Item No.	Classification:	Date:	MEETING NAME
14	Open	12/12/06	Executive
Report title:		Climate Change Strategy	
Ward(s) or groups affected:		All	
From:		Strategic Director of Environment & Leisure	

RECOMMENDATION(S)

1. That Executive:
   - 1.1 agree that the Council, working with its partners, seeks to reduce carbon dioxide (CO_2) emissions across the borough by 80% of current levels by 2050
   - 1.2 agree the strategy and framework for action on climate change set out in this report, and that the officers "Sustainability Forum" be tasked with implementing the initial actions outlined in paragraph 74.
   - 1.3 agree specifically to pursue a 'decentralised energy strategy' for the borough – set out in paragraphs 29 - 39, and to ensure that this is integrated into regeneration schemes and planning policies
   - 1.4 agree that a report be brought to Executive at the earliest opportunity exploring the options for establishing an "Energy Services Company" (ESCo) vehicle to finance investment in decentralised heat and power networks across the borough
   - 1.5 agree to consult with Southwark Environment Forum, Southwark Alliance, the community and partners on this draft strategy, and to identify with them actions and targets for their organisations
   - 1.7 agree that the Council will sign the "Nottingham Declaration on Climate Change"
   - 1.8 note that this climate change strategy is proposed within the context of the Council sustainability policy
   - 1.9 note that there needs to be an ongoing project to evaluate and maintain the most up to date data on CO_2 emissions across the borough, and that officers be requested to devise an effective emissions monitoring system
   - 1.10 agree to lobby the relevant government departments to make data available at a sufficient level of detail in order to monitor and review this climate change strategy
   - 1.11 agree to lobby the relevant government departments to address the existing barriers to, and provide financial incentives for, the greater adoption of decentralised energy.

BACKGROUND INFORMATION

The problem

2. Climate change is one of the most serious threats facing humanity in the 21st century. The main cause of climate change is the rise in levels of CO_2 in our atmosphere . Levels have been increasing because CO_2 is produced whenever we burn fossil fuels

(coal, oil and gas) - whether this is to heat our homes, run our cars or to generate electricity in power stations.

3. The UK government climate change programme has the objective of reducing CO_2 emissions to 60% of their current levels by 2050. This target is based on keeping the amount of CO_2 in the atmosphere below levels that would cause catastrophic change in the climate – but accepts that we will have to adapt to a certain level of climate change. However, climate science has advanced since the 60% target was proposed in 2000. More alarmingly, much recent evidence indicates that climate change is happening faster than predicted.

4. Current research urges that, not only should the 2050 target be increased to a 80-90 percent reduction[1], but CO_2 levels must start declining by 2015 if we are to avoid runaway climate change.

5. Even if we meet these tough emissions targets, some climate change is inevitable. Londoners will need to adapt to the changes outlined in table 1 over the coming decades. Southwark's citizens will also be affected by the global impacts of climate change (e.g. increased migration, impacts on global food production).

Hotter, drier summers	✘	Uncomfortable conditions at work, at home and on the tube. Increased demand for air-conditioning will increase electricity consumption.
	✘	Vulnerable people at higher risk of death from heat stress.
	✘	Poorer air-quality, leading to serious health problems for those with respiratory illnesses.
	✘	Restrictions on water use, increased stress on river and wetland environments.
Warmer, wetter winters, more intense rainfall	✓	Less demand for heating, fewer cold-related deaths, fewer families unable to afford to heat their homes properly.
	✘	More flash floods, leading to increased river pollution incidences.
Rising sea levels	✘	More public investment required for London's flood defences.

table 1 : Impacts of climate change ***(Source : "London's Warming", 2002, London Climate Change Partnership)***

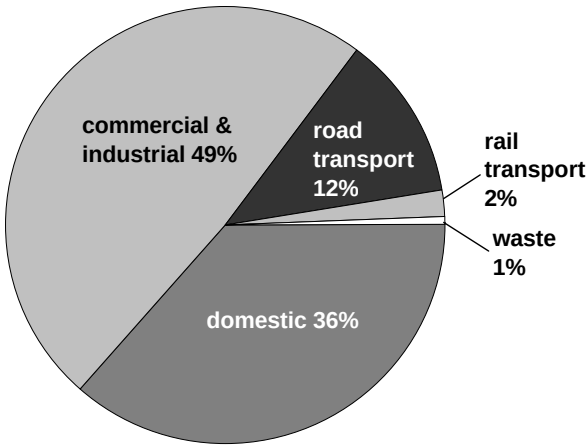
Emissions in Southwark

6. The most reliable set of CO_2 emissions data for Southwark is for 2003 and is derived from actual energy consumption figures across the borough (with the addition of modelled data for transport). Figure 1 shows the annual CO_2 emissions for the whole borough, compared with the annual emissions for the UK (for the same year). For both sets of data, the CO_2 emissions from remote electricity power stations are allocated to the end users.

