District Energy Vanguards Newsletter – October 2016

Editorial: HNIP Haste

Research on the delivery of successful district energy projects over the last 10 years identified a key success factor as being 'wilful individuals' who confronted and overcame the multiple challenges to project delivery. Frequently these included the institutional inertia of their own organisations making it necessary to work on project development in their own time in the evenings and at weekends. Such 'wilful individuals' yearned for the day that the benefits of heat networks would be recognised and given adequate support. Consequently there was elation when late last year the then Chancellor of the Exchequer announced a £320m capital support programme for heat networks. After a year's work and a public consultation the Heat Network Investment Project (HNIP) is now ready to go and the pilot phase was launched on 28th October.

After a week to digest the HNIP pilot guide one thing is very clear. **There is an awful lot to do in a very short space of time**. There are still going to be long evenings and weekends pouring over drafts and spreadsheets. Furthermore, such is the complexity of the Project – with eight interacting criteria for the projects and seven metrics for HNIP evaluation – one wonders if there is sufficient time for it to settle down. Typically such programmes bed in, a sense of clarity emerges and stakeholders learn to work with them through a trial and error approach over what is successful and what is not. **There does not seem to be much time for this evolution to happen.**

For example, the central purpose for HNIP is to provide capital funding because that is not currently forthcoming from the investment market. Commercial investors are seeking returns on capital in double digits whereas district energy projects can mainly only deliver single digit returns. Therefore the rationale is to provide a capital contribution that plugs the funding gap and boosts the IRR to the hurdle rate that investors expect. But that opens up the opportunity for investors to '*game'* the programme by increasing their hurdle rate. To guard against this grab at the tax payer subsidy, the project metrics will be fed into a shadow HNIP financial model that will calculate the project IRR and then allocate the appropriate amount to fill the funding gap between that and "*an acceptable tolerance*" in the investor hurdle rate with "*a ceiling set by HNIP*". Intriguingly, "*this figure will not be published*". [page 19/20 of Salix applicant guidance document]

Overtime investors will second guess this figure until enough projects have passed through the process and they then have a pretty good idea of what it is. But my point is that we are trying to deliver the Project is a very short space of time. Will it be long enough for this market-based approach to find its mark?

Investing in an ISA you get the return you can expect in advance. Why not for HNIP?

Michael King
Editor

Spotlight on BEIS *HNIP Government Response : Capital funding for building heat networks*

Our investment over the next five years will create the clean, efficient and affordable heating systems of the future. This will initially take the form of grants and loans to overcome the hurdles to investment that currently hold back the sector. This will act as the catalyst to build a flourishing and independent market for new heat network construction. [p4]

The Government will only support heat networks which can provide heat at prices no higher than the alternatives, and we will be specifically encouraging those that can show they will be able to cut bills. [p4]

By providing funding for project development and their own expertise and support, HNDU has built up a pipeline of over 200 projects across more than 130 local authorities.

But we know from extensive research and consultation that support at the feasibility and development stage of current projects will not be enough to see them all get built. And those that do get built may not, without Government support, be built in the most optimised way for the future, with low carbon, strategically-connected and affordable heating. That is why the Government announced in November 2015 that it was making available £320m of funding for heat networks over the next five years, expected to draw in up to £2 billion of additional capital investment. This should lead to the construction of hundreds of heat networks in urban and rural areas. [p5]

- A Pilot Scheme is being launched now for applications this autumn, with all payments to be made by 31 March 2017. The budget available for the Pilot Scheme is £39m, split across two financial years (2016/17 and 2017/18).

- This Pilot will consist of one single competitive funding round and will inform the Main Scheme, which is expected to open in 2017 and run for four years.

- Eligible costs include the construction, expansion, refurbishment and interconnection of heat networks, including works to access recoverable heat and upgrade of heating systems inside some existing properties as well as commercialisation phase costs (where they are capitalised).

- Multiple criteria will be used to score and rank applications with respect to their carbon savings, customer impact and social net present value.

The criteria for support under this scheme should ensure that good quality, efficient, low carbon and affordable heat networks are built. Alongside this, the industry also needs to play its part by driving down costs, learning from elsewhere, and bringing innovation to the sector.

