

**EXETER CITY COUNCIL****EXECUTIVE  
18 JUNE 2013****EXETER ENERGY NETWORK****1.0 PURPOSE OF REPORT**

- 1.1 This report advises Members of the final outcomes of the detailed feasibility study into the potential for District Energy in Exeter. It asks for approval to enter into a Memorandum of Understanding with other stakeholders to prepare a business case for District Energy and recommend a preferred structure for an Energy Services Company to deliver the network.

**2.0 BACKGROUND**

- 2.1 We commonly think about heat as something generated on-site in individual buildings; the most common sources of space heating being gas boilers, electric heaters, and oil boilers. However, district heating networks can be used to transport heat to consumers through insulated pipes, so that the source of the heat is not within the building and is on a larger scale. There are around 2000 such networks in the UK, whilst most of these are small scale serving campuses or new inner city mixed commercial and residential developments and high-rise flats there are a number of city scale schemes already operating in Woking, Southampton, Sheffield, Nottingham, Tower Hamlets, Southwark, Pimlico, Harrow, Aberdeen, Lerwick, Lisburn and of course Cranbrook. The Government believes there is great potential to develop networks so that they can play a part in the move to low carbon heating. The Governments approach is set out in the DECC publication "The future of heating: meeting the challenge" published 26 March 2013.
- 2.2 District energy networks can allow us to benefit from increased efficiencies of fuel use through local combined heat and power engines and also to take heat from many new sources of heat such as waste industrial heat. They also offer energy storage potential, which is important given the highly variable nature of demand for heat, and the growth in intermittent renewable electricity supplies.
- 2.3 The creation of district energy networks in those parts of Exeter where evidence suggests that they will be feasible and viable is a requirement of Policy CP13 of the adopted Core Strategy. The draft Development Delivery Development Plan Document includes policies that will provide additional policy support. The areas identified so far are Monkerton and Hill Barton urban extension, Matford and south west Exeter and the City Centre, Heavitree Road and Wonford corridor.
- 2.4 A detailed feasibility study has now been completed. The ECC portion of the required funding came from the Waitrose Section 106 contributions. The study concludes with 10 recommendations for the implementation of a district energy network. A full copy of the completed study is available in the Member's room.

### **3.0 EXETER ENERGY NETWORK STUDY APRIL 2013**

- 3.1 The Exeter Energy Network Study, carried out by Parsons Brinkerhoff working with Northcroft, was an initiative supported by the University of Exeter, Royal Devon and Exeter NHS Foundation Trust, Devon County Council and Exeter City Council.
- 3.2 There are low carbon and renewable energy policy drivers at national and international levels. The Government's Heat Strategy works in parallel with the proposed decarbonisation of the electricity system and promotes the use of district heating in dense urban areas as a means to help meet ambitious UK carbon reduction targets. The Heat Strategy emphasises that district heating networks are an enabling technology which allows future low carbon technologies to be implemented more quickly and at lower cost. The reduction of CO<sub>2</sub> emissions is a key component of each of the participating organisations' long term energy plans and a District Heating network is seen as potentially a major component for achieving this goal.
- 3.3 The study builds on previous work related to the City Centre by Cofely District Energy and shows that retrofit district heating schemes can also be viable in Exeter and deliver an annual emissions reduction of the equivalent of 9,800 tonnes of CO<sub>2</sub>. If the SW Exeter Urban Extension is delivered emissions savings could increase to 11,500 tonnes of CO<sub>2</sub> annually.
- 3.4 The study has assessed the economic and emissions reduction performance of potential energy networks: A small scheme serving mainly new developments around the Sidwell Street; a scheme also serving loads on Heavitree Road (Waitrose, St Luke's Campus and Heavitree Road Hospital Site); a scheme serving these plus the Main RD&E site at Wonford and extending to County Hall; and a scheme that extended to Marsh Barton. A summary of the results is appended to this report.
- 3.5 Heat supply from gas fired Combined Heat and Power (CHP) at the RD&E and in the City Centre and the Energy from Waste (EfW) plant at Grace Road was compared against the current supply from gas boilers. This analysis was based on an assumption that energy prices rise in line with DECC's central energy price scenario. The sensitivity of the best option within each scheme was also assessed using Department of Energy and Climate Change (DECC) high and low energy price scenarios. Finally the sensitivity of the schemes supplying heat from the Energy from Waste (EfW) plant at Grace Road to high and low levels of support under the Renewable Heat Incentive (RHI) has also been assessed.
- 3.6 A scheme supplying Wonford and Heavitree Hospitals, St Luke's University Campus and new developments and existing loads in the City Centre from a gas fired energy centre at Wonford hospital is the most financially attractive scheme under all price scenarios examined. Using DECC's Central price scenario this Wonford and City Centre scheme provides an Internal Rate of Return (IRR) of 8.9%. The smallest scheme based on energy supply from an existing BT exchange to the Sidwell Street area provides a 4.5% IRR while the largest scheme based around heat supply from the EfW plant, yields a 3.9% rate of return (with the RHI at 1p/kWh).