7. The CO_2 figure for waste is derived from the annual methane gas emissions from landfill sites. Methane has over 20 times the 'global warming potential' of CO_2.

8. Energy use in buildings is responsible for around 85% of the CO_2 emissions across Southwark. Not surprisingly, road transport makes up a much smaller share of total emissions in Southwark than in the UK. The 'commercial & industrial' figures include

[1] Tyndall Centre for Climate Change Research



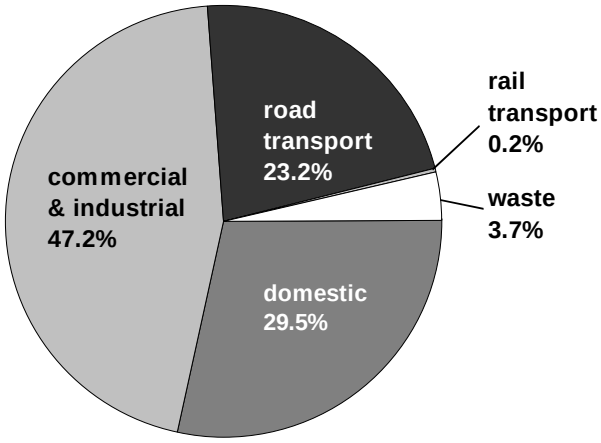


figure 1 : CO_2 emissions for 2003

Southwark total : 1.69 million tonnes CO_2 **UK total : 577 million tonnes CO_2**

public sector buildings such as municipal offices, schools and hospitals. Southwark Council and local schools are directly responsible for around 8% of the borough's total emissions.

9. CO_2 emissions per head of population for 2003 were as follows:-

tonnes/year	Southwark	UK
total emissions	6.7	9.7
domestic emissions only	2.4	2.7

The total per capita emissions for the UK should be expected to be higher than for London because there is little heavy industry, manufacturing and food production in London. However, Southwark's lower domestic emissions are a result of its dwellings being more energy efficient than average UK homes (i.e. flats and terraced houses are more thermally efficient than detached and semi-detached properties).

10. The emissions reported above are only the 'direct' emissions which result from local energy use (and waste disposal). But Southwark's homes and businesses consume large quantities of products, food and resources that have been produced elsewhere – using energy which results in CO_2 emissions. The analysis of these wider emissions is generally known as a 'carbon footprint', and the best estimates are that for the average London household these indirect emissions are around four times the amount of the direct emissions (from buildings and transport within the borough).

11. Southwark's population is set to increase over the coming decades, with an additional 14,000 – 20,000 households needing somewhere to live by 2016. If this growth occurs under 'business as usual' conditions then CO_2 levels will increase further, and there will be other serious impacts on the natural resources and local environment.

12. The draft community strategy "Southwark 2016" (agreed at Executive 11/09/06) highlights the need to tackle climate change through making year on year reductions in CO_2 across the borough. The strategy sets out an ambition for Southwark to become a leading borough in tackling climate change. The Southwark Alliance is considering the draft Southwark 2016 strategy and has identified sustainability as one of the top four

priorities for action.

13. In order to achieve the ambition of being a leading borough on climate change, the Council needs to review how its own operations, services and policies affect CO_2 emissions – and in turn, how climate change will impact on services. If CO_2 emissions are to be tackled across the whole borough, the Council will need the support of partners - both within the borough (Southwark Alliance) and beyond (GLA, Carbon Trust, Energy Saving Trust etc.)

Proposed strategy & framework for action on climate change

14. It is proposed that the Council should prioritise action on tackling climate change according to the following principles:-
    - level of CO_2 emissions
    - ability to effect change in level of emissions – in a timely and sustained way
    - leading by example – if we are to inspire others, we must tackle our own emissions.

