

# District Energy Vanguards Network Newsletter

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## Editorial

### District Energy in the Age of Austerity

The Government's Spending Review is looming into view with the Chancellor asking government departments to draw up plans to help to deliver £20 billion of "consolidation" over the next 4 years, which means that each unprotected department (of which DECC is one) needs to come up with savings plans of between 25% and 40% of their budget. This column considers what will be the significance of these major budgetary cuts for the growing district energy market.

Firstly, it's useful to remember that, on the face of it, there is relatively little central government money spent on supporting the district energy market: the £9 million budget for HNDU pales into insignificance against virtually any other area of sustainable energy support that DECC manages. And, as highlighted in last month's column, support through ECO did not materialise due to policy changes made by Government.

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As we have seen over the past few weeks the Government's [narrative](#) has been about "reducing energy bills for hard working British families and businesses". That could be positive as, after all, district energy is all about to doing more with less. A return to municipal energy companies could provide long-term, sustainable revenues to local authorities to deliver priority front line services. The provision of warm comfortable homes could reduce the negative impacts of fuel poverty on the health service. Jobs could be generated by keeping the money spent on energy bills within towns and cities and recycling it through the local economy rather letting it leave the area. And that money could be kept within the UK instead of spending it on imported fuels, simultaneously improving our energy security.

But this vision requires a step change from current levels of provision. To achieve such a step change will require a long term government view, as indicated by Energy Minister Lord Bourne in a recent [speech](#) in which he acknowledges heat networks as a cost effective means of achieving the Government's statutory carbon targets. To achieve that potential a short term impetus may be required to kick start the market into reaching a higher level of activity. Most observers agree that the potential is there for district heating with a possible expansion from currently serving 2% of the heat market to anywhere up to 33% and more. As a start [HNDU](#) and the [Scottish Heat Network Partnership](#) (SHNP) are building a pipeline of projects up to feasibility stage. The challenge will be to take these projects onwards through commercialisation to financial close and implementation. A short term impetus could be in the form of two interventions:

Firstly, the support currently offered is in the form of consultancy services and handholding. It needs to go further. The Scottish Expert [Commission](#) on District Heating recommended that funding be provided to embed district heating champions within local authorities to drive these projects internally and liaise with the external overarching coordinators at HNDU and SHNP. They suggested that such champions be supported for three years, given the length of time required for project delivery.

Secondly, as we know, district energy requires significant upfront capital expenditure. The recent DECC [report](#): 'Delivering UK Energy Investment: Networks' indicated that £800 million of investment will be required to commercialise 50% of the HNDU pipeline. Adding the Scottish district heating target and other needs from private projects obligated by planning policies pushes to total investment requirement up to near £1.3 billion over the next ten years. In this ongoing age of austerity for the public sector, new ideas will need to be capitalised upon to help deliver the full potential that district energy can bring.

There is supposedly a 'wall of capital' building up from imbalances in the global trading system that is looking for a home through the City of London. The managers of this capital have tentatively reached out (to me and others) to explore the opportunity for investing in district energy. But they are not familiar with it, do not understand the drivers, technical

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and commercial nuances or indeed the language and do not have sufficient visibility over the project pipeline to be able to develop this opportunity as an asset class in its own right. This makes these projects appear risky 'one offs'. And higher risk is reflected in a requirement for a higher return on capital, higher than most projects can support. This could be addressed by Government providing a short term risk underwriting mechanism to allow a period of time for the investment community to develop their understanding of this market, build relationships with the projects in the pipeline and gain an overview of it. Furthermore, it will allow the district energy community to forge an understanding of the due diligence requirements of investors. As such a mechanism would need to overlap and follow on from the work of the internal district energy champions embedded within local authorities. Such a risk underwriting mechanism would need to be in place for at least four years.

