

LOW CARBON HUB BOARD

Date: 7th October 2016

Subject: **HEAT NETWORK UPDATE**

Report of: **Julian Packer, Low Carbon Investment Director**

PURPOSE OF REPORT

This paper provides a brief update on the heat network programme development in Greater Manchester led by the GM Low Carbon Project Delivery Unit (LCPDU). As will become apparent, much of the work reported below has received funding from the Heat Network Development Unit (HNDU) of DBEIS, with which the GMLCPDU has an excellent relationship.

RECOMMENDATIONS:

The Board are recommended to:

- Note the report.

CONTACT OFFICERS:

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BACKGROUND PAPERS:

Appendix 1: Heat Network Investment Project

Appendix 2: GM Combined Authority Heat Network Project Tracker

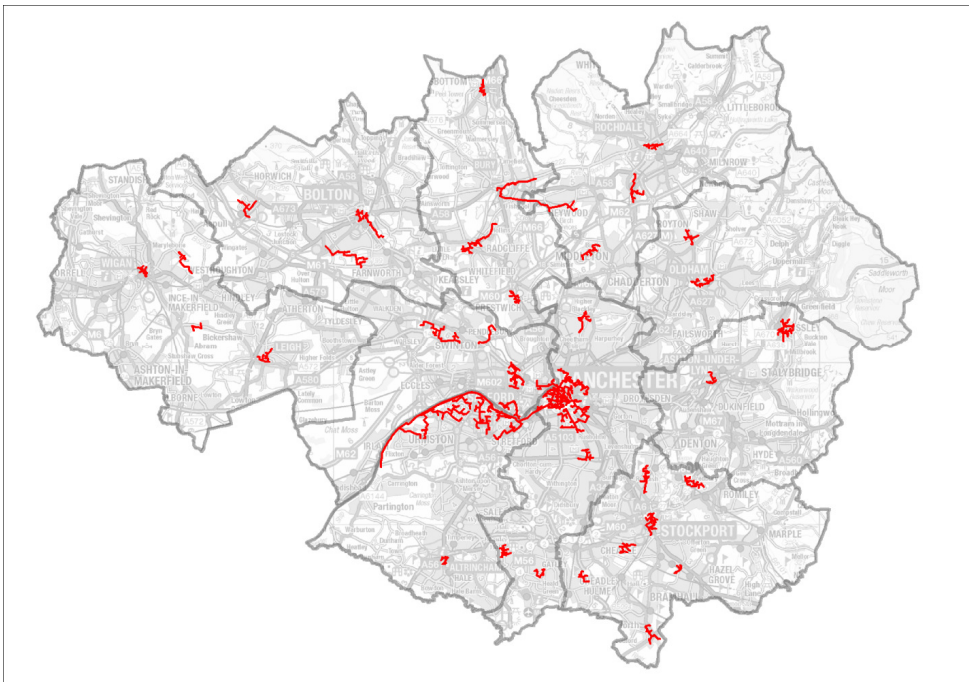
TRACKING/PROCESS		[All sections to be completed]
Does this report relate to a Key Decision, as set out in the GMCA Constitution or in the process agreed by the AGMA Executive Board		No
EXEMPTION FROM CALL IN		
Are there any aspects in this report which means it should be considered to be exempt from call in by the AGMA Scrutiny Pool on the grounds of urgency?		[Please state any reasons here]
AGMA Commission	TfGMC	Scrutiny Pool
7 th October 2016	[Date considered at TfGMC; if appropriate]	[Date considered/or to be considered at Scrutiny Pool; if appropriate]

1.0 INTRODUCTION

- 1.1 Greater Manchester (GM) has an overarching CO₂ reduction target of 48% by 2020 compared with 1990 levels. In 2014 (latest available data), GM had achieved a 35.5% carbon reduction (from 1990) against the target. GM therefore has 6 years of reporting and 4 years of delivery to achieve a further decrease to annual emissions of circa 2.5mtCO₂e. The recently agreed Climate Change and Low Emissions Implementation Plan sets out a pathway which could achieve all but 0.5mtCO₂e of our target, however this assumes full delivery of identified energy generation and efficiency programmes including district heat/energy networks, decentralised energy generation, energy efficiency in domestic and non-domestic buildings, behaviour change and low carbon transport schemes.
- 1.2 In the wider UK context the decarbonisation of heat through the deployment of district heating/district energy is a key element of DBEIS (formerly DECC) policy and is underlined by the launch of the Heat Network Investment Project (HNIP) managed by DBEIS's Heat Network Delivery Unit (HNDU) before the end of this year. Over the next 4 years the HNIP is offering £320m of funding (grants/soft loans) and DBEIS is anticipating that this could leverage up to £2bn of other funding leading to a step change in the deployment rate of heat networks. A briefing paper on the HNIP is attached at Appendix 1.

