



Leicester  
City Council

**WARDS AFFECTED: ABBEY, LATIMER, SPINNEY HILLS, CASTLE, STONEYGATE**

**FORWARD TIMETABLE OF CONSULTATION AND MEETINGS:**

**CLIMATE CHANGE PROGRAMME BOARD  
OVERVIEW & SCRUTINY MANAGEMENT BOARD  
CABINET**

**12 JUNE 2008  
8 JULY 2008  
14 JULY 2008**

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## **EXTENDING DISTRICT HEATING AND CHP IN CENTRAL LEICESTER**

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### **JOINT REPORT OF CORPORATE DIRECTOR, ADULTS & HOUSING AND THE CHIEF FINANCE OFFICER**

#### **1. Purpose of the Report**

- 1.1 To describe how extending the network of our district heating schemes will help achieve transformation of Leicester into Britain's Sustainable City.
- 1.2 To seek a decision whether to proceed with a potential scheme.
- 1.3 If agreed in principle, to decide the procurement route and the steps to achieve it.

#### **2. Summary**

- 2.1 It is the vision of the Council and Leicester Partnership to transform Leicester into Britain's Sustainable City over the next 25 years.
- 2.2 One of the priorities for action to achieve the vision is to reduce our carbon footprint.
- 2.3 District Heating networks, supplied with heat from combined heat and power (CHP) units are an established technology which is recognised as providing heat and power with less carbon emissions than individual heating systems.

- 2.4 The proposed scheme would be fuelled by gas, but having the network in place provides future potential for using renewable fuels on a large scale, with the possibility of near zero carbon heat and power. The required technology and fuel supplies are not available for the scale of the proposed scheme, but they are developing rapidly.
- 2.5 The proposed scheme for central Leicester could reduce the Council's own current (2006) emissions by 13-15% and offer the same opportunity to Leicester University, Leicester Prison and any other public and/or private organisations, who could join the network.
- 2.6 The Scheme is proposed as two Projects. Project 1 network links together the current district heating networks on St Marks, St Matthews, St Peters and St Andrews estate. The network runs outside the inner ring road along the eastern and southern edge of the City Centre.
- 2.7 Project 2 would run to the west of the City Centre, largely along the inner ring road, completing the circle. Further pipework would be to the east of the City Centre, but within the ring road. Project 2 offers opportunities for many regeneration projects, but is considerably higher risk than Project 1.
- 2.8 Further extensions and other district heating networks in other parts of the City could also be viable, but they are not considered in this report. Some will be explored as part of the Growth Point, e.g., at Ashton Green and Abbey Meadows.
- 2.9 The proposed scheme will help achieve the following objectives:
- Reduction of per capita CO<sup>2</sup> emissions in Leicester (National Indicator 186 - estimated reduction 0.3%).
  - CO<sup>2</sup> reduction from Council operations (National Indicator 185 - estimated reduction 13-15%).
  - Tackling fuel poverty (NI 187).
  - Some resilience in the security of energy supplies.
  - Supporting the private sector generally and new Regeneration Area initiatives to comply with Local Plan requirements on energy.
  - Help the City Council and the private sector prepare for January 2010 when large energy users will need to comply with the mandatory carbon emissions trading scheme.
- 2.10 There are a number of options for owning, constructing, financing and operating the proposed scheme. Typically an organisation that manages energy delivery is known as an Energy Services Company (ESCO).
- 2.11 The report describes two basic options for delivery: a Council led project and a private sector led project. The Council could consider a minority share in a private project.
- 2.12 Officers have assessed the risks and benefits of the two delivery options and, on balance, consider that the private sector approach offers the best opportunity to minimise risk,

while ensuring an expertly run scheme which provides the outcome we require. The procurement route would be planned to deliver the best attributes of both approaches.

- 2.13 The next stage would be to appoint a specialised Project Manager with procurement expertise in this field, who would develop a specification for procuring the service. The required output would be agreed with Members.
- 2.14 The Council homes which are already connected to District Heating do not have individual meters. To be energy efficient and give tenants individual control, meters are essential. The Project Manager would explore whether they should be procured as part of this scheme or complementary to it.
- 2.15 The Project Manager will also advise on whether Projects 1 and 2 should be procured at the same time or sequentially.

### **3. Recommendations**

It is recommended that: -

- 3.1 The Council supports the principle of implementing the Scheme as set out in the report to extend district heating and the use of combined heat and power in central Leicester and that a private sector led approach is chosen as the preferred delivery mechanism.
- 3.2 Expenditure of up to £100,000 is authorised for a Project Manager and technical advice from the provision of £400,000 for combined heat and power, approved as part of the corporate capital programme by Council on 27<sup>th</sup> March 2008.
- 3.3 That work commences with partners on the design of procurements exercises and that a further report be brought to Cabinet on the specific details of what the Council will “buy”, before expressions of interest are formally sought from the market. In particular, the specifics need to resolve:
  - whether or not it is technically more efficient to procure individual meters as part of the same process, whilst ensuring that this does not jeopardise the fundability of the scheme;
  - the extent to which the second project is incorporated within the approach to the market, without making any form of pre-commitment at this stage.

### **4. REPORT**

#### **District Heating, District Energy, Combined Heat and Power and Renewable Energy**

- 4.1 District Heating comprises underground pipes carrying hot water to a number of buildings from a boiler house. Today it is becoming more usual to talk about District Energy and recognise that the network could include pipes carrying hot water for heating, domestic hot water, chilled water for air conditioning and electricity cables, to a number of buildings from one or more Energy Centres.
- 4.2 A district heating system brings efficiencies and security of supply and has been installed for some of our Council Housing Estates since the 1950's. Originally it was coal fired, then converted to gas.