In line with good policy making the first funding round of the HNIP will be run as a pilot designed to build momentum, and gather important additional learning to help with the design and delivery of the Main Scheme expected to be launched in 2017. [p8]

The full details of the grants and soft loans available under the Pilot are detailed in the HNIP Pilot Application Guidance11.
For Loans, it is intended that they will have the following characteristics:

- The term will match closely to the 'project life' (see definition in Pilot Application Guidance) up to a maximum of a 40 year term.
- A low interest rate below Public Works Loan Board (PWLB).
- An annuity repayment profile with the first principal repayments to start after construction; either the earlier of project operation or a fixed deadline. [p34]

Birmingham New Street station launches carbon-savings calculator to showcase savings generated through district energy scheme (networkrail) 08 November 2016
A new carbon-savings calculator has been unveiled at Birmingham New Street station, to demonstrate the emission reductions resulting from its connection to the Birmingham District Energy Scheme.

District Heating and Cooling Industry - Detailed Study Analysis and Forecast by 2024 (Digital Journey) 7 November 2016
The district heating and cooling (DHC) market report by Transparency Market Research provides in-depth analysis of the district heating and cooling market globally. The report segments the market on the basis of geography

Paris geothermal district heating on track to deliver heat by winter (thinkgeoenergy.com) 4 November 2017
Geothermal heating development continues in and around Paris, the Capital of France. The Grigny geothermal project, just outside of Paris has reached a drilling depth of 1,200 meters with a target depth of 1,600 meters. The project expects to tap into water with a temperature of around 70 degrees Celsius.
It is expected that the project will start delivering heat to around 10,000 households and communal buildings in the municipalities of Grigny and Viry-Châtillon.

Free Guide Detailing New Changes To Heat Network Regulations (Blue & Green Tomorrow) November 4 2016
A guide to the latest legislative changes affecting the UK's communal energy and district heating schemes and what they mean for heat suppliers has been released by community heating specialist Switch2 Energy.

District Heating & Cooling Market: Economies of Scale offered by District Heating & Cooling Systems to Augment their Installation Worldwide (TMR) 4 November 2016
TMR has estimated the global market for direct heating and cooling systems to exhibit a CAGR of 6.2% and 5.8% in terms of energy sales revenue and volume, respectively between 2016 and 2024. Expanding at this rate, the market is projected to reach US$243,428.3 mn by the end of 2024. Based on volume, the market is forecast to reach 12,187,491.8 tera joules by 2024.

CBx RESEARCH REPORT – Low Carbon Heat Networks. How to optimise an existing system for improving performance (CBXchange.org) 3 November 2016
Today CBx launches the results of an industry-led study into improving the energy performance of existing heat networks, with recommendations for the operators of heat networks and policymakers.

How to develop support schemes for Renewable Heating and Cooling: A publication by the FROnT project (progressheat) 3 November 2016
The FROnT project is an IEE project closely linked to progRESsHEAT as it aims at promoting a level playing field for Renewable Heating and Cooling (RHC) in Europe, and develop strategies for its greater deployment.
The FROnT manual of good practices provides guidance for policy makers establishing successful support schemes for renewable heating and cooling. It does

so in order to help them effectively deliver competitive, affordable, and sustainable solutions for consumers and at the national level.

Best Presenters at 2nd 4DH Conference are working close to reality (4DH.DK) 2 November 2016

The two winners of the Best Presentation Award at this year's 2nd International Conference on Smart Energy Systems and 4th Generation District Heating were both chosen because of their excellent presentations of issues in the real world of district heating.

The winner of the PhD category, Industrial PhD Fellow Magnus Dahl from AffaldVarme Aarhus and Aarhus University, won the 1000 euro prize sponsored by Kamstrup for his presentation on "Applications of a heat load forecast with dynamic uncertainties". His research is focused on cost and risk assessment in district heating systems.

The winner of the Senior category, Martin Crane, is owner and Managing Director of the UK district heating and energy efficiency consultancy Carbon Alternatives. He won the 1000 euro prize sponsored by Danfoss. Martin Crane's presentation was about the development of the UK Heat Interface Unit (HIU) testing regime which he worked on together with energy consultants Fairheat, inspired by a Swedish test and modified to British conditions.

CIBSE develops checklists for heat networks (Modern Building Services) 02 November, 2016

A new scheme that allows clients to hold suppliers to account over the performance of heat networks using the 'Heat networks code of practice CP1', produced as a joint project between CIBSE and the Association for Decentralised Energy, has been open for public consultation (with a closing date of 9 September. The client checklists have been designed to allow clients to check that their heat network has been installed to minimum standards set out in CP1 and to give them confidence that their scheme is of high quality and will provide low-cost low-carbon heat.

