District Energy Vanguards Network Newsletter

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Editorial

Big Picture needs a broad scope.

A blog by DECC's Chief Scientific Advisor Prof David Mackay reflected on recent British Energy Challenge roadshows, the purpose for which *"was to crowd-source a consensus pathway in the 2050 Calculator."* Discussions were held around the English core cities examining how the nation's energy system would need to change if the UK's 2050 climate change target is to be achieved, using the energy calculator tool that DECC have developed. And it's clearly not easy – as the blog reports all audiences struggled to reach the emissions target. A number of reasons are given for why they found it so hard, including the following:

"…the urge to have lot of district heating supplied by combined heat and power may have actually made it harder to achieve the target: all the heating options have difficulties – ordinary gas boilers or micro-combined-heat-and-power boilers require gas, which is likely to be a fossil fuel (unless sufficient bioenergy is created and turned into methane); biomass boilers require wood, which has to come from somewhere; heat pumps require extra electricity, especially in mid-winter; and district heating requires a heat source, which, if local, is likely to be fuelled by wood or gas, and, as I just said, gas can only be low

carbon if it is made from bioenergy. The amounts of bioenergy required to deliver a significant share of the nation's space heating are very large."

A great deal is happening in the district heating sector at present, so it might be useful to pen some reflections in response to the feedback from the workshops reported by Prof MacKay in his blog.

Firstly it's heartening to see the level of interest in district heating being shown at these workshops. This is borne out by the Vanguard Networks' own experience over the past few years which has helped support some excellent efforts being undertaken by cities and local authorities across the length and breadth of the UK to help stimulate the development of heat networks. It should be recognised, that district heating activities are not being undertaken solely in response to helping reduce the carbon impact of local energy systems, but also to provide affordable heat, exploit local waste heat resources, stimulate economic development and take advantage of key regeneration opportunities, and to improve energy resilience and security. These are all actions beyond of the scope of a simple 2050 carbon calculator tool but are all priorities that need to be factored in when evaluating where a technology such as district heating could fit in to any future energy strategy.

The UK government has also highlighted its desire to increase competition in the energy market. Whilst many local authorities have a strong desire to help support their local communities through the provision of energy services, the building new CCS plant or a new nuclear power station to provide such competition is probably beyond PWLB lending criteria! On the other hand many municipalities across Europe, North America and elsewhere are showing the benefits that they can deliver through the use of district heating and establishing local energy companies where their priority is to deliver cleaner, affordable energy to local homes and businesses.

Further on in the blog, Prof Mackay goes on to say that the calculator needs to expand the range of heating options to include district heating options served by large-scale heat pumps, as already exists in a number of Scandinavian and North American cities. It does seem odd the 2050 calculator covers everything from CCS to new nuclear, where progress has been patchy at best, to include even esoteric areas of energy technology such as geologic sequestration, but has not to date considered large scale heat pumps and district heating. As Prof Mackay points out – this is something already being used in cities elsewhere – and perhaps points to a peculiar UK government trait of always seeking to create new and unique solutions to solve our energy priority objectives (Green Deal any one?) – when sometimes it might just be good occasionally to use something tried and tested elsewhere?

Other areas where government might consider commissioning research are:

- Studying the huge resource of waste heat that could be made available to district heating. A recent study on low carbon heat by the Greater London

Authority found as much as 50TWh of London's 66TWh heat requirements (2010 consumption) could be delivered from secondary heat sources in London.

- The total amount of heat requirement is not only key, but also when it's required temporally. DECC's Heat Team have highlighted the difference in heat peak load far exceeds that of electricity demand. Heat networks have a powerful role to play here
- As Denmark has shown, heat networks also provide great system flexibility and energy storage opportunities which is critical with increasing amounts of fluctuating wind generation is added to networks

In the fullness of time these issues might also be incorporated into the Carbon Calculator to give a 'system wide' view. Parliament's Energy and Climate Change Select Committee is currently working on its enquiry into 'Heat'. The Vanguard's Network gave oral and written evidence and we anticipate that when it publishes its findings it will pick up similar issues for the government to prioritise.

