

Report of the Director of Environment and Housing

Report to Sustainable Economy and Culture Scrutiny Board

Date: 17th February 2015

Subject: Jobs and Skills Opportunities from District Heating

Are specific electoral Wards affected? If relevant, name(s) of Ward(s):	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Are there implications for equality and diversity and cohesion and integration?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the decision eligible for Call-In?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Does the report contain confidential or exempt information? If relevant, Access to Information Procedure Rule number: Appendix number:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Summary of main issues

1. The council has strong ambitions to develop a citywide district heating (DH) network with many smaller DH clusters, over the next 15 or more years. Other core cities and Leeds City Region (LCR) authorities are also investigating similar opportunities.
2. The DH supply chain is currently very immature in the UK. Consultation with industry has revealed that although there are some employment opportunities in the development and construction phases of DH there are very limited ongoing employment opportunities.
3. However, given the focus of the council and LCR on developing DH networks, there is merit in encouraging this market. To this end, we have tools related to our procurement powers, apprenticeship programme, higher and further education links and business incentives.
4. The whole DH programme is at a relatively early stage of development which gives us the chance to shape a jobs and skills programme. However, as this is so reliant on convincing the market that there will be long-term employment opportunities it is unlikely that this can be launched until the phase 1 citywide DH network is in a position to start procurement which is unlikely to be before late 2015.

Recommendations

1. Scrutiny to note the findings of this report and provide comments.

2. The Director of Environment and Housing and the Employment and Skills team to be responsible for developing a comprehensive plan to maximise training and employment opportunities associated with DH. We expect this to focus on:
 - Using the forthcoming procurement of a phase 1 DH network to secure local employment and apprenticeships, via development of a strong social impact strategy and use of employment and skills obligations in tenders and the final contract;
 - Ensure that future Leeds City Region apprenticeship programmes include DH skills as a specific strand and are promoted to local DH supply chain partners in order to increase relevant DH skills.
 - Working with Leeds City Region and local Further Education and Higher Education institutions to develop modules within existing courses that provide skills required for the long-term development and operation of DH.
 - Working with the local supply chain and potential inward investors to demonstrate that there is a strong pipeline of DH opportunities across Leeds and LCR to justify their investment in skills and jobs.

1 Purpose of this report

- 1.1 To provide an initial review of the employment and skills potential associated with DH together with an indication of future work required to maximise those opportunities.

2 Background information

- 2.1 The Council aims to reduce carbon emissions by 40% by 2020 across the city. This requires us to take every opportunity to reduce carbon, including the development of a sustainable, modern, decentralised energy infrastructure for the city. This will allow power and heat generation to be shared at a local level through public and private networks.
- 2.2 The Recycling and Energy Recovery Facility (RERF) currently being constructed at Cross Green is already designed to generate enough electricity to power over 22,000 homes. There is a further opportunity to harness the heat that is also produced whilst processing the waste, and develop a district heating network.
- 2.3 Scrutiny received a report on the 21st October 2014 outlining the council's plans for a city wide DHN, with details on phase 1 to supply heat from the RERF to council owned tower blocks and operational buildings, as well as public and private sector commercial buildings and significant development sites in the city centre.
- 2.4 Scrutiny board members made a number of useful comments including a request to understand more about the employment and skills opportunities presented from the design, development and operation of DH networks. This included the immediate opportunities associated with the phase 1 and longer term DH networks in Leeds and the wider Leeds City Region.
- 2.5 This report provides this initial review and recommends specific further work.

3 Main issues

- 3.1 District Heating Networks are long term propositions. They normally take three or more years to design and secure funding, another one to two years to construct and then operate as a utility almost indefinitely. Therefore there are a range of short and long-term job opportunities, with skills ranging from detailed technical design, through to lower skilled construction work, and ongoing billing and technical maintenance.
- 3.2 To try to refine the scale and type of opportunities available, we have consulted with industry partners, government departments, academia and local authorities with experience of operating networks. It has proven impossible to get robust information on jobs associated with DH. However, the research has indicated strongly that there are not significant numbers of long-term jobs associated with DH. For example:
 - 3.2.1 In Sheffield, the E.on power station created c300 construction jobs but will only create c35 jobs during the operational phase.

- 3.2.2 The Stoke-on-Trent District Heat Network will use deep geothermal heat energy to develop a £52m DH network around the city. They estimate that this will support more than 200 jobs directly, with 1,350 jobs protected in the supply chain, but the vast majority of these are in the construction phase.
- 3.2.3 Wyndford (Glasgow) sought to use local labour as much as possible which did require a large number of installers in the short-term construction phase, particularly to install wet central heating in flats.
- 3.2.4 Aberdeen has a mature district heating network serving c1,500 flats and 9 public buildings. They employ a full time general manager and a part-time bookkeeper and retain the services of a maintenance and repair engineer.
- 3.3 Despite this, the research has indicated that there are five main work stages of DHN design, build and operate, as described below:
- 3.3.1 **Feasibility/Business Case.** A multi-disciplinary team is required here to fully develop the project. Likely roles within that team include: Project Engineer, Planning Consultant, Chartered Engineer (with energy/process industry experience), Legal (property - land searches/easements investigation), Civil Project Manager and the Energy Generation Facility Manager. None of these are full time and are normally provided on a consultancy basis due to the specialist nature of the work.
- 3.3.2 **Detailed Design.** As 3.3.1 but with introduction of CAD Technician/Engineer (for drawn information).
- 3.3.3 **Build.** As per 3.3.2 but with subcontracted building work. This tends to be to industry specialists of which there are few in the UK for pipework. The pipe consultants ratify the design which in turn drives the specification for the other 'build' work packages. One subcontractor would need to cover the civil engineering/ rigging/ welding/ sealing/ alarm wires/ controls etc. This is where the bulk of the person-years of employment will be created, albeit on a short-term basis.
- 3.3.4 **Operate.** Very limited. No-one 'operates' the system as such and 'operation' (monitoring heat flows and alarms) tends to be done via the control room of a main heat provider. There is a role to undertake customer metering and billing but again this is not a full time role and is often picked up by an accounts function in a major heat provider.
- 3.3.5 **Maintain.** Initially, this would be done through the construction company's defects liability period. Whilst there is planned preventative maintenance this would not be full time initially. After 2-3 years a large scale DH network such as proposed for Leeds may benefit from an in-house maintenance engineer and apprentice.
- 3.4 We have a number of tools open to us to develop local skills and secure local jobs to support DHN:
- 3.4.1 Our **procurement procedures** can place obligations on delivery partners;

- 3.4.2 Our **employment and skills services** can help link prospective employees to companies working in the DHN field through apprenticeships and direct recruitment opportunities;
- 3.4.3 We can **influence local universities and colleges** to develop courses or modules to provide young people with the skills needed to support DHNs over the longer term and promote career opportunities of DHN/energy in schools.
- 3.4.4 We can **influence national or international companies** to locate teams within Leeds to service a concentration of DHNs and support development of local supply chain.
- 3.5 These will be examined in turn below. It is worth emphasising at this point that all of these opportunities are reliant to a lesser or greater extent on the leadership shown by the council and LCR: companies will only take on apprenticeships and young people choose DHN related courses *if* it is clear that there will be work available. The council and LCR must therefore have a **clear commitment to developing DHNs and have a development pipeline** as evidence of that commitment.

Procurement

- 3.6 Where a contract has a value greater than £100k, it will automatically be appraised for the inclusion of employment and skills obligation in the contract. This will include evaluating the tenders against specific employment and skills criteria. Employment and skills are also examining a more flexible approach that allows them to target particular contracts, such as this.
- 3.7 The procurement route for the phase 1 DHN is still being developed and is unlikely to be confirmed until summer 2015 at the earliest, when further development work has been completed. However, whichever option we choose, we will ensure that all bidders develop strong social impact strategies as part of their tender. We will seek to work with industry bodies and local partners (such as the Heat Network Delivery Unit, Combined Heat and Power Association and Construction and Housing Yorkshire) to include challenging targets within that social impact strategy.

Apprenticeships

- 3.8 The LCR currently runs an Apprenticeship Hubs programme, funded up to 2016. They are looking to extend beyond that date, and are applying for European funding to enable them to do this. If successfully extended, we will be able to work with the team to help connect the local DH supply chain with apprentices.

Higher and Further Education

- 3.9 An initial review of Leeds City Region universities shows that although none currently run specific DHN courses, in 2012, around 6,700 students were studying related subjects (i.e. science, engineering, technology and building subjects). The breakdown is given in Appendix 1. All of these courses have the potential to integrate some content that would give students skills relevant to DHNs.