Phil Jones, chairman of the CIBSE CHP and district-heating group, said, 'The code of practice on heat networks is designed to raise standards in heat-network installation and ensure that the industry helps low-carbon district heating to become a major part of the future of heat in the UK. We have introduced these checklists to give clients confidence that their networks are installed to the highest standards and with the latest guidance.' The checklists will be trialled later this year.

Lib-Dems hail ex-coal mine heating plan (Oldham Evening Chronicle) 1 November 2016

CONFIRMATION that Oldham Council will be supporting a bid to investigate the potential for using heat from disused coal mines has been welcomed by the leader of the Oldham Liberal Democrats

No action for non-compliance with heat networks regulations (energylegislation.co.uk) 26 October 2016

The Government has provided clarification on compliance with the Heat Network Regulations following intervention by the European Commission (EC) on the UK's cost effectiveness test. The EC's cost effectiveness criteria have been delayed and

consequently the government will be consulting early next year on its revised regulations. The Department for Business Energy and Industrial Strategy (BEIS) is working towards the launch of a public consultation on a revised methodology for assessing the cost effectiveness of metering for district and communal heat networks. The consultation will also seek views on some additional areas where the regulations could benefit from clarification following the first two years of implementation.

Job BEIS: Heat Networks Specialist (Deadline 21 November 2016)
£48,400 - £57,7353 Whitehall Place, London
BEIS is looking for a Heat Networks Specialist to join the new Heat Networks Delivery Unit. Your role will include:
• Being the lead contact for LAs on certain projects as directed, co-ordinating resources from across HNDU
• Supporting LAs to identify schemes and establish project governance;
• Assessing grant applications in order to make recommendations to the HNDU Investment Director and Grant Appraisal Panel
• Recommending to the Investment Director and Project Board any areas for discrete pieces of work
• Supporting Las with various work ranging within the Unit

Heat network investments: getting the numbers right (PublicSectorExecutive) 24 October 2016
Tanja Groth, decentralised energy manager at the Carbon Trust, explains why the organisation has launched a District Heating Cashflow Quality Assurance Template to assist public sector bodies in their investment decision-making.

Prevention or cure – legionella prevention in heat networks (CIBSE Journal) October 2016
There are two options when it comes to safeguarding low-temperature district heating systems from legionella – safe design or sterilisation treatments. Xiaochen Yang, Hongwei Li and Svend Svendsen, from the Technical University of Denmark, look at the options

Making EfW heat pipe dreams a reality (Let'sRecycle) 21 October 2016
Nadeem Arshad, Head of Waste and Energy at law firm Bevan Brittan, discusses the Government's £320 million support for heat networks and the 'golden opportunity' for the Energy from Waste (EfW) sector.

Combined heat and power quality assurance (CHPQA) standard (BEIS) 21 October 2016

£100m energy bill debt as temperatures plummet Independent 20 October 2016
As part of £230m initiative that draws on the experiences of a number of Scandinavian cities and will roll out over the next 5 years, the networks will mean cities in England and Wales can recycle the wasted heat they produce from places like factories, power stations and even the London Underground and pump it into homes and businesses to keep them warm, the Government has claimed. "Heat networks can significantly improve the efficiency with which heat is provided to our towns and

cities, as well as helping to develop local infrastructure and reduce carbon," Minister of State for Energy, Baroness Neville-Rolfe has claimed.

SSE calls for further measures to support district heat (Utility Week) 20/10/2016
SSE has welcomed the announcement of a £39 million funding scheme to support district heat development, but said further measures are needed.
SSE's director of heat, Mike Reynolds added that "more needs to be done in parallel to encourage sustained growth in the sector and bring appropriate quality assurance to customers."
He said that while good progress has been made in enabling areas with better guidance, such as the introduction of CIBSE design codes and the Heat Trust, "progressive policy intervention should go hand-in-hand" with the funding.
"It is important to ensure that we continue to remove barriers to entry to the market for new suppliers; that we enable competition; that we bring good quality assurance; and, critically, that we address the relatively untouched retrofit market as well as new build," Reynolds said.

Campaign group calls for extra conditions on heat network funding (Utility Week) 18/10/2016
Campaign group Fuel Poverty Action has called for additional conditions to be attached to government funding for heat networks to ensure consumer's interests are protected. But the group said following a briefing with the Department for Business, Energy and Industrial Strategy (BEIS), it believes BEIS is "concerned about whether what they fund now through the Heat Networks Investment Project could damage consumers' interests or the industry's reputation. "Fuel Poverty Action (FPA) welcomed the announcement of a pilot scheme worth £39 million yesterday which is designed to drive through development of heat networks in the UK.

Scaling up local energy infrastructure; An agent-based model of the emergence of district heating networks (Energy Policy) October 2016
Jonathan Buscha, Katy Roelicha, Catherine S.E. Balea, Christof Knoeria,

- Energy policy should account for diverse actor motivations and capabilities.
- Project development is a multi-stage process, not a one-off event.
- Participatory agent-based modelling can inform policy that accounts for complexity.
- Policy should take a portfolio approach to providing support.
- Local authorities have an important strategic role in local infrastructure.

Consumer protection a vital part of Government's heat network investment requirements (Heat Trust Press Release) 17th October 2016
Consumers will be placed at the heart of new Government backed heat schemes according to a major new initiative launched today. Applications to the Heat Networks Investment Project (HNIP) for funding to support the development of heat networks will be required to sign up to consumer protection scheme Heat Trust or offer equivalent standards to domestic and micro-business customers.
The requirements form part of the pre-qualification questionnaire which invites local authorities to apply for a share of £39 million as part of the HNIP's Pilot Scheme. Multiple criteria will be used to score and rank applications to the Pilot Scheme and include scores for carbon savings, customer impact and social net present value.

Welcoming the launch of the Heat Networks Investment Project, Bindi Patel, Head of Scheme at Heat Trust said:
"The long-term legacy of heat networks will be defined by how well heat networks operate and deliver for the customers they serve. Striving for excellence in customer service should form a central part of any heat network project.
It is, therefore, fantastic to see that the principles set out under Heat Trust for customer service standards and customer protection form part of the selection criteria in allocating funding."

The energy of Scotland: Heating, moving and powering our lives from now to 2030 (WWF/FOE report) October 2016
Heat: renewables supply 40% of Scotland's heat in 2030, up from 4% today. Heat pumps are routinely installed in offices and homes, and district heat networks have expanded in cities. The renewal of Scotland's heat infrastructure helps tackle fuel poverty and provides jobs across the country.

Next steps for UK heat policy (Committee on Climate Change report) 13 October 2016
Heating and hot water for UK buildings make up 40% of our energy consumption and 20% of our greenhouse gas emissions. It will be necessary to largely eliminate these emissions by around 2050 to meet the targets in the Climate Change Act and to maintain the UK contribution to international action under the Paris Agreement.
Progress to date has stalled. The Government needs a credible new strategy and a much stronger policy framework for buildings decarbonisation over the next three decades. Many of the changes that will reduce emissions will also contribute toward modern, affordable, comfortable homes and workplaces and can be delivered alongside a major expansion in the number of homes. This report considers that challenge and sets out possible steps to meet it.
Infographic: The future of heating in UK buildings

Stoke-on-Trent district heat scheme benefits from Swedish expertise (Stoke Sentinel) October 10, 2016
Swedish experts are helping to cut the costs of Stoke-on-Trent's £52 million plan to heat homes and businesses using renewable energy. Stoke-on-Trent City Council's district heat network would involve creating a geothermal well to extract the energy from two-and-a-half miles beneath the Etruria Valley. It could then be transferred to a closed loop of water pipes to provide families with cheap heating.
Now the authority has formed a partnership with Oresundskraft, a council-owned district heating company in Helsingborg, Sweden, where the technology has been in use for 52 years.

Can district cooling make FM go green? (ConstructionWeek) Oct 9, 2016
Engineering consultancy Aecom announced this August that it has committed its operations to reducing greenhouse gas (GHG) emissions by 20% across its global operations by 2020. Aecom said it will focus on its largest sources of emissions – fleet vehicle fuel, purchased electricity, and heating and cooling for offices – to fulfil these aims.

Record amount of Scotland's heating being generated by renewables, report reveals (Herald) 7 October 2016

A record amount of Scotland's heating is being generated by renewables, according to a new report. Figures published by the Energy Saving Trust on behalf of the Scottish Government show that 2015 had the largest increase in renewable heat output since measurement began in 2008/09. During the year, Scotland generated at least 5.3% of its non-electrical heat demand from renewable sources, up from 3.8% in 2014.

Update on Renewable Heat Target and Action - 2016 (Scottish Government) Friday, October 7, 2016 Report
The Climate Change (Scotland) Act 2009 requires Scottish Ministers to produce a plan for the use of renewable sources and to report regularly on progress. A Renewable Heat Action Plan was produced in November 2009 updated in 2010, and refreshed again in 2011. The Heat Policy Statement published June 2015, updates and replaces the Renewable Heat Action Plan and subsequent updates. This 2016 update report outlines progress made against Scotland's renewable heat target and actions to achieve it.

Sunamp eyes project to ship waste heat by barge to Bristol (Business Green) 7 October 2016
Renewable heat firm is seeking funding for project to float heat upriver to serve Bristol's district heating system
Renewable heat specialist Sunamp is preparing a pioneering project to transport heat from a waste treatment plant to the homes and businesses of Bristol - by barge.

Interview with Tim Rotheray, ADE Director (New Power) October 2016
User-led energy could help improve the efficiency and lower the cost of the UK's energy supply, and improve security of supply, but inherent bias in the system has to be rooted out to develop it, says the director of the Association for Decentralised Energy. Tim Rotheray spoke to Janet Wood

Trailer: Smart Heating Europe (Youtube video) EnergyPLAN 3 Oct 2016
Today, 40% of the energy consumed in Europe is for heating. All this energy can become sustainable through modern district heating systems collecting waste heat from power plants and industry, and working at low temperatures which minimizes the heat loss and integrates more sources of renewable energy. Did you know that the heat currently being wasted in Europe could heat all of our buildings if it was collected in smart district heating grids?

The perfect return – heat network return temperatures (CIBSE Journal) September 2016
For a heat network to be energy efficient, it is essential that low flow return temperatures are achieved. Carbon Alternative's Martin Crane explains why it is so important

International News

Paris geothermal district heating on track to deliver heat by winter 2017 (thinkgeoenergy.com) 4 Nov 2016
Another geothermal district heating project near Paris is on track to deliver heating to households and communal buildings by the winter of 2017.

Experts on City District Energy Systems Job Advert (deadline 9 Nov) Technical University of Denmark
The Copenhagen Centre is establishing a new team of City Energy Efficiency Experts to provide technical support, starting with a team of three district energy experts.

City of Sydney adopts low-carbon energy production 27 October 2016
City of Sydney employees are now working in an environment powered by a low-carbon trigeneration plant.

Natural Gas vs District Heating in Urban Areas (Heat Roadmap Europe) 13 October 2016
General information about Heat Roadmap Europe/Stratego:
Heat Roadmap Europe: http://heatroadmap.eu/
Stratego: http://stratego-project.eu/

Commission promises boost to district heating (ENDSwasteandbioenergy.com)
13 October 2016 by Susanna Ala-Kurikka
EU gives further boost to district heating, which if often fired on biomass and waste feedstocks
The European Commission is looking into new financing arrangements for district heating as it prepares to deliver on the EU's heating and cooling strategy in December, a senior official said this week.
Aspects of the heating and cooling strategy will be integrated into the energy efficiency package, the Renewable Energy Directive as well as the proposal for a new electricity market design, which the commission plans to publish in December, Marie Donnelly, director at the commission's energy department, told a district heating conference in Brussels.
Heating and cooling will also be an integral part of the governance process whereby member states will be asked to review their national energy and climate plans, she added.
The commission offered to work with the industry to engage the European Investment Bank (EIB) in aggregating financing packages to promote the development of district heating and cooling networks across Europe.
"Normally, the volumes of money might not be big enough to attract their attention," Donnelly said, adding that a modular approach could help to get such large institutional investors interested. The heating and cooling strategy, published in February, highlighted the need to slash emissions from the heating and cooling sector, which uses half of Europe's energy. Moving the sector toward sustainability is going to be a "big task", requiring the deployment of renewable energy, energy efficiency and circular economy principles as well as waste heat and cooling, another commission official said.

Danish engineers to clear the smog of Shangri-La with district heating (GlobalConstructionReview) 12 October 2016
Billed as a first for China, a Danish district heating system is being installed in the mountain hide-away city of Shangri-La in a bid to clear the air and save local forests.

Framework conditions for flexibility in the district heating-electricity interface (nordicenergy.com) 10 October 2016
Daniel Møller Sneum, Eli Sandberg, Emilie Rosenlund Soysal, Klaus Skytte, Ole Jess Olesen
This report identifies framework conditions, i.e. existing market or regulatory arrangements that act as drivers or barriers for investment in – and the operation of – flexibility resources that can enable flexibility. The report focuses on flexibility with a time horizon of sixty minutes or more at the interface between district heating (DH) and electricity in the Nordic and Baltic countries.

Tackling Air Quality, Comfort and Energy Efficiency with District Heating (Cityfied) 10 October 2016
CITyFiED partner, Manisa Metropolitan Municipality is responsible for installing and developing district heating for not just the Soma pilot site, but also the whole town. The municipality possesses the highest capacity of brown coal minerals in Turkey and a power plant, which produces 2,09% of the whole country's energy.

Historic Change: Green District Heating for Denmark's Second Largest City (stateofgreen.com) 10 October 2016
One of the biggest biomass-fuelled Combined Heat and Power (CHP) stations in the world is in Aarhus. The Studstrup plant began to burn wood pellets instead of coal on 10 October, bringing green heating and electricity to city residents and businesses whilst reducing CO2 emissions by 1 tonne per resident.

Research of 4DH and Heat Roadmap Europe Resonates in EU and UN (4dh.dk) 07 Oct 2016
Last week, almost 300 researchers and representatives from industry and organisations met to discuss the future of district heating and the energy system at the 2nd International Conference on Smart Energy Systems and 4th Generation District Heating.

Waste heat powering Parisian swimming pool (pennenergy.com) October 7, 2016
The French government is looking at using more of the Parisian sewage infrastructure for building heating purposes following one such successful effort at the Aspirant Dunand swimming pool in the in the 14th arrondissement of the city. Wednesday, 5 October saw the inauguration of a new heat recovery facility at the busy municipal building, serving to heat water basins and showers.
The pool is heated by a heat uptake mechanism from sewage waters with temperature ranges between 13 ° C and 20 ° C due to the heat of the water discharged by sanitary and domestic equip

Missed the progRESsHEAT webinars? Watch the recordings! (progressheat) October 2016

In the framework of the progRESsHEAT project, we are holding a series of webinars on various topics related to district heating and cooling.
Three webinars already took place:

- Assessing the potential for combined heat and power in EU member states – insights from Austria and Germany
- The success story of the extensive Danish district heating system
- Waste heat integration into district heating networks – Experiences from district heating providers.

Events

Heat 2016: from global agreement to local action - Heat 2016 takes place on Wednesday 23rd November at The Grand Connaught Rooms, 61-65 Great Queen Street, London, WC2B 5DA. Registration will be open from 9.00am.
We are planning this year's Heat Conference at a time of great upheaval in the European political landscape. In the uncertainty, the energy and climate change debate clearly remains key. The Paris Agreement, forged last December and newly ratified by the USA and China, set a global ambition for controlling climate change, while the UK Government has reinforced its own ambitions by committing to a 57% reduction in carbon emissions by 2032 in its 5th Carbon Budget.
This year's conference, Heat: from global agreement to local action, examines what a local, devolved future means for the heat sector.

CLASP is working with the Nordic Heat group to bring you a number of district heating masterclass events in November.
We are still taking bookings, and free places are available to participants from Local Authorities, Housing Associations and any public sector organisation.
Heat Generation Technologies
9th November -Stoke
http://heat_technology.eventbrite.co.uk
Digital Heating
16th November – Stoke
https://digital_stoke.eventbrite.co.uk
17th November – Edinburgh
https://digital_edinb.eventbrite.co.uk

SmartReFlex: Renewable district heating and cooling - Workshop & site visits
Kolding, Denmark 24-25 November 2016
This is the final event of the EU-financed project "SmartReFlex", presenting and discussing the key findings and experiences on increasing the diffusion of smart and flexible district heating and cooling (DHC) systems, based on high shares of renewable energy sources (RES), in European cities.

Technical Design and Planning of RES District Heating and Cooling (DHC) Training Course January 24-25 2017, Dublin
This 2 day course is part of a series of training opportunities that will bring some of the best international experience in district heating to Ireland. It is organised as part of the European SmartReFlex project, which includes Irish partners Tipperary Energy Agency, Kerry County Council and XD Consulting.