

# A city-wide district heating vision for Dundee

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## DUNDEE PARTNERSHIP STAKEHOLDER EVENT

**DATE: FRIDAY 10 JUNE 2016**

**Venue: Discovery Point, Falcon Scott Suite, Discovery Quay, Dundee, DD1 4XA**

**Event Title: Energy Attitudes - Creating A City-Wide District Heating Network For Dundee**



**Attendees:**

39 attendees

<b>Name</b>	<b>Company</b>	<b>Table Number</b>
Seddon, Alan	Keppie Design	1
Dunn, Alistair	D&A College	1
Lorimer, Andy	Dundee City Council	1
Roberts, Christina	Dundee City Council	1
McCurrich, Eve	Whiteburn Projects	1
Simpson, Ian	Abertay	1
Steen, Paul	Ramboll	1
Leckenby, Alistair	Synergie Environ	2
Harris, Bryan	Dundee City Council	2
Hird, Euan	Hillcrest	2
Dow, Kenneth	Michelin	2
Le Miere, Suzanne	Scottish Government	2
Rainger, Ben	Keppie Design	3
Drysdale, Charlie	Pinnacle Power	3
McQuillan, Heather	Dundee City Council	3
Dunsmore, Ian	Scottish Water	3
Duedahl, Morten Jordt	Danish Board of District Heating	3
Copeland, Peter	Dundee University	3
Adams, Roger	Hillcrest	3
Tucker, Toby	SFT	3
Frew, Craig	Zero Waste Scotland	4
Esson, Graham	Perth & Kinross Council	4
Alexander, John	Dundee City Council	4
Mackintosh, John	GI Energy	4
Robertson, Julie	Dundee City Council	4
Gellatly, Neil	Dundee City Council	4
Pedersen, Rob	Dundee City Council	4
Bush, Ruth	Scottish Government	4
Kearns, Saskia	Scottish Government	4
Brown, Amy	Scottish Enterprise Tayside	5
Braithwaite, Bruce	MVV UK	5
Koch, Christian	BRE	5
Wilkie, Colin	D&A College	5
Park, David	Vital Energi	5
Ogilvie, Gordon	Angus Council	5
Smith, Gordon	D&A College	5
Conway, Mark	NHS	5
Street, Mark	Vital Energi	5

## Minutes

The event provided an opportunity to hear from experienced experts and take part in discussions with a range of stakeholders who are also exploring district heating opportunities in and around the Dundee area. Sessions will cover:

- the context and drivers for low carbon heat in Scotland;
- update from the Dundee Partnership for the Environment on their vision for Dundee;
- information from district heating projects already underway within the city;
- case studies from world leading district heating in Denmark, as well as the use of novel technologies in schemes in Scotland; and
- opportunities to feed in to development of the Dundee strategic approach to low carbon heating. Is there potential for establishment of a city-wide ESCO? How can we integrate our approach to district heating with work to tackle fuel poverty?

Time	Session Title	Speaker/Leader of Task
09.00 – 09.30	Arrival and registration (tea/coffee)	
09.30 – 09.45	Introduction and aims for the day	Rob Pedersen, Dundee City Council
09.45 – 10.30	<p>Speaker session: understanding the potential of district heating in Dundee</p> <ul style="list-style-type: none"> <li>• Dundee Energy Strategy</li> <li>• The Scottish Government vision and policy context for district heating</li> <li>• The opportunity in Dundee</li> </ul> <p>Question and Answers</p>	<p>Mike Galloway, Dundee City Council</p> <p>Suzi Lemiere, Scottish Government</p> <p>Representative from the Dundee Partnership</p>
10.30 – 10.45	Tea/coffee break	
10.45 – 11.40	<p>Case studies demonstrating the potential benefits of District Heating</p> <ul style="list-style-type: none"> <li>• Dronninglund Community Co-operative (solar thermal, seasonal storage).</li> <li>• Ramboll - An Independent Assessment</li> <li>• An Operators Perspective</li> </ul> <p>Question and Answers</p>	<p>Ruth Bush, Stratego Project</p> <p>Paul Steen, Ramboll</p> <p>Morten Duedahl, Danish District Heating Association</p>
11.40 – 12.15	<p>Themed group discussions</p> <ul style="list-style-type: none"> <li>• Community engagement in district heating</li> <li>• Tackling fuel poverty with district heating</li> </ul>	Led by facilitators at each table