- 3.7 The level of RHI payments has a significant impact on the schemes supplied with heat from the EfW plant. Using DECC's central price projection with the RHI at 1p/kWh the Net Present Value (NPV) is £1.1m. If the tariff for RHI rises to 4.1p/kWh as indicated in a recent Government consultation then the NPV rises to £10.3m and the IRR to 7.4%.
- 3.8 The EfW heat supply schemes also perform significantly better at higher energy prices than the purely gas fired schemes. This is because the heat price at the EfW plant is less sensitive to energy price rises and so the relative cost benefit of EfW heat supply increases faster than schemes with gas as the fuel. A combination of higher prices and increased RHI support would favour the EfW supply schemes.
- 3.9 The study includes a high level assessment of the potential heat supply available from the EfW plant to support development in the SW Exeter master plan area and the associated costs. The SW Exeter masterplan area is potentially a standalone scheme although the EfW heat supply to it would be better delivered under the same project delivery vehicle as the city centre schemes. SW Exeter has not been evaluated in detail by this study but is the subject of a separate study. As the masterplan area crosses authority boundaries and the scheme relies on heat from the DCC commissioned EfW plant, the fact that the New Growth Point already brings together all of the necessary parties in support of low carbon development is a major advantage.
- 3.10 As with DH schemes in other cities in the UK it is likely that the Exeter Energy Network will expand over time. Once in progress this type of scheme can underpin delivery of an overarching vision for a low carbon city. The key challenge is deciding how and where to start.
- 3.11 It is clear from this study that the hospital is critical to the initial development of retrofit district heating in Exeter. It represents about half the heat load of the potential customers identified; has a site for a gas fired CHP energy centre and, most importantly, can consume the electricity generated on-site thereby maximising the value of the scheme.
- 3.12 The financial indicators of the Wonford and Heavitree Hospitals, St Luke's University Campus and new developments and existing loads in the City Centre scheme suggest that it could be partly funded by private sector investment. The scheme cashflows would cover all the costs of funding if it were to be financed via prudential borrowing. This conclusion is cautious because there is considerable further work needed to develop these economics into an ESCO business case which captures all of the potential value identified. Collaboration and openness between the stakeholders through a District Heating Group, preferably as part of the Growth Point Low Carbon Task Force, will be important if this is to be achieved. It will also be essential to engage the right private sector delivery partner to bring expertise and management drive to a suitable delivery vehicle. Development of a clear set of agreed objectives between the stakeholders, and then instigating a process to select the best structure and partner to achieve these objectives, is a priority.
- 3.13 Other parts of the network, while showing positive net present values (NPVs), are less financially attractive and have potential barriers to implementation. However, if the vision for a greater city wide scheme is to be realised stakeholders will need to tackle these barriers. To do so the stakeholders will need to be able to exert a degree of control over the investment policy of the

delivery vehicle. This may include reinvestment of surpluses from most viable parts of the network and/or bringing in lower cost finance from public sector sources. The stakeholders will need to have the same control across the various projects and the three key projects identified should be carried forward as part of the same project delivery vehicle.

