1.2MW gas boilers which act as stand-bys. As the Riverside Dene estate expands the demand for heating and hot water will increase, meaning that the energy centre had to be future proofed to enable sustainable development. To achieve this Vital Energi's in-house design team incorporated space for additional micro generation equipment that may be required in the energy centre in the future. Heating and hot water is distributed from the modified 'heat hub' in Cruddas Park to the five external tower blocks through Vital Energi's creatively designed underground pipe network. Heat loss is kept to a minimum due to Vital Energi's specialist twin preinsulated pipe system. Cruddas Park itself is heated by the tower's existing distribution system with greener hot water and heating provided from the modified 'heat hub'.

Two plate heat exchangers and heat meters control and measure the hot water that is supplied to the towers from the energy hub. Each of the six tower blocks also has a plate heat exchanger and heat meter which means that the heat and hot water that is supplied to individual flat can now be measured and billed according to usage. Riverside Dene's more efficient and measurable heating system is already being praised.

Local resident Dave Seargent said:

"We're already feeling the benefit in my block as the heating charge has come down by £6 a week and it's good to know that the new system is cutting carbon emissions."

Vital Energi has also been awarded the role of carrying out the on-going operation, management and maintenance of the community heating system for the next 10 years as well as the responsibility for the biomass fuel supply for the next five years.

> Conclusion

Vital Energi's innovative heating solution has reduced the carbon footprint of the Riverside Dene development, helping Newcastle maintain its position as the UK's most sustainable city. The Riverside Dene project illustrates how biomass fuels can significantly reduce energy bills and carbon emissions, especially when replacing fossil fuels in heat only applications. Remarkably, it is predicted that it will take Newcastle City Council less than eight years to pay back the capital costs of the scheme. Vital Energi was able to design, supply and install the groundbreaking biomass community heating system on time and on budget, meeting the essential deadlines that were imposed as part of the government's funding commitments.

"Vital Energi has been flexible in its approach to developing a sustainable district heating system which the residents in Riverside Dene will benefit from for many years. We have developed a very strong professional relationship with Vital Energi ensuring the scheme was delivered on time and budget. The heating scheme compliments other energy efficiency measures installed in the refurbished blocks to ensure the area makes a large contribution to reducing the carbon footprint of the city."

Clare Wood, Senior Project Officer, Newcastle City Council