

# Cabinet Report



Listening Learning Leading



Report of Head of Corporate Services

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## Didcot Garden Town Heat Mapping and Masterplanning

### Recommendations

- (a) Cabinet is requested to approve an application to Government for £60,000 match funding for a detailed feasibility study into the technical and commercial viability of a North Didcot district heat network using waste heat from Didcot power station.
- (b) Cabinet is requested to approve the allocation of £15,000 from South and £15,000 from Vale, from existing resources in the Didcot Garden Town and Energy budgets, to fund the councils' share of this work.
- (c) Subject to the above government grant funding being approved and received, Cabinet is requested to agree that the Lead Cabinet Member can approve, via an ICMD, to; i) implement the proposed project ii) delegate authority to the head of housing development and regeneration to finalise terms of, and enter into, a drawdown contract for the appointment of AECOM to deliver the feasibility study under the Places for People Placemaking Hub framework approved at the Cabinet meetings of 5 October and 6 October, as permitted under the framework.

## **Purpose of Report**

1. This report presents the results of the Didcot Garden Town Heat Mapping and Masterplanning project and seeks agreement for the next steps. Specifically, the report seeks approval to spend £90,000 (£30,000 from existing council resources and £60,000 from government match funding when received) on a detailed feasibility study for a district heat network in 'North Didcot' using waste heat from the Didcot Power Station.

## **Corporate Objectives**

2. South: This project supports the corporate objective to unlock the potential of Didcot - masterplan the wider town centre to develop a transformational change programme that meets garden town objectives.
3. Vale: This project supports the corporate decision to realise the Didcot Garden Town Vision.

## **Background**

4. This report presents an overview of the Didcot Garden Town Heat Mapping and Masterplanning project, which took place from January to September 2017.
5. The final project report including full technical and commercial analysis is available [here](#) and includes an Executive Summary for a non-technical audience.

## **What is a district heat network?**

6. A district heat network is a network of buried pipes connecting a cluster of buildings that require heat. The network is linked to an 'energy centre' which supplies heat from one central source. An energy centre can be powered by different fuels and a variety of technologies, ranging from traditional sources such as gas powered combined heat and power (gas CHP) to innovative or renewable sources such as waste heat, hydrogen, solar, ground source heat and biomass.
7. District heat networks can have the following benefits:
  - reduce emissions of greenhouse gases
  - reduce pollution and improve air quality
  - increase fuel security (resilience)
  - improve affordability of fuel supply (reduce fuel poverty)
  - contribute to a low carbon or zero emissions strategy
8. District heat networks can also contribute to local authorities' targets and aspirations for regeneration, inward investment, local jobs and growth. A local council's role in developing district heat networks can range from sponsor, planning authority and relationship broker to heat customer or heat source provider.

## **Government aims and funding**

9. The government has set ambitious climate change targets for 2050:
  - heat from domestic properties will need to be almost entirely zero carbon
  - industrial properties will need to reduce emissions by 70%
10. The Future of Heating (UK Government, 2012) identified district heat networks as a key element of the UK's cost effective delivery of greenhouse gas targets.

11. The government's Heat Networks Delivery Unit (HNDU) provides guidance on district heat networks and allocates funding support for feasibility studies and business case preparation.
12. In addition, the Heat Networks Infrastructure Project (HNIP) has £320m funding for capital investment to bridge any gaps that may exist between project costs and a commercially viable level of investment.
13. HNDU project support involves five stages:
  - a. heat mapping - exploration, identification and prioritisation of heat network opportunities
  - b. energy masterplanning - high-level technical and financial modelling
  - c. feasibility study - technical feasibility, design, financial modelling and delivery approach
  - d. detailed project development - more detailed technical and financial feasibility, and outline business case; contractual arrangements
  - e. commercialisation, including some legal costs; tariff structuring; financial business case modelling

To date, we have completed stages 1 and 2 for the Didcot Garden Town area of influence.

14. Note that a district heat network can use a low carbon fuel from the start, however this is not essential. A network can be put in place now with a conventional fuel. The fuel source in the energy centre can be substituted in the future with a low carbon alternative when the first plant reaches the end of its life. This would be much easier and cheaper than retrofitting many individual buildings and is a key reason why the Government is providing funding for heat networks.

### Overview of study method

15. The heat mapping stage of our project (HNDU Stage 1) included:
  - data collection of heat demands from existing buildings and proposed developments
  - creation of GIS heat maps
  - review of potential sites and technologies with councils and key stakeholders
  - selection of sites and clusters of buildings showing a concentration of heat demands to take forward for energy masterplanning
16. The energy masterplanning (HNDU Stage 2) included:
  - site visits and further energy data analysis
  - preliminary network design and energy centre locations
  - consideration of appropriate low / zero carbon technologies
  - high level techno-economic modelling
  - sensitivity analysis
  - additional site-specific information from review with councils and key stakeholders
  - review of risks and key issues
  - recommended schemes and next steps

