District Energy Vanguards Newsletter

November 2016

Editorial

Standing high?

Two weeks ago the Association for Decentralised Energy (ADE) held its annual heat conference at which Wilfrid Petrie, the CEO of Engie (previously GDF Suez) in the UK delivered a noteworthy speech. Engie's UK operation, known as Cofely (which has also been folded into the new brand) is well known in the district energy sector as the developer heat networks. The approach has been that cities such as Southampton, Birmingham, Leicester and the Olympic Delivery Authority granted Cofely a concession to design, build, finance, operate and maintain (DBFOM) networks over terms ranging from 25 – 40 years. Investment is recouped over the term. Cofely set up a wholly owned special purpose vehicle (SPV) known as an ESCO (Energy Service Company) in each locality to develop and operate the heat network. What Wilfrid Petrie at the ADE conference said was that Engie is no longer focusing on asset ownership but instead providing management, operation and maintenance services to the owners of the assets.

Since 2004 the Greater London Authority has used its planning powers to prioritise heat networks in new buildings as a part of their strategy for London to source 25% of its heating and power needs through local decentralised energy generation by 2025. Since 2010, when data began to be collected, more than 200,000 new build dwellings served by heat networks have been granted planning permission. Previously housing developers usually installed electric systems for space and water heating. These systems were passed to the owners of the flat on purchase. In other words the capital cost was recouped through the sale price. But heat networks are external to the flats and cannot be so easily transferred between developer and purchaser. Furthermore, they cost a lot more than electric heating systems to install. Theoretically they should cost less in use – but the high cost of using an electric heating system is passed onto the resident and therefore does not concern the developer.

Consequently, the DBFOM approach, piloted by Utilicom in Southampton before that company was bought by GDF Suez, was a god send to housing developers. Not only could they hand the ownership of the heat network assets over to another company to own and operate in the long term but they could also get them to finance it as well and so avoid the capital cost. This model has now been followed by other companies with at least three others operating across the UK.
However, this approach has created problems. Firstly, most buyers thought that they had paid for their heating system in the purchase price of the flat. Secondly, in common with other commercial companies these ESCO's need to secure a

return on capital around 15%. This has resulted in high standing charges on top of the unit or variable heat charge. These standing charges clock up even when the resident is not using heat. Had the flat owners paid for the heating system in the purchase price then it would have been covered by the mortgage – currently being offered at 3.5 – 4.5%. In other words the standing charge would be 3 -5 times less. Understandably they are not very happy and some are very vocal about it. Last year's Which? report on heat networks found that the total cost of ownership of a gas heating worked out at 9.55 – 11-6p/kWh, electric at 21.9 – 22.99p/kWh whereas district heating ranged between 5.51 – 14.94p/kWh. So it can be substantially cheaper. But the angry voices of flat owners paying at the higher end are crowding out that message.

Consequently, the news that the company that originally developed this approach has decided to move away from asset ownership is interesting. But that begs the question who will be the asset owners of heat networks?
One possibility is to put the heat infrastructure into a not-for-profit vehicle known sometimes as a 'pipeco' that can accept a much lower return on capital in line with other energy infrastructure, resulting in substantially lower standing charges. A concept paper on it by Dr Tanja Groth of the Carbon Trust and Ian Manders of the Danish Embassy was previously covered in this column.

A second approach being explored by a housing developer is to set up a community owned not-for-profit company. After the development (and heat network) is fully built out, then the assets are transferred to community ownership. It is not clear as yet whether the capital cost is paid via the purchase price and transferred for free or the community-owned company must raise capital to buy out the developer, which it can do at substantially lower rates than the 15% that the ESCO's charge.

A third approach is municipal ownership. Traditionally, most heat networks were developed and owned by the housing department of local authorities. Whilst some continue to provide a good service, others were poorly managed and as with housing itself, suffered from under-investment resulting in a poor service leading to decommissioning. However, the lessons have been learnt from that era. Innovative local authorities, such the London Borough of Enfield, have established municipally owned SPV's that can provide a focussed management and a ring-fenced budget. Nottingham City Council is deriving solid revenues from their ownership of EnviroEnergy. Local authorities can access low cost capital (providing they have sufficient headroom on their present borrowing) which will feed through to lower standing charges. But it remains to be seen if other local authorities will follow this lead given the financial cuts they are enduring.