    There will inevitably be gaps where the Council has little influence over activities which are significant emissions sources. In these cases, the Council must seek the support of members of the Southwark Alliance, the community and other partner organisations across the borough.

15. Table 2 sets out the main sources of CO_2 emissions across Southwark (as identified in the above section). The table identifies which Council functions and services affect the CO_2 emissions from each of these sources. The last column in the table highlights both where progress is being made, and where additional action is required. This table provides a framework for developing and monitoring action on tackling climate change across the borough.

Indirect emissions

16. Paragraph 10 highlights that the majority of CO_2 emissions that Southwark homes and businesses are responsible for occur outside the borough. Around 80% of total CO_2 emissions are estimated to be associated with our consumption of food and products – these emissions may have originated in a power station in China, or from the fuel to air-freight green beans from Kenya.

17. The greatest scope for the Council to tackle these emissions is through its own procurement. The legal framework for public procurement does restrict the extent to which we can limit emissions. For example, purchasers cannot discriminate against suppliers across EU states – "buy local" policies are illegal. However, there is still plenty of scope to minimise indirect CO_2 emissions through technical specifications – e.g. purchasing goods manufactured from recycled materials.

18. The Council is a signatory to the Mayor of London's "Green Procurement Code" which supports and stimulates the market for recycled products. The Council should encourage local businesses and Southwark Alliance partners to join the scheme.

19. A region's "Ecological-footprint" is an analysis of all the resources (energy, water, food etc.) that are necessary a maintain its standard of living. The best data on indirect CO_2 emissions comes from such studies. However the data available at Southwark level is

not reliable enough to be used to monitor actions to minimise these emissions. Therefore reduction targets will be set only for the direct emissions, shown in figure 1, and these will be reported on an annual basis. The Council should continue to pursue actions to minimise indirect emissions, particularly where these form part of initiatives to minimise our consumption of natural resources.

Table 2

Source of CO_2 emissions (% share from figure 1)			What council services affect CO_2 emissions	What is being done? What needs to be done?
Housing 36%	Council	Existing	Housing management – capital programme (energy standards) Refurbishment standards HECA programme (see para. 21)	£6.1m invested in energy efficiency measures 05/06. Draft "CHP & Insulation Strategy" (see Appendix B)
	Private & RSL	Existing	Housing HECA programme	Significant external grant funding secured for energy efficiency measures. Trial Council Tax Discount scheme – for residents who install energy efficiency measures (energy supplier also provides discount) "HelpCo" provides energy services for households (described in table 6) Private sector more difficult to influence – need to extend 'energy services' packages, similar to HelpCo to finance energy saving measures, also need improved "signposting" to external advice and funding schemes.
		New	Planning policy Building regulations enforcement. Regeneration schemes – setting of CO_2 targets for developments	Renewable energy and energy efficiency policies. Requirement for 10% renewable energy on significant developments. Elephant & Castle energy strategy and 'MUSCo' (described in Appendix B) Need to explore feasibility of a borough ESCo that could deliver sustainable energy in other development schemes.
Non-domestic buildings 49%	Municipal	Existing	Regeneration – Property services Asset / facilities management IT / office equipment procurement	Municipal buildings are still poor energy performers compared to benchmarks for equivalent buildings. Accommodation review is critical to future energy performance & CO_2 emissions. In the short-term, there is an urgent need to establish central systems to manage energy billing and consumption data. Need to ensure that energy efficiency standards are set for IT/office equipment
		New	Planning policy New-build performance standards	There is currently no set of recommended energy/CO_2 performance standards for new municipal buildings (or for major refurbishment projects)
	Schools	Existing	Education – capital works E&L – "Eco-schools" programme	Development of energy services for schools - could be part of internal development of facilities management services, or external provision (e.g. local agency SEA/Renue has established a limited ESCo scheme for schools)

