District Energy Vanguards Newsletter

Issue 28 - September 2015

This District Energy Vanguards Network Newsletter is called September as it covers items emerging over the past month.

In this issue Michael King celebrates the fifth call for Feasibility Study bids from the Heat Network Development Unit – which was positively reviewed in the evaluation just released.

We invite your thoughts for future lead articles and offers of pieces of up to 500 words.
David Somervell

Moving beyond a pipe dream

An '*Evaluation of the Heat Network Delivery Unit'* was published 3rd September by DECC. This was not a roundup or conclusion to the Unit's work, but only a marker along the way – something reinforced by the fact that HNDU has announced a surprising and welcomed Round 5 call for Local Authority District Heating Feasibility Bids (deadline 1st November!).

I was heartened to read that – outside of HNDU – the Vanguards Network came top (31%) for recognition by respondents surveyed as a source of support and assistance for local authorities (and that is without any source of government funding!). But also note that 44% of respondents had not had contact with any outside agency. Apparently District Energy virgins outnumber District Energy Vanguards! Either a cause for concern or for celebration (or possibly both?); but a sign that the network has more work to do!

One interesting finding was that *"commercial drivers including economic regeneration, cost reduction and income generation are becoming more important than 'traditional' drivers such as carbon reduction and fuel poverty"*. This suggests that even in the age of austerity local authorities are keen to develop local infrastructure and recognise that district heating can deliver multiple societal benefits, help attract investment and stimulate economic regeneration. The scale of district heating projects now being looked at across the country – over £1billion worth – suggests a real sense of momentum.

So it was encouraging to attend the "*Heat Network Investment"* event on the 25th September at the BIS Conference Centre – jointly hosted by DECC and UK Trade & Investment.

Over one hundred delegates were told

that DECC will shortly be publishing a document on the '*Heat Infrastructure Investment Pipeline'* together with an investor guide.

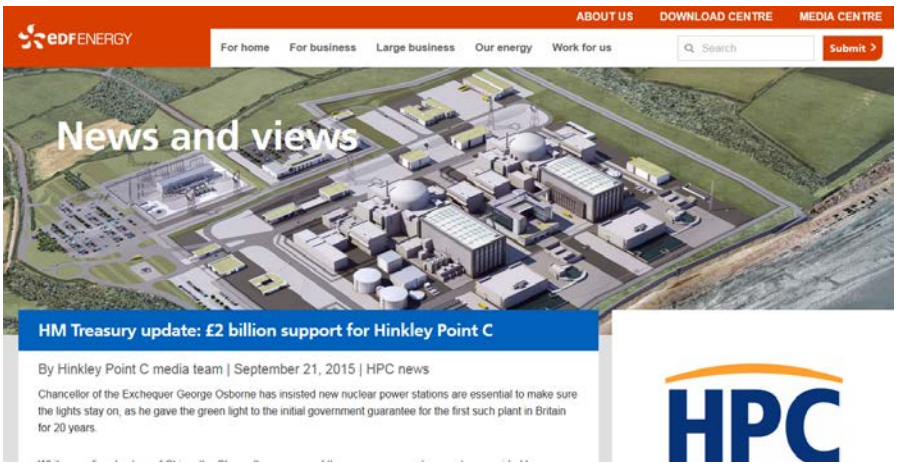
The former promises to detail a series of case studies of projects supported by HNDU – including key parameters such as capex, return on capital and preferred business model. A presentation on the pipeline's highlights revealed that the internal rates of return (IRR) for 'investment ready' projects ranged between 5 – 12%.

However, there remains a gap between many of the projects in this pipeline and those that might be deemed '*investment ready*', a point picked up by a delegate who questioned how the gap might be closed. DECC's view is that as the District Energy market matures, confidence is built, helping reducing risk, pushing investor rates of return downwards as well as potentially bringing forward institutional investors to the sector who have longer term and lower investment return requirements.

Crucially initiatives such as the launch of the CIBSE Code of Practice, the Heat Trust and the District Energy Procurement Agency (DEPA) – an initiative I have been leading and will return to in a future Editorial – all help in reducing risk; but more can and must be done if we are to realise the market's full potential.