- 4.3 Installing Combined Heat and Power (CHP) gives further efficiencies by obtaining a bigger energy output from a given amount of fuel. The CHP unit, which is usually a reciprocating engine, generates electricity. In conventional power stations the heat is deliberately “wasted” (cooling tower) and more energy is lost in electricity transmission. In CHP the heat created by the engine is used for central heating and domestic hot water. Surplus heat could also be used to convert to chilled water for air conditioning. The electricity will be used locally in place of electricity produced by central power stations, so loss in transmission is minimal.

It is expected that a gas fired CHP scheme will need around 37% less energy to produce the same amount of heat and electricity as a normal power station and central heating boilers (Source: Combined Heat and Power Association).

- 4.4 Finally, once the District Energy network and gas-fired CHP is installed, the source of energy can be changed in the future, or as a ‘backup.’ ‘Renewable’ fuels could be used as they become available, offering more carbon reductions and giving potentially more energy security. A forthcoming power shortage is being forecast within 8 years by some commentators (source: Inenco energy consultants report Jan 2008 ). CHP would give additional resilience in this scenario.
- 4.5 Typically, cost savings will be available to consumers. For example, in a recently completed Birmingham CHP scheme, it is claimed that energy consumers can usually expect to save at least 5% and potentially up to 10% on their overall energy bills, compared to conventionally supplied energy (source: Utilicom).

A developer of a new building can potentially expect to save about 20% on capital costs of heating equipment and secondly, significant space saving by not needing boiler rooms (source: Utilicom).

- 4.6 CHP provides the foundation for an ongoing and increasing reduction of CO<sub>2</sub> over time. Firstly, carbon emissions will reduce in line with the greater efficiency of the system, and in the future, where renewable fuels or inputs are used, there will be significantly larger carbon savings.
- 4.7 The robustness of a CHP system is increased by having multiple heat centres and ideally the completion of a distribution ring, thus there is the facility to isolate faulty areas with a little or no effect on customers. Flexibility of fuelling provides resilience against redundancy, as long as there is a requirement for hot water-based heating.

These services, in many public and private sector cases, are provided by an Energy service Company or ESCO.

### **The role of an Energy Service Company**

- 4.8 An ESCo is a vehicle for overseeing the operational management of an energy delivery enterprise. It would usually procure investment, oversee the design, construction and operation of desired infrastructure, negotiate fuel purchase tariffs, establish energy sale contracts, set energy sale charges and collect revenues. Its ownership may be in the public or private sector or a partnership.
- 4.9 Additionally, an ESCO may take on other roles, such as both the promotion and implementation of wider energy efficiency improvements in the community it serves out of

surpluses made from operation. Energy efficiency measures could potentially reduce demand from the CHP system, as their purpose is to avoid the need for the energy. The sums available may depend significantly on the ownership, source of finance, profitability and outlook of the owners.

- 4.10 Increasingly, facilitated by the necessary civil engineering works, a role for ESCOs in providing simultaneous communication services, such as cabling, is attracting interest. Such enterprises are referred to as MUSCOs (multi-utility service companies). They are seen to add to the potential income and profitability of any scheme
- 4.11 An ESCO seeks to protect and enhance its investment by entering into long term contracts for the sale of its energy . Appropriate protection to customers would usually be through contracts which set a price at a level competitive with, and perhaps slightly below, similar services derived from the traditional utilities. Price levels might be contractually agreed and set in relationship to primary fuel price movements.

### **A Scheme for Leicester**

- 4.12 The proposed scheme for Leicester is based on extending existing district heating schemes currently supplying four inner city council estates, to include Leicester University, the Prison, other public buildings and potentially many private buildings.
- 4.13 Following a technical study provided by Arup, the findings of which were presented to Members in October , financial and business consultants Ernst and Young (E&Y) were commissioned to undertake a high level review of the Arup work, assess further the financial viability through modelling, consider regulatory environment, identify key risks and assess their impact on the parties, identify a number of potential delivery mechanisms, including in-house, provide information on their advantages and disadvantages and recommend preferred delivery mechanisms or shortlist.

### **The Proposed Scheme**

- 4.14 Following the reports of the consultants Arup and E & Y , the proposed scheme has been split into two parts, namely:

Project 1 which is envisaged to start in 2009 and which is based on existing energy users, essentially the Council, Leicester University and the Prison.

Project 2 which is a potential further expansion, with a link through the City Centre and on towards Abbey Meadows, the Science Park and Waterside regeneration sites. This scheme was not envisaged by the consultants to start until 2015, and it is much more uncertain whom the users would be.

4.15 **Project 1** (see location and route plan at Appendix B) is based on more certain predictions, because it includes existing energy users who have identifiable and predictable energy needs. It would supply 2800 tenants and potentially upwards of 40 buildings. Its output would be 24Mwe/year. Of the identified energy use of Project 1, 67% is consumed by the City Council. It includes:

- Linking existing community heating schemes at St Marks and St Matthews and introducing a new CHP plant. This includes a school, community buildings and other LCC properties on the estates.
- Linking both these with the St Peters community heating scheme and providing new CHP plant. This includes 2 schools, Moat College, community buildings and other LCC properties.
- Connecting all of these with the main Leicester University campus where new CHP plant would be hosted.
- Connecting with additional City Council and other properties where available, including De Montfort Hall
- Leicester Prison
- St Andrews estate and community heating system, including an EPH day nursery, and commercial premises

The construction period is anticipated as 3 years and could commence in September 2009.