Recently the post of DECC's Chief Scientific Advisor has been advertised, which suggests to that Prof Mackay is moving on. The Vanguards' Network looks forward to working with his successor on integrating some of these important elements into a refreshed 2050 Policy Calculator. DECC's Heat Network Unit has evidenced the huge appetite for district heating with Energy Minister Greg Barker stating *"Heat networks are a defining part of our smarter, cleaner energy future."* It's therefore critical that we get a more consistent message on the role of heat networks potential across the whole of government. Incorporating the full range of benefits of district energy into its working models would be a useful start.

Michael King, 28th April 2014

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UK and EU Policy

Open consultations, funding and workshops

20 June – Re-thinking district heating conference 2014 (London) | Removing the barriers for successful projects. This is a joint CHPA-ARUP event bringing together Government (includes speaker from HNDU), local government, developers, academics and professionals from all parts of the DH industry. Please book by emailing Brian as per link.

12-13 Jun –Danish DH experts to share experiences (Tipperary, Ireland) – the workshop is jointly organised by Tipperary Energy Agency and XD Consulting as part of the European SUNSTORE4 project.

5 Jun –no-cost webinar to discuss the findings of new IEA publication – the report "Linking Heat and Electricity Systems: Co-generation DHC Solutions for a Clean Energy Future" analyses case studies of successful CHP-DHC systems and will be published in May.

13 May – Scotland: Developing & Delivering District Heating Projects (Edinburgh). - this seminar is aimed at the public sector in Scotland, in particular local authorities, NHS Boards, universities/colleges, and housing associations. The event is organised by Scottish Futures Trust on behalf of the Heat Network Partnership for Scotland.

7 May – Scotland: An Emerging District Heating Market (Edinburgh) – this seminar is aimed at Scottish local authorities and is organised by Scottish Development International, the Danish Board of District Heating and the Danish District Energy Partnership.

9 Apr – European Commission adopts new rules on public support for energy – the new rules will make it easier and quicker for public authorities to implement measures such as the promotion of renewable energies or DH or to improve energy efficiency in buildings.

2 Apr – Decentralised Energy Delivery: the Business Case (workshop) –this workshop was hosted by the Greater London Authority. Materials presented by the speakers can now be downloaded via the above link.

4 Mar – draft Heat Generation Policy Statement:(Scottish Government) – this consultation sets out an Environmental Report of the policies in the Draft Heat Generation Policy Statement. Section 7 consists of the report's conclusions and recommendations and poses a number of questions to which responses are invited by the 9 June 2014.

UK and devolved administration policy

7 Mar – maximising the Opportunities for Scotland from DH – this joint Scottish Renewables-WWF parliamentary briefing was issued ahead of a Scottish Parliament debate on DH and decarbonising heating held on 6 March.

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UK News

28 Apr – energy centre to reduce carbon footprint by 35% (Newcastle) – the gas fired system, developed by E.ON, will provide the 1600 house new-build Scotswood community project with heating and hot water via a DH network based on CHP technology.

27 Apr – Scottish universities given funding for low carbon projects – St Andrews University will receive £10m for a wood-fuelled biomass project linked to a DH network. Strathclyde University will receive £8m to construct a CHP-DH system and a £2m will be given to Stirling University for the installation of a CHP plant to serve its main campus.

25 Apr – Boris Johnson outlines plan to bolster London's energy independence – the plan will make the mayor's office an electricity supplier with an official launch next year of a scheme aimed at lowering bills and bolstering the capital's energy independence.

18 Apr – council works with Swedish advisors on DH project (West Cumbria) – the scheme will use excess heat from factories in the north Workington area to bring warmth to thousands of homes and local businesses.