- 3.14 The one area of the proposed City Centre scheme that encompasses significant new developments is the Sidwell Street scheme. The assessment shows that, while connection to a larger scheme would be preferable, a scheme based on serving new developments around Sidwell Street could be viable in its own right. The impending build out of the new developments connecting to this scheme suggest that the Sidwell Street area merits further dedicated follow up to maximise the future benefits to the wider scheme. The planning led nature of this scheme will need the involvement of the City Council.
- 3.15 Three clear development opportunities have therefore emerged from the study; Wonford and the City Centre, SW Exeter and Sidwell Street. The need for, and benefits of, the coordinated development of these and involvement of all the stakeholders has also been clearly identified.
- 3.16 At this stage, the most likely structure for taking forward district energy in Exeter is a public/private sector ESCO. This would have at least a partial involvement in all these networks and would therefore retain the ability to influence the development of schemes both in the City and across the Growth Point.
- 3.17 Making resource available within each stakeholder organisation and the need to commission external support (technical, financial and legal) during the process of selecting a private sector partner will be important for success. Estimates of up to £0.5m are typical for establishing an ESCO. This sum, while high, should be seen in the context of the overall level of investment in the City that would result from these schemes. Eight potential external funding sources including DECC Low Carbon City programme may provide some of this funding.
- 3.18 Recommendations for implementing the Exeter Energy Network are summarised as follows with actions on each point undertaken to date noted:

Recommendation 1. Establish a stakeholder District Heating Group, as part of the Growth Point Low Carbon Taskforce, to drive and coordinate the development of District Heating.

Actions: An officer level District Heating Project Group comprising representatives from the RD&E, DCC, ECC, TDC, University of Exeter and the Growth Point team has been set up. This group will draw in expert advice and support as required.

Recommendation 2. Establish a mechanism for support to stakeholders in delivering necessary studies to enable decision making and underpin internal governance requirements

Actions: This support is currently being offered by the project group.

Recommendation 3. Develop a stakeholder agreement setting clear objectives and the basis for participation

Actions: A draft Memorandum of Understanding between the parties listed under the response to point 1 is appended to this report. It is intended that approval for such an MoU to be signed by ECC be sought of the Executive at the meeting of 18<sup>th</sup> of June 2013.

Recommendation 4. Identify and apply for funding where/when available.

Actions: Funding bids to the Regional Growth Fund round 3 have been made and the DH Project Group are seeking to access to current Department of Energy and Climate Change funding for district heating. Other potential funding sources will be pursued as opportunities arise.

Recommendation 5. Create work groups to follow up the three network workstreams; Wonford and the City Centre, SW Exeter and Sidwell Street.  
Recommendation 6. Identify/appoint legal, financial and technical advisors.

Recommendation 7. Develop the overall business case for the DH scheme(s) including selection of preferred structure for ESCO participation.

Actions: The MoU referred to under point 3 allows the group to work collaboratively as far as the preparation of an outline business case and a recommended Energy Services Company structure. A report would be brought back to members at that stage and seeking endorsement of the recommendation and commitments to further participation.

Recommendation 8. Undertake the selection of a private sector partner based on the stakeholder agreement and business case.

Recommendation 9. Develop the ESCO structure and associated documents.

Recommendation 10. Establish the ESCO and commence delivery.

## **4.0 CONCLUSIONS**

- 4.1 It is apparent that a viable scheme for a significant heat network is likely to emerge and that one which also uses the waste heat from the EfW plant is also expected to be viable. A summary of the results is attached to this report as Appendix 1.
- 4.2 The establishment of an Energy Services Company (ESCo) with public sector participation is believed to be the most effective way forward in delivering the 'city centre' scheme and collaboration with other public bodies the best way of delivering the necessary leadership.
- 4.3 A Memorandum of Understanding between the key stakeholders committing them to work together has been drafted. The purpose of this is to set out the commitment of the partners to moving forward the outcomes of the study towards the delivery of the Exeter Energy Network. The first steps are to prepare an outline business case with which to test market interest and to present recommendations for an ESCo structure.

## **5.0 RECOMMENDATION**

- 5.1 That Executive agrees that ECC continue to support the project with officer time, sign the Memorandum at Appendix 2 and request that a report is brought back to Executive at such time a business case and assessment of the need for public sector involvement has been prepared and soft market testing has been undertaken.

**RICHARD SHORT**  
**ASSISTANT DIRECTOR CITY DEVELOPMENT**

Originator: Howard Smith

### **ECONOMY & DEVELOPMENT DIRECTORATE**

**Local Government (Access to Information) Act 1972 (as amended)**

***Background papers used in compiling this report:-***

APPENDIX 1: Study results summary table.

APPENDIX 2: Draft Memorandum of Understanding