2.0 THE GM HEAT NETWORK PROJECT PIPELINE

- 2.1 In 2014 the consultants Ramboll completed a heat mapping project for GM. This identified 35 potential projects, of these a number of those showing the most promising project IRR from the perspective of a delivery SPV were selected for further investigation.
- 2.2 The heat map is shown below, the red lines indicate the location and extent of the heat network transmission routes.



- 2.3 The heat mapping used historical data and subsequent to the completion of the Ramboll work a number of further opportunities have arisen as a result of redevelopment.

- 2.4 A summary of the current pipeline is given in Appendix 2. (Note that the Stockport and Town Centre projects are greyed out as they are currently not active)
- 2.5 The estimated capital expenditure for each project is confidential however the active projects constitute a total estimated investment value of in excess of £150m with a similar value for the operating and maintenance costs over the initial 25 year operational period.

3.0 RECOMMENDATIONS:

- 3.1 The Board are recommended to:
- Note the report.

Appendix 1 - Subject:: Heat Network Investment Project (HNIP)

Author(s): Alex Trebowicz, Julian Packer, Amy Beasley

PURPOSE OF NOTE

This paper is to introduce the Department of Business Energy and Industrial Strategy (DBEIS) Heat Network Investment Project (HNIP), the £320 million funding for which was announced in the November 2015 Spending Review.

Government will provide £320 million of funding on heat network projects over the next five years, intending to lead to the delivery of ~200 heat network projects, and leverage around £2 billion of private and local capital investment.

The details of the HNIP are still to be confirmed; however this paper outlines the current thinking of how the project may be structured. A consultation process has recently concluded and it is anticipated that the first awards totalling £50m will be made in this financial year

HNIP principles

The stated aims of the HNIP are split into short-term and long term:

Short-term:

- Increase the volume of heat networks by providing seed money that will draw significant additional investment;
- Deliver carbon savings for carbon budgets 4 and 5 (spanning the years 2023 and 2032);
- Empower public sector actors to meet local needs, through heat network projects that would not have been possible without government support, i.e. those that:
 - Have explored a suitable range of technical options, and are future-proofed;
 - Are commercially future-proofed;
 - Operate with no customer detriment in comparison to fossil fuel based heat.

Long term:

- Contribute toward and develop a self-sustaining district heating market, meaning one that can prosper without subsidy.

DBEIS has identified 3 classes of projects (noting that the IRR ranges shown below reflect DBEIS's current thinking and the definition and ranges are still to be confirmed) :-

- “sub economic” with a project equity IRR of less than 5%
- “economic” with a project equity IRR between 5% and 12%
- “commercial” with a project equity IRR greater than 12%

A key driver for DBEIS is the principle of “Additionality”. What this means in practice is supporting projects with merit which would not go ahead without the DBEIS funding.

Another key principle is that the funding has to be split evenly between “fiscal” and “non fiscal” spending. In practice “non fiscal” spending is funding going to projects involving the private sector.

For the first funding Tranche (which DBEIS is treating as a pilot) applicants may be owners of a network or sponsors of one. DBEIS is limiting funding to public sector

applicants in Tranche 1 (however, the private sector can still partner with or be sponsored by public sector applicants and benefit from funding); there will only be a second Tranche (with private sector applicants directly able to apply) if sufficient public sector applications fail to emerge in Tranche 1.

Tranche 1:

- Local Authority led/sponsored projects, including wider public sector (Education, Health);

Tranche 2 (assuming Tranche 1 projects do not cover the £320m):

- Private sector projects, including community schemes.

From a state aid perspective the HNIP will be run as far as possible under a general block exemption, where pipe-work infrastructure and heat generation assets are considered separately.

The £320m will be split into annual (financial year) pots with 3-4 rounds per year from 2017/18, with no carry over likely from year to year. The spend profile defined by Treasury is back-loaded, given that it is anticipated not many projects will be ready to apply for the first Tranche.

Application procedure

DBEIS has suggested that the application process will enable prioritisation of projects while minimising the burden on applicants. At this stage proposals include:

- Each competitive funding round will consist of three stages.
 - Stage one: the application form is submitted and there is an eligibility assessment.
 - Stage two: DBEIS performs a techno-economic assessment; initial decisions are made with specific conditions.
 - Stage three: Due diligence is performed; conditions are assessed and a final decision is made.
- The next step is a contractual agreement, the release of funds, state aid notification and ongoing applicant support.

A positive decision regarding the funding can be made before the final business case and/or commercial structure is agreed / approved, i.e. to feed into the commercialisation stage.

Funding mechanisms

In the consultation DBEIS sought views from the public and private sectors on the type of funding mechanisms that will prove most beneficial achieving the aims of the HNIP, the following are currently under consideration:-

1. Soft loans (possibly including low interest rates, repayments after construction, payment holidays, subordinated debt etc);
2. Grants;
3. Public sector equity stake (e.g. from the relevant local authority);
4. Heat guarantees – although the current thinking is that the drawdown profile of a loan could be linked to development phases rather than provide a “guarantee”

The disbursement of funds will not extend beyond 2020/21 however loan terms will extend beyond that date

Eligibility

Beyond the eligibility of applicants for Tranche 1 (and possibly Tranche 2), new heat networks, expansions, refurbishments, interconnections, cooling networks, and heat networks that generate electricity are all considered eligible. DBEIS has embraced a relatively broad definition of eligibility, but projects must be 'future-proofed' so that they don't pass on high costs to consumers. Additional eligibility requirements include:

- If a heat network intends to use waste heat, one thing the HNIP funding will not cover is new sources of waste heat, such as new factories or waste incineration plants. The heat source must already exist.
- A heat network must connect two or more buildings, and there must be no explicit impediment to future expansion or interconnection.
- The network must use at least 50% renewable energy, 50% recovered heat, 75% CHP, or a combination of the above which gives 50% contribution – this is likely to be defined as percentage of delivered energy.
- In addition there must be:
 - A reduction in primary energy versus the counterfactual from fossil fuels,
 - The network must comply with the heat metering and billing regulations
 - The generation plant (assuming use of CHP) must operate as 'good quality' as defined by the CHPQA.
- Other criteria under consideration:-
 - Compliance with Code of Practice CP1
 - Membership of the Heat Trust (currently only relates to domestic heat connections)

Scoring criteria

DBEIS officials have not decided on a selection procedure but may employ an expert panel or auction to choose winners.

- Scoring criteria will closely scrutinise project additionality, or the extent to which new carbon savings are achieved that would not have occurred without Government support. Two pots of capital are likely with regards to additionality:
 - One pot will support projects that would not have been possible without support.
 - Another pot will support projects that are already commercially viable but will be able to achieve additional characteristics with Government support.

Appendix 2 Greater Manchester Combined Authority heat network project tracker														
Version: 6		Date: Sept 2016												
Project	Project reference	PDU owner	LA project contact / Project & application description	Project area	Main energy source	Anticipated size of network (as per HNDU definition)	First heat customers	Current stage	Approx CO2 savings (tonnes / annum)	Partners/ Stakeholders	Ownership model & LA role	Technical study funding source (HNDU, ELENA)	Finance Source	Next steps
1. Manchester			Alex Trebowicz a.trebowicz@manchester.gov.uk 07904 536 825											
a) Civic Quarter Heat Network (CQHN)	M001	JP	The core buildings are: the Town Hall, the Town Hall Extension, Central Library, the Midland Hotel, Manchester Central, Number One St Peter's Square, Manchester Art Gallery, Heron House and the Bridgewater Hall. Private wire connection to Manchester Central, Midland Hotel, Town Hall Extension and Bridgewater Hall. Additional private sector loads are being identified, commercial discussions ongoing.	Manchester City Centre, Civic Quarter	Gas CHP & gas boilers, plus private wire (PW) electricity	Medium	2018	In procurement (CEF) for delivery partner	3,600	Midland Hotel, Manchester Central, 1/2 SPS, Jacksons Row, Friends Meeting House, 1 Central Street.	LA leadership	Pioneer Cities	MCC	Out to dialogue/tender for delivery partner Q2 2016, financial close by Q4 2016 / Q1 2017
b) St Johns (Allied London)	M002	JP	Allied London development of 2,400 residential units, workspace and studio space (The Factory), three new hotels, arts culture and entertainment buildings. Development to include: a) Site wide district heating network b) Onsite CHP with private wire c) Onsite heat infrastructure to be capable of integration with the emerging plans for district heating in the local area.	Former ITV / Granada site, Manchester City Centre	Gas CHP & gas boilers, plus private wire electricity	Medium	2018	Allied London in procurement for delivery partner	2,600	Allied London, MCC	Private sector (AL)	n/a	Allied London, plus potential target for GM Low Carbon Fund	Procurement ongoing (AL)
c) Corridor Manchester - Northern Crescent	M003a	AT	Transmission Network SPV proposed in Arup report - entity trading spare or waste heat between stakeholders. Consideration of two clusters for initial phases: Northern Crescent – key stakeholders are MMU (campus network including energy centre) and Bruntwood (Circle Square development, Oxford Road station redevelopment). Other connections include Aquatics Centre, Brunswick Housing tower blocks, RNCM, plus north to Civic Quarter (Project M001). Southern Crescent (see project ref M003b)	Corridor Manchester - northern end centred on MMU campus and Bruntwood Circle Square development.	Gas-CHP led scheme at MMU / Circle Square. Potential fuel cell CHP as part of MMU proposals.	Medium	2018/19	Into detailed development Soft market testing with potential delivery partners complete Engagement with KPMG, PwC, EY and Deloitte. Support to north/south cluster stakeholders to develop scheme, including business	TBC Arup report: 933 NB, heat trading entity only, no electricity generation offset	Primary: MMU, Bruntwood (Circle Square). Secondary: UoM, RNCM, Potentially Bruntwood (Oxford Rd station redevelopment).	TBC - potentially MMU / Bruntwood JV	Feasibility - HNDU R2 funding	Bruntwood / MMU Potentially MCC (Oxford Street station)	PDU support to MMU and Bruntwood to develop project proposals and business case development (JV)
d) Corridor Manchester - Southern Crescent	M003b	AT	Transmission Network SPV proposed in Arup report - entity trading spare or waste heat between stakeholders. Consideration of two clusters for initial phases: Northern Crescent (see project ref M003a) Southern Crescent – key stakeholder are SSE (Octagon development), Bruntwood (MSP) and Central Manchester Hospitals. Various additional connections possible including Grove Village housing, Nuffield Health. SSE to potentially deliver first phase through data centre development at Octagon House.	Corridor Manchester - southern end, centred around Octagon project and Bruntwood MSP site.	CHP-led scheme providing generated power for electricity, cooling and data services. Export of surplus heat and power to local customers. Bruntwood MSP proposals tbc.	Medium	2018/19	MoU signed between Octagon and MCC to define co-operation in developing business case, and defining project area/stakeholders. Business case completion Q42016/Q12017. Engagement with Bruntwood/MSP Sept 2016 - outcome/actions	TBC Arup report: 933 NB, heat trading entity only, no electricity generation offset	Primary: Octagon Project, Bruntwood (MSP). Secondary: CM NHSFT, UoM (Whitworth halls), Nick Everton House, National Blood Centre, Nuffield Hospital.	TBC - potentially Octagon own/operate	Feasibility - HNDU R2 funding	Octagon / Bruntwood	PDU support to understand Bruntwood appetite, support Octagon in BC development, identify potential off-takers.
e) Piccadilly Station	M004	AB	A heat network masterplanning study for the Piccadilly Station area in Manchester City Centre. It is currently proposed that this will take the form of gas-fired CHP plant located within Piccadilly generating electricity and heat for on-site consumption at the station and Square One building, with heat exported into a local heat network of high heat demand buildings near the Station. An initial phase would serve buildings such as London Road Fire Station and KAMPUS, with a second phase expanding to further users including the Crown Court and Hilton Hotel. Longer term interconnection opportunities with the redevelopment of North Campus and Mayfield are also possible.	Piccadilly Station and surrounding buildings (mainly hotels, commercial and leisure)	Gas CHP	Medium	2020	Masterplanning nearing completion. Final report sign-off anticipated end of Sept 2016. Work ongoing to mobilise procurement of next stage detailed feasibility and business case development	2,600	Primary: Network Rail Secondary: Allied London Capital&Centric StayCity MacDonald Hotel	TBC - potentially NF-led although likely to be JV?	Masterplanning funding through HNDU Round 4	TBC	Twin-track detailed technical feasibility and development of the business case.

f) Civic Quarter 2 / NOMA	M005	AT	The potential heat network opportunity centred on the Co-operative Group's (Co-op) NOMA development to the north of the City Centre is based on identified NOMA loads. It is intended that the network will serve a typical city centre mix of buildings. In particular there are significant new and existing residential plots, as well as significant commercial, retail and hotel developments. The longer term intention of the NOMA scheme will be a link to the Civic Quarter Phase 1 scheme.	NOMA development, north of Manchester City Centre	Gas CHP, existing biodiesel boiler, plus private wire electricity	Medium	2019	Feasibility complete - PDU awaiting senior stakeholder (Co-op / Hermes) view on next steps.	620 tonnes per annum compared to counterfactual	Co-op / Hermes	Co-op / NOMA led	Feasibility - HNDU R2 funding	TBC	Awaiting feedback from Co-op / Hermes stakeholders regarding next steps.
f) Smithfield AD	M006	-	As part of the Council's plans to modernise and refurbish the New Smithfield Market, a commercially operated anaerobic digestion (AD) system is proposed by the developer. The purpose of the AD system is to supply biogas to a combined heat and power unit which will generate electricity and heat. The AD system will take food waste from the market and other sources as its fuel.	Smithfield Market	Anaerobic digestion plant feeding CHP	Small	2017	Currently paused pending a decision as to whether to proceed (to be reviewed in June 2016).	-	-	Private developer (EPC contractor), potential MCC funding	-	Private, potential MCC	Confirm business case & funding, appoint contractor
g) Regional Centre masterplan	M007	PDU	This application is for funding to support a masterplanning and detailed project development study for the Greater Manchester (GM) Regional Centre. The study will enable strategic planning and co-ordinated development of the portfolio of active heat network projects across Manchester, Trafford and Salford. The study will also investigate legal structures, commercial structures, governance options and funding options for a Regional-level network, leading to a strategic business case.	Regional Centre - Manchester City Centre, East Manchester, Salford City Centre, Salford Quays, Trafford Park	Various	Large	-	Masterplanning / strategic business case development - ITT to be developed	-	Various	-	Application to HNDU Round 4	TBC	Develop ITT
2. Oldham			Andy Hunt andrew.hunt@oldham.gov.uk 0161 770 6587											
a) Town Centre	O001	-	A network could potentially serve a number of existing buildings including the Civic Centre, Magistrates Courts, Police Station, Oldham College campus, Tommyfield Market, and the Spindles / Town Square shopping centre. In addition, the network may also serve two new buildings which are currently being designed, namely a hotel linked to the Civic Centre and a new Council owned leisure centre to the south of the college. Alongside the potential town centre DHN, Oldham has an existing long established heat network in the form of the St Mary's network located to the north of the town centre.	Oldham Town Centre	Gas CHP or biomass, connection to existing network	Medium	?	Feasibility / business case / development plan complete - OMBC considering next steps. Oldham also investigating other network options across town centre / fringes (i.e.	546	TBC	TBC	Pioneer Cities	TBC	TBC Oldham also considering other options for developing networks Potential for further work under HNDU R7?
3. Stockport			Darren Pegram darren.pegram@stockport.gov.uk 0161 474 3171											
a) Town Centre	ST001	-	A number of potential options exist for the development of DH schemes in Stockport town centre, centered around a Civic buildings cluster, the Grand Central cluster (swimming pool, offices, hotel) and a Stockport College cluster. Stand-alone CHP systems at each of the clusters considered a viable option compared to a larger network, with improved the potential for gaining revenue from electricity sales.	Stockport Town Centre	Gas CHP at each cluster, potentially biomass	Medium	?	Feasibility / business case / development plan complete - SMBC considering next steps.	2,200	TBC	TBC	Pioneer Cities	TBC	TBC Potential for further work under HNDU R7?
4. Salford			Tony Ennis tony.ennis@urbanvision.org.uk 0161 686 7415											
a) Media City expansion	S001	AB	Peel own and operate a 2MW trigen (heating, cooling and electricity) generating system with a 9MW back up boiler set on the MediaCityUK site. The current trigen system has the capacity to supply energy to the remainder of Phase 1 development. Peel have been engaged by the Greater Manchester Heat Networks Programme (GMHNP) to explore the potential utilisation of this capacity to integrate into a broader scheme which could, if feasible, serve multiple buildings and developments across the area.	MediaCity UK, Salford Quays	Gas CHP	Medium / large	2019	Feasibility and masterplanning procured and delivered together - final report March 2016	3,300	Peel, SCC	-	Feasibility - HNDU R2 funding	TBC	Final report March 2016 - meeting with Peel and SCC to discuss next steps held. Peel to take forward expansion as part of MediaCity Phase 2.
b) Pendleton redevelopment	S002	AB	The project masterplanning will assess the viability of heat network development at the residential-led Pendleton redevelopment site, either as a stand-alone heat network, or as a heat demand connected to a wider Salford / GM network in future. The masterplanning will tie-in with the feasibility work being carried out for an extension to the existing network at MediaCity UK, through exploring connection potential between these two developments.	Pendleton, Salford	Gas CHP	Medium	2019	-	4,900	SCC, Together Housing	-	HNDU R4	TBC	
c) Salford Central masterplan	S003	AB	Heat network masterplanning study for the Salford Central development area, where £650m of investment includes significant development sites such as Greengate, Middlewood Locks, New Bailey and Chapel Street. The project is strategically located in a GM heat network corridor including schemes/opportunities across Trafford, Salford, Central Manchester and East Manchester.	Salford Central, from Middlewood Locks (west) to Greengate (east)	TBC	Large	2020	Consultant appointed for Masterplanning (Aecom) - study due for completion Nov 2016	18,000	Various private sector stakeholders TBC	-	HNDU R4	TBC	Develop project opportunities for detailed techno-economic work.