16 Apr – vacancy for Mechanical Design Engineer - District Heating (London) - the majority of projects will involve energy centres and DH networks there is scope for involvement in other energy infrastructure and saving schemes. Closing date not specified.

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15 Apr – second phase begins for DH project in Solihull (Birmingham) – phase 2 of the project comprises multiple biomass fuelled energy centres supplying a total of 1,156 flats across 21 high rise buildings.

9 Apr – vacancy for Contract Manager – Sustainable District Energy – the contracts involve operating and maintaining a major London based CHP energy scheme to supply energy to a range of consumers on a long term basis. Closing date not specified.

9 Apr – tender for Energy Centre and DH Network (University of St Andrews) – the University wishes to develop a low carbon energy system to provide heat to its campus at the North Haugh and potentially other University buildings. Closing date is 12 May.

8 Apr - Vital Energi Win £2.6m Community Heating Contract (Southwark, London) – the contract involves replacing DH pipework originally installed circa 1977. The new network will connect community buildings and over 800 homes in Rouel Road.

3 Apr – Sheffield Council awarded £30k HNDU funding for low carbon heating – the award will go towards providing heating to homes and businesses through new projects using technologies which include EfW or recovered heat taken from industry.

1 Apr – Stoke awarded £224k HNDU grant to prepare DH-geothermal business case – the authority has already secured £20m of Government funding for the project through Stoke-on-Trent and Staffordshire's City Deal, and will also invest £3.4m of its own funds.

1 Apr – Green heating system for businesses in Bath's new Enterprise Zone – Bath and North East Somerset Council has received a £95k grant from DECC via HNDU to fund new heating projects that are low carbon.

1 Apr – £225k funding boost for low carbon heating in West Cumbria – in a bid led by Britain's Energy Coast (BEC), Copeland and Allerdale Borough Councils have been awarded £123k and £101k respectively from DECC to develop a number of low carbon heat network propositions for investors and energy companies to take forward.

31 Mar – Sefton Council works with social housing provider on DH project (Liverpool) – the Council successfully secured £40k of funding from HNDU to carry out a heat network feasibility study in the Bootle area of Merseyside.

28 Mar – Three Welsh councils secure second round funding from HNDU. – the County Borough Councils of Blaenau Gwent, Neath Port Talbot and Bridgend were awarded £104k, £40k and £27k respectively to support the development of heat network projects.

27 Mar – Plans for two new DH networks receive £184k HNDU funding (Devon) – under new plans, properties in central Exeter including the Royal Devon and Exeter Hospital site, and a major new housing and commercial development south west of Exeter will benefit.

26 Mar – Vital funding boost for low carbon heating programme – the Leeds City Region Enterprise Partnership have been awarded £201k grant funding by HNDU to further develop DHNs in the region.

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Europe

17 Apr – EBRD considers sovereign loan of up to €7m for Balti DH (Moldova) – the loan will be used to modernise and upgrade DH services and thereby reduce coal and gas consumption and CO_2 emissions and ensure sustainability. Target Board date is 9 July.

16 Apr - Absolut vodka deploy DH to reduce carbon footprint by 80% (Sweden) – over the last ten years, the Åhus based company have upgraded their plant to recycle heat via DH and shifted to the use of renewable electricity.

15 Apr – EBRD Kaliningrad DH (Phase 2) - project implementation support – the Bank is considering further financing to enhance the energy efficiency of Kaliningrad's DH system. The investment would include the closure of the coal and mazut boilers, by connecting customers to existing gas boilers and CHP stations. Closing date is 28 May.

14 Apr - Macedonia Prime Minister announces DH project – the energy company, REK Bitola, will provide heat for the city of Bitola, agricultural greenhouses and the settlements of Novaci and Mogila.

11 Apr – tender for DH pipe supply - Zhytomyr (Ukraine) – the upgrade to the City's DH system is being funded via a loan from Nordic Environment Finance Corporation (NEFCO) and a grant from Swedish Development Cooperation Agency (Sida).