3.10 Of these courses, the following have been identified as ones into which content could possibly be most easily incorporated:

Institution	Course
University of Leeds	Chemical and energy engineering http://www.engineering.leeds.ac.uk/chemical/undergraduate/degree-chemical-energy-engineering/index.shtml
	Electronics and renewable energy systems http://www.engineering.leeds.ac.uk/electronic/undergraduate/degree-electronics-renewable-energy-systems/index.shtml
	Civil and environmental engineering http://www.engineering.leeds.ac.uk/civil/undergraduate/degree-civil-environmental-engineering/index.shtml
Bradford University	Industrial engineering http://www.bradford.ac.uk/courses/view/?c=industrial-engineering-beng-3-years
University of York	Environmental science http://www.york.ac.uk/environment/undergraduate/environmentalscience/bsc-environmental-science/
	Natural sciences http://www.york.ac.uk/natural-sciences/

3.11 Similarly, a review of local colleges shows:

Institution	Course
Leeds City College	Environmental sustainability extended diploma: http://www.leedscitycollege.ac.uk/courses/fe_course.php?course_id=662&pagenumber=0&tab=fe&sub=8&atten=Any
Leeds College of Building	Building services engineering: http://www.lcb.ac.uk/courses/103/full-time-and-part-time/hecm/building-services-engineering-level-3-btec-diploma
	Civil engineering: http://www.lcb.ac.uk/courses/104/part-time/hecm/civil-engineering-level-3-btec-diploma
Bradford College	Sustainable built environment higher apprenticeship: https://www.bradfordcollege.ac.uk/courses/undergraduate/sustainablebuilt-sep-2015
	Heat pumps City & Guilds, covering installation of solar PV systems https://www.bradfordcollege.ac.uk/courses/further/heatpumpscitygu-sep-2015
Calderdale College	BTEC Level 3 Extended Diploma in Construction with Environmental and Sustainable Technologies: http://www.calderdale.ac.uk/courses/view/btec-advanced-diploma-construction-the-built-environment-level-3

Selby College	Foundation Degree - Engineering for Power & Energy (in college prospectus but no link available to specific course)
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- 3.12 To raise awareness and start discussions with higher education, LEP gave a presentation to the Yorkshire Universities curriculum board, outlining the opportunities that we believe exist. This was well received and an open invitation has been extended to all Yorkshire University to work with the council and LEP to increase the skills available for district heat network development in the City Region through their existing degree courses.

Attracting Companies and the DH Pipeline

- 3.13 The council already works closely with the Manufacturing Advisory Service (MAS) and Chamber who will be key partners for any supply chain development work. We already have some tools which can help to encourage investment in particular industries (e.g. business rates discounts and enhanced capital allowances). These are particularly prevalent in the Enterprise Zone which could form the focus for a DH cluster.
- 3.14 The council is actively developing a pipeline of work which should give the supply chain the confidence to invest in training and skills. For example the council is:
- 3.14.1 Installing biomass DH in 231 flats in the Clydes;
 - 3.14.2 Undertaking research on DH in the 1,700 flats in the St James' area;
 - 3.14.3 Undertaking investment planning for all 122 council multi-storey blocks with DH one of the preferred heat supply options;
 - 3.14.4 Considering ways to use the Merrion House refurbishment to stimulate local DH;
 - 3.14.5 Developing plans to supply heat from the RERF and other low carbon facilities on the edge of the city into the city centre and other major development sites over 3 phases up to 2028.
- 3.15 In addition, the LCR is supporting neighbouring local authorities to undertake energy masterplanning which should lead to further viable schemes. These will be supported over the longer term by the LEPs Energy Accelerator, which has received growth funding.
- 3.16 Making the market aware of this scale of development will help to provide the long-term confidence to invest in skills locally.

4 Corporate Considerations

4.1 Consultation and Engagement

4.1.1 As this is an initial review, the research has been primarily desk based. Industry partners, government departments, academia, comparator local authorities and teams from Leeds City Region, Economy and Skills, Economic Development and Sustainable Energy and Climate Change have all been engaged.

4.2 Equality and Diversity / Cohesion and Integration

4.2.1 An Equality, Diversity, Cohesion and Integration Screening was undertaken in August 2014 for the District Heating Project. This concluded that district heating would have an overwhelmingly beneficial impact, by reducing fuel costs for tenants in some of the more deprived parts of the city, with consequent positive impacts on fuel poverty and cold related ill health.