Table 2 - continued

Non-domestic buildings (cont.)	Schools (cont.)	New	Planning policies Education – "Building Schools for the Future" programme	Need to establish energy/CO_2 performance standards for new schools. Feasibility of borough ESCo – finance low CO_2 energy services for new schools
	Commercial	Existing	Regeneration – business & enterprise support	Need to integrate energy efficiency advice, and 'signposting' to sources of funding with business support initiatives. Explore use of "Business Improvement Districts" to provide access to government funding for energy measures. Need to secure engagement with energy and climate change from Southwark Alliance partners. Feasibility of borough ESCo – particularly relevant for large health sector or higher education sites (which may already have site based combined heat & power systems in operation)
		New	Planning policies Regeneration schemes	Feasibility of borough ESCo – finance low CO_2 energy services for new commercial developments.
Transport 14%	Council		Fleet management	Fuel policy in place and being implemented.
			Staff travel – to and for work	Travel plans in place – ensure monitoring can provide estimates of CO_2 emissions
	Whole borough		Local Implementation Plan Planning policies Regeneration schemes	Existing policies encourage switch from car based travel to public transport, cycling and walking. Consider introducing actions that will also encourage switching to lower CO_2 emission vehicles (e.g. via parking charges)
Waste 1%	Municipal (& commercial contracts)		Waste Management	Resource Programme - will result in reduction of landfill (and associated methane emissions), increase recycling (reduced energy and associated CO_2 emissions to produce materials/products)

Other sources of CO_2 emissions – quantities unknown

Waste	Commercial		Secure engagement in waste reduction and recycling from Southwark Alliance partners.
Indirect emissions	Council	All procurement activity	Continue development of 'Sustainable Procurement Strategy' – integrate into day-to-day procurement. Continue engagement with Mayor of London's "Green Procurement Code".
	Whole borough		Promote sustainable procurement via Southwark Alliance. Encourage Alliance partners to sign up to the Mayor's Green Procurement Code.

Building emissions

20. Energy use in buildings is responsible for 85% of the direct CO_2 emissions from Southwark. It is here that the Council has the greatest scope to influence emissions through:-
    - Statutory duties under the "Home Energy Conservation Act 1995" (HECA) – covering the existing housing stock
    - Its own operations. In addition to municipal buildings the Council manages around 100 central boiler houses which supply 22,000 council dwellings with heating via district heating networks.
    - Regeneration schemes – development of energy strategies with tough CO_2 emissions targets
    - Planning policies – energy efficiency and renewable energy requirements
21. The HECA is the only statutory duty that the Council has which is strongly related to climate change. This requires the Council to identify measures to increase the energy efficiency of all the borough's housing (public and private) by 30% over 1996 levels by 2011. There is no legal requirement to implement these measures, but annual progress reports must be submitted. The HECA has since been strengthened by the "Sustainable Energy Act 2003" which enables the government to set binding targets on those authorities falling short of meeting their HECA targets.
22. The majority of the Council's progress to date on cutting energy consumption, and CO_2 emissions, across the borough has been achieved through its HECA duty. It is estimated that the HECA programme achieved a reduction in 41,761 tonnes CO_2 for the year 2005/06. The Council's HECA programme will remain as the main mechanism for driving CO_2 reductions across the existing borough housing stock.

Where do building CO_2 emissions come from?

23. The majority of energy use within buildings in Southwark (and the UK) is for:-
    - Heating and hot water – mostly provided by natural gas (there will also be a small amount of electric heating)
    - Lighting, appliances and equipment - all electricity

    Domestic buildings differ from commercial in the balance of energy demand (and subsequent CO_2 emissions) between heating and electricity requirements. Table 3 shows that gas for heating and hot water dominates the energy requirements of Southwark's dwellings, whereas electricity and gas demand are roughly equal for commercial buildings. This is due to the higher electricity loads for IT and air-conditioning equipment in offices.

table 3 : breakdown of building energy use and CO_2

		domestic	**commercial**
Electricity	Energy	20%	49%
	CO_2	36.5%	71%
gas (heating & hot water)	Energy	80%	51%
	CO_2	63.5%	29%

24. It is also clear from table 3, that the CO_2 emissions resulting from electricity

consumption are higher than for gas. This is because of the mix of fuels that are used to generate electricity in the UK – along with the inherent inefficiencies in the generation process. Overall, electricity consumption is responsible for 57% of the CO_2 emissions from buildings in Southwark.

25. Figure 2 shows the mix of electricity generation in the UK supplied in 2005. Of the fossil fuels, coal produces highest levels of CO_2 emissions, gas produces the lowest. Nuclear fuel results in only around 4.5% of the CO_2 emissions of gas generation (this is as a result of the mining and enrichment of the uranium fuel).