These interventions could allow the district energy market to scale up to the point where it was self-sustaining at a higher level of activity and not require further Government support whilst driving down on many of the costs of social and environmental challenges facing the Government. This may seem to be the opposite of what the Review is meant to achieve. However, as Secretary of State Amber Rudd has recently [said](#) before the Energy and Climate Change Select Committee:

*"I do accept that we need to do more on heat. Heat is hard. It is a difficult area to get right. We have a number of initiatives, both in terms of domestic and non-domestic, but we need to do more about it, which is one of the reasons I am looking at the whole range of policies to see what else we can do to work on heat in people's homes, because that will be a double win in terms of addressing our fourth carbon budget and in terms of keeping bills low. It has been hard. It has been slower than I would have expected and hoped for, but it is going to be a priority going forward".*

Such an intervention could be put forward as a 'priority' policy for the Spending Review.

Lastly, as part of the process of the maturation of the district energy market, we must acknowledge the work of Chartered Institute of Building Services Engineers (CIBSE) supported by the Association for Decentralised Energy (the ADE) on the ['Heat Networks: Code of Practice'](#) published during this past month. This document and the associated training courses will help to drive improvements in the design, management and operation of heat networks.

Congratulations to Phil Jones and Paul Woods who led this initiative.

*Michael King, Editor, 31<sup>st</sup> July 2015*

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## UK, devolved and EU administrations

### Policy, regulation, consultations, guidance and funding

NB articles marked **(M)** include members' only viewable items and those marked **(R)** require free registration to view.

**23 Jul** – [Heat Network \(Metering and Billing\) Regulations 2014 explained](#) – lawyer Claire Haynes provides the answers to leading questions concerning the new legislation.

**21 Jul** – [changes to heat network metering and billing regulations announced](#) – as consequence of updated guidance by the European Commission, DECC's Heat Metering Viability [Tool](#) has been withdrawn and an alternative version is being developed.

**20 Jul** – [DECC publish responses to Call for Evidence on barriers to gas-fired CHP](#) – this document summarises the fifteen responses received and the key points from discussions at the stakeholder events. The consultation response can be viewed [here](#).

**8 Jul** – [Chancellor announces removal of CCL exemption for renewable generation](#) – the Climate Change Levy [exemption](#) for renewable sourced electricity will be removed from 1 Aug 2015 which will affect all renewable generation, including renewable CHP.

**7 Jul** – [House of Commons launch: a low carbon roadmap for domestic heat](#) – in this [report](#) from the [HHIC](#), practical steps are outlined that will need to be taken to make low carbon heating a reality for UK homes (includes many references to DH).

**7 Jul** – [low carbon economy key to UK growth, government must do more to back it](#) – in this [report](#) from the Aldersgate Group, leaders from diverse business sectors, academia and civil society set out key policy priorities that will allow the UK to meet its carbon targets on time, on budget whilst benefitting the UK economy (includes references to DH).

**6 Jul** – [government announces amendments to RHI scheme](#) – the changes cover updated installer standards for heat pumps, solid biomass and solar thermal; a new methodology for calculating heat pump efficiency; and a more accurate forecasting methodology to better reflect operational realities for biomethane plants.

**2 Jul** – [DECC publish complete list of all heat network funding](#) – the list is of all heat network funding to all the LAs across the 4 rounds of HNDU funding.

**30 Jun** – [CCC publishes report on UK's progress on emissions reduction targets](#). – the report calls for urgent action in areas of infrastructure to avoid 'locking in' high carbon pathways citing the development of heat networks and [CCS](#) as high priorities.

**17 Jun** – [barriers to growth and productivity in the energy sector](#) – the Dept. for Business, Innovation & Skills are seeking help to identify where regulation or the implementation of regulation is causing unnecessary problems. **This review will run until 14 Sept.**

### UK conferences, workshops and awards

**17 Nov** – [Energy4PowerLive 2015 conference and exhibition \(London\)](#) – among the conference topics are CHP, DH and data centres. There is also a call for [papers](#).

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**16 Jul** – [first Thermal-Energy Research Accelerator \(T-ERA\) event to be held](#) – this Government funded research project will include developing capability in thermal energy storage, heat networks, heat pump technology, thermal manufacturing and advanced bio-refining technologies. The [ERA](#) collaboration prospectus can be viewed [here](#).

