

Report for: ACTION



<b>Contains Confidential or Exempt Information</b>	NO – PART I
<b>Title</b>	<b>Maidenhead District Energy Network</b>
<b>Responsible Officer(s)</b>	Russell O'Keefe, Strategic Director Corporate and Community Services
<b>Contact officer, job title and phone number</b>	David Scott, Head of Governance, Partnerships, Performance and Policy. Tel: 01628 79 6748
<b>Member reporting</b>	Cllr Coppinger, Lead Member for Sustainability
<b>For Consideration By</b>	Sustainability Panel
<b>Date to be Considered</b>	14 <sup>th</sup> March 2016
<b>Implementation Date if Not Called In</b>	Immediately
<b>Affected Wards</b>	n/a

### REPORT SUMMARY

1. This report provides information about decentralised energy and how the Council could potentially benefit from a district energy network in Maidenhead.
2. This report recommends that members provide comment on the proposed scheme and if there is support in principle for the scheme it recommends an initial assessment is carried out by specialist consultants to determine its viability.
3. This recommendation is being made to ensure members have the relevant background information, and are interested in the scheme in principle, before any decisions are made on whether further investigations should be carried out.

### If recommendations are adopted, how will residents benefit?

Benefits to residents and reasons why they will benefit	Dates by which residents can expect to notice a difference
1. Should members agree that initial investigations are carried out then this will help the Council to better understand the merits of a district energy scheme in Maidenhead. If the scheme is found, by the initial investigations, to be viable and it is implemented then this may lead to reduced energy costs for the Council and it may lead to a commercial enterprise. The scheme would therefore help to improve the Borough's value for	March 2017

<p>money for its residents. Since district energy schemes are more efficient and can provide more security of supply and flexibility than traditional grid based systems this scheme will also help to improve the sustainability of the networked buildings and therefore Maidenhead town centre.</p>	
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## 1. DETAILS OF RECOMMENDATIONS

**RECOMMENDED:** that the members of the Panel provide comment on the district energy network proposal and determine whether there is support in principle for the scheme. If there is support in principle and the panel is in agreement that the scheme should be investigated further, an initial high level assessment will be carried out by a specialist consultancy to determine the viability of a district energy network in Maidenhead at a cost of £6k.

## 2. REASON FOR RECOMMENDATION(S) AND OPTIONS CONSIDERED

- 2.1 The Royal Borough is currently regenerating Maidenhead town centre which means that many new buildings are being built in close proximity to one another. All of these buildings will require energy in order to maintain their required comfort levels. The energy provided to the buildings could come from traditional grid supplies but as an alternative the energy could come from a local 'decentralised' energy plant. The energy plant could deliver energy in the form of heating, cooling and electricity to buildings that are connected to the Maidenhead network. There are a number of potential reasons for constructing an energy network such as this, these include: generation of low carbon energy, reduced energy prices, improved energy security and income generation.
- 2.2 Should the Sustainability Panel be supportive of the proposal the first step in taking the scheme forward would be to carry out an initial assessment to assess the scheme viability. This assessment would be a high level appraisal only, with the principal purpose of assessing whether the authority should commission more detailed technical and economic feasibility studies.

Option	Comments
(a) Members of the panel consider the district energy network scheme and decide to not investigate the scheme further.	(a) By not investigating the decentralised energy scheme, the Council may potentially be missing a positive and commercially viable enterprise.
(b) Members of the panel consider the district energy network scheme and decide that an initial assessment for a district energy network in Maidenhead should be conducted. <b>Recommended</b>	(b) The initial assessment may prove that the scheme is viable. This could potentially mean in the future, if the scheme was to proceed, that not only the Council successfully regenerated Maidenhead but it also ensured efficient local large scale energy supply to a number of Maidenhead buildings. This

Option	Comments
	project could help the Council to improve the sustainability of Maidenhead, reduce its energy bills and could potentially lead to a commercial enterprise.

