Renewable Energy Select Committee Topic Paper

Energy Networks and District Heating – an opportunity to lead by example in Kent?

While it could be said that the UK has some catching up to do in terms of its utilisation of waste heat from energy production, in the 1930's it was the world leader in CHP and Battersea Power Station had the first decentralised CHP system, supplying heating and hot water to 11,000 London homes in Pimlico, across the Thames[1].

Today, examples of district heating in the UK are rare and so success stories like Woking and Southampton are often cited. European examples are much easier to find with 50% of Denmark's electricity coming from CHP plants.

It is easy to appreciate that making use of the heat generated in energy production is less wasteful than not doing so and that this, in itself, helps to offset the fossil fuel that would be otherwise be required to generate that heat[2]. It is also intuitive that locating plants close to the places where both the energy and the heat is required helps to minimise transmission losses. (Overall efficiency is, by these means, more than doubled.) However, it should be noted that heat recovery comes at a price, which is reduced efficiency of electrical production, so this *cost* needs to be taken into account, particularly since electricity is incentivised through ROCs[3].

David MacKay, author of 'Sustainability without the Hot Air', suggests that *gas powered CHP* 'is a mistake', saying:

> *'I believe we should leapfrog over gas-powered combined heat and power and go directly for heat pumps.'*

He also believes it is important for us to remember that electrical energy is more valuable than heat and we should be wary of efficiency figures that lump those two things together.

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[1] Institute of Civil Engineers (ICE) (May 2009), *Why Waste Heat?*

[2] The Institution of Civil Engineers believe that adding heat recovery systems to centralised power plants could meet five per cent of UK heat demand and cut CO_2 emissions by 10 million tonnes. (The government had set a target of 10GW electricity from CHP plants.)

[3] Renewable Obligation Certificates (ROCs). The Renewables Obligation (RO) is the main support scheme for UK renewable electricity projects in the UK, obliging electricity suppliers to source an increasing percentage of electricity from renewable sources. A ROC is issued to an accredited UK generator for eligible renewable electricity generated, and supplied to customers, within the UK by a licensed electricity supplier. One ROC is issued for each megawatt hour (MWh) of output and each ROC has a monetary value and can be traded.

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A Greenpeace video entitled 'what are we waiting for?' explains the CHP concept and shows that in Copenhagen a high level of efficiency has been achieved by using a variety of fuels, including waste straw, at a site with both power and heat networks. The DVD can be found at:

http://www.greenpeace.org.uk/blog/climate/decentralised-energy-w

Woking Borough Council

Thameswey built its first CHP energy centre in Woking in March 2001 to supply electricity and heat to its civic offices and to businesses in the town centre. This enabled the council to form an ESCo (energy services company) to provide community energy services as a joint venture with Xergi Limited, a Danish company (having a 10% share of the business). Further sustainable energy projects have provided heat and power to Woking's Pools in the Park (fuel cell CHP) and Brockhill Residential Home (PV system). Thameswey are building upon this work with a variety of projects in Milton Keynes.

What does the evidence received so far say on district heating?

The South East England Partnership Board (SEPB) commented that part of their role as regional planning body would be to ensure that the Regional Spatial Strategy and any future regional strategy, included policies as well as a 'means of promoting and enabling appropriate renewable energy development' and that at the medium scale this would include biomass and co-firing power plants with district heating. A medium scale scheme, located correctly, could showcase biomass CHP as a viable technology[4].

Provided there is an adequate supply of waste, processing by anaerobic digestion (AD) can also be used to generate district heating as well as provide continuous electricity[5] and WRG have also provided evidence regarding Allington Energy from Waste (EfW) plant (which is not currently fitted for heat capture) and another of their plants in Nottingham, UK where capture of 375GW of high pressure steam annually is successfully undertaken, supplying via district heat main 5,000 homes and a number of large heat users including shopping centres, civic, educational and recreational sites.[6]

Since any integrated scheme is complex and requires time to set up, it was also pointed out to the select committee that a stable period where the availability of any grant funding or support was unchanged would be an important enabling factor.[7]

[4] CEN written evidence
[5] Hadlow College written evidence
[6] Energy from Waste will be the focus of a forthcoming topic paper
[7] Mr Latimer written evidence

Renewable Energy Select Committee – Hearing 14th April 2010

1. Mr Andy Morgan – KCC Head of Energy Management and Mr Peter Binnie, Head of Operations (Property Group)[8] 1.30 p.m.

KCC officers will update Members on progress at Oakwood House to demonstrate and utilise renewable technologies at the conference centre and will then outline for Members their ideas in relation to a more significant piece of work on the Oakwood Park Estate.

2. Mr John Thorp – Managing Director, Thameswey Energy and The Energy Centre for Sustainable Communities (ecsc) 2.30 p.m.

(We applied to Woking Borough Council for written evidence regarding their district heating scheme and our enquiry was referred to Thameswey, who wrote to us saying they would be happy to come in and speak to the committee.)

Thameswey Energy[9] is the energy trading name of the Thameswey group of companies, established as an ESCo (energy services company) in 1999 by Woking Borough Council to assist them and other private and public sector organisations to meet their carbon reduction targets by delivering locally generated low carbon energy to the community.

John Thorn has over 30 years' experience of energy efficiency and renewable energy technologies in industry and the government sector. He has an MBA from Cranfield, is a Chartered Biologist and a Fellow of the Institute of Energy and the Royal Society of Arts.

One of the core services provided by Thameswey relates to the design, setting up and operation of local energy centres. Thameswey is internationally recognised as a publicly owned ESCo.

Themes/questions

1. The work of Thameswey and ecsc.
2. The 'Energy Centre' concept and how it works
3. Could you tell us something about the infrastructure required e.g. physical accommodation of the plant, pipe and private wire network.
4. What legal hurdles are there and what 'powers' exist (in comparison to the powers that utility companies have?)
5. What is the situation regarding the electricity and gas grids e.g. in relation to the need for back up or if, say, domestic customers wished to install additional renewable technologies of their own, would they be able to do so, and to link to the grid?

[8] Andy and Peter may be supported by other officers according to availability
[9] Information obtained from Thameswey and Thameswey Group websites

6. The Woking system runs on gas which is a low carbon solution – is there (particularly in relation to government incentives) potential to use renewable fuel sources and if so, what are the implications?

7. Can you comment on the viability of CHP/district heating in terms of base heat load and demand, customer buy in and energy pricing?

8. What in your view, are the key considerations and funding options when setting up a new ESCo venture?

9. Could you tell us about C-plan and for example how widely it is used across authorities (in Surrey, elsewhere), the cost of implementation and whether the system has received any positive feedback? (C-plan is a planning tool to assess the performance of a development)