District Energy Vanguards Newsletter

February 2016

Editorial

Getting the Big Picture

Last week it was widely reported that Energy UK, *"the voice of the energy industry"*, had performed a historic handbrake turn and dropped its defence of coal-fired power stations and is now supporting a move towards greener energy. In a report published last week they call for a "*whole systems approach*" and recommends establishing a "*taskforce comprising of representatives from the electricity, heat and transport sectors to map out the critical requirements for delivery of a low carbon economy"*. Crucially this would bed into the work of the National Infrastructure Commission on the National Infrastructure Needs Assessment. I'll come back to that.

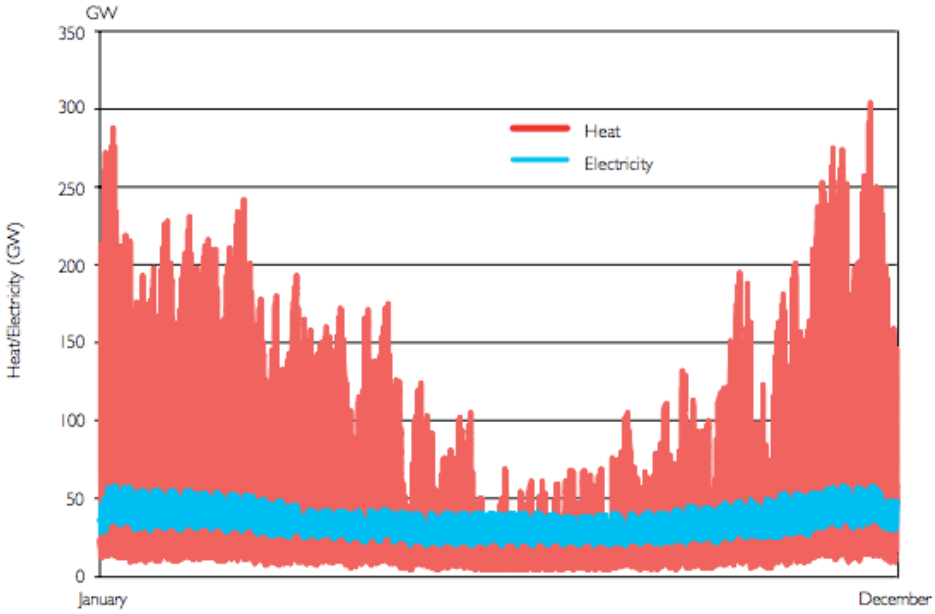
But the report is oddly myopic when it comes to heat. The focus is very much on power-related heat technologies – PV, heat pumps, fly wheels, micro-wind and micro-CHP. Even thermal storage is in the context of an exciting new system that *"will use heat to compress argon for electricity generation*". District heat networks get a paragraph, mainly to flag up the various barriers to their deployment. Heat sector representatives arriving at such a recommended taskforce will feel like invited guests arriving at a party where the host doesn't seem to know who they are. If the wish to know what a real "*whole systems approach*" they should consider the work of Prof David Connolly at Aalborg University, previously cited in this column.

The critique of what has been called the 'all electric future' was eloquently illustrated in Box 19 on Page 103 of DECC's 'Future of Heating' report (copied below). The table provided from Imperial College shows a comparison between heat and electricity demand variability across a year. The point being that the electricity distribution and generation systems simply could not cope with the huge variations in heat demand, often for quite short periods. It would require astronomical investment in strengthening the power distribution network as well as a near tripling of existing UK electricity generation capacity when you consider that the government also wishes to push more of the transport sector onto electricity.

Box 19: Meeting the peak demand for heat

Heat demand varies significantly over the course of the day, and, with space heating, over the course of the year, particularly pronounced during winter months, when space heating demand is greatest and total demand can reach 300 GW.[126]

Chart 36: Comparison of heat and electricity demand variability across a year (domestic and commercial) – 2010



Source: Courtesy of Imperial College. For illustrative purposes only and based on actual half-hourly electricity demand from National Grid and an estimate of half hourly heat demand.