### Preferred schemes

17. The Heat Mapping and Masterplanning report recommends the following four schemes:

Priority	Name	Description	Key reasoning
1=	North Didcot	Energy centre on RWE (power station) site. Potentially serving Didcot A, Giant and D-Tech enterprise zones and non-residential buildings at NE Didcot. Potential to extend into Milton Park. Water source heat pump technology connected to power station waste heat circuits and River Thames	Innovative scheme of potentially national significance. Good greenhouse gas emissions savings and customer energy cost savings. Strong engagement from RWE. Some network demand risk although opportunities to mitigate this with potential additional connections
1=	South Gateway	Commercial and residential development adjacent to Didcot Railway station. Gas-engine CHP technology	Small relatively simple network. Potentially valuable pilot scheme for the councils. Relatively low risk. Strong stakeholder engagement. Will deliver sustainability objectives at prime Garden Town site.
3	Harwell	Rutherford Appleton Laboratory existing buildings at Harwell Campus. Water source heat pump technology gathering waste heat from cooling towers circuit plus a gas engine CHP system	Reasonably innovative scheme, low demand risk, reasonable greenhouse gas emission savings, some good stakeholder engagement. Potential requirement for gap funding.
4	Culham	Gas engine CHP technology serving existing Culham Science Centre buildings and non-residential new developments.	High indicative financial performance and customer energy cost savings, although higher network demand risk and stakeholder risk. Low innovation

18. Further details on these schemes including financial assessment, site opportunities and constraints, proposed heat network routes, key assumptions, key risks and sensitivity analysis can be found in the full Heat Mapping and Energy Masterplanning report. Other potential schemes are also described that, at present, are considered to have lower priority.

### Options

19. There are three potential options for action for each of the four top priority heat networks:

1. do nothing
2. present findings to key stakeholders  
rely on other parties to initiate and develop networks  
councils can promote and advise
3. present findings to key stakeholders  
councils take a lead, in partnership with others, in pursuing more detailed feasibility work (HNDU stage 3) including technical and commercial viability

20. The Councils propose to take the following actions with respect to the four priority projects:

#### **Priority Project 1=: North Didcot: Option 3**

This is an exciting opportunity for a strategic and nationally significant project using power station waste heat. Although there has been good stakeholder engagement, there are many disparate interests in this proposal which will require leadership. The councils propose to take the lead and commission a detailed feasibility study to take this project forward. A bid for match funding from HNDU round seven was made in December 2017. A stakeholder presentation took place in November 2017. Accordingly, this paper is recommending that South and Vale Councils agree to provide the £30,000 match funding on a 50:50 basis, so that an application for £60,000 can be submitted to HNDU.

### **Priority Project 1=: South Gateway: Option 2**

The councils will lead on the development of the South Gateway project as part of the Didcot Garden Town Delivery Plan. A heat network with a centralised energy centre will be specified as the preferred heating option in the South Gateway development brief. This is a small project that will ultimately be funded by whichever developer is given the task of developing South Gateway site, and it is not thought that further government-funded feasibility studies are required.

### **Priority Projects 3 and 4: Harwell and Culham: Option 2**

The councils has disseminated the results and recommendations through presentations to Harwell Campus and Culham Science Centre. Due to the public ownership of these sites, we recommend that feasibility studies and project development for these two projects be led by the land owners or their developers with the council taking on a more advisory or partner role.

## **Financial Implications**

21. The detailed feasibility study for the 'North Didcot' proposed district heat network will cost an estimated £90,000. This sum includes allowances for complex technical modelling for this innovative proposal, extensive stakeholder engagement, and a project management resource to co-ordinate activities. The Project Board will include RWE npower and other external stakeholders.
22. A bid for match funding of £60,000 from HNDU was made in December 2017. The councils' contribution of £30,000 will be met from existing resources (Didcot Garden Town and Energy budgets).

## **Legal Implications**

23. This project involves appointing a consultant to carry out detailed technical and commercial modelling. State Aid regulations are not believed to apply to this project as it does not involve the establishment of a heat network delivery vehicle, but legal advice will be sought on this once the detailed specification is available.
24. We expect to be procuring this work under an established framework agreement. A full procurement exercise is not likely to be necessary. Legal advice will be obtained in negotiating the draw down contract in order to protect the council's interests.

## **Risks**

25. This project does not commit the council to any further action beyond the feasibility study proposed. A more detailed study may show that the project is not viable or stakeholder interest may not be sufficient. Neither of these outcomes are thought to present any reputation risk to the council as the act of investigating these forward looking and innovative energy options will in itself put the Councils in a positive light.
26. The risk of the contract costing more than the budget will be mitigated by reviewing the specification in conjunction with the suppliers if necessary.

## **Public relations implications**

27. We have had regular meetings with stakeholder organisations throughout the project.

28. The project will be of interest to residents and an opportunity for the council to highlight our work on viable environmental solutions to the business sector and other partners. Some may believe that the money spent on studies and eventual implementation may outweigh the positive impacts. This can be counteracted by highlighting the economic and environmental benefits, and the fact that the final cost of the projects is expected to be met by partners and developers.

## **Conclusion**

29. This report provides an update on progress to date with the Didcot Garden Town Heat Mapping and Masterplanning project. It invites councillors to approve the expenditure to carry out further feasibility work.