4.16 **Project 2** could also follow from 2015 onwards This is a mixture of existing and potential future users, which could supply 3000 residential occupiers, tenants and potentially in excess of 50 buildings. Its output would be c70 Mwe/year. It should be noted though that Project 2 is only at an exploratory stage and that this report would not commit the Council to it.

The likely users are:

- City Council's current central operational buildings (may be subject to later revision )

Central administrative buildings including:-

New Walk Centre  
Phoenix House  
Welford House  
Marlborough House  
16 New Walk  
Sovereign House  
Greyfriars  
Central Library  
York Road

The partially quantified potential users include:

- New Community (St Georges West)
- Wolsey Island residential and
- Abbey Meadows Science and Technology Park
- Office Quarter
- Waterside

Additional connections along the route may include:

- Planned and anticipated development along Burley's and Vaughan Way
- Highcross area new development
- Retail core
- De Montfort University
- LRI

The construction period would be 4 years and could commence March 2015.

- 4.17 It is currently envisaged that project 2 would be part of a separate approval process at a later date, although it may be feasible to combine both projects and run as a simultaneous project, although some of the energy demand will not materialise until after 2012 at the earliest. This issue could be explored further with potential developers, but only on the basis that the risk was underwritten by the private sector. If project 2 was included in a final scheme it would be subject to a further report to members. The procurement arrangements for project 1 would need to include arrangements for procuring project 2 from the ESCO in due course.

### **Climate Change Impact**

- 4.18 District Heating and CHP can bring significant reductions in carbon dioxide emissions.

From April 2008 the Government will require local authorities to monitor both their own and the City's carbon dioxide emissions. The National Indicator for the City emissions is one of the Leicester Partnership's 35 priorities. From January 2010 the Council and other large energy users will be included in a mandatory carbon emissions trading scheme, designed to offer direct financial incentives to reduce energy use. The Council will have to purchase fixed price 'allowances' from Jan 2010 for its carbon emissions. From January 2013 the Government will begin to cap the number of allowances available and allowances will be sold by auction.

- 4.19 The City generates 1.983 million tonnes of Carbon Dioxide annually, of which the City Council emissions are 3% and it presently produces an estimated 39,000 tonnes from buildings alone (De Montfort University 2006). This includes emissions from both the operational estate and tenanted residential properties.
- 4.20 Project 1 could reduce CO<sub>2</sub> by 7,300 tonnes per year in total. Of this, 4,300 tonnes is estimated to be saved from the LCC building emissions, representing over 13% reduction on current Council building emissions and 0.37% for the City.
- 4.21 Project 2 could see further reductions of 5,800 tonnes per year, about 15% when compared with the alternative conventional energy supply to these buildings. This would reduce City emissions by a further 0.3%.

## **The Business Case**

- 4.22 The evaluation of the scheme is based on project 1 which stands on its own merits. It is considered that aspects of project 2 are too uncertain at this stage in terms of timing and demand for any meaningful evaluation to be undertaken. The evaluation is based on the assessments undertaken by the consultants Arups and Ernst & Young, but adapted to reflect how the costs and revenues would affect the City Council if it undertook the scheme itself.

## **Capital Cost**

- 4.23 The total capital cost of project 1 is estimated at £10.251 million excluding £0.4 million for set-up costs, which has already been provided for within the corporate capital programme, and also excluding an estimated £4.5 million for meters in Council housing which could complement the scheme.

The breakdown of the £10.251m capital spend is as follows:

- £2,939,000 towards CHP units that generate electricity and heat.
- £294,000 towards ancillary equipment such as pumps and pressurisation units.
- £3,767,000 for the main pipe route infrastructure.
- £200,000 for additional set up costs.
- £1,282,000 for pipework connections to public buildings within 100m.
- £183,000 for heat exchanger connections including metering for non-domestic council buildings, Leicester University and the Prison.
- £846,000 contingency.
- £740,000 for design and project management.

## **Expected Income**

- 4.24 The proposed scheme generates income from the sale of heat and power. The customers for project 1 are based mainly on existing users, plus Leicester University and the Prison, who have expressed a keen interest in the project. By far the largest component of expected demand is from the existing 2,879 council tenants from the St Marks, St Matthews, St Peters and St Andrews residential estates, who are already linked to the current district heating system. These tenants constitute approximately 58% of the expected demand, with the University taking up 30%, the Prison 3% and the balance from various other potential users.
- 4.25 Charges based on the analysis undertaken by Arup are assumed to be £0.045 per KWh for heat and £0.065 per KWh for power, plus an additional 20% of the tariff standing charge for heat and a 10% one for power. The estimated total income in 2014/15 which is estimated to be the first full year of full operation, is approximately £10 million.
- 4.26 With the main cost being natural gas consumed at a base cost of £0.035 per KWh, the income should always be greater than the cost, provided that the charging structure is aligned to the cost of the energy consumed.
- 4.27 An attractive element of the scheme which should attract interest from the private sector is that the majority of the demand is either from existing users attached to the district heating system, or from the University and Prison, which have expressed a keen interest



in the project partly because they have their own energy saving targets to meet. It would be important though for any operator to get these users to commit formally.

- 4.28 However, a key assumption within the model of expected cash flows is that expected revenue income increases by an average of 5% p.a. due to energy inflation. As the project makes a surplus from the difference between the sale and cost of energy, as long as the percentage differential between the sale price and cost of energy is maintained, increases in energy inflation are beneficial to the profitability of the project.

### Revenue Costs

- 4.29 The largest component of the cost of the project is the supply of gas estimated at a base cost of £0.035 per KWh. The estimated total cost of this in 2014/15 is approximately £7.3 million, though the consumption can be adjusted to demand.
- 4.30 Other significant costs include the staffing required to run the system and its maintenance. The estimated costs of the operation and maintenance of the scheme has been calculated at £0.01 per KWh based on the consultants' advice. In 2014/15 the total cost of this including cumulative inflation, is estimated at approximately £1.47 million. This assumed cost stands comparison with the cost of the operation of the relevant part of the existing district heating system of £1.04 million (on an equivalent price basis). It is expected that the staffing costs of the new scheme would increase slightly from the existing 6½ staff and that maintenance costs would increase with the new infrastructure.
- 4.31 It is also assumed that there would be a 5% administrative cost, which could include the operation of a prepaid card system for council tenants, if individual meters had been installed (see 4.34). Such a system should reduce the risk of bad debts and the costs of billing.

Finally there would be the cost of capital financing were the council to fund the scheme itself using its prudential borrowing powers. On the basis of an interest charge of 5.5% p.a. and equal annual repayments over 25 years, capital financing costs on a total capital spend of £10.25 million are estimated to peak at £0.93 million in 2014/15 and decline slightly each year thereafter (Note this excludes any potential cost of meters).

### Base Case Estimate of the Project

- 4.32 The base case of Project 1 using the assumptions of the consultants Arups and Ernst & Young, shows that the scheme estimated to cost £10.25 million (excluding £4.5 million for meters and £0.4 million for set up costs) and would be expected to break even in 2015/16 and then move into profit thereafter. There would however be cumulative losses of an estimated £874,000 until the scheme moves into a break even position. This is summarised as follows:-

year	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
	£000	£000	£000	£000	£000	£000	£000
Cost	35	1,663	3,501	6,799	8,605	10,125	10,526
Income	0	(1,586)	(3,330)	(6,553)	(8,352)	(10,033)	(10,535)
Net	35	77	171	246	253	92	(9)

## **Key Sensitivities**

4.33 There are however a number of key sensitivities which could affect the base case assumption, possibly dramatically. The main ones are:

- The assumption that increases in the cost of energy purchased are passed onto the users.
- The assumption that the ESCO can buy competitively on the wholesale gas market.
- Energy costs rise on average 5% p.a. (this is a particularly sensitive assumption).
- Energy use remains at the current level identified by the consultants.
- Capital costs are as estimated.
- Running costs are £0.01 per KWh and increase by 2.5% p.a.

## **Other Issues**

### **Meters**

4.34 Additionally there is a desire to install meters in existing housing stock within the St Marks, St Matthews, St Peters and St Andrews estates which are part of project 1 and which currently receive unmetered supply. This cost amounts to an estimated £4.5 million, and would complement this initiative as it should also further reduce carbon emissions. Installation of meters would allow introduction of pre-payment cards, which tenants may find helpful to reduce costs. The decision can be taken independently, but should be considered at the same time as the main project.

### **Project 2**

4.35 Project 2 CHP capital costs have been estimated at approximately £25 million and is not initially envisaged to start until 2015. This can be considered at a later date, although it may prove attractive to a private contractor undertaking project 1 in terms of economy of scale, and this can be considered at the tendering stage.

### **New Parks District Heating**

4.36 Project 1 excludes the district heating system at New Parks. However, if most of the rest of the district heating facilities are transferred to the private sector as part of the new CHP scheme, there is a potential issue as to whether the Council would still have the capacity to operate the existing facility at New Parks. One possible option could be to also transfer the New Parks facility (which currently approximately breaks even) to the private contractor operating the new scheme.

### **Staff Transfer**

4.37 It is expected that the existing staff operating the district heating system would transfer under TUPE to any new operator. This is estimated to involve 6½ staff based on a pro-

rata of the areas included within project 1, or 9 staff if New Parks was also considered. It is not expected that there would be any redundancies as a result of the new scheme, indeed the demand for staff may be expected to rise slightly.

### **Charges and Benefits to Council Residential Tenants**

- 4.38 Tenants on the St Marks, St Matthews, St Peters and St Andrews estates are supplied with and charged for heat by the Council on the basis of block charges related to property size. The Council decides on the level of charge as part of the HRA budget setting process. The Council can and has in the past subsidised the cost of heat, but does not currently. The heat is not presently metered. Both these practices reduce the incentive to tenants to save energy and need to be addressed. If the Council decided as a matter of policy to always pass on the real and full cost of providing district heating, tenants should still enjoy a 5-10% saving on heating costs, compared to tenants with gas individual fired central heating systems. Note that the existing District Heating schemes are not fired by combined heat and power boilers at present. CHP installation will reduce fuel costs, and being part of a wider network brings further efficiencies and security of supply, this giving the possibility of reducing fuel poverty.

### **Disruption to Tenants**

- 4.39 There is expected to be minimal disruption to tenants as a result of the scheme. If meters were also installed, tenants would not have to move out and there would be a few hours disruption of heat supply.