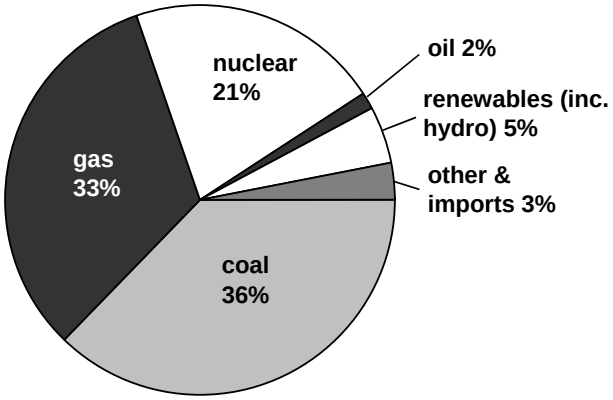


Figure 2 : UK electricity generation by fuel in 2005

26. The share of nuclear generation is decreasing as the UK's older stations are being decommissioned (while no new nuclear stations have been constructed in the UK since the completion of Sizewell 'B' in 1994). In addition, the older coal fired stations are also closing and in the short term, the shortfall in electricity generation will be taken up by new gas fired plant. This has led to fears that the UK will become over dependent on increasingly imported supplies of natural gas.

27. The government's Energy Review Report 2006 ("The Energy Challenge") set out to address the twin objectives of achieving energy security and reducing CO_2 emissions. The report states that the government believes that nuclear power would play a significant role in meeting these twin policy objectives. The report states that any investment in new nuclear plant must be met entirely by the private sector – including the costs of decommissioning the plant, and paying a "fair share" of waste disposal costs.

28. In their submission to the government energy review, the "Sustainable Development Commission"[2] (SDC) highlighted that even a doubling of current nuclear capacity would cut total UK CO_2 emissions by just 8% by 2035, with little contribution before 2020 (because of design and construction timescales).

A decentralised energy strategy for Southwark

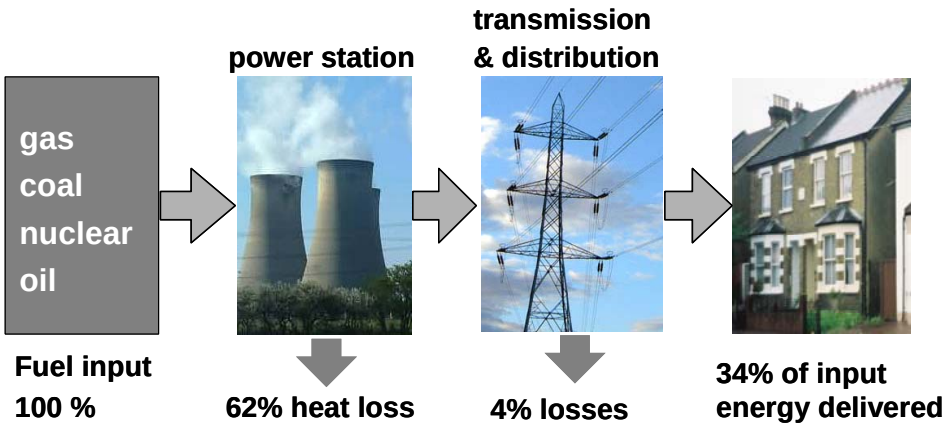
29. In addition to the fuel used in electricity generation, the efficiency of the generation process determines the CO_2 emissions produced. The majority of UK electricity is generated in large, central power stations which are remote from population centres. Most of these power stations (including nuclear) use the fuel to heat water to produce steam which is then passed through a turbine to generate electricity. Modern gas fired power stations first burn gas in a turbine, the exhaust from this is then used to heat

[2] "The role of nuclear power in a low carbon economy", SDC, March 2006

water to produce steam which drives a second turbine

30. Even though the gas stations are more efficient, all these processes produce waste heat. Figure 3 shows the overall inefficiency of the UK's centralised power stations. Only 34% of the input fuel energy reaches the customer as useful electricity. The UK's power stations waste enough heat to meet the heating requirements of all the UK's homes and businesses

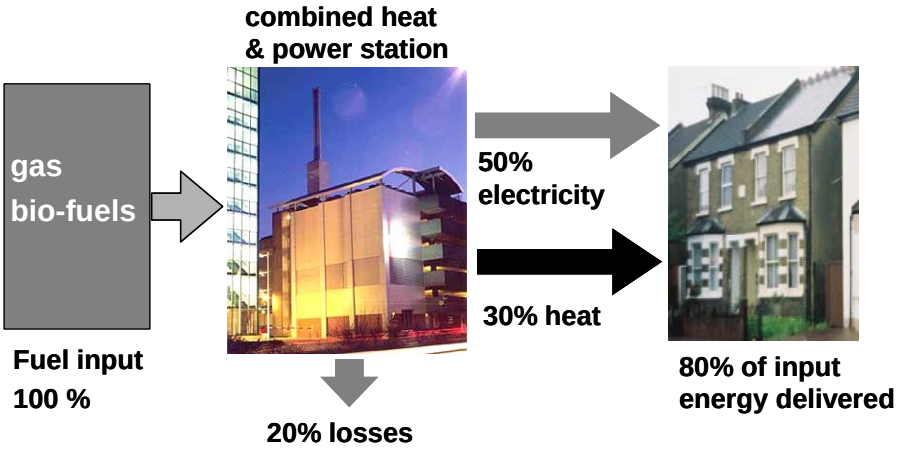
Figure 3 : UK central electricity generation



31. Combined heat and power (CHP) generation is where electricity is generated, but the waste heat is used to heat buildings (or used in manufacturing processes). This approach is common in some European countries – for example 90% of the greater Copenhagen area is supplied with heating from CHP. The UK originally adopted the more wasteful, centralised power station approach because the country had an abundant supply of cheap coal. The UK network for natural gas was subsequently developed when supplies became available from the North Sea in the 1970s. Gas has since become the dominant fuel used for heating, and is now also used to generate 37% of the UK's electricity – but in centralised, heat wasting plant.

32. Figure 4 shows the increased efficiency of the CHP approach to generating electricity, and providing the 'waste' heat to buildings (to provide heating and hot water). The CHP approach requires a network of heat pipes if it is to operate at a district or city-wide level. The cost of this heat network is dependent on the distance between the supply and the customers. This is the dominant cost of a district sized scheme.

Figure 4 : localised combined heat & power generation



33. The economic viability of CHP/district heating is dependent on securing sufficient revenue from the sale of heat and electricity to cover the investment in CHP plant and the heat network.
    - Dense, urban areas are most suitable where there is a high heat demand in a small area. This optimises the income from heat sales for each metre of pipe laid in the ground.
    - The maximum revenue from electricity sales can be achieved where customers are supplied directly via 'private wires'. If customers are supplied via the existing distribution network, then the CHP operator must pay for use of the network. The lowest revenues are achieved where the CHP operator sells electricity to a licensed electricity supplier. The addition of a private wire network presents a small additional capital cost if they are installed at the same time with the heat network.
    - CHP/district heating is also more economic when providing a steady supply of heat. As dwellings require heat and electricity at different times to offices or schools, a mixed use area is most suited to CHP as these different loads are evened out.
    - In the summer months there is no heating demand, but electricity use can be higher due to demand for air-conditioning. CHP heat can be used to provide chilled water (via absorption chillers) to commercial premises. This enables the CHP plant to keep generating low CO_2 electricity through the summer, while also displacing grid electricity which would have been used for air-conditioning.

Flexibility & security of CHP/district heating

34. The provision of heating to buildings via hot water is inherently more flexible (and 'future proof') than the existing public gas network, which effectively locks customers into using one fuel - gas. Aside from the need to move away from fossil fuels to tackle climate change, the cost of gas has been rising by around 30% per year. Once a district heating network is in place, it is a simple task to convert a handful of district CHP plant from natural gas to biofuels. In the longer term, hydrogen fuel-cells may be viable, these systems produce heat and electricity at the same time and therefore would be entirely compatible with any existing heat and private wire networks.