### 3. KEY IMPLICATIONS

Defined Outcomes	Unmet	Met	Exceeded	Significantly Exceeded	Date they should be delivered by
Subject to member support of the district energy network proposal, conduct an initial high level assessment of a network in Maidenhead	No work carried out	Assessment carried out by 31/07/16	Assessment carried out by 30/06/16	Assessment carried out by 31/05/16	31 <sup>st</sup> July 2016

### 4. FINANCIAL DETAILS

#### 4.1 Financial impact on the budget

Capital	2015/16	2016/17	2017/18
	Capital £'000	Capital £'000	Capital £'000
Pre-approved	£0	£6	£0

An initial assessment conducted by an energy consultancy would require an estimated budget of £6000 (based upon a quotation provided). This can be funded from the approved Energy Savings Initiatives capital budget for 2016/17 currently held within the Performance team.

### 5. LEGAL IMPLICATIONS

5.1 There are no direct legal implications arising from this report.

## 6. VALUE FOR MONEY

- 6.1 This report, which recommends an initial assessment is conducted, may lead, if the project is found to be viable, to the Council reducing its expenditure on energy and potentially creating a commercial enterprise.

## 7. SUSTAINABILITY IMPACT APPRAISAL

- 7.1 Decentralised energy is considered a more sustainable model for energy generation due to its high efficiency when compared to traditional centralised power station generation and distribution.

## 8. RISK MANAGEMENT

Risks	Uncontrolled Risk	Controls	Controlled Risk
If an Initial assessment is conducted and it does not provide any further information to suggest that the scheme is viable or not.	Medium	Council officers provide as much information as possible to allow a full assessment to be carried out.	Low

## 9. LINKS TO STRATEGIC OBJECTIVES

- 9.1 The district energy scheme meets the following strategic priorities of the Council:

### Residents First

- Improve the Environment, Economy and Transport

### Value for Money

- Improve the use of technology
- Invest in the future

### Delivering Together

- Deliver Effective Services

### Equipping Ourselves for the Future

- Developing Our systems and Structures

## **10. EQUALITIES, HUMAN RIGHTS AND COMMUNITY COHESION**

10.1 There are no direct equalities, human rights or community cohesion implications arising from this report.

## **11. STAFFING/WORKFORCE AND ACCOMMODATION IMPLICATIONS**

11.1 There are no direct staffing/accommodation implications arising from this report.

## **12. PROPERTY AND ASSETS**

12.1 This report contains content relating to the generation of usable energy to a number of buildings in Maidenhead including potentially the Town Hall and Maidenhead Library.

## **13. ANY OTHER IMPLICATIONS**

13.1 There are no other implications.

## **14. CONSULTATION**

14.1 No formal consultation has been carried out.

## **15. TIMETABLE FOR IMPLEMENTATION**

<b>Date</b>	<b>Details</b>
31/07/2016	Initial assessment completed

## **16. APPENDICES**

16.1 There are no appendices.

## **17. BACKGROUND INFORMATION**

### **What is decentralised energy?**

17.1 Decentralised energy is where energy is converted into useful forms of energy such as electricity, heat and cooled water on a local scale. It is therefore the opposite of electricity generated through a power station which is classed as centralised energy generation.

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

17.2 One form of decentralised energy can be achieved using a technology called combined heat and power (CHP) which generates electricity and heat usually from natural gas. Cooled water for cooling applications can also be generated when the CHP is coupled with an absorption chiller. The inclusion of cooling capacity with heating and electrical capacity is called trigeneration.

17.3 CHP units are already being used in the borough, for example at both Magnet and Windsor leisure centres there are CHP units, so the utilisation of CHP is nothing new. This project, however, seeks to go further than individual buildings using their own CHP units by creating a network of buildings connected to a CHP unit via private wires and pipes. This would create a district energy network. Whilst the

majority of generation would likely come from a CHP unit, the network does not necessarily have to be purely fed by one. The network can also encompass other generation technologies that feed into the network to help balance the supply and demand.