d) Charlestown	S004	AB	Potential scheme combining hydro electric project at Charlestown Weir with WSHP-supplied low temperature network for new low density residential development being delivered by Keepmoat	Salford Charlestown Riverside	WSHP	Small	2018	Pre-feasibility/ concept development work and initial engagement with	500	Keepmoat	-	TBC	Meeting with Keepmoat (Sept 2016) to discuss appetite for involvement	
5. Bury			Chris Horth c.horth@bury.gov.uk 0161 253 5520											
a) Town Centre	BU001	AT	This project opportunity located in Bury Town Centre and involves predominantly existing buildings together with some infill redevelopment. A significant amount of the heat demand is council owned or owned by other public sector bodies with whom the council has existing relationships. The supply asset proposed for this project is a gas engine CHP with an installed capacity of 1.35MW.	Bury Town Centre	Gas CHP, plus private wire electricity	Medium	2019	Draft final report and CF model due 15th Sept.	1,800	Bury College, Bury Leisure centre 6Town housing	TBC	Funding secured from HNDU R3	TBC	Feasibility complete Sept/Oct 2016 Business case discussions with BMBC depending on feasibility outcomes
6. Tameside			Ade Alao ade.alao@tameside.gov.uk 0161 342 2795											
a) Ashton town centre	TA001	AT	This project opportunity is centred around the new council office building. Together with the town hall building, planned swimming pool and college, these are the main municipally owned anchor heat loads for the project. The current proposal is based around gas fired CHP scheme with an installed capacity of 1.75MW.	Ashton Town Centre	Gas CHP, plus private wire electricity	Medium	2019	Draft final report and CF model due Sept.	800	Primary Care Trust, new college building	TBC	Funding secured from HNDU R3	TBC	Feasibility complete Sept/Oct 2016 Business case discussions with BMBC depending on feasibility outcomes
7. Trafford			Richard Roe richard.roe@trafford.gov.uk 0161 912 4265											
a) Trafford Park	T001	AB	Masterplanning study for Trafford Park to identify opportunities to expand the proposed Peel-led scheme around the Trafford Centre Rectangle. The project is also investigating the potential for a Local Development Order to facilitate the roll-out of DH in the area	Trafford Park Industrial Estate	Barton biomass power station, plus some local generation (gas-fired boilers and CHP)	Large	2019	Masterplanning work in progress by Ener-vate. Due for completion early October	TBC	Peel, and various industrial stakeholders TBC	TBC	HNDU R4	TBC	Complete masterplanning and identify preferred option.
8. Bolton			Nicola Farrell nicola.farrell@bolton.gov.uk 01204 336654											
a) Raikes Lane EIW	B001	AT	This project opportunity is located in Bolton Town Centre, the existing heat loads for which are a diverse mix of commercial buildings, with a core of Local Authority buildings. The proposed key supply asset is an existing EIW plant, located 2.8 kilometres to the south-east of the Town Centre, which is operated by Viridor on behalf of the GMWDA. Key stakeholders are Bolton Council and the GMWDA.	Bolton Town Centre, EIW plant to south-east of town centre	Energy from waste plant, plus back-up boilers/CHP Alternative scheme excluding EIW.	Medium	2019	Feasibility draft final report received (Peter Brett) - further work needed to unlock Round 6 funding for DPD..	6,100	GM Waste Disposal Agency		HNDU R4 - feasibility. HNDU R6 - DPD.	TBC	Feasibility complete August 2016. Scope of works for additional technical work (town centre scheme) being drafted to meet HNDU requirements regarding R6 funding.