It may be that the expectation of higher rates of return may reduce for other reasons. There is a growing appetite in the financial market for 'green investments' that are of sufficient scale to justify transaction costs. As the government is in effect closing off investment opportunities in other green energy sectors, such as onshore wind and solar, aggregating a relatively small number of district energy projects could achieve the scale that would attract investors to our market.

My view is that it may also need a more active intervention. My reference in last month's editorial that government might look to underwrite the risks associated with the initial development of heat networks was met with a degree of incredulity by some colleagues. But in the last few weeks we have seen the Chancellor underwrite risks to the tune of £2billion to attract Chinese investors to development of Hinkley Point C nuclear reactor.



If Mr Osborne can consider supporting a country which has some of the largest investment funds on the planet for one pipe dream – how about supporting cash strapped councils in the UK for their district heating pipe dreams!!

It would certainly spread the economic benefits of infrastructure investment more broadly across ***this*** country and devolve downwards decisions about where it should be made.

Michael King, *Editor*

UK policy, regulation, consultations, guidance, funding

Water source heat pumps get £2.3m boost – Scottish Government Challenge Fund to encourage the development of large scale water source heat pump schemes in Scotland. £2 million capital on offer + £375,000 to help develop business proposals. EoI by 16 Oct.

Bids for a 5th round of Heat Network Development Unit funding (£2m) invited from Local Authorities in England & Wales for Feasibility Studies for heat networks where heat maps & energy master planning already completed. Submissions due in by 1 November 2015.

The Energy and Climate Change Committee inquiry into future of electricity infrastructure seeks input on role distributed energy plays in the move towards a smarter, more localised and diverse systems – submissions invited by 2 November.

Reforming the business energy efficiency tax landscape – Treasury & DECC consultation – single GHG reporting framework via ESOS, "as required by EU law"; abolishing CRC; revising Climate Change Levy (no CCL plan to change treatment of CHP). 9 Nov deadline.

The Fuel Poor Network Extension Scheme published by Ofgem includes district heating solutions through a mechanism to encourage Gas Distribution Networks (GDNs) to offer this option to eligible households – starting April 2016.

How to charge for Communal Heating is an online guide to pay-as-you-go heat metering from ENER-G Switch2. Useful re 2014 Heat Network Regulations due in by December.

UK conferences, workshops and awards

Debate on UK government's energy policy – 10.30-14.00, 13 Oct 2015 – Energy Institute. Event at CMS Cameron McKenna, London EC4N 6HL.

Mainstreaming Heat Networks in the UK – 9.45-16.45 27 October 2015. Workshop hosted by University of Manchester's EPSRC Centre for Doctoral Training in Power Networks with Manchester Energy, IEEE Student Branch PES Chapter and the IET.

Distributed Generation stakeholder workshop – 9.15-13.00 (free lunch) 3 Nov Birmingham hosted by the DNO for Midlands, South West and Wales – Western Power Distribution. Contact mail@westernpowerworkshops.co.uk or phone 020 3397 2414. 2014 report here.

North of England – Denmark District Heating Exchange 2015 – 3rd November (Leeds) and 5th November (Manchester). 3 days of presentations, networking & one-to-ones offered.

Energy Transitions: Mapping road ahead in a changing energy industry – 9.30 Monday 9th to 13.30 Tues 10th November, Chatham House, London.

Heat Networks Code of Practice Certification: CIBSE is offering two-day courses with the opportunity to take an exam leading to entry on the Heat Networks Consultant register. They are intensive / require a high level of knowledge / two years' experience – so check on: Competencies / Self-assessment questions / List of required reading and preparation.

- London 6-7 October 2015
- Manchester 21-22 October 2015
- Edinburgh 3-4 November 2015
- Birmingham 18-19 November 2015
- London 30 Nov-1 December 2015
- Manchester 1-2 March 2016`
- London 9-10 March 2016
- London 18-19 May 2016
- Leeds 8-9 June 2016
- London 6-7 July 2016

CIBSE are running a one-day Introduction to Heat Networks and the new Code of Practice on 11 November in London.