9 Apr - iCON Infrastructure acquires Fortum's Norwegian DH business – in 2013 the business delivered 215 GWh of district heat and 63 GWh of district cooling to its customers who are mainly in the greater Oslo and Akershus areas.

9 Apr - Iren Energia to be split into natural gas and DH components (Turin) - on completion of the agreement, Iren Energia will own and operate the DH network servicing the districts of Moncalieri and Nichelino - the most extensive network in Italy.

9 Apr - tender for implementation of Hautepierre DH network in Strasbourg – the deadline for receipt of tenders or requests to participate is 27 May.

6 Apr - Jenbacher engines to power 5MWe bio-gasification CHP plant (Bulgaria) - the units, which will be powered by syngas derived from straw and wood chip waste, will help reduce Bulgaria's heavy dependence on imported energy.

4 Apr - Fortum wins award for efficient CHPs based on local fuels - the COGEN Europe Annual Recognition Award is an acknowledges of the achievement by Fortum of commissioning four CHP-DH plants in one year in four different Baltic countries.

3 Apr - World Bank funds biomass DH project in Belarus - the $90m loan will finance replacement of existing gas and oil boilers by biomass boilers, provision of wood chipping equipment and biomass fuel storage facilities, installation of individual building-level heat substations with temperature control, and upgrading of DH networks in 13 towns.

26 Mar - consortium to lend EUR 250m to develop biomass CHP schemes (France) - the financing agreement, which includes the EIB, will make it possible to enhance the value of forest or agriculture-based biomass by using it, together with household and similar waste, to generate electricity, biogas and heat in France.

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The Americas

14 Apr – CHP plant to heat business park (City of Guelph, Ontario) – the natural gas-fired facility situated in the Hanlon Creek Business Park will produce 10.2MWe that will be fed back into the grid. The plant will also provide heat to the recently completed DH system.

14 Apr – woodchip-fired DH plant successfully warms campus (New Hampshire) – during the long winter, Grafton County's new biomass DH system heated the county's administrative offices, nursing home, courthouse, and supplied domestic hot water to the county jail, all on the 757-acre North Haverhill County campus complex.

11 Apr – DH gains momentum in Canada – in Fort McMurray, Alberta, two planned neighbourhoods, Saline Creek and Parsons Creek, will be heated by district energy systems, and the city is considering a district system for its downtown redevelopment.

10 Apr – Ontario Power Authority (OPA) develops program for DE projects – OPA is developing a CHP Standard Offer Program 2.0 (CHPSOP 2.0) for district energy projects and agricultural industry projects, including greenhouses.

2 Apr – KKR to seek $2bn for second infrastructure fund – the fund will primarily invest in renewable energy, pipelines, utilities and transportation-related assets. The New York-based private-equity firm is gathering capital as investors increasingly turn to asset classes that promise steady cash flow and a hedge against inflation.

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China, Asia and Australasia

21 Apr – Middle East is rapidly developing into a major hub for DC globally – the Middle East's lack of fresh water resources has forced the region to look at innovative methods to keep its residents cool - especially in the searing heat of summer.

21 Apr – Dubai reviews energy demand management strategy – the Supreme Council of Energy discusses various topics including regulatory framework for district cooling.

19 Apr – Dubai Discovery Gardens buildings cooling to be turned off – the company, Palm District Cooling (PDC), are seeking to recoup unpaid service charges owing from some landlords, but residents who are not in arrears feel they are being unjustly penalized.

18 Apr – Tabreed launches inaugural Corporate Social Responsibility report – the report outlines the company's environmentally-friendly practices, such as the use of thermal storage tanks, treated sewage effluent (TSE) and water recycling system designed to maximize efficiencies within its DC network.

17 Apr – vacancy for Project Manager - District Cooling (Abu Dhabi) – the company, Parsons International Limited, are seeking a person with five years' experience in airport construction. Closing date 19 May.

17 Apr – EBRD to support modernization of DH system (Kyrgyzstan) – the EBRD and CTF have agreed to extend a loan of up to $23.5m to refurbish and improve the efficiency

of the Kyzylorda DH system. The program will cover the installation of heating sub-stations and upgrades to the transmission and distribution networks.

14 Apr – alliance formed to deliver Christchurch DES – this will be the first large-scale central city DES in New Zealand. It will allow heat generated at Christchurch Hospital (and other energy centres) to be distributed to neighbouring facilities.

9 Apr – Qatar Cool acquires Cool Tech Qatar and Installation Integrity 2006 – the acquisition establishes Qatar Cool as the leader, in providing district cooling, and related services in local and regional markets.

8 Apr – tender for feasibility study - Kyzylorda DH (Kazakhstan) – the project is funded by the EBRD and will support the transformation of the local DH system into a demand-driven and consumer-friendly reliable service with an efficient use of resources.

4 Apr – Qatar Cool manager explains economies of DC – the spokesperson explained that through DC only one KW is needed for one tonne of refrigeration, while 1.7KW is required for the same amount of refrigeration through conventional cooling.

25 Mar – GE Marks Order for 1,000th Jenbacher Gas Engine in Pakistan – in addition to generating electricity, the units will also recover heat from the engine exhaust to produce steam for the mill's production processes and also recover heat from the engine's jacket water to produce chilled water to support cooling needs at the textile mill in Karachi.

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Conferences, symposiums and forums

10-11 Nov – dates for 6th Annual Middle East DC Summit announced – this event will be held in Doha, Qatar and will see the participation of a broad range of global and regional government authorities, decision makers, stakeholders and many others with an interest in the development of major district cooling projects in the region.

5 Nov – Energy4PowerLive (London) – this event will be held at the Queen Elizabeth Conference Centre and will offer four conferences on one day, with both indoor and outdoor exhibition opportunities.

30 Sep – 2 Oct – Nordic District Heating Fair (Jonkoping, Sweden) – the fair will include seminars and study tours as well as suppliers covering the areas of DHC, CHP, fuels, fuel handling, combustion technology, power production, logistics, control systems etc.

7-9 Sept – 14th International Symposium on DHC (Stockholm) – this event aims to gather the international research community around issues important for DE development.

8-11 June – IDEA's 105th Annual Conference and Trade Show (Seattle, US) – "Moving Community Energy Forward" call for technical presentations.

3-4 June – the second solar DH conference (Hamburg, Germany) – the 2014 edition of the solar DH conference invites market actors and experts to gather, exchange experience and network at international level, also there is a call for abstracts.

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22 May – CHP, DH & Renewable Conference/Networking Event (London) – this event focuses on the latest technology with attractive technical seminars aimed at investors, consumers and suppliers.

13 May – Decentralised Energy 2014 Forum (London) – this forum is aimed at Government, LAs, financiers, technology providers, consultants, corporate business and housing developers considering operating or expanding decentralised energy projects.

5-6 May – 2nd DC (District Cooling) Stakeholders Summit (Dubai, UAE) – the Summit will emphasize energy conservation and increasing the efficiency of power generation via the deployment of cost effective and efficient DC methodologies.

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General interest, technology and research

24 Apr – CITyFiED project to develop strategy to transform European urban ecosystems – one of the main strands is to develop cost-effective pioneering methodologies for planning, deploying and replicating energy efficient retrofit solutions, including DH facilities.

17 Apr – Researchers progress efficient conversion of waste heat into electricity – the Northwestern University research team have determined that tin selenide (SnSe) has the highest Carnot efficiency for a thermoelectric cycle ever found, making it potentially a possible material for use in generating electricity from waste heat.

15 Apr – Mitigation of Climate Change - IPCC report – chapters 7 and 9 of the final draft report affirms the role of DH in climate change mitigation.