**14 Jul** – [UK-first renewable heat network demonstrator wins DECC funding \(Exeter\)](#) – the project will see the installation of approx. 2,000m<sup>2</sup> solar thermal array on land near to the [Cranbrook energy centre](#) to power a high temperature (>80°C) heat pump to supplement heat already provided by a CHP plant to the local DH system. See also [here](#) and [here](#).

**14 Jul** – [DECC funds PassivSystems to develop new heat network controls](#) – the controls will introduce a direct digital link between homes and the energy centres that supply them with heat to optimise heating supply over the day and reduce demand peaks.

**13 Jul** – [urban projects receive Scottish Government renewables funding](#) – among the 23 [LECF](#) awards, the “Heat from the Street” Linlithgow based project will use heat pump and solar panel technology to capture heat from the local waste water system and distribute it to town centre buildings via a DH system.

**10 Jul** – [Industry welcomes new heat network Code of Practice](#) – key players from across the district heating industry attended the [launch](#) of the new heat networks Code of Practice. More information on the Code of Practice can be found [here](#).

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## UK News

NB articles marked **(R)** require free registration to view.

**30 Jul** – [DECC release Digest of UK Energy Statistics \(DUKES\) for 2015](#) – 2014 saw 88 CHP schemes serving DH&C with a [Good Quality CHP](#) power outputs and heat outputs of 5,575 GWh and 11,686 GWh, respectively – see section 7.20 of [Chapter 7](#).

**30 Jul** – [GLA holds close-out event for the District Energy Project Delivery Unit](#) – the project was set up in 2011 with €3.3m in funding, 90% of which was secured from the EU's [ELENA](#) facility. The Unit provided support to London Boroughs and others in delivering more than £60m investment in low to zero carbon DE schemes, many of which incorporate heat networks, with final investment realised expected to exceed £100m.

**27 Jul** – [CHP-DHC see Manchester civic buildings reduce CO<sub>2</sub> emissions](#) – to maximise output from the trigeneration system, thermal stores allow night-time charging with the cooling potential utilised for the [ICT](#) communications rooms.

**25 Jul** – [Bradford Council gives green light for DH network plans](#) – under the plans up to 20 buildings, including nine council sites and 11 social housing blocks comprising around 700 homes in the city centre, will be linked on the low carbon heating system.

**22 Jul** – [Glen Tanar Estate opts for biomass DH scheme \(Aberdeenshire\)](#) – the scheme uses woodchips from the annual timber harvest to heat the main office building, the ballroom and eight properties on the [Estate](#) with the remainder connected up in 2016.