Lastly, an alternative approach is to focus not on asset ownership as a means of reducing high standing charges but on regulation. This past month Ofgem has published a paper exploring these issues. This recognises the establishment of the Heat Trust as a "positive step" but acknowledges the difficulties with the voluntary nature of the scheme, particularly with a supplier of last resort should the operator go bust. It considers a number potential statutory models. Firstly, as a regulated asset base (RAB). Presently standing charges are high because heat

network projects are perceived as risky which increases the cost of capital. Additionally, the risky capital investment must be recovered from the customers connected only to that particular network. A RAB approach allows it to be recovered from all customers connected to all networks owned by that operator. Socialising the risk across a much larger customer base is one reason why gas and electricity standing charges are much less. However, Ofgem believes is not appropriate as it requires full transparency of the risks and how they are allocated. It also creates a barrier to market entry for new operators as they will only have the few customers on their first project.

A second model is to follow the current regulatory framework for independent gas transporters and electricity distribution network operators. These are licensed by Ofgem and subject price caps that dictate that the charges can be no higher than for other networks. This does not require a detailed understanding of the risks. Or the model used for new electricity interconnections. This allows the network developer to earn revenues depending on how well used and valuable the asset becomes.

It is not yet clear what the answer is. But fresh thinking on ownership and regulatory models are very much to be welcomed, as would government direction. The issue of high standing charges is potentially undermining the reputation of the industry. Disgruntled flat owners blame district energy when it is the way that risks are managed and financed that is causing the problem.

This nut must be cracked.

Michael King
Editor

UK News

Minister sees how Greenock's district heating system is tackling fuel poverty district heating, fuel poverty (Scottish Housing News) 1 December 2016
Paul Wheelhouse MSP, minister for business, innovation and energy, has visited Broomhill, Greenock to see its new £7 million district heating system providing warmer, more energy efficient homes with dramatically reduced energy bills.

Heat Network Regulations Delayed Until 2017 (TEAM Press Release) 2 Dec 2016
The feasibility study and requirement to fit heat meters by December 2016 has been delayed until 2017 as part of the Heat Network Regulations. Find out more.
National Measurement and Regulation Office (NMRO) has announced that the feasibility study and requirement to fit heat meters by December 2016 has been delayed until 2017.

Council approves next stage of £12m River Clyde District Heating Network (Scottish Construction Now) Nov 28, 2016
Queens Quay 1 Ambitious plans to use water from the River Clyde to heat homes and businesses in Clydebank have moved forward after West Dunbartonshire Council agreed the next step in securing funding for a £12 million high-tech heating system. The development would see water extracted from the River Clyde through heat pumps and directed to businesses and homes for the town's Queens Quay area via insulated pipes to be used for heating.

Smart meters system for district heating launched (Network) 19 November 2016
A new smart metering system for district heating has been launched to enable housing associations and local authorities to solve debt management issues.
Secure Meters has launched the smart heat meter and wireless in-home-display in a bid to "vastly improve energy efficiency".

HNIP papers (SALIX) November 2016
1 Heat Networks Investment Project Consultation, published 29 June 2016
2 Heat Networks Investment Project Consultation Government response, 17 Oct
3 Heat Networks Investment Project Full Application Guidance, updated 2 Nov
4 Heat Networks Investment Project - Full Application Guidance Work Shop, updated 3 Nov
5 General Input Template V 1.0, published 3 Nov
6 Shadow Heat Model Guidance Document, published 3 Nov
7 Shadow Heat Model Template V 2.1, published 3 Nov
8 Draft Heads of Terms for the HNIP Funding Agreements, published 9 Nov
9 Slides from input templates workshops held on 21st and 22nd November
10 Cost benchmarking worked example, published 22 November 2016
11 Application process map, published 24 November 2016
12 Example gross grant equivalent calculator, published 24 November 2016

Proceedings from Heat Conference 2016 (ADE) November 2016
Heat Conference 2016 Speakers, Presentations & Biographies

SMRs have 'key role' in district heating (Power Engineering Intl) Nov 2016
Small modular nuclear reactors can play a key role in providing low carbon heat for district heating systems, according to the strategy manager of the UK's Energy Technologies Network.

JOB: Research Assistant in Economic Evaluation of District Heating (Nottingham Trent University) 11 November 2016
Nottingham Trent University - College of Art, Architecture, Design and Humanities, School of Architecture Design and the Built Environment. Deadline for response 9 December 2016.

Innovating Urban Energy (Arup) November 2016
Reducing the impact of urbanisation through energy efficiency
Heat Networks allow cities and businesses to capture heat from numerous low-carbon sources, helping smooth peak loads and avoid grid capacity constraints.

€3m THERMOS project will reduce planning costs of heat networks (CSE Energise Newsletter) November 2016
After much preparation we've started work on THERMOS (Thermal Energy Resource Modelling and Optimisation System), a multi-partner €3m project to accelerate the development of low-carbon district energy networks in Europe.