Resource Efficient Scotland one-day event on the Code of Practice for Heat Networks – especially feasibility study guidance for developments supported by Scottish Government – on 12 November in Edinburgh. Contact Calum.Robertson@zerowastescotland.org.uk

REHAU District Heating workshop: 9:30-15:00 Wed 4 November, London Building Centre. Speakers include DECC, CIBSE and Buro Happold – free to attend – aimed at consultants, contractors, local authorities, developers and housing associations.

The ADE / EI HEAT 2015 Conference and ADE Awards Dinner 25 November in London.

Low Carbon Project Development in Scotland: Delivering energy efficient investment – Wed 9th Dec, Edinburgh, set to explore Grangemouth, Clyde Gateway etc opportunities.

International 2016 Low Carbon Heat and Water Conference & Showcase – 23 Feb, 2016: Major international event bringing together suppliers and customers in the low carbon heat & cooling and water & wastewater sectors. Free. Royal Concert Hall, Glasgow.

UK general news

Less Waste, More Growth: Boosting energy productivity – new ADE report, supported by 14 NGOs, says 54% of energy used to produce electricity is lost by the time it arrives at a UK home or business, where further losses occur. This is worth £9.5 billion a year.

Investment In Heat Networks In Scotland – Heat Network Partnership estimates that delivery of 50% of the 103 known heat network projects in Scotland offers an investment opportunity of £100m to £240m.

Stoke-on-Trent seeks partners to sell heat from their planned £52m geothermal district heating project - with nearly £20m Government funding. The network is to be council owned, collaborating with private sector to set up a company to sell heat to customers.

Bioenergy: Enabling UK biomass – an insights report by Energy Technologies Institute with infographic follows earlier value chain report on biomass with previous infographic.

Cramlington Biomass 28MWe CHP in Northumbria – planned by Estover Energy Ltd – has won £48m from UK Green Investment Bank & John Laing Group towards £138m project for generating power to grid and heat to a pharmaceutical factory – fueled by local wood.

Blackburn-based Vital Energi “could be up for sale this year” reported the Sunday Times.

Veolia has re-badged Cogenco Ltd – its specialist CHP company with 600 units operating – with parent company name and a "Resourcing the World" strapline.

A new 2030 Energy Scenario by Demand Energy Equality for Greenpeace UK shows how 80% of UK electricity could be generated from wind, solar and tidal power within 15 years – thanks to advances in storage and smart technology and fall in renewables cost.

Energy Trends from DECC report that Renewable energy met 25% of the UK's power demand in quarter 2 of 2015 – more than coal-fired power stations for first time.

The U.K. is considering whether to close all of its 12 coal-fired power plants by 2023 as part of its effort to reduce greenhouse gases blamed for global warming, an official involved in discussions in the run-up to COP21 in Paris told Bloomberg Business.

A new pre-payment heat meter – EE Monitor – has been launched by Nottingham City Council's wholly-owned Energy from Waste company Enviroenergy.

Robin Hood Energy – another wholly-owned Nottingham City Council offshoot – launched an alternative to Big Six utilities promising No private shareholders No director bonuses.

Our Power – a revolutionary energy company launched by 35 social landlords – also plans to offer up to 10% savings to low income households in early 2016. Set up as Community Benefit Society it aims to sell heat and power to 200,000 homes across Scotland by 2020.

Midlothian: £144m Energy from Waste project – located at former Millerhill site south of Edinburgh – has finally achieved planning from the Council. FCC Environment is to run the project for 25 years under a £475m contract with Midlothian and Edinburgh Councils.

Aberdeen: EfW plant moves forward – Council has started planning process for a 150,000 tonne / year facility, planned for a derelict industrial site at East Tullos. The £120m project would process non-recyclable waste from Aberdeen City, Aberdeenshire and Moray and district heating could connecting with the growing Aberdeen Heat and Power networks.

An open loop aquifer thermal energy storage system will feature in a ground water source heating and cooling system for redeveloped Chelsea Barracks in west London.