2 Apr – Case Study: Low Carbon Technologies – Heat Networks and Smart Grids – this joint research presentation was given at the "Investing in local energy: realising local value" stakeholder day held in Newcastle.

Apr – Community DH - getting together with your neighbours –installing a cost-effective DH scheme is not too arduous; the equipment is readily available and there are benefits of scale, reduced capital and running costs, and potential income from the RHI.

Mar –Developing low-carbon heating networks – this briefing from the Heat and the City project highlights research findings from case studies in three UK cities which explore models of local energy governance and organisation.

Mar –Overview of Solar DH Grid in European Countries - this new market research publication has been announced by Reportstack. The fact that solar collectors can be installed on rooftops has increased their popularity compared to other more space-intensive renewable such as biomass.

Mar - report: European CHP to make a big leap by 2020 - the report by GlobalData identifies rising electricity prices as the driver for CHP as an alternative for power generation due to the option of using both natural gas and biomass as fuel and the cost savings from the production of heat for use in DH systems.

Mar - fuel cell CHP becomes commercialised - long term public funding in Europe and Asia for hydrogen and fuel cells has seen, for the first time, fuel cells outselling other micro-CHP technologies with fuel cell manufacturers beginning to break even and the startup of several new production sites.

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Glossary

AC – air conditioning

ACEEE – American Council for an Energy-Efficient Economy

AD – anaerobic digestion

AREA – Air Conditioning and Refrigeration European Association

ASHRAE – ASHRAE (formerly the American Society of Heating, Refrigerating and Air Conditioning Engineers)

ASPs – air source heat pumps

CDM – Construction, Design and Management

CERO – Carbon Emissions Reduction Obligation

CCHP – combined cooling, heating and power

CHP – combined heat and power

CNREC – China National Renewable Energy Centre

CRM – Customer relationship management

CSP – Concentrated Solar Power

CTF – Clean Technology Fund

DCLG – Department for Communities and Local Government

DECC – Department for Energy and Climate Change

DE – decentralised energy

DES – district energy system

DEA – Danish Energy Agency

DH – district heating

DHC – district heating and cooling

DHN – district heating network

EBRD – European Bank for Reconstruction and Development

ECCC – (House of Commons) Energy and Climate Change Committee

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ECO – Energy Company Obligation

The three obligations under ECO are:

CERO - Carbon Emissions Reduction Obligation

CSCO - Carbon Saving Community Obligation

HHCRO - Home Heating Cost Reduction Obligation

EIB – European Investment Bank

EPSRC –Engineering and Physical Sciences Research Council

ESCo – Energy Service Company

EGS – Enhanced Geothermal System

EfW – Energy from waste

FT – Financial Times

GCC – Gulf Cooperation Council

GHG – greenhouse gas

GSPs – ground source heat pumps

GTCC – gas turbine combined cycle

H&S – health and safety

HNDU – Heat Networks Delivery Unit (DECC)

I&C – information and control

IBRD – International Bank for Reconstruction and Development

IDEA – International District Energy Association (US)

IEA – International Energy Association

ITT – Invitation to Tender (European equivalent to RFP)

JV – Joint Venture

KDHC – Korea District Heating Corporation

LLC - Limited Liability Company

LPG – liquefied petroleum gas

LEEF – London Energy Efficiency Fund

NEFCO – Nordic Environment Finance Corporation

Ofgem – Office of Gas and Electricity Markets

ORC – Organic Rankine cycle

OTEC – Ocean Thermal Energy Conversion

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PIP – Preliminary Investment Proposal

PV – Photovoltaic

QUEST – Quality Urban Energy Systems of Tomorrow

RFP – Request for Participation (N. American equivalent to ITT)

RHI – Renewable Heat Incentive

RT – Refrigeration Tonnes

SDC – Seawater District Cooling

SUDS – Sustainable urban drainage systems

Sida – Swedish Development Cooperation Agency

T&Cs – Terms and conditions

TSB – Technology Strategy Board

TSE – Treated Sewage Effluent

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