4.2.2 Work undertaken now to ensure that the local employment and skills opportunities are maximised will contribute further to this positive impact.

4.3 Council policies and City Priorities

4.3.1 The district heating project supports delivery of the Best Council Objective, 'Supporting communities and tackling poverty' by reducing fuel costs and cold-related ill health.

4.3.2 The inclusion of district heating with the RERF clearly supports the Visions for Leeds aim to ensure that "all homes are of a decent standard and everyone can afford to stay warm" and several Best City objectives:

- Best city... for business:
 1. Support the sustainable growth of the Leeds' economy;
 2. Improve the environment through reduced carbon emissions.
- Best city... to live:
 1. Maximise regeneration investment to increase housing choice and affordability within sustainable neighbourhoods;
 2. Improve housing conditions and energy efficiency.

4.4 Resources and value for money

4.4.1 This will be defined during the next stage of project development.

4.5 Legal Implications, Access to Information and Call In

4.5.1 n/a.

4.6 Risk Management

4.6.1 The project team established to take forward the district heating work are currently developing a full project plan and risk register.

5 Conclusions

- 5.1 The council has a unique opportunity to create a citywide DH network over the next 10-15 years. This will connect some of the relatively small scale DH networks already in place and allow new networks to expand rapidly to enable existing buildings to connect and new developments to be built with DH connections in place.
- 5.2 However, despite the large capital investment required, other than in the construction phase, few long-term jobs are created.
- 5.3 The best strategy for developing a supply chain in the city and LCR appears to be to create a long-term pipework of DH projects so that companies have the confidence to locate in Leeds and invest in skills for their employees.

6 Recommendations

- 6.1 Scrutiny to note the findings of this report and provide comments.
- 6.2 The Director of Environment and Housing and the Employment and Skills team to be responsible for developing a comprehensive plan to maximise training and employment opportunities associated with DH. We expect this to focus on:
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 - 6.2.3 Working with Leeds City Region and local Further Education and Higher Education institutions to develop modules within existing courses that provide skills required for the long-term development and operation of DH.
 - 6.2.4 Working with the local supply chain and potential inward investors to demonstrate that there is a strong pipeline of DH opportunities across Leeds and LCR to justify their investment in skills and jobs.

7 Background documents¹

- 7.1 None

¹ The background documents listed in this section are available to download from the Council's website, unless they contain confidential or exempt information. The list of background documents does not include published works.

Appendix 1: breakdown of students studying relevant courses

HESA Student Record 2012/13 (Restricted Population)							
	Institution	University of Bradford	University of Huddersfield	Leeds Beckett	University of Leeds	University of York	Total
Physics	Postgraduate	-	-	-	46	95	141
	Undergraduate	-	-	-	376	398	774
	Total	-	-	-	422	493	915
Science of aquatic & terrestrial environments	Postgraduate	-	-	-	115	-	115
	Undergraduate	48	-	-	257	-	304
	Total	48	-	-	372	-	419
Physical geographical sciences	Postgraduate	-	-	-	103	83	186
	Undergraduate	18	-	-	265	278	561
	Total	18	-	-	368	361	746
General engineering	Postgraduate	339	-	-	80	-	419
	Undergraduate	193	28	3	51	-	275
	Total	532	28	3	131	-	693
Civil engineering	Postgraduate	18	-	-	288	-	306
	Undergraduate	278	-	321	582	-	1,181
	Total	296	-	321	870	-	1,487
Chemical, process & energy engineering	Postgraduate	3	8	-	65	-	75
	Undergraduate	135	-	-	407	-	542
	Total	138	8	-	471	-	617
Others in engineering	Postgraduate	-	-	1	-	-	1
	Undergraduate	-	8	32	-	-	40
	Total	-	8	33	-	-	41
Minerals technology	Undergraduate	-	-	-	23	-	23
	Total	-	-	-	23	-	23
Biotechnology	Postgraduate	-	-	-	11	-	11
	Total	-	-	-	11	-	11
Others in technology	Postgraduate	-	9	38	4	-	50
	Undergraduate	17	216	753	-	-	986
	Total	17	225	791	4	-	1,036
Building	Postgraduate	-	-	13	13	25	51
	Undergraduate	-	60	582	21	-	663
	Total	-	60	595	34	25	714
Total		1,048	328	1,743	2,704	879	6,702