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- 22 Jul** – [advantages of pre-insulated polybutene \(PB\) DH pipe demonstrated](#) – the new DH system for the Cheshire-based charity, [Seashell Trust](#), is using flexible [PB](#) pipework which can be installed more speedily and has better corrosion and insulation properties compared to traditional steel DH pipes. PB pipework is also being installed in [Plymouth](#).
- 22 Jul** – [multi-story revamp completed \(Solihull\)](#) – the two year refurbishment programme has seen 30 high-rise buildings fitted with solid wall insulation, and heated by a dozen biomass energy plants via DH. Wet radiator systems with programmable controls and an [HIU](#) have replaced electric storage heating and electric immersion heaters for hot water.
- 17 Jul** – [District Energy Vanguard Network workshop reaches local authorities](#) – the event titled, “Financial Plans, Building a Heat Tariff and Heat Metering”, was attended by representatives from local authorities across the UK.
- 15 Jul** – [DECC awards £67k for DH plans in the Marches \(Shropshire\)](#) – the award will go towards four feasibility studies into potential DH schemes in Hereford, Shrewsbury, Whitchurch and Telford. The [Marches LEP](#) will provide the remaining £33k towards the overall cost which has come from the EU [ERDF](#).
- 14 Jul** – [Gospel Oak: a successful DH case study \(Camden, London\)](#) – the system is based on a 5 MWe gas-fired CHP plant in the [Royal Free](#) hospital. A partnership between the hospital, the local [council](#) and the system operator, [MITIE](#), has subsequently seen 1.5MWth used to provide heat for six blocks of flats comprising 1449 dwellings.
- 14 Jul** – [£20k awarded for River Tay heat pump and DH feasibility study \(Perth\)](#) – the study aims to demonstrate that water source heat pumps can be used to capture low grade for heat for a DH network from an ecologically sensitive river without environmental detriment. The [award](#) is from the Scottish Government’s [LECF](#)
- 14 Jul** – [CBI report “small steps, big impact” calls for more on-site generation](#) – the report uses case studies to underline the major role that on-site generation and DH can play in meeting the UK’s energy and climate change challenges. See [here](#) for report.
- 14 Jul** – [the new face of DH in the UK \(CIBSE blog\)](#) – in this article the author evaluates the significance of the recently unveiled [Code of Practice](#) for Heat Networks concluding that it marks an important milestone for the future of heating in the UK.
- 14 Jul** – [UK-first renewable heat network demonstration wins DECC funding](#) – the project is led by E.ON working with Exeter University and technology providers, SK Solar and [Star Renewable Energy](#), with the aim of creating an innovative energy system supplying one of the UK’s largest DH systems from diverse heat sources including a 2000m<sup>2</sup> solar thermal array and a large scale water source heat pump.
- 7 Jul** – [RHI helps biomass-DH company expand workforce \(Angus\)](#) – the company designs, builds and maintains biomass heating systems and large scale DH schemes.
- 7 Jul** – [EuroSite Power to install 100kW CHP system at leisure centre \(Stevenage\)](#) – the 15 year agreement will see the company fund, own and operate the plant with the leisure centre buying the power and heat produced at a guaranteed lower rate than if it were to buy directly from the grid. The [agreement](#) is one of five with the [BH Live](#) leisure group.

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**7 Jul** – [three year lead time on potential DH system discouraging for RWE](#) – having invested £12m in the biomass CHP plant at the defunct Tullis Russell paper mill the energy provider, RWE, are keen to recoup their investment by selling heat.

**6 Jul** – [work begins on £25m green energy centre \(Fife\)](#) – the biomass fueled plant will be built on the site of a former paper mill and will pump hot water four miles underground to heat and cool laboratories and student residences at St Andrews University.

**30 Jun** – [farmers' guide to financial benefits of waste energy published](#) – the biogas generation specialist [ENER-G](#) has published a free guide to help British farmers gain financial benefits from turning farm waste into electricity and heat via anaerobic digestion.

**29 Jun** – [Cambridge-based COHEAT claims heat network innovation](#) – the energy technology company which specialises in community scale heat networks, is working with [Trident Social Investment Group](#) to deliver what they describe as, ‘the world’s first truly integrated heat network’ for a social housing development in the West Midlands.

**25 Jun** – [ZERO Carbon Future awarded £378k DECC funding for UK heat networks](#) – the company specialises in the integration of solar thermal panels, heat pumps and biomass boilers with DH systems.

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## UK Tenders

A list of tenders which include the [CPV code](#) for district heating can be viewed [here](#).

## UK Jobs

A list of district heating related jobs can be viewed [here](#).

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## Europe

NB articles marked **(R)** require free registration to view.

**23 Jul** – [EIB lends €400m for upgrading municipal infrastructure \(Ukraine\)](#) – the funds will support 25 to 40 projects covering DH refurbishment, energy efficiency in public buildings, municipal lighting and will contribute to Ukraine’s energy security.

**17 Jul** – [association reports strong growth of DH cooperatives \(Germany\)](#) – the cooperative association, [DGRV](#), said that over the past three years DH cooperatives accounted for more than 60 of 140 new companies.

**7 Jul** – [Lamborghini obtains CO<sub>2</sub>-neutral certificate \(Sant'Agata Bolognese\)](#) – the company’s new trigeneration and DH system is based on a natural gas fired 1.2MWe CHP plant which the company plan to convert to biogas in 2017.