Time	Session Title	Speaker/Leader of Task
	<ul style="list-style-type: none"> <li>integrating district heating into a wider Sustainable Energy &amp; Climate Action Plan</li> <li>Dundee – An Energy Esco?</li> </ul>	
12.15 – 12.30	Plenary Feedback from each table	Table facilitators
12.30 - 13.30	LUNCH, Tea/coffee	
13.30 – 14.15	Speaker session: upcoming projects <ul style="list-style-type: none"> <li>Heat Mapping Dundee</li> <li>City Centre District - Abertay University</li> <li>Ninewells Campus and Opportunities</li> </ul> Question and Answers	Christian Koch, BRE Ian Simpson, University of Abertay Mark Street, Vital Energy
14.15 – 15.00	Group discussions Themes for discussion: <ul style="list-style-type: none"> <li>What needs to happen to support a citywide expansion of district heating in Dundee ?</li> <li>What are the barriers – finance/governance/regulation/attitude?</li> </ul>	Led by facilitators at each table
15.00 – 15.15	Plenary Feedback from each table (led by facilitators)	
15.15 – 15.50	Closing session <ul style="list-style-type: none"> <li>DERL – Partnership Energy Supply</li> <li>Plenary Q&amp;A session with the speakers</li> </ul>	John Cowan, Dundee and Angus Residual Waste Treatment The speakers
15.50	Closing remarks	Ruth Bush
15.30 -16.30	Tour of place of interest eg V&A site?	TBC

**Main Presentations:**

**Speaker session 1: Local and national context**

[The Scottish Government vision and policy context for district heating](#) – Suzanne Le Miere, Head of Heat Policy, Scottish Government

[Dundee Energy Strategy](#) – Bryan Harris, Sustainable Development Manager, Dundee City Council

[Dundee's District Heating Future](#) – Andy Lorimor, Dundee Partnership

**Speaker session 2: How do we realise the benefits of district heating in Dundee? Learning from case studies**

[Why do district heating? Danish Background, Scottish Perspective](#) – Morten Duedahl, Danish Board of District Heating

[Designing for local benefits – Case studies of district heating projects](#) – Ruth Bush, Stratego Project Officer

[Assessing and delivering the opportunity in Dundee](#) – Paul Steen, Ramboll

[BRE: Stratego Council Support](#) – Christian Koch, BRE UK



The project “Multi level actions for enhanced Heating and Cooling plans – STRATEGO” (IEE/13/650/SI2.675851) is co-funded by the Intelligent Energy Europe Programme of the European Union and the Scottish Government.  
Project website : [www.stratego-project.eu](http://www.stratego-project.eu)

## Presentations : Specific Questions to Presenters

### *Suzie Le Miere*

1. There is a need to look at the Heat Map to develop plans for District Heating across Scotland – it is not improbable to connect networks. **[Euan Hird]**
  - The Scottish Government will encourage District Heating “where it is appropriate”. **[Suzie Le Miere]** Dundee City Council would like a ‘whole city approach’ to District Heating (full coverage). **[Dundee City Council]**
2. The UK Government Autumn Budget Statement indicated a provision of £300 million for District Heating, but the Spending Review means that there will be different impacts for Scotland. This Financial Year (2016-17) the Scottish Government has committed £7 million to District Heating. **[Suzie Le Miere]**

### *Morten Duedahl*

1. Who were the teams who did the District Heating zoning work in Denmark? **[Charlie Drysdale]** The Energy Agency provided figures on cost and a heat map – local authorities then calculated District Heating feasibility based on this information. **[Morten Duedahl]**
2. How much would you relate Denmark’s District Heating success with the use of regulations? Legal gives protection. **[xx]**
  - Denmark’s local authorities had the option to force people to connect, but this was very rarely invoked. Rather, benefits of being connected were ‘sold’ to customers. **[Suzie Le Miere]** Zoning was for historic reasons – we don’t actually use force as a means to encourage connections anymore. We talk to locals about the benefits – when we have 60% sign up to a scheme we roll it out. But we do force people to then stay connected (you cannot leave the District Heating scheme). But people know they have the best option.
3. If a customer’s existing heat is supplied via conventional gas, do you then force them to disconnect from the gas network so that they have no choice? **[xx]**
  - Customers have a contract, but yes in effect we do force disconnection. There is a fixed fee to be paid if you wish to reconnect to old system. **[Morten Duedahl]** Zoning also means it is impractical for customers to switch back to gas. To note as well, disconnection from gas is done by bleeding the pipes, they are not actually ripped out of the ground. **[Paul Steen]** The problem is that a ‘free market mentality’ is embedded in the UK. **[xx]**

**ACTION:** Morten will draft a one pager on the connection/disconnection process underwent in Denmark and share with the conference delegate cohort.

## Presentations : Open Floor Discussion

3. A Heat Strategy is related to: energy use, conservation, community energy, fuel poverty, and private sector business opportunities. This requires collaboration and connectivity between the public and private sectors. Focus should be placed on stakeholder engagement and Dundee City Council's objectives. **[Mike Calloway]**
4. An Energy Strategy is about achieving a "low carbon, sustainable city". The Dundee Partnership is helping to secure a more integrated energy system under SEAP, by developing objectives that include 'resilience' (new priority determined by Covenant of Mayors). A key District Heating objective is 'decentralisation'. **[Bryan Harris]**
5. Given that a new Scottish Government to achieve 80TWh by 2050 is likely to become a new target, it is important to recognise that the RPP3 and Energy Strategy scenarios to meet 2032 targets are models only. The outcomes from these are not always correct. This may suggest that there is a need for more District Heating to be delivered to achieve said objectives. **[Paul Steen]**
6. There is no masterplan to identify District Heating sites when it comes to meeting Scottish Housing Standards – these are achieved using current available funding. **[Housing, Dundee City Council]**
7. Discussion approx. ten years ago focused on developing Heat opportunities – the problem is that too many potential projects that exist are not working collaboratively with communities (community ownership). **[Peter Copeland]**
8. Planning a heat island requires there to be multiple heat sources for resilience and robustness **[Peter Copeland]**
9. Why are the presentations so focused on public sector, large scale institutional clients? We want to target the private and domestic sector, but to do this we need a base load to work from. A Heat Strategy needs to target, in the short term, commercial and public sector clients to establish a secure supply (there are high start-up capital costs involved). **[Alan Seddon]**
10. For District Heating in Dundee, we need an approach that matches all interests – we should start with the commercial sector not domestic as easier to collate. **[Abertay University]**
11. Lots of work is bottom up, but now we're focusing on top down through, for example, SEEP (area based approach). The problem is getting engagement from private sector – the aim should be to consider all types of non-domestic buildings not just public sector. **[Heather McQuillan]**
12. What does the panel think about an Energy Agency being created (energy masterplanning)? **[Amy Brown]**
  - The Scottish Government encourages all local authorities to adopt a strategic approach to District Heating. What the Energy Strategy will say may reflect the Special Working Group's recommendation to require local authorities to develop a Heat Map. If this were the case, we would expect there to be a need for an organisation to review the Heat Maps against guidelines, but whether this was done by an existing or new organisation I don't know. **[Suzie Le Miere]**



## Group Discussions : Facilitated

### Group 1

Discussion referred to:

- Concerns about how to take projects from good conceptual ideas into actual projects. The strategy and the preliminary clusters presented appear sound and stakeholders around the table wanted to see these projects move forward. There was a general view that it was difficult to navigate the available support to projects. There needs to be a focus towards developing the business case which needs a straightforward route to cover project development costs.
- There was a general feeling that further development of specific Scottish Government policy and regulation would be welcome. This includes in particular to create the conditions that oblige developers to install district heating – particularly at a time where gas is far more competitive for developers to build into projects.
- The group were supportive of strengthened planning policy in the Local Development Plan.
- Gas prices make DH uncompetitive to customers.
- Asset value of gas infrastructure offers significant incentive to developers to remain with installing gas instead of DH.

### Group 2

Challenges/Barriers discussed:

- **Attitudes**
  - anecdotal evidence indicates District Heating often seen as “too hard” or “too complicated”, particularly amongst developers.
  - Role for better marketing of opportunities afforded by District Heating.
  - Needs more of a balance between carrot and stick (e.g. how stringent can planning policy be at this relatively early stage in District Heating development in Scotland without local support?).
  - Long terms views not being taken – still a fixation on gas.
- **Knowledge**
  - at all levels. Is there a lack of confidence?
  - Feelings from public sector employees engaged in District Heating is that this is a new field for them and there is an expectation on them to have “the right answers” when committing to District Heating technologies.
  - Planners are also feeling the pressure to quickly upskill in order to include policies on heat network development into local planning policy and guidance.
- **Engagement and co-ordination**
  - lack of capacity to progress District Heating on a strategic basis.
  - Need for “connectability”, yet organisational agendas, timescales and technology requirements often vary, making synergies more difficult.

- **Support**
  - experience of finding it difficult to navigate through the project support landscape and finding the right contacts within agencies

What needs to happen for Dundee?

- **Priorities**
  1. Need a strategic Outline Business Case for city-wide District Heating development opportunities. (capacity/cost?).
  2. Need Detailed Business Cases for each cluster area (capacity/cost?).
  3. Establishment of an ESCO (but requires political will).
  4. Encouraging District Heating through planning policy and support for planners in doing so.
  5. Partnership working to progress joint schemes (see challenges above).

Group 4

1. **What are some of the challenges facing District Heating and, more broadly, the SEAP context?**
  - **Resilience** – important to establish if going to build confidence in District Heating systems.
  - **Energy source** – must be low carbon e.g. CHP offers great carbon savings now, but as you decarbonise the grid the savings' impact decreases. What could be done is to develop a CHP system that provides electricity while recycling heat from the CHP plant to recharge the system. District Heating can take off if the infrastructure to support it is there, but this will only be developed if industry can see the fuel source as cheaper than conventional sources. The problem is people will only look at today's current fuel price, and at present gas is cheaper than biomass. There must be more done to increase renewable District Heating systems.
  - **Energy Storage** – important for establishing a renewable District Heating system. You must be able to capture the lost energy generated e.g. seasonal thermal storage of heat via heating and cooling granite.
  - **Adaptability/flexibility** – District Heating systems must be able to absorb new or alternative energy sources, through building in flexibility in their design now.
  - **Buy-in** – this is the main issue. House builders are sceptical and negative about District Heating – they feel that they shouldn't have to deliver it. There should be a role for Scottish Government at a more national level to secure domestic construction sector buy in, aligning developers with existing demands from home owners for District Heating. This responsibility should not be placed on Planners at a local authority level. How can you assess if a developer has really considered District Heating opportunities properly? There is a need to build this into Planning Regulations i.e. leaving District Heating to local authorities to do on their own is too risky (or else owners see this as a burden). This is especially since local authorities compete with one another. There

needs to be a national level move towards providing the tools that support and strengthen the case for District Heating e.g. regulations for new builds.

- **Marketing** – it is often forgotten that District Heating can be revenue generating. There needs to be a marketing push on this front. There is a need to get to individuals to increase their demand for District Heating. The energy market should also have the ‘no choice’ scenario currently present in relation to gas thrown back at it via District Heating connections. It is important to highlight that businesses cannot put a social value on District Heating, but local authorities and the Scottish Government can. Businesses may accept a lower IRR if the risk is lower too. It is ultimately a market failure if we cannot get businesses interested in District Heating. We need to make the business case for the fact that unless there is a large sum of capital funding available, via the Scottish Government, for District Heating then the cost of the minimum risk level associated with it for the consumer will increase.
- **Engaging the private sector on fuel poverty** – it is difficult to find viable District Heating projects if you only consider public sector organisations i.e. there is a need to include the domestic sector more. The private sector also needs to be educated more on ‘fuel poverty’ needs. By ‘community’ what should be meant here is ‘community’ in the widest sense possible i.e. all those living within a region, or common district (all shareholders or stakeholders). For example, there should be a rule that private sector developers must upgrade all domestic homes identified as in ‘fuel poverty’ – this should be done for free to the customer but requiring the home to be signed up to a thirty year contract to a private sector owned District Heating network (‘Green Deal for District Heating’). It is important to recognise the difference between Scotland and Denmark – in Denmark, utilities companies must deliver what the consumer wants or needs. They must demonstrate and deliver. Why? Because Danes have higher expectations of their energy provision as a result of greater education and exposure. In Dundee, there is a strong bottom up approach via the Local Community Plan, but private landlords are leading to degradation of the housing stock. How do you encourage those who are not interested in upgrading homes? Perhaps a solution is to create a ‘National Forum for Developers on District Heating’ (big and small) to allow them to share how they have successfully introduced a District Heating network, what costs they faced and questions they made decisions on.

## 2. Why do you think that capital costs of building District Heating systems are higher in the UK than in, for example, Germany?

- **High capital costs** – a variety of likely reasons exist, including: health and safety management, a lack of skilled welders and suppliers of pipes (not in the UK). But new procurement frameworks are currently being developed that will help alleviate this problem – these will come with the offer of new finance as well. Members will be able to buy in to the framework, as well as new organisations, allowing bulk buying economies of scale. These frameworks will include service provision as well (but only accessible to local authorities). Costs in Denmark are lower because of: lower trenches being dug, fewer checking processes required, higher skill level of labour, easier District Heating kit available. A key risk related to kit is the insulation and welding quality of the network pipes – when a problem arises with pipes after they have been buried this is a major issue. This is why the quality of the kit must be high before installation. The variation in

infrastructure costs represented in a Business Case is also complex – it would help if there was a benchmark the industry could refer to for this, such as in the case of the Danish Energy Agency.

- **Disaggregated support** – there is a challenge getting private sector developers to regularly engage with public and/or third sector organisations. What is needed is a means for aggregating all available support for District Heating together in a package, with a navigational tool to help simplify the system.

### 3. What needs to happen in Dundee, at a city-wide level, to progress District Heating here?

- **Establish an ESCO** – Dundee must outline the strategic case for District Heating, including identification of the opportunities available. This requires access to feasibility figures. The question then becomes, if you are to establish an ESCO, do you do this before or after access to these figures is available?
  - The role of the local authority in this process should be to help support set up of the ESCO, not to take on the responsibility for running and managing it day-to-day. The local authority can then sell its shares in the ESCO once it has become established – the ESCO should then revert to a not-for-profit organisation. A local authority member should have a position on the ESCO to champion the local authority. The ESCO then does the delivery function, providing the feasibility work as evidence to be used in the case for District Heating.
  - It does not take much to establish a company such as an ESCO – and by doing so the project for District Heating in Dundee can be given shape and a focal point. The ESCO must be self-supporting, requiring senior level local authority buy-in and support. A detailed Business Case should be presented to the council to vote on.
  - However, current customers won't talk about an ESCO and developing its Business Case until there is an ESCO – chicken and egg problem. To overcome this, the ESCO membership could originally comprise of those already involved in existing District Heating projects and then expand.
  - Another problem is that local authorities are so risk averse the provision of finance to enable the establishment of an ESCO would slow the whole process down. What is needed is for the case to be made strongly internal to the local authority, as well as externally through garnering the support of wider city stakeholders who can then demonstrate demand for an ESCO to Dundee City Council.
  - This argument in turn suggests though that there must be a focal point, or someone to push and make the case to these external stakeholders in order for the demand to take shape. Therefore, the local authority setting up an ESCO in the first instance via an arm's length arrangement is not uncommon.
  - An ESCO can create the drive for a strategic view for District Heating in Dundee – it can enable a multi-agency approach through providing a coordinating function across these organisations. The shareholders of the ESCO should therefore be a mix composed of not only local authority representatives.

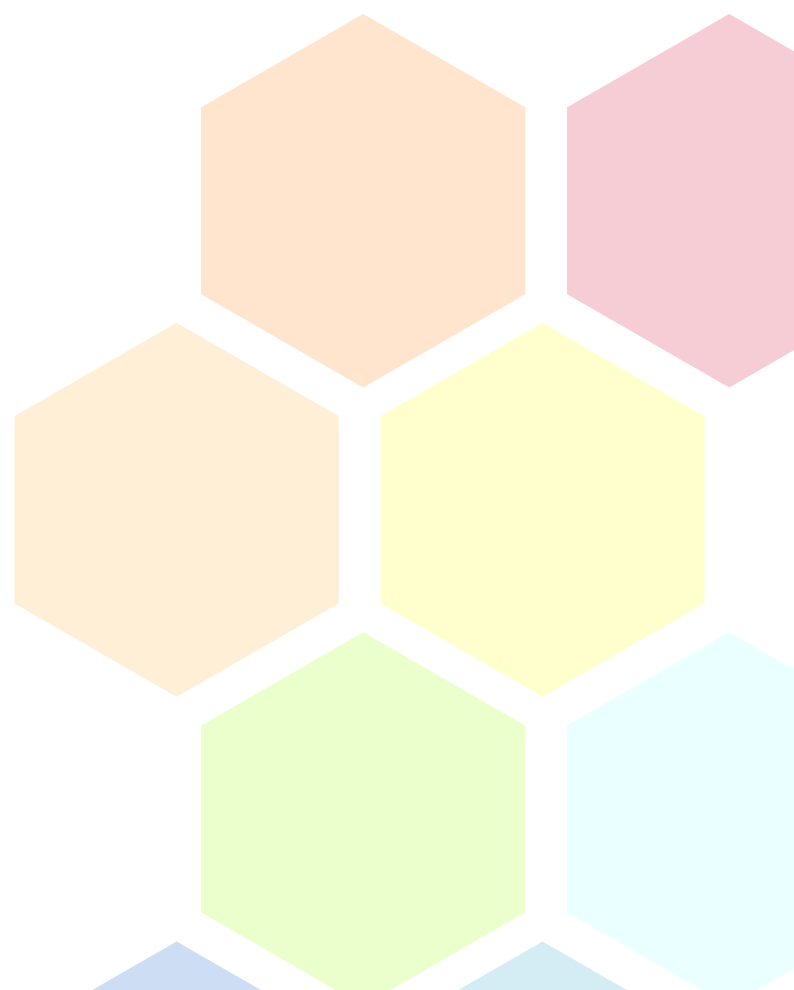
- Could the current Dundee City Council Environmental Sub-Group (comprised of public sector members only, focused on more than District Heating) providing the catalytic push for an ESCO?
- To get the ESCO going you then need to pick a focal point to start introducing District Heating networks to – you cannot do all clusters across the city at once. Perhaps this is also part of the problem at present – there are too many disparate projects with different stakeholders?
- To note that a new owner is about to buy DERL in March 2017 – this new owner will produce excess heat from the site that it could potentially link with the ESCO.
- To ensure the financial viability of an ESCO you must work out the total cost, supply and demand first and *then* look for finance to support it (e.g. selling shares in the ESCO). So viability will depend on the proportion of subsidy to be received versus a good rate of commercial return.

#### 4. What are some of the barriers to introducing and establishing District Heating in Dundee?

- **Attitude** – “it’s too hard”. But with the right leadership this can be overcome. The attitude of developers is that they have lots of understanding of District Heating, but are unfamiliar with it. Local authorities also do not have the correct tools to be able to properly assess if District Heating has been fairly considered in a development planning application. Perhaps there should be a building standards certificate attached to it? The implication of this however would be the attitude of the developers if they were required by the local authority to provide even more information or documents in support of an application – they would see this as too much of a burden.
- **Planning** – can planners require developers to incorporate future adaptability for District Heating into their application instead of requiring additional certification, to make it easier on the developer (e.g. connectivity)?
  - However, planners cannot require something if it is not regulated for by the Scottish Government. Planners can set conditions for what happens on the ground through a development, but these must be competitive with other local authorities or else the council risks losing investment from developer.
  - To do this there should be some sort of national guideline requirements for District Heating (e.g. requiring publication of an Energy Statement by developer that details how they are going to introduce/support District Heating, or the reasons why they can’t) that local authority planners can refer a developer to, which they must then ensure their development is in line with. This would ensure a level playing field for District Heating across local authorities.
  - How do you then assess this? Would planners need to be additionally trained, or could there be a central, national consultancy who provides this evaluation function?
  - There is lots that is required to make a development successful that is not under planners control, yet people often seem to see planners as the end-all solution.
  - Is there something so wrong with enabling local authorities to require District Heating from developers, such as in Germany or Denmark? The ‘stick’ approach is not bad, if it is applied Scotland wide.

## Summary : Other Key Points

- For District Heating to be successful we must adopt a long-term view.
- There are lots of lessons to be learnt from current, existing schemes.
- Different clusters of projects have different flow rates – this means that they do not have inter connectivity.
- Why not set up a West of Scotland District Heating company, comprised of a set of experts with a single point of contact for developers. The company would be centrally funded by Scottish Government, with the pipe network being owned by the Scottish Government and local authorities as they are more able to carry long-term risk until properties connect to the network. The company could then do [support] the development to implementation. Once properties connected to the network, the assets could be sold off to a pension fund and the money generated from the sale reinvested back into new schemes. Projects should also be aggregated to help establish economies of scale and best value for procurement. Local authorities could also pay £x per year to help fund the company.
- District Heating is not seen as a utility in the UK.
- Under the Dundee long term ambitions to 2050, key stakeholders should be identified and grouped so that all clients are represented.



## District Heating Priority Web : Summary

Below is a priority web representing the average results of all webs completed by delegates who attended the Dundee Strategy Stakeholder event. The web indicates how delegates conceptualised the key priorities delivered through District Heating. The higher the score, the greater importance delegates placed on the priority.