### **HRA Role, Costs and Implications of Proposals**

- 4.40 The HRA presently administers the operation of the district heating system and controls the income and expenditure of the heating service to tenants.

Once a delivery option is chosen, the following need to be considered:

- The value of existing assets and their future ownership to be considered; for example, assets would be transferred to a private ESCO in return for an equity share.
- Staff who currently manage the district heating would need to be transferred to the ESCO under TUPE.
- The HRA also runs district heating at both Aikman Avenue and Beatty Avenue. It would not make sense to split their management from the management of the sites included in this scheme.

### **Implications for Other Council Buildings**

- 4.41 Costs for each connection is the installation of a suitably sized heat exchanger, metering and controls for existing buildings are included in the cost of scheme.

Disruption within buildings and to building heat services should be minor and interruption to supply negligible and managed (see Disruption to Tenants).

## **Implications for Work on the Highway**

- 4.42 Traffic management provisions will be overseen by a special project team under the Council's Transport Systems Group and will consult with interested parties, including businesses and residents along the planned routes and take account of season peaks and events.

Within the projected 3 year construction programme (potentially 2009 – 2012), works within the highway would require advance planning and ongoing traffic management inputs to ensure disruption is minimised. Flexibility available within the order of works will further reduce occurrences. The City centre is not affected by Project 1. Project 2 could include a link through the St Georges and the Business Quarters. The City Centre refurbishment work has not been programmed for these areas, so could plan to synchronise.

## **Use of Renewables**

- 4.43 The projects have been evaluated assuming gas as the fuel. A change of fuel (eg, to renewables) would be possible as sources develop and are considered economic or otherwise desirable.
- 4.44 The use of renewables, such as woody biomass as a fuel for CHP necessitates an intermediate stage. There is a choice between pyrolysis, which produces a combustible oil product, and gasification, which produces a combustible gas. These are unfortunately constrained by:
- insufficiently proven technology of the necessary scale (the celebrated BeZed scheme in Surrey is not using the installed gasification system).
  - the level of necessary throughput to operate the plant economically.
  - uncertain supply chains for a guaranteed and economic supply of fuels.
- 4.45 Direct burn of biofuels produces heat but not electricity, whereas in CHP economies are available from the co-generation of heat and power. The Arup study states that future shifts to renewable fuels will be possible for direct combustion boilers as these are replaced in the future and subsequently as the first generation of CHP plant is renewed – approximately years 2022-2024. Meanwhile, a pilot project is being undertaken at the St Andrews district heating scheme, where recycled vegetable oil will fuel a direct burn boiler. This will provide a test bed for the technology and enable availability of larger scale supplies of this fuel to be investigated. Initially, it will operate alongside a gas-fired boiler.

## **5. Delivery Options and Financing the Scheme**

There are essentially two delivery options available namely:

### **A Council Led Project**

- 5.1 This would involve the Council funding the capital costs through prudential borrowing and then operating the scheme via a Council owned ESCO. All the costs and income resulting from the scheme would accrue to the Council, which would bear any profits or losses. All the risks would be left with the Council.

## **Private Sector Led Project**

- 5.2 This would be private sector driven, with an energy performance contract – this would involve the private sector funding, designing, building and operating the project via an ESCO. There would be an energy performance contract under which the ESCO supplies the Council (and other customers) with heat and or energy and meet various performance requirements. The details of such an energy performance contract would be subject to the scheme specification at invitation to tender stage. Under this option, the private sector would bear the main risks of the scheme but would also benefit from any profits generated.

As long as we get the specification right, the Council can ensure other deliverables are included in the contract (subject of course, to the private sector being prepared to provide it). This might include:-

- meters (and work by Arup suggests the scheme is fundable with the meters included);
- a minority share in the company;
- profit sharing and sharing of early losses (although officers would recommend that the Council contribution to losses is capped);
- appropriate “One Leicester” badging of the project, including the issuance of City Council bonds to members of the public to help fund the project (see below).

## **The Possibility of a Bond Issue**

- 5.3 A variant of the private sector option could be for the Council to underwrite a minority stake in the financing in return for an equity share, and then to offer up a bond issue to the citizens of Leicester to finance it. Under this scenario, the Council would underwrite the financing of its minority share (of for example £1 million) through prudential borrowing, but would then offer up a bond issue to the citizens of Leicester to invest in the scheme in return for a fixed income return. The capital financing costs of such a bond issue are likely to be slightly more expensive than normal borrowing costs, but not by a large margin (and also involve administrative costs). A decision to use bonds would not be taken for financial reasons.

Such a bond issue could however give the scheme a higher profile, although it would only work if the Council underwrote the scheme from the outset, and the scheme didn't require the bond issue to be fully subscribed before it began.

## **Grant Aid**

- 5.4 There have been no firm promises of any grant aid towards this project although officers will continue to explore any possibilities of such aid. The analysis of the scheme does not depend on any grant being available.

## **The Next Steps**

- 5.5 Assuming that members accept the recommended way forward, the next steps are: -
- Take a decision in principle to proceed

- Agree a procurement route
- Appoint a project manager and a technical consultant
- Put together a project team
- Commence period of:
  - discovery exercise
  - soft market testing
  - putting together the specification and tender document
- Make a decision on meters and their funding.

### **The Pros and Cons of the Public and Private Sector Options**

- 5.6 The physical design of the Scheme is the same in all the options. The difference lies in the financing and the risks and whether the Council runs the extended schemes (as it runs the current scheme) or contracts with the private sector to provide services.
- 5.7 Under the Council led scheme the Council would control the scheme and bear most of the risks in terms of construction, operating, financing, fuel price changes and demand.
- 5.8 The base case analysis shows that the scheme should be viable. Under a Council funded option using assumptions from the consultants previously employed by the Council, the cashflow analysis under a base case shows that the scheme could break even by the year 2015/16 and move into surplus thereafter. There would however be cumulative losses of approximately £0.9 million until then. Any decision to provide meters would require separate funding.
- 5.9 Should Councillors favour an in-house solution a consultant should be used to prepare a full business case with risk analysis before a final decision is taken. This would lead to a decision to proceed or alternatively a decision to look at a private sector solution. If a private sector option was chosen, this would not be required and thus would not delay the scheme.
- 5.10 Under a Council led scheme, it would have more control over future development of the ESCO the most important of which could be development of the Company to provide other services (if considered desirable and viable) and specifying at a future date fuel supply, e.g., specifying the use of a locally sourced renewable fuel. However, some of these issues could be included to some extent in the Tender specification which would be written for the private sector driven option.
- 5.11 In all options there would be the risk of fuel price rises. In all options this would be covered by a contractual arrangement which regulated the relationship between the ESCO's fuel costs and heat charges to the Council and other customers will always benefit from the savings which arise from the inbuilt efficiency of using District Heating with Combined Heat and Power.

- 5.12 As with any business venture there are inherent risks. The consultants have made a series of assumptions in reaching their conclusions, which may or may not prove accurate over time. In reaching a decision over whether to proceed with an in-house or independent sector solution, Councillors will need to consider the extent to which it is appropriate for a local authority to take on risk. They will also want to consider the extent to which running an energy company which could increase significantly in size over time, is in keeping with the authority's main reason for being which is to provide community leadership. Councillors may also consider whether the Council can bring the same level of expertise to the project as an independent energy company with significant experience in delivering schemes of this sort.
- 5.13 For example, using the same cashflow analysis referred to above, but changing the assumptions shows the effect of these risks. The table below illustrates this.

Assumption	Year of Break Even	Cumulative Losses Until Moves Into Profit
Base case	2015/16	£874,000
Energy costs rise 3% p.a not 5%	2021/22	£2,474,000
25% less energy use as a result of using meters	2018/19	£1,859,000
Capital costs increase by 20% over budget	2017/18	£1,712,000

- 5.14 It should be noted that the 3 alternative assumptions to the base case outlined above are not outlandish theoretical risks, but are instead quite possible outcomes. For example, if meters were installed, it would be expected that usage would fall, capital costs of large capital projects can often be in excess of initial estimates and Ernst & Young considered that the assumption of energy costs rising 5% p.a. was possibly on the high side.
- 5.15 Also any combinations of the alternative assumptions would further put off ( even for ever) the year of break even and increase the cumulative losses until the scheme moves into profit. However, if other energy users tap into the supply, it is possible that the scheme could be more profitable than the base case.

If a decision is taken at this stage to pursue the private sector solution then risk is likely to be transferred significantly away from the Council; although the final agreement will determine the extent of this. The Council's role then becomes that of a commissioner and its focus will be on ensuring a competitive tendering process which will offer the best options to the Council. Clearly there would be an option for the Council to have a share in the new business, though this would be reflected in the tenders.

- 5.16 On balance, it is considered that that the private sector approach is preferred, because they would have the expertise to run such an ESCO and bear the resultant risks. The risks to the Council are greater than any potential benefits.

## 6. **Comments from the Climate Change Programme Board**

The Climate Change Programme Board considered the report on the 12<sup>th</sup> June. They considered that renewable fuels should form part of the proposal at an earlier stage. Officers advise that the issue of using renewable fuels will be fully explored as part of the procurement process. The current proposal is based on gas because there is an assured supply and known technologies for the scale of the current project. Paragraphs 2.4, 4.44 – 4.45 of this report consider some of the current issues around using biofuels.

## 7. **Financial Implications**

- 7.1 If members accept the recommended way forward there will be an estimated cost of £400,000 for set-up costs for which there is provision in the corporate capital programme. All other costs of developing the scheme should be borne by the private sector which would be responsible for the profits and losses of the scheme. Any further Council costs would be met by prudential borrowing on a “spend to save” basis.
- 7.2 Depending upon the negotiations with a private tenderer, it may be possible for the Council to obtain a minority stake in the scheme to reflect the value of existing physical assets that may be transferred.
- 7.3 The Council may also decide to underwrite a bond issue for the citizens of Leicester to invest in return for a fixed income. Such a bond issue is likely to be more expensive than through traditional sources of capital financing, but is feasible.
- 7.4 The council’s existing district heating scheme is operated very largely for the benefit of council tenants and is funded and operated entirely from within the Housing Revenue Account (HRA). This is a ring-fenced account relating to the management and maintenance of the council’s housing stock and no cross subsidy is permitted.
- 7.5 The scale of the extended district heating scheme (together with the associated risks) is such that it is no longer appropriate for the operation to be managed from within the HRA; though clearly it will need to be compensated for the transfer of assets (the existing infrastructure) to the new provider.
- 7.6 'Project 1' includes the proposed extension of the existing HRA district heating schemes at St. Peters, St. Andrews, St. Marks and St Matthews. Based on the figures in the Ernst & Young report, the increased efficiencies and economies of scale would be such that heat/hot water could be supplied to the 2,879 HRA properties in the above four schemes at slightly less cost than is currently the case, while also allowing for the cost of meters to be installed in the properties.
- 7.7 It is envisaged that, for the relevant properties, the ESCO would take over responsibility from the Council (HRA) for the supply of heat/hot water, the setting of charges and the collection of those charges. However, while the Council would no longer directly set these charges, it would be necessary to have an agreement with the ESCO to ensure that the charges were fair and reasonable. Also, with the installation of meters, the tenants on the district heating scheme would be in the same position as other householders, in being able to regulate their energy usage and therefore determine their own bills.



