

**Project:**

Cargenbridge District Heat Network

Client:

Dumfries and Galloway Council

Project Description:

Produce a techno-economic study investigating the viability of a heat network in Cargenbridge, to be supplied by a new biomass combined heat and power plant. The heat network would supply a mixture of private and public buildings helping Dumfries and Galloway Council meet its low carbon targets.

Services Provided:**Analysis and modelling of heat demands**

Natural Power obtained heat demand data from the Council, which was checked and corrected for anomalies. Actual data was also obtained from existing building owners and occupiers, and forecast data was estimated using industry benchmarks. Heat demand profiles were calculated using energyPRO which enabled plant sizing to be determined.

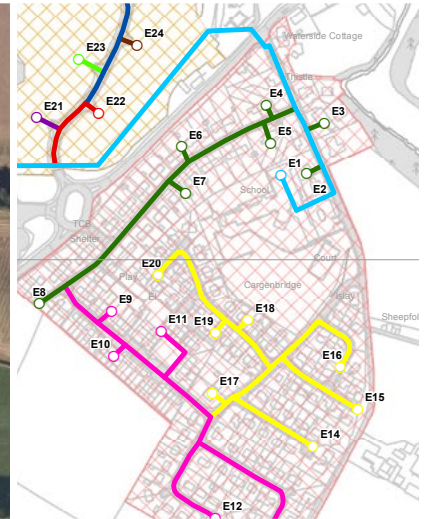
Heat network concept design

A heat network layout drawing was produced showing pipework routes and a phased building connection programme. The pipework layout was determined taking account of local physical constraints, including roads, buildings and existing services, and with the aim of minimising network length and maximising linear heat density. An initial appraisal of the connectability of the proposed buildings was conducted and assumptions presented for physical connection requirements and operating temperatures.

Financial assessment, including phased construction plan

A financial assessment was conducted using Natural Power's in-house modelling tool. The 20-year model estimated capital costs and annual operating costs and revenue streams. The scheme was analysed using a discounted (NPV) cash flow model incorporating the Council's cost of capital, and the IRR was determined. Sensitivity analysis was carried out on key project variables to determine the impact on IRR and NPV.

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Services Provided:

Planning and environmental assessment, including carbon savings

Natural Power estimated the annual carbon savings versus business as usual using UK Government emission factors. Natural Power advised on how the planning system both supported and regulated the project, taking particular account of gaseous emissions to the atmosphere.

Commercial considerations

Natural Power advised on potential business ownership structures, including potential partners and their interests, and to key factors that could impact on the preferred business model. Advice was also given on how to approach heat supply contracts.

Risk Register

A detailed Risk Register for the project was produced which categorised and scored risks according to the likelihood of their occurrence and the severity of their impact. Recommendations on how to mitigate risks were given, which were then re-scored assuming the proposed mitigation measures were put in place.

Added value:

Dumfries and Galloway Council sought to understand whether a technically and financially viable heat network could be built in Cargenbridge to deliver carbon savings and provide heat at affordable prices. Through detailed analysis of heat loads and financial calculations, Natural Power advised the Council on how a potential scheme could deliver on their objectives. The study enabled the Council to decide how to proceed at Cargenbridge and helped inform their strategy for heat networks on a regional level.

// Natural Power delivered a detailed heat network study for us at very short notice. The study gave us a vital understanding of the partnership approach in district heating networks and how this feeds into developments on a wider regional level. The expertise of Natural Power and their ability to deliver in a tight time scale was a key part of the project. //

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