**7 Jul** – [Solar thermal in Europe: the market is shrinking, but there are exceptions](#) – the latest [market report](#) from the European Solar Thermal Association [ESTIF](#) shows that Germany still dominates the shrinking European market with Greece and Spain as notable exceptions.

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**6 Jul** – [DH is common factor in transition towards cleaner European cities](#) – more than 6,000 cities have signed up to go further than EU climate targets via the [Covenant of Mayors](#) initiative with Copenhagen, Bristol and [Växjö](#) leading the way.

**2 Jul** – [ISP and Fortum sign data centre heat recovery agreement \(Stockholm\)](#) – the energy company, [Fortum Värme](#), will be supplying cooling to [Bahnhof](#), a Swedish ISP, who in turn plans to sell back surplus heat to Fortum's city-wide DH system.

**2 Jul** – [Savo-Solar to deliver 5,500m<sup>2</sup> solar thermal collector field for DH plant](#) – the contract covers stage two of the solar project in the Danish town of Løgumkloster. Stage one covered 9,600m<sup>2</sup> with a further 36,000m<sup>2</sup> to be installed by the end of 2016.

**30 Jun** – [EPEE sponsors lively evening debate on heating & cooling](#) – the European Partnership for Energy and the Environment ([EPEE](#)) sponsored a lively evening debate entitled "Heating and cooling in the Energy Union project: the challenges ahead for implementing an efficiency-based energy approach."

**29 Jun** – [Alfa Laval wins SEK 100m \(£7.5m\) DH order in China](#) – the Swedish company will supply compact heat exchangers to a DH plant in China which supplies heating for nearly 1m households.

**Jun** – [Heat Roadmap Europe 3 \(STRATEGO Work Package 2\) published](#) – this extensive report of the [STRATEGO](#) project quantifies the impact of implementing various energy efficiency measures in the heating and cooling sectors of five EU Member States: Czech Republic, Croatia, Italy, Romania, and the United Kingdom.

## European tenders

A list of tenders which include the [CPV code](#) for district heating can be viewed [here](#).

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## The Americas and Africa

**28 Jul** – [DH&C company fined for discharging ozone-damaging refrigerant](#) – the company, based in the City of [Windsor](#), was fined \$100k for successive discharges of the [R22](#) refrigerant contrary to the Canadian Environmental Protection [Act](#).

**23 Jul** – [progress underway on remediating Cheakamus Crossing DES \(BC\)](#) – staff at the Resort Municipality of Whistler ([RMOV](#)) are in the process of developing resources for residents who experience problems with the district energy system.

**23 Jul** – [Canadian and European cities exchange approaches to sustainability](#) – both DC (Halifax, Nova Scotia) and DH ([Kronsberg](#), Germany) feature strongly in the context of the EU-Canada Municipal Cooperation on Urban Policy [initiative](#).

**21 Jul** – [new guide explains how to plan and finance community microgrids](#) – the [report](#) lays out a roadmap for communities considering microgrids from setting goals and identifying the vision for a project to choosing sites, completing analyses, acquiring financing, and getting approval to build.

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**17 Jul** – [Boston-Cambridge DE System wins IDEA System of the Year Award](#) – since acquiring the system in 2005, Veolia has invested \$168m on improving network efficiency. Their recent \$112 million "Green Steam" project included the acquisition of [Kendall Cogeneration Station](#) and a 2,750m steam pipeline extension, enabling up to 75% of their heat supply to consist of recycled green steam.

**17 Jul** – [Pittsburgh and Department of Energy to develop localized energy plan](#) – the [MoU](#) is meant to jump-start development of local sources of power and could include at least one new heating and cooling plant near the [Consol Energy Center](#), Uptown.

**11 Jul** – [grants awarded to assist deployment of rural biomass-DH \(Minnesota\)](#) – the awards will facilitate transition away from fuel oil and propane dependency to locally sourced biomass, for example, the proposed [Grand Marais DH system](#) will use locally available waste wood to produce hot water for heating and [DHW](#) in multiple buildings.