7.8 It should also be noted that the HRA's district heating schemes at Aikman Avenue and Beatty Avenue are not included in Project 1. If the proposed ESCO is taking over the other HRA district heating sites, it would be logical to come to an arrangement with the ESCO to also operate (and possibly install meters at) these schemes on the Council's behalf.

## **8. Legal Implications (Joanna Bunting)**

8.1 At this stage members are being asked to select a preferred "option" which will form the basis of working up a more detailed "business case" report. The procurement and financial implications will depend on what option is chosen. The report outlines the potential use of prudential borrowing and a bond issue

In determining the next steps for procurement, consideration should be given to a "competitive dialogue" procedure which will allow responses to be secured from the market before a specification and other contract documents are finalised. However this will begin the formal procurement process as the relevant OJEU advert will have to be placed.

8.2 Depending on the option chosen, land or interests in land may be disposed of. "Best Consideration" can be addressed through competitive procurement.

8.3 The responsibility for, and the timeline for obtaining statutory consents will be further addressed in a further report. The impact of market regulation will need to be addressed in the detailed business case/s

8.4 The need for any "back to back" contracts to ensure contributions/payments from other parties will be addressed as the project is further worked up.

8.5 TUPE may apply if any staff are devoted to any work that is to be transferred/outsourced. Regard must also be had to the Code of Practice on Workforce Matters, which contains requirements as to pensions provision, two tier workforce conditions etc.

8.6 The report refers to various options which involve the Councils' participation in a potential company or joint venture. Involvement by the Council in such entities is regulated under the Local Government and Housing Act 1989 and associated regulations.

8.7 The Councils' principal powers to extend CHP are contained in section 11 Local Government (Miscellaneous Provisions) Act 1976 and Section 2 Local Government Act 2000 (well being).

8.8 Legal costs could be extensive, depending on the contractual model chosen. At this stage, I would advise that a prudent estimate of £250,000 be allowed for. This will exclude specialist Financial Services Act compliance/brokerage etc advice that will need to be separately procured.

## 9. Other Implications

OTHER IMPLICATIONS	YES/NO	Paragraph References Within Supporting information
Equal Opportunities	<b>No</b>	
Policy	<b>Yes</b>	Charging Prices for Heat
Sustainable and Environmental	<b>Yes</b>	Reduced CO2 emissions
Crime and Disorder	<b>No</b>	
Human Rights Act	<b>No</b>	
Elderly/People on Low Income	<b>Yes</b>	Council tenants on low income

## 10. Risk Assessment Matrix

Construction, business viability, financing, demand level, inflation, charging levels, fuel costs, revenue streams, stakeholder partnerships, reputation and public relations considered below in the context of either a public or private venture.

<b>RISK MANAGEMENT SERVICES - OPTIONS APPRAISAL - RISK MATRIX</b>			
	<b>RISKS</b>	<b>Option A</b>	<b>Option B</b>
	<b>15/04/2008</b>		<b>Private Sector Supplier Bulk Purchase - LCC single customer or enjoining with wider customer base to increase buying power</b>
		<b>Own Construction</b>	
	<b>FINANCIAL &amp; LEGAL</b>		
<b>1</b>	<b>Council as a supplier of heating</b>	Legal arrangements for the establishing of an external trading entity to supply heating to customers - prison service, university, etc.	Not Applicable
<b>2</b>	<b>TUPE</b>	Staff as part of Council Trading entity	Staff may need to transfer to supplier
<b>3</b>	<b>Funding</b>	Bid for Capital Commitment and ongoing maintenance of the facilities	Not Applicable
<b>4</b>	<b>Procurement process</b>	Tender for construction programme Tender for energy provider	Tender for heating/ power supply provider
<b>5</b>	<b>Insufficient finance for cost of pipeline highways works</b>	£2K/mtr - £3.9m overall	Less saving on heating costs as supplier costs for infrastructure would be built into price of supply
<b>6</b>	<b>Council and Partner finance suspended or insufficient</b>	Project in jeopardy or political embarrassment	Not Applicable
<b>7</b>	<b>Inflation</b>	Construction Budget figures need to be indexed-linked	Not Applicable
<b>8</b>	<b>Savings in heating charge</b>	Reduction from bulk purchase less premium for construction overheads	Reduction from bulk purchase less providers profit margin

9	<b>Income stream</b>	Delays to construction places delays start of savings to Council and revenue stream from partners	Supplier has inherent interest in delivering savings to Council asap
10	<b>Payback of infrastructure investment</b>	Council to be committed to the project for a minimum of 10 years	Flexible contract periods to suit changing needs
11	<b>Cost of meters</b>	Budget needs to include cost recovery for Tenanted Stock and Right to Buy properties	Less saving on heating costs as supplier costs for meters would be built into price of supply
12	<b>Legal challenge</b>	Delay at procurement and contract signing stages with extra costs/compensation/ damage to reputation	Delay at procurement and contract signing stage with extra costs/compensation/ damage to reputation
13	<b>Contract variations</b>	Contract variations /contractual cost increases eg extensions of time	Contract variations /contractual cost increases eg extensions of time
14	<b>Change in law</b>	tendering process should seek sharing of this risk	will impact more so on private , tendering process should seek sharing of this risk
<b>CONSTRUCTION</b>			
12	<b>Project Management</b>	Suitable PM to be recruited and costs included in budget	Supplier to provide PM and Council to budget for a Council Representative to oversee the Council's interests
13	<b>Delay to completion from bad weather, incidents, quality of materials, design issues</b>	Delays to construction places pressure on project to meet funding windows	Supplier has inherent interest in delivering service asap
14	<b>City disruption undermines community and business confidence</b>	Council reputation	Supplier reputation
15	<b>Security of heating supply installations</b>	Council responsible for protection of supply and boilers from being vandalised or penetrated by highway/ utility contract works	Supplier responsible for protection of supply and boilers from being vandalised or penetrated by highway/ utility contract works
16	<b>Liabilities arising out of the boilers</b>	Contractor to take control of works, together with residual installation and maintenance risks	Council to outsource the installation of new boilers and maintenance to provider
17	<b>Delays to permission for highway works</b>	New traffic management regulations require detailed planning of highway works	New traffic management regulations require detailed planning of highway works
18	<b>Construction failure</b>	Hiatus in development of system with financial and reputational risks & delays in re-letting contract	Potential hiatus in development of system with financial and reputational risks requires contractual flexibility to recruit alternative provider
<b>OPERATIONS</b>			
19	<b>Breakdown of boilers/ system</b>	Council responsible for ongoing maintenance and repair of boilers	Supplier responsibility
20	<b>Carbon footprint and other EMAS requirements</b>	May not meet KPI targets for One Leicester	Provider to be responsible for meeting KPI targets for One Leicester

<b>21</b>	<b>Disruption to service during operations</b>	Business Continuity Plan required to establish contingency arrangements	Contractor to take responsibility for BCP arrangements
<b>22</b>	<b>Operational failure</b>	Stakeholders/ customers affected	Stakeholders/ customers affected
	<b>CLIENTS</b>		
<b>23</b>	<b>Resistance to introduction of meters</b>	Heat charge to include pre-payment including meter installation, repair, and whole-life replacement	Heat charge to include pre-payment covering meter installation, repair, and whole-life replacement
<b>24</b>	<b>Collection of payments from Clients</b>	Council administration of the collection of payments and use of pre-payment cards to be considered	Council administration of the collection of payments and use of pre-payment cards, although outsourcing of this to supplier to be considered

## 11. Background Papers

Report of the Corporate Director of Adults and Housing – ARUP Presentation on Extending Inner City District Heating Scheme - Cabinet Briefing -15<sup>th</sup> October 2007.  
 Extending Combined Heat and Power in Leicester – Energy Services Company (ESCO) - Cabinet Briefing – 17<sup>th</sup> September 2007.  
 Report from Ernst and Young Consultants.

## 12. Consultations

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 Leicester Prison

## 13. Report Authors

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## **EXAMPLES FROM OTHER LOCAL AUTHORITIES**

This appendix summarises information from the London Energy Partnership Report “Making ESCO’s Work”, published in February 2007, contact made with Birmingham City Council, Southampton City Council and with consultants to the Combined Heat and Power Association. The first example is a Council arms length ESCO largely funded by the Council. The second two are private sector local ESCO’s in which Council’s have invested.

- 1. Aberdeen City Council and Wick and Highland Councils** set up an arms length ESCO. The majority of the funding came from the Councils and grants. It is not-for-profit with surpluses re-invested in the schemes. The company employed consultants to arrange design and build. Procurement followed public sector tendering. The ESCO operates and maintains the system. The Council has minority participation in the Company at member and Director level. The Council has an annual funding commitment, and the ESCO has also borrowed. The Council underwrites the borrowing.

The first stages were public housing and the scheme now supplies some owner-occupiers and other buildings. The agreements between the Council and the ESCO are ‘light touch’. A similar scheme operates in Wick, though with more detailed agreements, because in Wick a private sector company (a distillery) is involved as a beneficiary and contributor. The London Energy Partnership Report comments that the contractual structure in these schemes is not robust enough for significant private sector involvement.

- 2. Southampton City Council**

### **Southampton Geothermal Heating Company**

The former Finance Director of Southampton Council advised that the Council wanted a “risk transfer” model. The Southampton Geothermal Heating Company was set up in 1986 as a subsidiary of Utilicom. The Council put in land for the energy centre (boiler house) and some grant money. It has a profit share of the Company and a co-operation agreement with it. The co-operation agreement was key. The Council played a large enabling role to help with detailed planning of the scheme.

- 3. Birmingham City Council**

Three years ago Birmingham City Council decided to be risk averse and act as an enabler. They decided to bring a private ESCO to the City to start its ambitious plans to construct a number of schemes in the centre of Birmingham. It ran a competitive public procurement process and selected Utilicom. Utilicom created a separate company (wholly owned subsidiary) called Birmingham District Energy Company. The BDEC

signed a 25 year energy supply agreement with Birmingham City Council in December 2006.

Birmingham set up a specialist team to run the procurement process. They invested £370k grant in the company and in return have some share of profit. Birmingham would be happy to advise on the procurement process. They took about 21 months to procure and the first project, serving the private sector in the Broad Street area, became operational in Autumn 2007.