And if you have to dig up the road to put huge cables in why not put district heat pipes in instead and shed the load from power to heat distribution? Which segues into the second point. Heat is a low value form of energy. It is what is left over after the creation of high value energy such as electricity. Why use high value electricity to provide for low value energy demand such a thermal services – space heating, cooling and hot water? The heat and power distribution infrastructures should complement each other and not seek to replace one with the other. This needs to be recognised by the National Infrastructure Commission.

Lastly, debate has commenced on how DECC might choose to spend the £300m earmarked for heat networks. One option put forward is that it could be used to underwrite future demand load risk. Network developers then install pipes that are larger than are immediately necessary in anticipation of future networks extensions and connections. This is a good idea. The downside is that this would tie up the available capital for a long time. Instead heat networks should be brought within the scope of Infrastructure UK which provides the UK Guarantee Scheme for precisely such a purpose. This would then free up the DECC spending pot to be working capital to get projects moving. A point, once again, to be recognised by the National Infrastructure Commission.

Michael King, Editor

Heat Trust workshop invitation

The Heat Trust is delighted to invite you to a workshop on the Heat Trust Customer Protection Scheme on either:

- **Monday 21st March 2016 at 12.30hrs – 16.00hrs in London;**

or

- **Wednesday 23rd March 2016 at 09.00hrs – 12.30hrs hours in Glasgow at the 200 SVS events and conference venue, 200 St Vincent Street, G2 5RQ.**

Venue details for London will be confirmed shortly.

Heat Trust is a new GB-wide customer protection scheme, providing a common standard in the quality and level of customer service for domestic and micro-business customers, served by district and communal heating networks.
Heat Trust launched on 25th November 2015 with 34 heat networks in membership, covering over 15,000 customers. The heat networks that are currently eligible to join Heat Trust are those where the customer pays their heat supplier directly; this generally follows an ESCo-type arrangement.

We recognise that there are existing district and communal heat networks that have different operating models, which do not currently fit Heat Trust's Scheme Rules. We are, therefore, investigating options on how Heat Trust can be developed to cater for different operating models, such as heat networks that operate a 'rent with heat' model or where there may not be a direct heat supply agreement.
We would particularly welcome attendance from local authorities, housing associations, consumer advocates, metering and billing organisations and, operation and maintenance companies. Representatives from DECC and Scottish Government will be in attendance.

To reserve your place, please RSVP to **info@heattrust.org** by 16th March 2016, including the location (London or Glasgow) you would like to attend.

The half-day workshop will look to cover:

- Heat network policy in the UK and future ambitions;
- Overview of Heat Trust and its current scope;
- Challenges and gaps in coverage of Heat Trust; and
- Options to expand the scope of Heat Trust to accommodate different heat network models.

We look forward to hearing from you. If you have any questions, please feel free to contact us at **info@heattrust.org**

With best wishes,
Bindi Patel
www.heattrust.org

Forthcoming workshops

Heat Network Code of Practice Training sessions in Edinburgh – 16 March (introduction to the code) and 5+6 April (technical course leading to certification). Workshops will be held at the Edinburgh Centre for Carbon Innovation, and Scottish public sector bodies are eligible for a discount. Sign-up details can be found here.

Nordic Heat Masterclass: The Commercial Case of District Heating. Tuesday, March 15 (Manchester), Thursday, March 17 (Edinburgh) 09.30 – 17.00. The Masterclass will look at the proposition of district heating to end-users and decision makers. The session will focus on the market for district energy – customer segmentation, value proposition, pricing, sales strategy and business planning to secure support from key decision makers and stakeholders. The session requires a basic understanding of district heating, but it is not essential however to have attended our 2015 Masterclasses on district heating technologies.

To reserve a place on either of the Nordic Heat courses please email ailsa@claspinfo.org with your:

- Name
- Job title and Organisation
- Which location/date you would like to attend
- Any special dietary requirements

The course is free of charge for participants from Local Authorities, Housing Associations and other public sector institutions. There is a charge of £250 for other attendees.

DECC Heat Networks Pipeline – call for information on heat network projects

The Department of Energy and Climate Change's (DECC) Heat Network Delivery Unit published its second edition of the Heat Infrastructure Investment Pipeline. DECC would like to gather further information on heat network opportunities with the aim to stimulate the supply chain and encourage investment, to feed into this exercise or for further information please email hndu@decc.gsi.gov.uk.

UK News

Heat networks — how low can you go? (Modern Building Services) 4 February 2016 Maintaining the low system temperatures required for efficient operation of heat networks presents a design challenge for building-services engineers. Silas Flytkjaer of SAV Systems highlights the importance of effective temperature and pressure control.

GDN short termism 'hampering heat decarbonisation' (Utility Week) 4 February 2016 District heating networks must be treated as long-term energy infrastructure to avoid sky-high energy bills for consumers, the Association for Decentralised Energy (ADE) has warned. ADE's director Tim Rotheray said in an exclusive column for Utility Week that the industry is in danger of treating heat networks as "short-term

generation assets" which require subsidies to meet short payback periods on the investment.

North West Cambridge – District Heating Spine Complete (Bdaily) 8 February 2016
We are delighted to announce that we have successfully completed the 2.5km district heating spine on the first phase of the North West Cambridge Development. (further link here)

Multi-utility solution for new London development (SSE press release) – 9 February 2016
Hundreds of properties at the Riverlight development will be served by an energy centre housing a Combined Heat and Power (CHP) unit, gas fired boilers and ground source heat pumps. These will provide the site with heating, cooling and hot water. Installation and ownership of the water, gas and electricity networks on site means that SSE Enterprise Utilities is providing a true multi-utility service.

Leeds steams on with district heating plan (The Construction Index) 12 February 2016
Leeds city councillors have ratified the investment of £21m in a scheme to pipe heat from the city's new recycling and energy recovery facility (RERF) to homes and businesses.

Six innovation areas could drive renewable energy future (Scottish Renewables) 17 February 2016
Government innovation spending could deliver a world-leading energy system – if £500 million of allocated funds are targeted correctly, a new paper from industry body Scottish Renewables has said. "Scottish Renewables' new paper highlights the importance of the strategic allocation of these funds, and identifies six technology areas that have real potential to benefit from this funding, propelling British business to the forefront of a truly world-leading, next-generation energy system." Low-Carbon Heat – which accounts for 46% of UK energy demand, but of which only 4.9% was renewable in 2014. Decarbonising the sector will mean fully developing new technologies, supporting their large-scale deployment and integrating them into our wider energy system.

Controversial plans for Headington hospital pipeline declared "invalid" because Oxfordshire County Council may not own land (Oxford Times) 17 February 2016
PLANS for a controversial heating pipe in Headington have been declared "invalid" by Oxford City Council after being blasted as "unlawful" by local residents. Comments on the application for the £14.8m scheme to connect the John Radcliffe and Churchill hospitals, have highlighted that Oxfordshire County Council may not own the land where the pipe would be installed, as assumed by contractors Vital Energi.

Heat pumps can make district heating cleaner (Energyzine)

Integrating heat pumps into district heating schemes where there is a Combined Heat and Power (CHP) system installed can reduce carbon emissions by up to 84 per cent with potentially no increase in costs, according to a new DECC report

Running Hot and Cold (Scottish Renewables blog) 25 February 2016
Scottish Renewables Policy Manager, Stephanie Clark blogs from this week's Low Carbon Heat and Water Conference.

City Council plans heat-sharing network (Oxford Student.Com) 27 February 2016
Oxford University and Oxford City Council have jointly funded a £136,000 study into the possibility of creating a shared heat network amongst the laboratories and businesses of Oxford. Should a heat network be built, it could cut carbon emissions and save an estimated 20 percent on heating bills in the long term. Oxford, it should be noted, aims to have a 33 percent reduction in carbon emissions by 2020.