### **What are the benefits of a district energy network?**

17.4 District energy networks offer a number of direct benefits over centralised generation:

- They enable the efficient transportation and use of heat, cooling and electricity for a wide variety of users
- They allow a broad range of energy generation technologies to work together to meet demands
- They enable fuel flexibility through different generation sources
- They help to efficiently manage supply and demand of energy
- They lower costs of energy generation
- They increase fuel efficiency through the use of CHP
- They reduce labour and maintenance cost as compared to individual systems in each building e.g. boilers

17.5 These benefits in turn deliver these further beneficial outcomes:

- Significant reduction in carbon emissions through the optimisation of heat supply
- Improved security of supply for the energy network.

### **Why should the Royal Borough construct a district energy network and why now?**

17.6 The Royal Borough of Windsor and Maidenhead is a pioneering authority in many respects. The most recent pioneering project in the energy field alone was the implementation of an energy performance contract under the RE:FIT programme. The authority was the first in the country outside London to work on the scheme. Constructing a district energy network in the centre of Maidenhead, which would be the first of its kind in Berkshire, could provide another pioneering project that the authority could be very proud of. The authority would be constructing an efficient energy network for the future which would help improve the sustainability of the town.

17.7 With the huge development plans for Maidenhead town centre comes a great opportunity to include a district energy network as part of the wider regeneration opportunities. With so many new buildings being built it presents a unique chance to build in an energy network as part of the construction process of these buildings. The close proximity of the new buildings in the centre of Maidenhead also ensures that the appropriate connections would be viable. Of course there are also many existing buildings that will remain in the town centre and some of these buildings could also be linked to the network. This would deliver more efficient and cost effective energy to these buildings, for example the Town Hall.

17.8 National grid is currently very concerned about supply margins in the electrical grid. This is because many power stations are being closed down and the gap between what they can supply and what energy consumers require is closing. Schemes are already in place for decentralised generators to provide capacity in times of need as well as schemes for the end user to reduce demand at peak

times to allow the network to appropriately balance itself. Local generation capacity would allow Maidenhead to provide capacity to the grid at times of need and be reimbursed for this. Furthermore, following this demand for extra capacity on the grid the Department for Energy and Climate Change (DECC) also offer financial assistance with progressing heat network schemes to implementation. In the recent autumn budget government showed its commitment and has pledged £300m towards heat networks over the next 5 years.

### **Initial assessment**

- 17.9 An initial assessment would be needed to initially understand whether the project is feasible as a starting point. The assessment would be a high level appraisal only, with the principal purpose of assessing whether the authority should commission more detailed technical and economic feasibility studies.
- 17.10 This assessment would focus on major development sites, applying feasibility criteria to test their suitability for supply by district energy. In parallel to this, existing building stock in close proximity to anticipated development sites will also be appraised for their potential to connect to a decentralised energy network. The assessment would primarily be focusing on heating and cooling demand and mapping where the energy demand is around Maidenhead. Following the assessment, recommendations based on the scheme viability would be presented to allow further discussion and a decision on the next steps.