**8 Jul** – [council takes next steps on solar and biomass energy \(Nelson, BC\)](#) – the proposed DH system will heat a number of large buildings including the Civic Centre, community complex, curling club, and possibly the hospital by burning about 15% of wood waste from the surrounding area which is currently burned on site or taken to landfills.

**7 Jul** – [DE microgrids attracting real estate development in Boston](#) – in this YouTube clip from the recent IDEA [conference](#), Brad Swing, director of policy and programs for the city of Boston, sees thermal networks and microgrids as critical tools to attract commercial development.

**2 Jul** – [City of Edmonton looks at downtown DE scheme \(Alberta\)](#) – the City has been working since 2012 on a scheme to generate electricity centrally and heat buildings in the area via a DH scheme. The plan foresees the utility [Enmax](#) owning the generator and selling heat to customers, with [Epcor](#) building and maintaining the heat network.

**30 Jun** – [adviser to UNEP cites heat networks as key to energy efficiency](#) – speaking at the 106<sup>th</sup> IDEA Conference, [UNEP](#) advisor, Lily Riahi, listed waste heat from data centers, sewerage treatment plants, metro systems, industry and power plants as a free resource essential to the realisation of the full potential of energy efficiency via heat networks.

**29 Jun** – [US Environmental Protection Agency Energy Star CHP Awards announced](#) – the three winners were [Bowdoin College](#) (Brunswick, Maine); [Pepeco Energy](#) (Atlantic City) and [Thermal Energy Corporation](#) (Houston) all of which demonstrate the efficacy of DH&C.

**29 Jun** – [Texas Medical Center uses CHP 48MWe gas-turbine for DH&C](#) – the system is used primarily to heat and cool the 1,800,000m<sup>2</sup> centre with excess power sold to the local electrical grid thereby supporting grid stability in the greater Houston area.

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## China, Asia and Australasia

NB articles marked (R) require free registration to view.

**31 Jul** – [AuCom secures \\$NZD 4m DC systems contract in Qatar](#) – the New Zealand based [AuCom Electronics](#) secured the contract via its German subsidiary. The contract covers the provision of services and equipment for the control of water pumps for a DC system in the city of [Lusail](#), Qatar.

**24 Jul** – [DC company Tabreed posts first half profit rise](#) – lower finance costs and further growth across the [UAE](#) and the [GCC](#), with over 13,700 [RT](#) of new connections made in the first half of the year, are cited as the main factors in Talbreed's strong performance.

**23 Jul** – [reliable and affordable heating is essential to everyday life in Tajikistan](#) – over the past few decades, the share of urban households supplied by DH has decreased from 35% to less than 4%. The remaining assets operate at a fraction of their design capacity and are characterized by high losses, increasing pollution and low efficiency.

**23 Jul** – [MHI wins order for 80 large-scale centrifugal chillers \(Medina, KSA\)](#) – the units will provide a combined 200K RT cooling capacity to the DC plant to supply chilled water to an area of 160 hectares in the holy site. This is [MHI](#)'s largest order of this kind to date.

**16 Jul** – [GS Power selects GE 7HA gas turbine for DH \(Anyang, Korea\)](#) – in DH mode the turbine achieves more than 91% efficiency. The plant will have the capacity to generate 935MWe in combined cycle mode, the equivalent of powering 900,000 Korean homes.

**13 Jul** – [DC company Empower launches drive to cut energy usage](#) – the Dubai-based company has launched an emirate-wide summer campaign to reduce DC consumption and boost transparency levels in its billing methodology.

**11 Jul** – [DC company Empower wins two awards at 106<sup>th</sup> IDEA Conference](#) – the company was presented with the Gold Space Award for the total area of DC committed and Silver Award for total number of buildings committed to the system.

**4 Jul** – [a history of geothermal DH in Rotorua \(New Zealand\)](#) – regional councillor Lyall Thurston said geothermal was recognised as an important asset for the region, offering significant potential to grow the region's economy and social communities.

