

Item No.	Classification: Open	Date: 2 nd December 2003	Meeting name Executive
Report title:		Developing a major programme of CHP (Combined Heat & Power) and loft and cavity wall insulation	
Ward(s) or groups affected:		All	
From:		Keith Broxup Strategic Director of Housing	

RECOMMENDATIONS

1. That the Executive notes the development of a programme of CHP and insulation investment together with CHP strategy outlined at para.10.

BACKGROUND

2. The Executive considered the recommendations of an **Environmental Audit** of Housing and Strategic Services at its meeting of 29 July 2003 in a report entitled "Making the Council a greener organisation". The Environmental Audit recommended "A major programme of CHP (combined heat and power) connecting both Southwark's estates and offices as well as loft and cavity wall insulation." The report requested that the Strategic Director of Housing produce a report for the Executive on the feasibility of investing in a CHP and insulation programme.
3. The underlying purpose of the recommendations is to help achieve the '**cleaner and greener**' strategic priority of the Council through energy efficiency and reduced dependency on fossil fuels. This will have the potential to hugely reduce the environmental impact of homes and other buildings connected to a CHP network through reduced energy consumption, reduced greenhouse gas emissions and reduced resource depletion. Well-insulated homes with an affordable heating system are more comfortable and healthy and will promote the **well-being** of occupants. Municipal and commercial buildings connected to the network will reduce revenue costs and be more competitive; they will also be exempt from the **Climate Change Levy**. CHP also offers the opportunity for greater **social equity** and stakeholder involvement through energy production and procurement via a community or local government **ESCO** (Energy Services Company).
4. CHP – **Combined Heat and Power** – is essentially a very efficient means of producing electricity where the heat that is wasted in a traditional power station is used to provide heating and hot water in nearby homes, offices, factories, municipal buildings and so forth. CHP is sometimes referred to as '**co-generation**', as both heat and electricity are used. CHP '**tri-generation**' is where absorption chillers are installed to provide cooling (or air conditioning) in addition to electricity and heat. CHP energy is produced and consumed locally - hence the term '**embedded generation**' – and therefore does not suffer the system losses associated with the national grid. This local production of small-scale energy offers the opportunity of local ownership or involvement through a community ESCO or **Energy Services Company**. There is an important new development that will be made available to the public in 2004 – **microCHP**. This provides the benefits of CHP in an individual home, but is a very different technology to CHP and has different social, economic and environmental implications.
5. The most common **fuel** for use in CHP is **gas**, which is less carbon-intensive than coal or oil. **Renewable fuels** are also used, most commonly biogas or energy crops

(e.g. miscanthus or wood chip). Southwark is currently exploring the use of **biodiesel** for future CHP schemes, sourced from vegetable oils. There are also proposals to develop a **biogas** facility in the borough using anaerobic digestion of food waste. The opportunities for producing renewable energy in cities like London are limited. Wind farms are out of the question, and the opportunities for ground source heat pumps are limited. Solar thermal systems are just about cost effective thanks to the Solar for London project, but will have a marginal impact as they provide hot water only. Solar PV is prohibitively expensive for most applications. The primary options are to import renewable energy (e.g. through green tariffs) or to use renewable fuels in CHP. These renewable fuels will themselves largely have to be imported - from the countryside around London (energy crops) for example.

6. **Southwark** has four CHP schemes already operating, one of which (Wyndham & Comber) is the largest housing CHP in the UK. All of these are gas-fired and the electricity produced is currently sold to the grid. Of the 22,000 homes served by community heating, 1,697 are served by CHP and the rest have the potential to be converted. In addition, homes, schools, leisure centres and businesses close to existing boiler plant could be offered connections. Southwark maintains links with both of the companies that are developing **microCHP** in the UK, with a view to operating test sites in the borough.
7. CHP is the only technology capable of achieving all six of Southwark Council's home energy objectives. The six aims relate to improving energy efficiency, reducing energy consumption, reducing carbon dioxide emissions, increasing renewable energy, achieving affordable warmth and facilitate community energy/community ownership. Indeed, CHP could achieve the HECA (Home Energy Conservation Act) and carbon dioxide targets on its own. It is virtually impossible for anyone served by community heating to experience **fuel poverty** or the **health** problems associated with cold homes. There are many reasons for this, not least of all the fixed weekly or monthly outgoing for heating and hot water, which means that householders do not face high winter heating bills. Whilst CHP is not an alternative to insulation, the level of investment required in roof, floor and wall insulation is reduced.
8. A strategy designed to achieve the HECA target¹, together with associated affordable energy and greenhouse gas emissions targets, will rely heavily on both CHP and insulation. For the council rented sector the borough will essentially be divided into two: areas served by community heating and those that are not. Investment in the former will focus on modernisation and conversion to CHP, whilst the primary focus in the latter will be to provide insulation and heating controls in order to minimise heat loss. Homes that are close to areas served by community heating will of course be considered for connection in the future.
9. Energy efficiency measures such as **loft and cavity wall insulation** are very cost-effective and attract **Energy Efficiency Commitment** (EEC) funding from the utilities to cover around 50% of costs. Southwark has developed partnerships with British Gas and Osborne Energy to undertake these measures and access EEC funding. Schemes are already underway in some parts of the borough. The scope for loft insulation in council properties is, of course, limited as most homes are in blocks of flats with flat roofs. Furthermore, the opportunities for cavity wall insulation are limited as many homes have solid walls. The alternatives in these circumstances – external cladding or dry lining - are very expensive and disruptive. However, some neighbourhoods have recently installed the Sempatap Thermal

¹ The HECA target was established by the Secretary of State following Royal Assent in 1995. It is to improve the energy efficiency of homes by 30% over 1996 levels by 2006-2011.

product that eliminates damp and mould growth as well as providing thermal insulation. This is a cheaper alternative that attracts EEC funding. Discussions are currently underway at high levels within the Government to shape the second phase of EEC funding that begins in 2005. It seems likely that connection to CHP will be included in the funding criteria for the first time.

KEY ISSUES FOR CONSIDERATION

10. The exercise to look into the feasibility of investment in CHP (para 3.4 of the 29 July Executive report) is already underway. The first phase was launched in 2002 with an application to the Government's **Community Energy Programme (CEP)** for a development grant. The application was successful and consultants were appointed to undertake a major feasibility study in **Rodney Road** and **Taplow** neighbourhoods. This study will be followed up with a capital grant application in January 2004 with a view to undertaking works in 2004/5. Coterminal with this will be a series of further feasibility studies using the Rodney/Taplow study as a template. A CHP Strategy is being developed alongside this exercise, which itself will form part of a wider Energy Strategy for the borough as a whole. The following paragraphs explain these matters in more detail.
11. A major feasibility study covering **Rodney Road** and **Taplow** neighbourhoods has recently been completed. A CEP development grant met 50% of the cost of this. This study will be followed up with a CEP capital bid to be submitted by the end of January 2004. It is likely that the Council will request a grant of £2-3 million towards the cost of upgrading the community heating system on **Aylesbury Estate** and converting to CHP. It is anticipated that whilst gas may be the principal fuel to start with, the use of renewable fuels will increase over time.
12. The Rodney/Taplow study will form a template for further studies in other parts of the borough, so long as the Government makes grants available for this purpose. If the Aylesbury Estate implementation goes ahead, the standards it sets will be applied to all future CHP developments in the borough. This will ensure compatibility of systems for future networking and reduced maintenance costs.
13. Southwark is a lead authority in the **London Community Heating Option Appraisal**. This will be a major project co-ordinated by the Greater London Authority, who submitted a funding bid to the CEP on 31 October 2003. This study will not only look at the possibilities for future developments, but also at how existing community heating schemes in Westminster, Lambeth, Southwark and elsewhere could be linked.
14. A Housing **CHP Strategy** is currently under development. This will build on the findings of the Rodney/Taplow feasibility study and the Capita community heating condition survey. It will establish principles and standards for CHP developments, and suggest a potential programme of implementation over a 15-20 year period. Whilst this will initially be a 'housing' strategy, it is fairly certain that municipal buildings will be incorporated. Substantial efficiencies and revenue savings are possible through linking schools, leisure centres, libraries and other buildings to housing CHP schemes. A wider Southwark **Energy Strategy** is likely to be developed in 2004/5 and will consider all aspects of energy use, including housing, transport and business sectors. Initial discussions between key officers indicate that CHP will be central to this strategy. This is mainly due to the fact that most of Southwark is an area of high or medium heat density, where CHP is generally cost-effective. CHP also represents the principal means of providing renewable energy in an inner-city area.
15. As a very broad indication, a 15 year programme to convert all existing community heating to CHP would require an investment of some £4-5 million per year. Some of

this investment would be met by the Government through the Community Energy Programme, and some could be met by the private sector depending on the type of finance package that is agreed. A substantial investment will be required in any event in order to replace systems as they fail, regardless of whether we renew with community heating or replace community heating with individual boilers. The investment in plant will last for 30 years, with underground mains anticipated to last for 60 years. During this period there will be a gradual shift from the use of gas to renewable fuels and ultimately hydrogen fuel cells. A **hydrogen fuel cell** CHP is already in use in a leisure centre in Woking.

16. It is thought that the number of council homes with insulation is underestimated. The presence and quantity of insulation is not recorded on any property database. Therefore, national averages are used (with some amendment based on local knowledge) to estimate the prevalence of insulation. The Strategic Director of Housing has undertaken to tackle this shortcoming in two ways: (i) improve information systems; (ii) undertake surveys.

Policy implications.

17. The **HECA target** is to improve the energy efficiency of homes at 1996 by 30% over a 10-15 year timescale. This target could be achieved in the council rented sector by provision of CHP alone. However, in practice a large number of council homes will also be provided with loft and cavity wall insulation as well as a range of other energy efficiency measures. Taken together these would exceed the HECA target and would begin to work towards the proposed target for 2050 of reducing carbon dioxide emissions from current levels by 60% (Energy White Paper).
18. **Best Value Performance Indicator 63** relates to the annual change in the average SAP rating of the council rented sector. 'SAP' is the Government's Standard Assessment Procedure and provides an energy rating (as well as a number of other indicators) on a scale of 1-120, where 1 is very poor and 120 is very good. The current average SAP of council stock is 55, and the implication of Government policy is that this should increase by at least 1 or 2 points every year, if only to ensure that we achieve the HECA target. Government good practice guidance² provides a SAP target of 75 as the minimum to be exceeded wherever possible for refurbishment schemes.
19. Provision of thermal comfort is a key aim of the **Decent Homes Standard**. This will be met where a property is provided with insulation and an adequate heating system. The English House Condition Survey (2001) has indicated that thermal comfort is the most common reason for properties failing the standard. It is estimated that 5.6 million homes (26% of the total stock) fail the thermal comfort criterion. Analysis of the results of the public sector stock condition survey in Southwark is currently underway.
20. The **UK Government Climate Change Strategy** reports the legally binding Kyoto Protocol target to cut greenhouse gas emissions by 12.5% below 1990 levels by 2008-12. The Government has set a domestic goal to cut carbon dioxide emissions by 20% below 1990 levels by 2010. Southwark residents will be expected to make a contribution towards the achievement of these targets. CHP makes a considerable contribution to the reduction of greenhouse gases by displacing electricity generated in considerably less efficient power stations. In fact, if all community-heated estates in Southwark were converted to CHP we would meet our share of

² Energy Efficiency Best Practice Programme Guide 155 'Energy efficient refurbishment of existing housing'.

the national target by this means alone. Insulation too reduces the demand for energy and therefore carbon dioxide emissions.

21. The **UK Government** has a **target** of doubling the output of **CHP** (to 10 GWe) by 2010, and is supporting this with grant aid from the Community Energy Programme, and fiscal measures such as Enhanced Capital Allowances and exemption from the Climate Change Levy. CHP is central to the energy policy that is outlined in the Energy White Paper. CHP provides the largest single contribution to the UK CO₂ emissions reduction targets. Government guidance with regard to regional planning and CHP is provided in PPG 11. Since Southwark has the largest number of homes served by community heating in England and Wales it would be expected to play a major role in delivering the CHP target and accessing the funds that have been made available.
22. The **UK Government** also has a **target** to produce 10% of **electricity from renewable sources** by 2010. CHP could play an important role in delivering this, and is the primary means of meeting the target in urban areas such as Southwark. It is important therefore that full consideration is given to securing renewable fuels for CHP schemes developed in the borough, thereby ensuring that we meet our share of the renewables target.
23. The **UK Government** has two key targets in relation to tackling **fuel poverty**. These are (i) to end fuel poverty in vulnerable households (older households, families with children and householders who are disabled or have a long-term illness) by 2010 and (ii) to ensure "as far as reasonably practicable" that no household is in fuel poverty by 2016-18. It is very unlikely that any household served by community heating/CHP will be in fuel poverty. Two important reasons for this are (i) that households pay considerably less for their heating than equivalent homes with an individual boiler, and (ii) have access to as much heating as they need for the same fixed weekly or monthly outgoing. Provision of insulation also results in reduced heating costs and improved comfort. For example, loft insulation will save almost 20% of energy requirements in a typical home and therefore a considerable proportion of the annual fuel bill.
24. The **Mayor of London's** draft **Energy Strategy** makes many references to the importance of CHP in the capital. Specifically:

"Proposal 7: The Mayor expects planning applications referable to him to include combined heat and power and community heating wherever feasible and encourages boroughs to do the same."

Government and the GLA policy in this regard are clearly suggesting that individual local authorities should do their utmost to incorporate requirements to consider CHP in local planning guidance. This matter is not dealt with in this report.
25. Government agencies and the GLA recognise that Southwark Council will have a major role to play in meeting targets. Southwark has a major opportunity to secure Government funding through the Community Energy Programme. Further funding could be obtained from the Clear Skies initiative and the Innovations Programme if we link CHP to renewable energy and develop innovative ideas. Together these could represent £multi-million investment in the borough by Government every year for the life of these programmes.

Legal and financial implications.

26. There are no legal and financial implications contained in this report. The CEP Rodney/Taplow report will indicate the likely costs of schemes to provide CHP in the two areas. This in turn will provide indicative figures for converting all community heating to CHP over a 15-20 year period and will inform the CHP strategy that will be developed in 2004. The cost of the CEP feasibility study is

being met 50/50 by the Government and the housing capital programme. Future studies will be funded in the same way.

Resource implications.

27. A great deal of staff time will be required in order to develop a CHP strategy, and external expertise will almost certainly be required in order to assist with this. The external expertise will largely be in the areas of finance, economics, engineering and marketing.

Supplementary Advice from Other Officers

Borough Solicitor & Secretary

28. The Borough Solicitor has confirmed that there are no specific legal implications at the present stage. There will be legal implications at a later stage but this will be as the proposals move from policy development and consultation to implementation.

Chief Finance Officer

29. There are no direct financial implications at this stage in the development of a programme of CHP and insulation. Ultimately this will be translated into a programme of capital works that will require funding.

Effect of proposed changes on those affected.

30. If it transpires that a full-scale programme to convert community heating to CHP is viable and desirable, then widespread benefits to the local community will result over the long term. These will include access to low-cost energy (power, warmth, hot water), security of supply, reduced dependence on fossil fuels and the national grid, eradication of fuel poverty, substantial reductions in greenhouse gas emissions and the opportunity for community ownership of energy production. Community buildings and local businesses will also have the opportunity to benefit, leading to improved competitiveness. There will be opportunities for the training and employment of local people in the new local power industry.

Consultation.

31. There has been extensive consultation in the Rodney Road and Taplow neighbourhoods as part of the CEP feasibility study. The outcomes of this are given in the study report. Consultation with residents (and others directly affected) will always form an important part of any future CEP feasibility study. Tenants and leaseholders will be involved from the very beginning of the development of a project on the Aylesbury Estate in 2004, should the CEP capital bid be successful.

BACKGROUND DOCUMENTS

Background papers	Held at	Contact
Home energy strategy	Energy & Environment Team, 21-23 Bournemouth Road.	Colin Anderson
Rodney Road/Taplow CEP Study	“	“
Green light to clean power (The Mayor of London draft energy strategy)	“	“
Our energy future – creating a low-carbon economy (Energy White Paper)	“	“
UK Fuel Poverty Strategy	“	“

UK Climate Change Programme	“	“
Energy efficient refurbishment of existing housing (Energy Efficiency Best Practice Programme Guide 155, Defra)	“	“

APPENDIX A

Audit Trail

Lead Officer	Keith Broxup	
Report Author	Colin Anderson	
Version	14	
Dated	14 November 2003	
Key decision?		
CONSULTATION WITH OTHER OFFICERS / DIRECTORATES / EXECUTIVE MEMBER		
Officer Title	Comments sought	Comments included
Borough Solicitor & Secretary	Yes	Yes
Chief Finance Officer	Yes	Yes
Executive Member	No	
Date final report sent to Constitutional Support Services		