Global developments

U.S. monthly power sector carbon dioxide emissions fell to 27-year low in April says EIA. Coal down 18%, gas down 6% - now generating more than coal – and renewables up 2%.

Maybe you have all seen the final reports from the EU-funded Cogeneration Observatory and Dissemination Europe (CODE 2)? If not check out the following:

- European Cogeneration Roadmap
- European Policy Report
- Bio-energy CHP Potential Analysis
- Micro-CHP potential analysis European level report
- Cogeneration Roadmap: United Kingdom

The UNEP Sustainable Energy for All (SE4ALL) District Energy Accelerator has published District Energy in Cities: Unlocking Full Potential of Energy Efficiency & Renewable Energy – a major report including case studies of 45 Champion Cities globally and spelling out six major benefits of implementing district energy systems. US blog comment from IDEA.

Unlocking the potential for private sector participation in District Heating a report from International Finance Corporation (IFC) analyses opportunities for private participation in district heating (DH) in the Western Balkan countries of Bosnia and Herzegovina, Croatia, Kosovo, and Serbia, as well as in Mongolia and Ukraine – worth up to $1.5bn.

New York is to boost CHP– under the state's Reforming the Energy Vision – providing $41 million for 53 CHP projects. Private investors are providing the remaining $217 million.

Niehl 3 combined cycle gas turbine CHP has supplied the German grid for the first time. The Alstom and RheinEnergie power station will generate 453 MWe and 265 MWth. With an electrical efficiency of more than 60% and overall fuel efficiency of 85%, it is one of the most efficient in the world. Start of commercial operation is planned for spring 2016.

A critical review of proposed new rules for cogeneration in Germany and a rebuff comment – all complicated by need to align generation with renewable energy intermittency.

General interest, technology and research

NB most of the following articles may require free registration or to be purchased to view.

Biomass for heating in a remote Canadian aboriginal community biomass + district energy has potential to reduce heat costs, reduce cost of subsidy for electrical utilities, reduce emissions, and increase energy independence of remote communities (Canada).

DC systems: technology integration, system optimisation, challenges, opportunities – performance and progress of District Cooling systems integrated with sustainable energy technologies … with systems integrated with renewable energy systems, combined cooling, heating and power, and thermal storage systems (China).

Role of polygeneration in sustainable energy system development challenges – in a distributed energy system – its contributions to development of sustainable energy systems and efficient decision support tools for sustainability (Finland).

Thermodynamic performance assessments of a DH system with geothermal – the authors of this study use advanced exergetic analysis to identify the interactions among system components and the potential for improvement (Turkey).

Improved room temperature control in a DH system – this study presents an intelligent on-off regulation method using a 6-order fuzzy-control table to improve the performance of thermostatic valves commonly used in central heating systems (China).

Optimisation of a renewably-fueled CHP-DH system with energy storage – to cut overall costs of heat and power in a deregulated market. Thermal storage used more intensively with more fluctuating CHP load and a higher share of renewable fuel (China-Finland).

Simple calculation tool for central solar heating plants with seasonal storage – a design tool for CSHPSS using demand data and public climatic data evaluates the system early on and performs parametric analysis to establish optimization and design criteria. (Spain).

Energy efficiency enhancement of a seawater source heat pump DH system – in this study a field measurement with an emphasis on the energy efficiency of an actual seawater source heat pump DH system was conducted and analyzed (China).

Forecasting failures in DH systems – this study presents a failures forecasting method for DH systems based on a time series analysis using statistical data describing the frequency of damage in communal heat distribution networks over a ten-year time period (Poland).

Link to the glossary of terms and acronyms

This newsletter is prepared in Edinburgh with support of correspondents – in Aberdeen, London and elsewhere – who alert me of useful content. This is my second one – thanks to Mike Martin for the "General interest, technology and research" section above. I hope you find it useful. All contributions welcomed – email to David.Somervell@ed.ac.uk.

This is a legacy undertaking following the Heat and the City project led by colleagues at the University of Edinburgh which continues to bring together leading practitioners promoting District Energy in the UK.

Heat and the City has been supported by: