Heat and the City Workshop Report

Edinburgh, 15th-16th September 2011

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The purpose of the one day workshop (16th) and evening reception (15th) was to bring together local authorities (LA) from across the UK who are already involved in district heating – the pioneers. The day involved a mix of presentations and breakout discussions, with over 50 attendees mostly from local authorities, but also the private sector and academia.

This short report list the key actions identified by discussion groups, summarises the presentations (pages 2–5) and then collates the main points from the morning and afternoon discussion groups (page 6 onwards).

Key actions

- Create a dedicated regional or national body for expert advice to local authorities on developing District Heating
- Use light touch municipal community-level (rather than individual household level) policy and regulation, with clear financial incentives;
- Provide training for local authorities in skilled use of heat and energy mapping for project development, with external support to mitigate risk of non-viable projects being pursued;
- Think big – city-scale district heating – but start small, unless there are new resources for bringing large scale schemes up to investment grade;
- Provide specific public finance for the project development phase (est 10% total capital expenditure); promote public investment in infrastructure (heat networks) to offset risk/underwrite systems, and lever in private finance
- Use planning, with feasibility studies, to extend district heating systems; analyse the local commercial opportunities for expanding the heat network.

Introduction to the workshop

The day starts with a short welcome from *Gordon MacKenzie, Convener for Transport, Infrastructure and Environment, Edinburgh Council*, who notes there is a lot of support in the City of Edinburgh for district heating.

Professor Janette Webb, *the Principal Investigator* on the *Heat and the City* project gives a brief overview of the four year project and welcomes everyone from across England and Scotland. She notes how the energy landscape in the UK is shifting – its 'tectonic plates' are in flux – and that significant action at the LA 'middle' level is key to ensuring transition to an efficient, low carbon energy system, responsive to local needs for affordable warmth, and social and economic prosperity. While reductions in capital funding and increases in the cost of public borrowing make the context extremely demanding, this is also a stimulus with potential benefits for local revenues, lower energy costs, and lower costs for landfill taxes and CRC payments. Local Projects are diverse with respect to objectives, level of ambition, anticipated risks and returns, and business structures. The purpose of the workshop is to identify 3 key sets of actions to be taken: by LA, by governments (Scottish, UK), and by the research team.
http://bit.ly/njH698

Presentation One: DECC, 'UK energy policy for sustainable energy efficient heat'

Andy Cormie, *Assistant Director* in *DECC's Heat Policy and Strategy Team* begins by giving an overview of the government's energy policy objectives, including security of supply and climate change. The UK's energy infrastructure needs substantial investment – c.£200billion by 2050 – and it is recognised by government that a centralised solution is not the full answer. There is hence increasing scope for distributed and community-based energy (with community energy described as 'core government rhetoric'). In the 2011 Electricity Market Reform White Paper there are lots of references to distributed energy (both electricity and heat) and a government Industry Ministerial Contact Group on Distributed Energy is shortly to be convened to look at ways of increasing incentives to support local initiatives. The ability to mitigate risk from district heating is seen as key to catalysing distributed and community energy. District heating risk takes several forms, including: technology, construction, offtake/demand, maintenance and management, and pricing risk – with examples given of each.
http://bit.ly/oRHhp9

Key points:

- UK government support for district heating and community energy is growing
- Need to focus on reducing district heating risks
- New Industry Ministerial Contact Group on Distributed Energy

Presentation Two: Scottish Government "District Heating Policy in Scotland"

Katrina Chalmers, *Heat Policy Manager* from the *Scottish Government* begins by outlining key details of the 2009 Climate Change Scotland Act, notably the target of 11% of heat demand from renewables by 2020. The Heat Mapping Pilot in the Highlands is discussed, with the main output a 50 metre grid demand map. In the future the type of financial support available for district heating will shift from grants to loans. In September/October

2011 the successful projects in a Scottish district heating loan fund application will be announced (11 applications worth £2.33million have been approved, out of a total of 36 initial expressions of interest). The next steps for the Scottish Government in relation to district heating include: a further roll out for the heating mapping pilot, the Heat Partnership Project, and to establish an Expert Commission on the delivery of district heating.
http://bit.ly/pXFNCu

Key points:

- Stringent heat demand target in Scotland is driving policy
- Allocation of £2.33 million worth of loans for district heating in Scotland soon to be announced
- New Expert Commission on the delivery of district heating

Presentation Three – Heat and the City project and Michael King "Tackling the challenges of delivering district heating projects in the UK"

Dave Hawkey, *Research Fellow* on the *Heat and the City* project and *Michael King* Associate of the *CHPA* and Advisory Board Member for *Heat and the City* jointly presented some key findings of Year 1 of the project. Case studies of Aberdeen, Birmingham, Woking, Bergen (Norway) and Rotterdam (Netherlands) have been conducted and this work will feed into more detailed case studies of Glasgow and Edinburgh in Year 2. Key challenges for LA and district heating (DH) are summarised: first, that the powers and freedoms of UK LA are very different to EU success stories; second, that DH cuts across different LA departments making co-ordination difficult (and increasing the importance of local champions); third, that the UK lacks DH 'infrastructure' (social and physical) with skills and supply chains underdeveloped; fourth, that DH is 'stitched into complex terrain' meaning it must take into account interactions with existing physical and social infrastructures, and encompass both local and outsider actors; fifth, organisational forms for DH vary – there are lots of different models; and sixth, district heating requires significant resources (expertise and cash) and must navigate shortages. In discussion, issues of possible policy co-benefits (eg health) are raised, as well as how to make use of existing urban infrastructures for DH (eg disused rail tunnels in Glasgow).
http://bit.ly/oKo0vh

Key points:

- LA are central actors in the UK in driving forward DH
- Challenges for LA include co-ordination and managing risk
- There is limited experience of DH across some stakeholders

Presentation Four – Ernst and Young, "Managing financial risk and long-term investment for district energy"

Stuart Campbell, Assistant Director-Distributed Energy & Heat from *Ernst and Young* takes a funder's perspective on managing risk from district heating. Different parts of a district heating energy scheme carry risks for funders, and it is useful to separate the risks into those relating to: the generating plant - fuel (availability and price), offtake, price; the distribution network - heat demand, price, maintenance; and consumers – ability to access alternative

sources of heat. The heat offtake risk is considered in detail, under different scenarios. Funders use a 'worst case scenario test' to evaluate financial risk. LA and the public sector can help mitigate risks by providing offtake guarantees. The tenor (length) of loans from banks is up to 15 years for the public sector and 7 to 10 years for other organisations. In questions and discussion, potential funding from 'allowable solutions' is raised, as well as whether multiple offtakers might reduce risk for DH/CHP (according to funders, no).
http://bit.ly/qomzZA

Key points:

- Offtake risk is the main issue for funders of district heating
- Funders use a "worst case scenario" test when making decisions
- LA play a key role in mitigating risks by providing guarantees

Presentation Five – Brodies "Governance and Business Models for District Energy"

Roger Cotton, Partner at *Brodies* starts out by considering what an ESCO is. An ESCO can be many different things – it is a broad type of legal structure – and it does not provide an automatic answer to questions about DH governance. Roger advises that first of all one has to work out what the district heating project looks like and then decide what type of ESCO is required (public, private or third sector), and not the other way round. Issues to consider when choosing a legal structure for district heating are technical expertise, commercial expertise and project goals. Governance structures can create conflicts of interest, and these should be considered at the outset. The LA must see itself as a 'quasi-regulator' between supplier and customer – it is a long-term relationship. In discussion issues arise about consumer protection and how much regulation LA involved in DH should have.
http://bit.ly/qPzvTi

Key points:

- ESCOs can take many different forms and each project needs to carefully consider what type of ESCO would be best fit its characteristics;
- LAs are 'quasi-regulators' between suppliers and customers

Presentation Six – CHPA "Drivers and Opportunities for heat networks in the context of UK Electricity Market Reforms"

Tim Rotheray, Policy Manager from the *CHPA* gives an overview of current UK electricity market reforms and the potential implications for district heating. A fundamental starting principle is that electricity cannot be stored and this shapes the structure of the Electricity Market. Decarbonisation is the main policy goal driving changes to the UK electricity market. Decarbonisation will result in more intermittency and unpredictability. Increasingly the behaviour of generators in the market will be less closely related to price. On the demand side there will be a doubling or tripling of demand (because of increasing use of electricity for heat and transport), and peak demand will increase significantly too. To cope with these changes there needs to be better integration of heat and transport with electricity, and peaks in electricity demand will need to be alleviated. Heat networks can contribute part of the solution to balancing supply and demand on the grid, but will need to become widespread in the UK, combining heat storage and energy centres with a range of heat and CHP technologies (example of Skagen in Denmark discussed). A current hurdle to be

overcome is limited electricity market experience among many district heating network operators.
http://bit.ly/nJgVag

Key points:

- Big changes are ahead in the UK electricity market, with implications for DH
- Decarbonisation is the main policy goal driving changes to the UK electricity market.
- Heat networks will need to become widespread in the UK – comprising heat stores and several heat generating technologies – in order to contribute to effective grid balancing

Presentation Seven – Heat and the City Project "Next steps for action and conclusions"

Richard Bellingham, Co-Investigator on the *Heat and the City* Project summarises the main issues discussed during the day. There is a wealth of experience of UK district heating but it is quite fragmented. Heat is important because over half of energy in the UK is used for heat (mostly in urban areas). Government interventions in energy heating have to date been relatively minor and the government heat strategy is not yet fixed, thus providing us with opportunities for intervention. It is important not to miss the current window of opportunity, and leadership is crucial. Further actions on the *Heat and the City* project will include focus groups and workshops, perhaps on more specialist topics such as financing and risk, policy measures and information and expertise exchange (eg social networks for district heating, exchange of information). Feedback and ideas from delegates are welcomed.
http://bit.ly/qlDouY

Key points:

- UK government heat strategy is not yet fixed, and there are current opportunities for intervention
- Leadership is important in order not to miss the current window of opportunity
- There is a wealth of experience in the UK, but it is quite fragmented

Summary of break out group discussions (morning and afternoon)

Group 1 - Creating an energy services function; governance and leadership in Local Authorities

Facilitated by Jim Noble (Aberdeen City Council), and notes by David McCrone

1. problem of getting DH on to councils agendas; usually squeezed out by department silos and/or responsible officers having other responsibilities, and so DH responsibilities grafted on, usually as afterthought. One official described trying to make progress on new brownfield site (plans for housing, schools etc) as 'traipsing through treacle' as result of departmental silos. Whereas relations between LAs were good – sharing info etc – relations within LA were poor because of departmental rivalries (focus on kudos for depts.). Another official spoke of lack of joined-up thinking/strategic decisions. As a result, projects tend to be small and piecemeal (example of lack of transport tie-ups re infrastructure). Examples in one Scottish LA of council only willing to consider DH if cheaper than gas, and gas companies aggressively target councils to take 'problems off their hands' in terms of heating – but cherry-pick. One council had plans to do a multi development along Aberdeen model, but along came gas company and offered to install gas boilers in adjacent blocks, leaving original high and dry. Councils are susceptible to this sort of solution because it entails getting problems off their hands within current budgets. They are faced with problems of heating in multis which more often than not don't get DH schemes (or if they have old ones, they end up costing councils a lot of money). One large English authority had 10 multis lined up, could only afford to do 5 in current climate so as to address issues of carbon reduction and fuel poverty. Because something needs doing ASAP, then companies and developers are on hand to offer instant and cheaper solutions. Many LAs find it difficult to see how they might link up small schemes, which is all they can currently afford. Consensus seems to be that when old multis present with heating problems, it is easier and cheaper in short term to install individual boilers.

2. Problem of short-term view being driven by current budget concerns, and not longer-term thinking. Even where there is presenting reason – carbon footprint – it is not at all clear who does that. One official spoke of the 'dark parts of the council' where few knew what was going on. Failure even to link up a housing development with a new school being built across the road.

3. There is also problem (in one English authority) of hostility to climate change arguments ('hotbed of climate scepticism') which meant that officers had to work hard behind scenes, and to forefront other benefits of DH e.g. 'business' benefits. In this context, developers had big say in setting agenda. Not helped by divisions between district and county council levels. The driver now is sustainability for business/political reasons.

4. In councils where there was progress, this tended to happen where corporate services took the initiative especially at the planning stage, and other services

treated as 'customers'. Corporate funding handles set-up costs so as to avoid squabbling between departments re budgets. Another LA had created a climate change and energy team (not a department as such) which had benefit of linking in to council at highest levels; downside is that a lot of time taken up with fire-fighting and handling challenges from other services. However, this initiative has advantage of moving discussions away from dept silos.

5. Discussion too of value of setting up an ESCo on Aberdeen model (from an official from another Scottish council). Value of ESCo seen as arms-length arrangement which is not caught up in full glare of publicity and current short-term budgetary constraints.

6. Also important to have champions, either/both at officer or member levels, someone who will take it on and push it through. Success can be measured by elected members taking possession of/credit for achievements. That's when you know you have achieved something.

7. Important to 'sell' DH schemes in terms of building jobs and capacity, though (a) jobs are few because contractors bring their own; and (b) it's not a labour-intensive business anyway.

8. Discussion of feasibility of heat-plus-rent schemes (as in Aberdeen); some councils absolutely opposed to these, as are some tenants/owner who prefer meters so they can see what they use (and more importantly, that someone else isn't using 'their' fuel).

9. General consensus is that bottom-up approach is way to go; but you need a hook to link it to e.g. councils having a climate change strategy, which demands an action plan, and so on. Having an overarching energy group at the corporate level ensures that there is continual pressure which DH can buy in to. This involves frequent briefings of members in particular, often in small groups, even one-to-one. Example of complete turnaround with one councillor who went from hostility to support quite quickly.

10. Need for objective and dispassionate advice centre who would dispense this at short notice (and not 'consultants' – 'crawling around like flies'). Tendency is for councils to tackle only problems which confront them at the moment, and for companies to come forward with instant solutions.

11. General consensus that 'clusters' are the way to go such that small(er) schemes of DH can be linked up in due course. Need to have an eye on how this might work right at outset. Public authorities are key to success; they have broader strategic responsibilities as well as budgets spread out over time. One large English authority had three layers of schemes: the city itself; the 'greater city'; and a number of smaller local authorities on the periphery. The important thing was to learn from each other; keep information flowing.

Group 2 – Policy measures to drive district energy / heat networks – what do local authorities need from UK and Scottish Government?

Facilitated by Ron Mould (Renfrewshire Council) and notes by Mark Winskel

1. Should central policy be directive or facilitative? Pros and Cons? Much of the discussion in both sessions was spent discussing this first question.

2. There was some difference of view around the table about the merits of a more directive policy approach. One constructive way into this is to consider which aspects of DH development might be better served by a directive approach, and which are better left to more facilitative approaches.

3. For some LA officers, there were concerns about a more directive approach – since LAs had different resources, and local conditions, DH projects were seen as 'all one-offs'.

4. Others, working at a national / agency level, stressed the commonalities between projects, and to some research (e.g. from CHPA) stressing the need to focus on modularity and standardisation in project development, and the need for more directive policy and regulation e.g. forbidding the building of new housing developments above a certain size without CHP.

5. Some noted resistance in government to cross-cutting policy directives, but some felt that stronger 'public sector duties' could be imposed, e.g. to require participation in DH schemes, where available. Ofgem has tended to oppose the suggestion that DH should be a regulated market, but that may be changing with the Ofgem review.

6. Prescriptive regulation is common in other areas, and in other countries e.g. in some parts of Scandinavia households are compelled to join the DH network if it passes by their house.

7. A question was also posed whether a more directive approach would be politically acceptable in the UK. For some policy and LA people, this was seen as politically off the radar / unacceptable.

8. For advocates of a more directive approach, the risk of a less-directive facilitative approach was that it 'devolved down' the problems of project development.

9. For some a regulated approach wasn't that attractive, because it was associated with lack of innovation – regulated industries have low margins and low levels of innovation. Others noted that regulated asset bases provided long term income for investment.

10. Some examples of the failings of current UK practice: Oban, where a DH heat pipe ran straight past a NHS hospital, but it didn't convert – this wouldn't be possible if regulation stipulated a 'duty to convert' for key public sector anchor loads.

11. Some references were made to North Sea Gas grid development in the UK, where a central directive was made to convert on the grounds of national efficiency. Can DH credibly be presented as a successor network, displacing the national gas grid? Or will the national gas grid persist and be a strong barrier to DH penetration?

12. In this context, should there be a focus on off gas grid applications for DH in Scotland? i.e. the off-grid niche?

13. UK financial incentives (e.g. RHI, Green Deal) tend to incentivise individualistic responses, rather than more community-level actions and incentives / rewards. Can RHI allow for aggregated solutions?

14. Some distinction between regulation for installation (e.g. the MCS microgen scheme) versus regulation for design. The latter tends to be absent in the UK, and has created problems e.g. for micro-wind and heat pumps.

15. Even where there are apparently ambitious targets, e.g. zero-carbon homes, these have been softened-down and are seen as something of a moving target.

16. The 'allowable solutions' consultation was seen as a key. For some, it was essential that this is restricted to the built environment in the UK.

17. In reality, and in the absence of more directive policies, LA officers said that DH schemes were often devised to meet grant scheme criteria – 'grant chasing', rather than a more strategic approach. In turn, grants schemes in Scotland were seen by some as compensating for lack of real policy powers.

18. Another problem is co-ordinating players with different timescales, and given these differences, the need to take advantage of key 'windows of opportunity' when these different timescales come together.

19. Reference to energy company obligation (ECO) within the Green Deal / CESP.

20. Discussion of larger DH project scales needed to attract institutional investors / EIB.. LA officers have had experiences of developing schemes too small to be attractive for private sector. With more co-ordination, scaling-up, procurement, it might be possible to pool projects together to achieve an 'investment grade proposal'. There is some attention to this being given in the SEPA / Ofgem / SG / DECC group mentioned by Katrina in her talk

21. (A specific suggestion was for a follow-up seminar dedicated to financing – understanding the commercial options).

22. One way to move to a more directive approach might be 'pseudo-regulation' i.e. regulations which are announced by not (initially) applied. This is tried and tested in other areas.

23. Power companies / utilities can be actively obstructive – DH is a threat to their customer base.

24. Perhaps there should be more discussion of 'failed projects'? In other sectors, railways, telecoms, the effects of a laissez faire approach have been boom and bust cycles, and stranded assets.

25. One policy view was that there is no overall heat policy, at least in England and Wales. Important bodies like the CCC don't really grasp DH, partly because their consultants (and their models) don't grasp it either. Yet there is some real expertise around that does understand DH (albeit much of it abroad) – why doesn't this have more influence?

26. Another background policy problem is the impact of long term visions (to 2050) on current decision-making – a fear of stranded assets associated with gas-fired DH networks (EU zero energy/zero carbon homes by 2021 is also an influence here).

27. One specific concern is the expected decline in heat demand as efficiency measures for existing homes, and better new build standards, take effect. This means that the proportion of income from standing charges must increase.

28. There is a largely unaddressed problem in the private rented housing stock, where regulation exempts landlords for responsibility for energy efficiency.

Group 3 – Identifying and enabling DE projects through Heat Mapping, Energy Planning and Spatial Planning

Facilitated by Fran Bury (Hackney Council) and Jessica Sherlock (Harringay Council); notes taken by Heather Lovell

1. Heat mapping is useful but what is done with it is crucial: the translation of the information.

2. Recommend training for users of heat mapping

3. Discussed heat mapping project in the Highlands, including the difficulty of identifying and quantifying waste heat and the need to link the heat maps to the planning system.

4. It can be difficult to obtain data from commercial users (discussion about the London D-map method)

5. In the context of council funding and staff shortages it is hard to progress with heat mapping but there are opportunities for different LA to work together on heat mapping – partnerships are important;

6. Discussion about updating of heat maps – they need to be continually updated in order to ensure the maps are useful (this was a condition of the Scottish Highlands Heat Map grant for example)

7. Agreed to 'the value of a picture' in driving change

8. A heat map is a useful tool to approach stakeholders with – a good tool

9. Need to avoid 'cherry picking' from heat maps, ie selecting just the prime heat areas for DH

10. A template for local government to assist with commissioning heat maps would be useful

11. Links between heat maps and climate change resilience and energy security maps would be useful

12. Need to get out and see the local area, cannot just rely on maps

13. Heat maps are useful for identifying potential rural heat projects (such as the Scottish government heat mapping pilots) – heat maps are not only relevant for urban areas.

Group 4 – Business Models, governance, risk, market testing and procurement

Facilitated by Bob Fiddik (Croydon) and notes by Jan Webb

1. Discussion began with question about lessons to be learned from the older-established DH/energy from waste schemes. A system set up 20 years ago under Council ownership was cited as example. It was sold to the private sector incinerator operator in 2006/08. The Council is considering trying to buy back the network, to enable LA-led plans for extension. The Council wants greater control over future direction, based on belief that this would confer greater flexibility for supply of heat, cooling and electricity; it finds current private sector control relatively inflexible. Other areas of the city have been heat mapped, including identified potential for capture of waste heat from industrial production. There is a proposal for an additional network, including link to a planned biomass power station. Aim is for link to hospital as anchor load. Ownership and leadership for the existing and new phase extension are under discussion, with the ambition to cerate city-scale network eventually.

2. Central factor for successful business model was regarded as ensuring affordability for all users. Example of common formula for guarantee is use of basket of 6 utility gas prices, with a DH supply tariff discount of between 10 and 30%.

3. Another key factor critical to the shape of the business model is likely to be the mix of customers. Where all are public sector, then it is easier for the LA to take control and to manage long-term contracts. Where land ownership is in private sector, or in case of PPP contracts, then required control is more likely to be exercised through a series of specific contractual agreements, stating the roles and responsibilities of each party.

4. Phasing of business development is an area of uncertainty shared by most: having mapped heat load, there is a question of what can be financed first, while keeping options open for later phases to extend the network. Local circumstances also affect what is viable. City or urban centre regeneration is a common first phase, but with built-in capacity for expansion. Location of waste heat sources, and cost of pipe connection to

areas of heat demand, also matters. The particular combination of projects creates different demands on the LA, given the varying combinations of legal, financial and technical questions and solutions. An example was given of a combined JVC to develop DH for housing, procurement via private sector route but with scope for expansion, and a regional-scale public sector plan, taking advantage of Green Deal finances. There is also uncertainty about whether networks will evolve once the initial phase is in the ground and other developers and local business/housing see opportunity. This has happened successfully in Europe.

5. LA can play role in de-risking initial network by public financing; private sector developers should then come to the LA. A developer can contribute to finance through a charge to connect to the network. LA or ESCo can charge a commercially competitive rate for private developments, as opposed to council tenants.

6. Consumer protection requires an active regulator. Value of public sector as proxy-regulator in any business model for DE was argued to be a means of guaranteeing transparency and fairness in energy prices for long-term contracts. The afternoon discussion raised questions about to what extent a LA can guarantee 3rd party sales. Similarly, LAs were regarded as the actor best placed to ensure that the benefits of DH for ameliorating fuel poverty were built in to the business model. Overall, it was felt that LAs cannot escape the need to have a strong role in any local energy business model where there are public goods from investment.

7. Suggestion that the EU Energy Efficiency Directive will change the 'rules of the game' for LAs – specifically the Directive emphasises a requirement for all new power stations to be CHP, which can be interpreted as signalling a first step towards an EU-regulated heat market. In the wider context of EU energy market competition policies, there is a perceived risk that competition requirements may be used against DH development. Councils, as representatives of local interests, have a major role to play in shaping an effective business model for DE/DH. There is a need for input to EU policy in relation to what forms of competition, at what scale or level in energy systems, can work to guarantee consumer protection for DH, whether businesses are publicly owned, co-ops or joint ventures. Business models will require defensible plans for ensuring that competition has been achieved; this can be at a high level, as long as contestability is ensured. In a purely private sector development (such as new housing), there is a question about how competition is enabled. 'Competition' does not necessarily mean individual/consumer choice of energy supplier (as currently interpreted in the UK). In Denmark for example competition is achieved by means of public sector energy mapping to distinguish between areas best suited for DH or gas. The public sector evidence-based assessment of best solution is treated as the mechanism for ensuring competition, and hence best value for consumers. One officer suggested that LAs had a role to play in challenging the illusory concept of competition in UK energy markets. It was also suggested that competition occurs in relation to sales of electricity from DE to the grid, as well as in relation to contracting for fuel supply to CHP/DH.

8. There was discussion about effectiveness of cost/quality checks and balances on small private sector housing developments with DH in south of England, where there was some concern that schemes have been rushed through planning. Small schemes are unlikely to be feasible for scaling up without proper oversight, control or standard-setting by the LA. Some LAs are more proactive than others in engaging developers to promote value of connection to heat networks. Key dept is planning, but unless there is good communication between LA departments, there is unlikely to be effective

development and scaling up of heat networks. Cross-departmental communication is critical to proper control over DH business development and performance standards, to avoid reputational damage to DH downstream.

9. There was some evidence of a north-south England difference in housing developer business models and practices. General view of housing developers in London area reported to be that they would go it alone, procuring via the private sector, and drawing a 'red line' around their responsibilities/risks, in line with their business model. In the north of England, there was a counter example of developers preferring not to have any responsibility for network infrastructure, with a preference instead for the LA to construct the network as a means of mitigating risk.

10. There was discussion about the potential for a coordinated city-scale business model, based on area-wide energy planning to optimise use of existing local distribution network infrastructure capacity, and to devise a programme of interconnected developments. This should be a means to speed up development. The main problem is investment. A figure for development finance alone was suggested as circa £100M, but there is no funding mechanism for LAs to procure project development finance and contractors at this scale. There are perceived to be time-constrained opportunities such as pension fund and utility finance, which will eventually be directed elsewhere into other low carbon projects. Would-be financial investors are concerned about the risk of LA limited capacity; hence this model requires public-private partnerships in order to advance. At present the absence of a decisive business model is stopping progress, and the procurement process is regarded by a private sector partners as an obstacle. Any investment of project development finance by a private partner cannot be guaranteed to result in success in the competitive tendering process. For investment in development, design and commissioning, there has to be a viable return, which is not there in current models. For large suppliers to invest in DH, 25 year contracts for heat supply would be required. The risk of a new regulatory environment creates uncertainty over capacity to get the expected return on investment. LA officers suggested that there is a 'chicken and egg' problem resulting from distrust between public sector/LAs and utilities and a perceived risk-averse stance by utilities. An example of an earlier failed city-scale business plan for DH, with private and public sector partners, was referred to as unravelling over who had the responsibility for making the initial investment in infrastructure. The counter view is that there is no one right answer, but different answers for different areas, with the potential for scaling up from joining up small schemes. LAs need to be clear about objectives and order of priorities: finance, LA revenues, jobs, social impact; and to streamline decision-making. There is currently a large gap between a model based on big scale development and starting points for many LAs, including need for seed corn funding for small project development.

11. Finance issues:

    a. one DH developer was described as creating their own investment fund, on the basis that the developer carries highest risk at initial stages, such that the fund would enable them to take greater control;

    b. EU structural funds may be a means of de-risking investment, given that the will to develop DH is there at EU level;

    c. project financing can be staged with say 70% of Phase 1 investment coming from LA, to serve anchor load public sector customers; successful track record 3 years on, with minimum defaults, can be used in raising finance for Phase 2 with

extension to other customer categories. Noted that eventually there will be fewer and fewer public sector anchor loads available for this kind of model;

d. example of finance from a utility for DH to serve a defined heat load to specified number of households, but penalties incurred if numbers of subscribers were lower than expected, such that the housing body would refund an element of capital expenditure by the utility, according to an agreed formula;

e. possible business model to recirculate profits from DE, giving potential for some cross-subsidy

12. Procurement – it was suggested that the tool kits are there to enable procurement, but a proxy-regulator would be beneficial to drive the process, and this also has a cost. There was general LA concern about risk of closing off options too soon or unknowingly, because of EU procurement rules. Advice was to keep technical solutions open to competitive dialogue, and to avoid being overly-prescriptive either in relation to LA role or OJEU spec. Understanding how to get best public value through managing procurement is challenging.

Group 5 – Financial Planning and handling investment risk, financial control, revenues and reserves

Facilitated by Ken Brady (Energy Saving Trust), and notes taken by Andy Kerr (am)

This group had a wide-ranging discussion about finance issues. A key "ask" from the group was the need for a workshop just on financing issues – but including suppliers & contractors - to do the subject justice.

The three key topics that were discussed were:

1. Financing: Financing falls into two separate issues. The first concerns feasibility or development funding. The second is scheme financing.

    a. Development funding requires £10k+ to screen projects; identify potential revenues; and also importantly to identify actually what the local authority is trying to achieve (use more waste heat; reduce customer bills; etc). In the past, local authorities could find this type of development funding internally, but this was becoming impossible given the current financial constraints except where a major refurbishment or redevelopment scheme was ongoing – in which case a DH project could be piggy-backed on this existing scheme. In some areas (i.e. Scotland), the CARES loan fund could be used but elsewhere a major question was how to recover such seedcorn funding. The sense from the group was that political leadership was critical to ensure the availability of development funds. Also a strong sense that political drivers were around finding ways of reducing customer bills rather than environmental concerns per se.

    b. A second concern was the cost of consultants in the project development process. Some examples of good practice were provided, but often consultants were felt to provide expensive advice which was not always

useful. There was a strong sense in the group that once a local authority had undertaken one DH scheme, they had much of the necessary expertise in house – the question was how best to utilise and retain this expertise. One approach was to contract out time of local authority experts to other local authorities – this was an approach used by one London authority when working to support another with their DH schemes. More broadly, the notion of much more effective shared nodes of expertise was popular [e.g. Rather as the Sustainable Scotland Network seeks to provide in Scotland].

c. With respect to scheme financing, the group felt that DH schemes would need local authority underwriting them for some time because heat remains an unregulated market, unlike the Feed-in-Tariff frameworks. However, there were strong drivers to seek more innovative sources of funding rather than relying on local authority budgets. One example was the use of Venture Capital Trusts, which might provide 100% funding but only take 50% equity ownership of a scheme. The group also discussed the use of Special Purpose Vehicles (SPVs) as a way of getting the local authority financing at one step removed from the project. Other approaches included whether to retain equity in the DH scheme, or seek a buy and lease approach. One local authority noted that they required a 25 year NPV calculation to be done for their projects, which was a useful exercise to explore the long term value of the project.

2. The second topic of discussion concerned the question of why CAPEX for DH schemes in UK were of the order of 30% more expensive on the continent. No reduction in CAPEX was seen by group members. This was seen to be an action on CHPA to investigate and determine how better prices could be secured

3. The third topic of conversation concerned procurement issues. The group felt that there is a need for a route map of the different approaches undertaken by different local authorities around the country – to provide evidence base of good practice and ways of reducing costs.

Group 6 – Securing and Extending DE systems

Facilitated by Fran Bury (Hackney Council) and Jess Sherlock (Haringey Council). Notes taken by Dave Hawkey.

1. There was some discussion as to whether European experience would provide answers to the questions posed. Discussion around Denmark highlighted that the translation from plans to expanding projects was assured by the country's central planning approach to heat, and that a parallel approach in the UK is highly unlikely.

Securing DE systems

2. The importance of clear, robust, evidence-based planning was reiterated several times as crucial to securing DE systems (interpreted as ensuring the system achieves the rate of return intended).

3. Different LAs respond differently to drivers to develop DE. Rising energy prices are seen in some property departments as reason to pursue alternative solutions for energy services to the LA estate, while others appear unresponsive to this driver.

4. One officer noted that in their area, management and maintenance of DH systems is seen as too difficult for the LA, so they prefer to place the risks with a contractor.

5. Competitive dialogue procedures can help explore alternative solutions with the private sector. LAs need to be clever in understanding what the market can deliver and matching to the LA's (evidence based) requirements. As contracts are very long term (in comparison with other energy contracts) much care is needed to avoid being tied in to an unfavourable or inflexible arrangement.

6. Recently, the market has been changing rapidly in terms of what can be delivered by contractors, i.e., what conditions it is possible to find a willing partner to agree to.

7. Procurement process can be 18 months, so starting that process now is important to have arrangements in place in anticipation of housing and commercial development picking up again.

8. There was some debate about how DE systems can be financed. One officer expressed the problem as the public sector wanting DE systems to be built while offering no money and taking none of the risk. This was countered by another who pointed out that the public sector has relevant assets, not least large heat demands (through LA estate and social housing). From a developer's perspective, involvement of the LA is crucial for stability. This also led to some discussion about the use of Prudential Borrowing to finance systems, one suggestion being that the public sector can reduce risks, create local market certainty and finance early development with a long-term view to refinancing through the private sector once systems are up and running.

9. Local authorities find it very difficult to hold money in sinking funds as there are pressures to use money either to deliver services or to reduce tax burdens.

10. Splitting the operation of heat generator and network can create conflicts of interest, so important to ensure governance framework can align interests. Using waste heat is often the most resource/carbon efficient approach, but creates dependency on the source of heat. The example of a waste incinerator was discussed – as the incinerator needs to be able to shut down without prior warning (e.g. if unusual materials in the waste stream create problems) the system would require backup heating which creates additional cost.

Extending DE systems

11. One officer reported that local economic growth was the initial target for DE systems, but potential benefits of linking in existing buildings were soon recognised.

12. Two broad areas where future expansion has to be built in at the outset: physical and organisational/contractual.

Physical

13. Having the capacity to serve a network with different fuels (e.g. biomass and gas) allows long-term management of price risks.

14. Building sufficient capacity into the network to accommodate expansion is difficult as oversized pipes are more expensive (particularly if the comparison is welded steel pipes versus plastic pipes), and pumping larger quantities of energy around an oversized system imposes greater operational costs. However, officers thought it was generally impossible to be sure what load would eventually connect, so this issue will always be a gamble.

15. A ring system with different buildings feeding in and drawing heat out at different times is a model that could be developed, though building owners have wanted to be able to bill each other for heat which creates complexity.

Organisational and contractual

16. One officer said that his LA was reluctant to use an ESCo approach as this would constrain the LA's control over expansion of the system. However, there was agreement that, while an in-house approach may be appropriate to small schemes, expansion will require private sector involvement. Drawing up contracts which allow the public sector to control whether and how the scheme expands requires significant work. One English officer noted that this work had not been foreseen at the outset of their project, and had led to considerable delays.

17. Experience from long-established DE systems was seen as a useful source for direction on ensuring schemes could expand, particularly where expansion has been frustrated. One model for ensuring a commercially operated system could expand into affordable housing/fuel poverty areas would be to ring-fence some profits (e.g. through a profit share agreement) for investment in extension into these areas.

18. "Catalyst Schemes" (large anchor loads) can open the possibility of further connections. The risk profile of a catalyst scheme means they can often be 100% privately funded, but adding housing can be hard if the system is not set out in the right way. Billing, complications and lower heat density were cited as issues making these connections less attractive to private sector.

19. One officer described a catalyst scheme which took heat over land privately owned by developers. Access to the land was secured by offering developers the possibility of connecting new buildings on the land to the system in future. The pipe work was oversized accordingly. However, subsequent connections have been brought on to the system, taking heat load to the full capacity of the original pipe work which will create problems if developers seek connection in future.

20. New developments are seen as an important opportunity for extending DE schemes, and the planning system is a tool by which this can be achieved. However, a recurrent theme was LA concern that requiring new developments to connect to DE systems would make the area less attractive to developers.

21. One officer said that in his experience, developers resist connection to DE systems, and "throw as much as possible" at LAs to argue that a DE connection would diminish marketability. However, another reported that investigations had revealed less hostility among developers: connection to DE systems would make investment/construction/occupancy more attractive if costs were guaranteed to be lower than on-site alternative. However, the same investigation revealed that

requirements to connect did raise concerns around costs, backup, aligning DE and housing development, and other constraints that the requirement created.

22. A solid evidence base, such as calculations showing DE is the most cost effective way to meet planning regulations in a particular area, is important for making planning requirements effective (as even planning policies that establish requirements that new developments connect or be built to connect in future are caveated with reasonableness clauses).

23. One officer said the planning department in his area had wanted to "require" new developments to connect to the DE system, but when this went through the Planning Inspector the policy was watered down to "encourage". The intention of the original (caveated) policy was to put the ball in the developers' court to justify why they wouldn't connect. Inclusion of DE as a way of meeting requirements of a local Merton rule is another (weaker) way the planning system can be used.

24. A sound evidence base is also required to be able to build the possibility of expansion into contracts. OJEU procurement notices should be as explicit as possible in stating what expansion is intended. An English city has opened itself up to challenge as expansion plans were not sufficiently explicit in the original tender.

25. Maximising benefits of a scheme likely to be important to build support for further expansion/more schemes. Residents, private sector, LA will have different perspectives on "success". Metering important for control and understanding/support among residents (and so support from councillors too). Showing before and after impacts on bills is a powerful approach.

26. Existing schemes can be used as collateral to finance extensions.