**4 Jul** – [UNEP welcomes China's efforts in sustainable development](#) –spokeswoman and Director, Ligia Noronha, highlighted the importance of UNEP's recently launched District Energy in Cities [Initiative](#) at the 2015 Eco-Forum Global Annual [Conference](#) in [Guiyang](#).

**2 Jul** – [Danfoss looks to China's green economy](#) – the Danish energy-efficiency company is already implementing a DH system in the northeastern city of [Anshan](#) by using the surplus heat from the local steel plant to displace inefficient coal-fired boilers.

**2 Jul** – [Qatar Cool wins 2 international awards at 106th IDEA Conference](#) – the Doha based DC company received two 2014 Space Awards for "Total Area Committed" and for "Total Number of Buildings Committed."

**2 Jul** – [Empower wins Innovation Award at 106th IDEA Conference](#) – the Dubai based DC company received the award for their "Centralized Metering Data Management System".

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**2 Jul** – [Kai Tak DC system receives recognition](#) – the Chief Secretary for Administration of Hong Kong, Carrie Lam, commended the [EMSD](#)'s support team for their success in the District Cooling System project, which is one of the key infrastructural projects supporting the sustainable and green development of the [Kai Tak Development](#).

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## International conferences, symposiums and forums

**10-11 Nov** – [7<sup>th</sup> Middle East DC Summit to be held in Doha \(Qatar\)](#) – this year's presentations, discussions and case studies are expected to focus on technologies, regulations, projects and financing.

**30 Aug–5 Sep** – [3<sup>rd</sup> edition of the International DHC+ Summer School \(Turin, Italy\)](#) – the School is designed to provide a clear introduction to DHC technology, operational issues, and consumer determinants in evolving energy systems. The School will combine theoretical lectures with practical application, site visits and networking opportunities.

**25-27 Aug** – [4<sup>th</sup> Annual Asia Pacific District Cooling Conference \(Bangkok\)](#) – this three day event will include sessions on regulation, design, awards, technology and operations.

**25-26 Aug** – [Smart Energy Systems and 4<sup>th</sup> Generation DH \(Copenhagen\)](#) – the conference applies to everyone with an interest in energy systems and DH&C. Based on the Call of abstracts, [4DH](#) has received more than 70 interesting contributions to both industrial and scientific presentations. The programme can be viewed [here](#).

**28 Jun–1 Jul** – [106<sup>th</sup> IDEA annual conference explores latest DE trends](#) – this event saw 100 speakers and over 950 attendees discuss perspectives for more resilient and sustainable cities. A summary of the proceedings can be viewed [here](#).

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## General interest, technology and research

NB articles marked **(R)** require free registration to view and those marked **(P)** are purchasable only.

**8 Jul** – [District Cooling Through the Ages](#) – this week's CW Online guest columnist, [Ahmad Bin Shafar](#), explores the history of DC dating back more than 3,000 years to the present day and prospects for the future.

**7-8 Jul** – [heating and cooling with waste heat from industry](#) – this study into DH of the future, will be managed by the [EURAC](#) research centre with project partners which include the University of Stuttgart and agencies and companies specialising in DH systems from Italy, Spain, Germany and Denmark.

**1 Jul** – [combining solar with ground source heat pump is energy and cost efficient](#) – this study from the [VTT Technical Research Centre](#) used ecological hybrid solutions to enhance the efficiency of heat and power production in buildings to determine the most efficient solution with the lowest lifecycle costs (Finland).

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**July** – [DH&C market - Global Industry Analysis: growth and forecast 2015-2023 \(P\)](#) – this research report analyses this market on the basis of its market segments, major geographies, and current market trends.

**May** – [a Bayesian Approach for Forecasting Heat Load in a DH System](#) – this [thesis](#) proposes a probabilistic machine learning model using a [Naive Bayes classifier](#), to forecast the hourly heat load demand for three residential buildings in the city of [Skellefteå](#), Sweden over a period of winter and spring seasons.

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[Link to the glossary of terms and acronyms](#)

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