ENER-G publishes new CHP technical manual (ENER-G) November 2016
Cogeneration specialist ENER-G has published a new Technical CHP Manual to assist specifiers in selecting, sizing and installing CHP systems. The manual offers in-depth technical guidance on the physical parameters of cogeneration, emissions considerations and electrical and thermal outputs. It provides advice on sizing combined heat and power systems to optimise efficiency and discusses demand side measures that can be considered as part of the CHP specification process. The manual includes the latest technical specifications for ENER-G's Combined Heat and Power (CHP) systems ranging from 50kW to 500kW.

Smart meters system for district heating launched (Utility Week) 17/11/2016
A new smart metering system for district heating has been launched to enable housing associations and local authorities to solve debt management issues.
The system provides real-time usage, cost and credit information to tenants and offers pre-pay options to allow them to make informed decisions about how much energy they use. Landlords also benefit from a better debt management system which can recover historic debt and prevent future debt.

Combined Heat and Power Quality Assurance Regulations 2016 have been laid before Parliament (Statutory Instrument) November 2016
Regulations made by the Secretary of State, in relation to energy and energy sources, in exercise of the powers conferred by section 2(2) of the European Communities Act 1972(2). These will come into force in January 2017, and refer to "CHPQA 6" means the Combined Heat and Power Quality Assurance Standard,

Final report: Heating Controls Scoping Review Project (BEIS) 16 November 2016

Heating controls are potentially a cost-effective way of reducing and managing energy demand in homes. Their performance is difficult to determine due to occupant behavior and in some cases could lead to increased energy consumption.

Heat metering accuracy testing - updated with new annex (BEIS) 17 Nov 2017
Research report to evaluate the accuracy of heat meters, subject to installation and other errors, to provide a robust evidence base to be able to assess errors.

Heat in Buildings: The Future of Heat - Non-domestic buildings (BEIS Consultation) 16 November 2016
Non-domestic buildings account for 12% of greenhouse gas emissions. We are looking to unlock carbon and bill savings in areas we know less about, such as non-domestic buildings. We are seeking views from those in the building industry and decision-makers on the opportunities, and how we can:

- Keep energy bills as low as possible;
- Continue to ensure the UK has a secure and resilient energy system;
- Remain at the leading edge of science, research and innovation; and
- Reduce carbon emissions cost-effectively.

Passive flue gas heat recovery technologies report (BEIS) 16 November 2016
Report which gathers together the available evidence on passive flue gas heat recovery devices. This included a review of available products, current state-of-the-art, current and potential market, a review of current standards, performance, barriers to deployment, costs and an analysis of identified gaps in the available evidence.

Evidence gathering - High temperature heat pumps, hybrid heat pumps and gas driven heat pumps (BEIS) 16 November 2016
Reports which gathers together the available evidence on three heat pumping technologies. Each report includes a review of available products, current state-of-the-art, current and potential market, a review of current standards, performance, barriers to deployment, costs and an analysis of identified gaps in the available evidence. It is accompanied by a report comparing these technologies.
Comparative summary report: Low Carbon Heating Technologies - Heat Pumps

- Domestic High Temperature Heat Pumps
- Domestic Hybrid Heat Pumps
- Gas Driven Heat Pumps

Evidence gathering - Thermal energy storage (BEIS) 16 November 2016
Evidence report on thermal energy storage including domestic, non-domestic, inter-seasonal and large scale systems, commissioned under DECC.

Evidence gathering - Hybrid solar photovoltaic thermal panels (BEIS) 16 Nov 16
Report gathers the available evidence on hybrid solar photovoltaic thermal panels. it includes a review of available products, current state-of-the-art, current and potential market, a review of current standards, performance, barriers to deployment, costs and analysis of identified gaps in the available evidence.

Barriers and Enablers to Recovering Surplus Heat in Industry (BEIS) 16 Nov 16
A report prepared by Madano and Element Energy for the former Department of Energy and Climate Change (DECC). The focus of this report is heat recovery, a process by which (wasted) heat generated by an industrial process is captured and reused, either within the same process, on the same site, by another company or residential development (including through a heat network), or converted to power. The recovery and re-use of industrial waste heat has multiple benefits such as reducing fuel demand, reducing energy costs and CO2 emissions.

Building Energy Efficiency Survey (BEIS) 16 November 2016
The Building Energy Efficiency Survey (BEES) 2014–15 sets out to improve and update the evidence of how energy is used to provide an assessment of the abatement opportunities for all non-domestic premises across England & Wales.

Heat in Buildings: The Future of Heat - Non-domestic buildings (BEIS Call for Evidence) 16 November 2016
Non-domestic buildings account for 12% of greenhouse gas emissions. BEIS are looking to unlock carbon and bill savings in less well known areas, such as non-domestic buildings. It is known that there is significant potential for savings from heat, cooling and energy efficiency within the different non-domestic sectors (public, business and commercial) but accessing it has a number of challenges because of the diverse nature of energy usage in those buildings. BEIS evidence base is incomplete and needs to consider and test a number of policies which can deliver the most effective savings. This call for evidence sets out this path.

Standard Assessment Procedure (SAP 2016) (BRE) November 2016
This site hosts documents and information relating to the 2016 edition of the Standard Assessment Procedure. SAP 2016 is not yet finished and BEIS are consulting on proposed changes. SAP 2012 should therefore continue to be used for all official purposes. To support the consultation process this site currently hosts the following documents:

- A draft SAP 2016 specification, with proposed changes highlighted
- Supporting technical papers explain the basis of proposed changes

SAP 2016 technical papers (BRE) November 2016
The basis of changes to SAP proposed for the 2016 update is given below.
CONSP-04 - Distribution loss factors for heat networks, v1.0

Public consultation on proposals to amend the Standard Assessment Procedure (SAP) (BEIS) 16 November 2016
The SAP assessment is used for many purposes – including compliance with Building Regulations, and to produce Energy Performance Certificates. This consultation sets out twenty areas of the methodology which are under review and seeks views on proposed changes. Comments are welcome on any part of SAP.

Is district heating finally taking off in the UK? (Construction News) 11 November 2016 BY CRISPIN MATSON
After failed attempts in the 60s and 70s, recent government moves and major projects suggest district heating has turned a corner

Decarbonisation of Heat (Ofgem) 14 November 2016
This paper is the second in a series of "Future Insights" publications and outlines the key challenges involved with the decarbonisation of heat. It discusses how decisions might be made and potential consumer and regulatory implications.

Heat Trust welcomes on board Switch2 Energy Limited and its 45th heat network (Heat Trust) 11 Nov 2016
Today Heat Trust welcomes Switch2 Energy Limited and its Grafton Square heat network in to membership, extending independent customer protection to 45 heat networks and 27,500 customers.

Birmingham New Street station launches carbon-savings calculator to showcase savings generated through district energy scheme (networkrail) 08 Nov 2016

Your generation: Making decentralised energy happen (Grant Thornton)
There has never been a better time to develop decentralised energy schemes. Technological advances, combined with changes in energy system management, mean more individuals, communities and organisations are producing their own energy, linking into the wider distribution network and generating income.

International News

Amsterdam aims for district heating future (Decentralised Energy) 28/11/2016
Amsterdam is aiming to end its reliance on natural gas by 2050, replacing it with various forms of district heating. CityLab website reports that the city authorities have already begun to implement their objective with 10,000 new public housing units this week having their gas supplies removed, with various district heating options taking its place.

Amsterdam homes to be gas free by 2050 (Dutch News) November 17, 2016
Amsterdam City Council has published a plan to rid the city of gas-fired cooking and central heating by 2050, broadcaster NOS said on Thursday. The city has plans to build 50,000 new homes within the next 10 years and none will have gas heating or cooking facilities. Instead, the homes will be heated by surplus heat generated by industry. Some 70,000 homes in the city are already on district heating networks.

Sonera to Recycle Heat Waste from Finland's Largest Data Center for District Heating (fastmode.com) 12 November 2016
Finnish operator Sonera has recently signed an agreement with energy group Fortum for recycling of the waste heat from its new ultra-modern and energy-efficient data centre in Helsinki for district heating in the town of Espoo, Finland's second largest city.

District energy: a tried-and-tested energy efficient solution to modern urban energy problems – (Energy Efficiency magazine for COP22) Lily Riahi, Sustainable Energy in Cities Advisor, UN Environment Program (UNEP).
For many cities worldwide delivering sustainable heating and cooling means the development of modern district energy systems. These consist of networks of insulated pipes running under city streets, pumping hot or cold water to multiple buildings in a district, neighborhood or city. Modern district energy systems can reduce primary energy consumption for heating and cooling of urban buildings by half. This dramatic reduction in energy consumption delivers the diverse benefits that progressive cities are committed to providing for their citizens, such as clean air and local jobs.

Events

Technical Design and Planning of RES District Heating and Cooling (DHC) Training Course January 24-25 2017, Dublin

This 2 day course is part of a series of training opportunities that will bring some of the best international experience in district heating to Ireland. It is organised as part of the European SmartReFlex project, which includes Irish partners Tipperary Energy Agency, Kerry County Council and XD Consulting.