### **Funding**

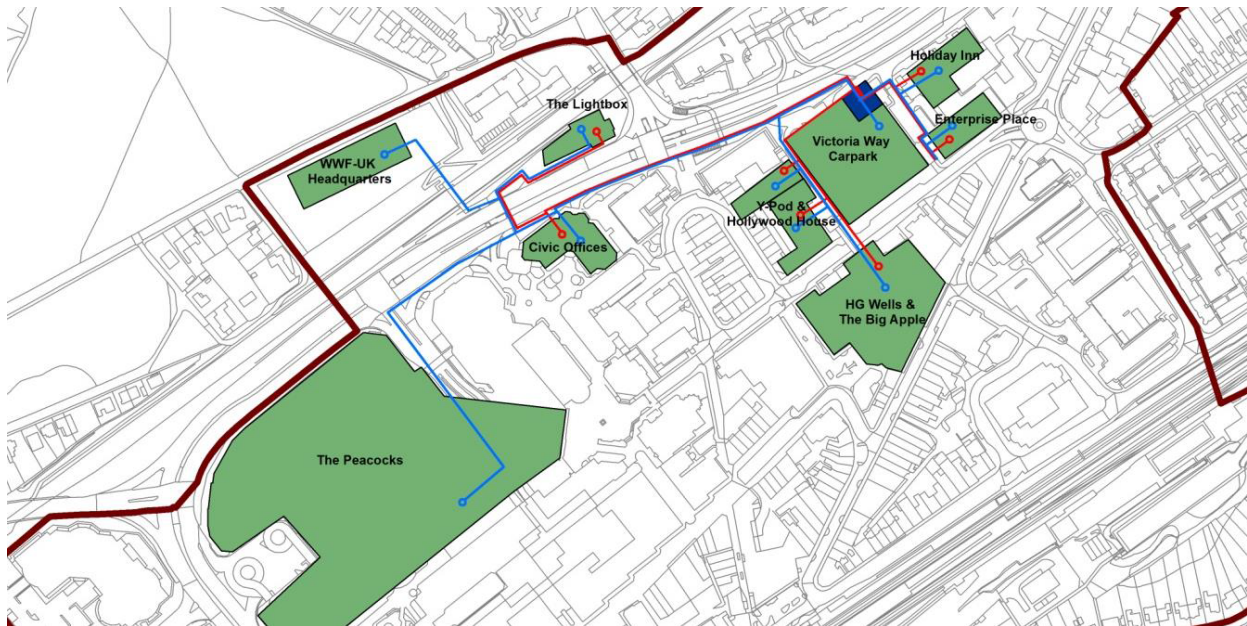
- 17.11 A scheme such as a district heating network is a large scale project that would require appropriate levels of funding. There are a number of stages of the scheme that would require consideration:
1. Initial assessment
  2. Specification, tender, master mapping, full feasibility and project development
  3. Installation
  4. Ongoing running costs
- 17.12 Step 1 is the step currently being proposed.
- 17.13 Step 2 can currently be carried out using match funding from DECCs Heat Network Delivery Unit (HNDU) – it is currently unclear how the recent government pledge of £300m will affect this funding.
- 17.14 At step 3 there are a number of possibilities for funding:
1. Authority self finance
  2. Private energy services company finances scheme
  3. 3<sup>rd</sup> party finance
- 17.15 Step 4 costs would be determined by the contracting model with the service provider.

### **Case Study – Woking Borough Council**

- 17.16 Woking Borough Council formed the Thameswey Group of companies in 1999. The group currently has a turnover of roughly £25m and owns assets worth over £70m. Part of the group are two energy service companies (ESCOs) that generate and distribute low and zero carbon energy to public, commercial and private

customers. One of these companies is based in Woking and the other in Milton Keynes.

17.17 In May 2000, Woking Borough Council set up its first Energy Services Company (ESCO), Thamesway Energy Ltd, to build and operate a gas CHP energy station in Woking town centre. The ESCO now includes an energy infrastructure of a 1.6MWe gas-fired Combined Cooling, Heat and Power plant in Woking town centre and nearly 2MWp of Solar PV. This was the first district trigeneration network built in the UK, providing low carbon distributed cooling, heating and electricity networks serving a conference venue, large hotel, council offices, museum and gallery, entertainments complex and over 120 private apartments. Below is a schematic of the Woking network.



17.18 In 2005, a second ESCO was set up by the Thamesway group in Milton Keynes. This ESCO runs and distributes energy from a 6.4MWe gas-fired CHP and provides heat and electricity in the centre of Milton Keynes to over 1100 business and domestic customers. This network currently has a radius of 1.5km and expansion of the network is planned to serve new and existing developments in the area.

## 18. CONSULTATION (MANDATORY)

Name of consultee	Post held and Department	Date sent	Date received	See comments in paragraph:
<b>Internal</b>				
David Scott	Head of Governance, Partnerships, Performance and Policy	24/02/16	25/02/16	Throughout



<b>Name of consultee</b>	<b>Post held and Department</b>	<b>Date sent</b>	<b>Date received</b>	<b>See comments in paragraph:</b>
External				

## **REPORT HISTORY**

<b>Decision type:</b>	<b>Urgency item?</b>
Non-key decision	No

<b>Full name of report author</b>	<b>Job title</b>	<b>Full contact no:</b>
Michael Potter	Energy Reduction Manager	01628 682949