1,000 London Homes Set For Low-Carbon Heat (Vital Energi news release) 22 February 2016
Vital Energi are celebrating winning two London-Based contracts with developer Barratt London, which will see them deliver the Combined Heat and Power (CHP) energy centres to provide electricity, heating and hot water for 1,000 new build homes in the capital. Vital are currently delivering the underground CHP energy centre on the Hendon Waterside development, connecting 358 dwellings and are delighted to announce the £8 million contract at Nine Elms Point, which will see them install the CHP energy centre, connecting a further 645 homes.

ENER-G free eGuide The Essential Guide to Small Scale Combined Heat and Power February 2016

District Heating Networks: analysis of information request (Citizens Advice) 20 January 2016 – and accompanying blog
There are an estimated 2,000 heat networks in the UK and with district heating schemes having been identified as one of the key technologies to decarbonise the heat we use in our homes and businesses this is set to increase.
At present there is very little available data on these existing district heating schemes making it difficult to assess how well they work in practice or whether they offer good value for their customers. There are many unanswered questions when it comes to the use of district heating for residential properties and without a central database of publicly accessible information questions about its applicability and affordability will remain.
Through the process of conducting this information request Citizens Advice has found the availability of information patchy at best and the fact that Local Authorities, through no fault of their own, don't have sight of these systems is concerning.

ADE: Keep your friends close, but your heat closer... (Energyzine) 29 February 2016
A decentralised energy revolution is coming and local authorities are leading the way but new Government policies would help speed market development, believes

Hanae Chauvaud de Rochefort, policy manager at the Association for Decentralised Energy (ADE).

The PipeCo: an alternate approach to financing heat networks (Carbon Trust Blog) 29 February 2016
District heating is booming in the UK, but to pose a serious alternative to the gas network a different funding model is needed, according to Ian Manders and Tanja Groth

International District Energy News

Vattenfall invests €83.5m in district heating in Germany (Energy Live News) 12 February 2016
Vattenfall has announced it will invest €83.5 million (£64.2m) in a district heating project in Hamburg. The money will be used to refurbish the Wedel combined heat and power plant (CHP)

Cogen Europe press release 16 February 2016
The European Commission published today the long awaited Heating and Cooling Strategy, putting for the very first time the heat sector on the map of EU policymaking. COGEN Europe welcomes the Strategy and is hopeful that it will support better and more consistent European energy and climate policies, where the cogeneration principle plays a key role.

An EU Strategy on Heating and Cooling (EU News Release) 16 February 2016
European Commission Factsheet: Towards a smart, efficient and sustainable heating and cooling sector
Heating and cooling is the unglamorous consumer of half of the EU's energy, with 75% of this generated from fossil fuels. Only 25% is generated from low-carbon sources. This sector sits alongside transport and electricity, which consume 31% and 20% of the EU's energy, respectively. Yet it has so far received scant attention from policymakers in Brussels, who have admitted that understanding of the sector is "insufficient" — even while acknowledging that heating and cooling will have a major impact on whether the EU is able to meet its 2020 and 2030 climate change goals.

Researchers change the direction of EU heating strategy (Heat Roadmap Europe 2050)
Over the last five years, the European Union has radically changed its views on heating, partly thanks to a series of studies led by a group of researchers at Aalborg University, Denmark. This is evident from a new EU Strategy on Heating and Cooling launched today, 16.02.2016.

The key to success in district heating (StateofGreen.com) 16 February 2016
The widespread use of district heating and combined heat and power is one of the main reasons why it has been possible to increase energy efficiency and reduce carbon emissions over the past decades.

Belgrade to become a champion of low-carbon district heating: UNEP Global District Energy in Cities initiative aims to drive green transition (UNEP News Release) 17 February 2016
The United Nations Environment Programme (UNEP) is among bodies providing technical advice for the overhaul of Belgrade's district heating system, with the aim of securing major efficiency gains and helping move towards use of renewable energy.

Rotterdam makes heat roundabout with surplus heat for South Holland (4th Generation District Heating (4GDH) News) 17 February 2016
The industry in the Port of Rotterdam currently produces 150 PJ of heat going to waste, but this amount of heat could heat a small country like Denmark. Now, plans are set in motion to make a "Heat Roundabout" that will eventually bring district heating with all the surplus industry heat to people living in southern Holland

Intelligent heating à la Aarhus (Microsoft News Service) 17 February 2016
With a clear green vision of becoming carbon neutral by 2030, Aarhus is investing smartly in its district heating network and is digitally paving the way for a sustainable future. Through cloud, IoT and Machine Learning technologies, the city is bringing District Heating into the 21st century. …"*When a pump is new it sounds like Queen. When it's failing it sounds like Metallica. Machine Learning will help us capture the different frequency and vibration patterns and turn that precious data into actions."*

The future is dynamic (Decentralized Energy) 22 February 2016
As Europe's power market changes, combined heat and power plants such as those used in district heating networks are increasingly called on to help balance the grid. Adam Rajewski and Hanna Alavillamo discuss how dynamic district heating plants can address this growing need.

Germany's New CHP Act explained (Decentralized Energy) 22 February 2016
Germany's new CHP Act is effective from 1 January. In it, the CHP expansion target has been lowered and the regulations have become more complex. Markus Gailfuss asks who will benefit from the new law, and which CHP owners will be worse off.

How to renovate Europe's buildings using less energy (European Commission News Release) 22 February 2016
The paper sets out the results of a workshop organised in December 2015 in Brussels by the Horizon 2020 Energy (Buildings) team of the EASME in conjunction with http://www.buildup.eu, the European portal for energy efficient buildings and some 40 EU-funded projects supported under Horizon 2020, 7th Framework Programme (FP7), Intelligent Energy Europe programme, and other regional and cross-border programmes such as the European Structural and Investment Funds (ESIF).

Times are changing for district heating (Decentralized Energy) 22/02/2016

As recently as a few years ago, politicians in the Netherlands saw district heating as old-fashioned - but it is gaining in popularity as it enables the distribution of both renewables and surplus heat, writes Klaas de Jong

District thinking and doing: A path to net zero (UKGBC) 24 February 2016
Although it's not new, the idea of an energy district for heating and/or cooling is a strategy increasingly being considered as a path to net zero. Depending on fuel source, a district heating system, while not necessarily energy resource-efficient, could provide a significant advantage in reducing the carbon footprint of those buildings served, even if it paradoxically doesn't necessarily help the net zero energy equation for those same buildings. Traditionally, college or corporate campuses and some cities have installed centralized utility plants to produce district steam for heating and chilled water for cooling, primarily for economic reasons.

District Energy: Energy Efficiency for Urban Areas – New White Paper (State of Green) 10 February 2016

Heat roadmap China: New heat strategy to reduce energy consumption towards 2030 (Elsevier Energy – £££) 1 March 2016

- New district heating strategy is designed for China.
- The new strategy is compared with individual heat and current heat strategy.
- New strategy could save primary energy supply by ~60% with ~18% lower cost.

Alaska: Juneau company plans to bring seawater-based heating to downtown (Alaska Dispatch News) 13 February 2016
Renewable energy company Juneau District Heating on Tuesday announced its plans to build a heat pump system that can provide heat to downtown Juneau using technology that pulls energy from seawater in Gastineau Channel.

District Heating: Prisoners of Monopoly Market (German Tenants Association news release) 24 February 2016 [*Note: Google Translate text provided below*]
Around 5.5 million households are supplied with district in Germany, representing 14 percent of all connections. The expansion of district heating is widely regarded as an important building block for an efficient energy supply of the future. But unlike the development of the electricity and gas markets over the past 15 years in the district heating sector each individual district heating system represents an unregulated monopoly. It is not possible to change provider in response to price increases. Therefore vzbv, bne and DMB are demanding reforms".

New C40 cities Good Practice Guides

Good Practice Guide: District Energy 1 March 2016

Good Practice Guide: Cool Cities 1 March 2016