Options appraisal

35. There are a number of ways that CO_2 emissions from buildings can be reduced, these are set out in table 4.

table 4 : basic principles of reducing CO_2 in buildings

Reduce the need for energy – energy efficiency	Design of building – insulation to reduce heat demand, natural cooling to avoid air-conditioning, maximise natural daylighting. Efficient heating plant, efficient lighting & electrical equipment
Supply with low CO_2 energy	Gas has a lower value of CO_2 per unit of energy delivered than oil or electricity. Electricity and heat from CHP results in lower CO_2 than electricity from the national grid and heat from gas boilers. Heating from 'heat pumps' – use electricity, but are highly efficient
Supply with zero CO_2 energy	Electricity - from solar photovoltaic (PV) cells, wind turbines Heating – from solar hot water systems

36. Renewable energy is often thought of as being zero CO_2 energy. This is not always the case, and the full life-cycle of the renewable energy source must be considered carefully.

37. Bio-fuels are renewable, and they absorb CO_2 while being grown and then release the same volume of CO_2 when burned. However, energy is used to manage, harvest and then process the bio-fuel crop. More critically, high levels of CO_2 are generated in the production of artificial fertilizers which may have been applied to the crop. A worse case is the production of palm oil (for transport fuel) where old growth forests have been cut down to make way for palm plantations. However, some bio-fuels are produced from

38. The greatest scope in applying energy efficiency is in reducing the need for heating. It is possible to eliminate the need for heating in new dwellings, and insulation can be added to existing buildings to reduce heating need. But there is less scope to reduce electricity demand through energy efficiency. For new-build offices, the greatest potential to cut electricity use is to eliminate the need for air-conditioning. Good design is essential to avoid potential conflicts e.g. maximising daylight and solar gain for free winter heating can result in severe overheating and need for air-conditioning in the summer.

39. The longer-term impacts of climate change (table 1) will reduce the need for heating in the winter. However, demand for air-conditioning in the summer will increase electricity demand. Electricity is already responsible for over half the emissions from buildings in Southwark, there is therefore an urgent need to tackle these. The supply options for electricity are:-
    - Renewable : Solar PV – This remains an expensive technology, even with the grant funding available, payback time is around 47 years (longer than the equipment life). PV can be more viable in new buildings where it is incorporated into glazing or cladding materials. Long-term improvements in PV manufacture may reduce the costs substantially.
    - Renewable : Wind – The power available from a wind turbine is highly dependent on the wind speed. Wind speeds are lower and less predictable in urban areas than open areas. This means that the payback times for urban wind vary greatly according to site specific conditions. However, a wind survey undertaken on the roof of the Portland Estate (13 storey) recorded average wind speeds that would provide a payback time of between 4 -5 years for commercially available wind turbines.
    - CHP – Gas fired CHP is economically viable now. The use of bio-fuels could further reduce CO_2 emissions for CHP supplied electricity and heat. Bio-fuels are close to becoming economic, but the development of reliable supply chains is still an issue.

40. As part of an EU funded project[3], the Council worked with SEA/RENUE to carry out a study to assess at what range of measures would be necessary to meet a target of 80% reduction in current CO_2 emissions by 2050 (along with phased targets for 2016, 2020, 2030). The study modelled and costed five scenarios. All scenarios include a mix of energy efficiency, use of CHP and renewable energy. Each scenario assumes that a different group of CO_2 reducing measures will dominate.

[3] "Building in Europe Intelligent Energy Forums" (BELIEF)

- *Energy efficiency* – Assumes that most of the potential for insulation measures are installed.
- *Renewables* – Assumes that renewable energy technologies are adopted on a large scale across the borough.
- *Micro-CHP* – Small, domestic sized CHP units are nearly market ready. These are fuelled by natural gas and generate electricity and heat at the same time. This scenario assumes that micro-CHP is adopted widely across the borough
- *Large CHP* – CHP and district heating are widely implemented across the borough.
- *Hybrid* – This scenario assumes a more even mix of technologies being rolled out. It assumes that energy efficiency and CHP will be adopted initially. Individual boilers and building CHP units are then replaced by large scale CHP/district heating and solar PV (which is assumed to become economic post 2030)

34. Installation of CHP and district heating networks are required to meet the emissions targets in all scenarios. The economic impacts of each of the scenarios is shown as table 5 – each scenario achieves the 80% CO_2 saving by 2050.

table 5 : economic appraisal of CO_2 reduction scenarios

Scenario	CO_2 saving (kilo tonne/year)	Capital costs £ million	CO_2 saving kg / £ invested	NPV £ million
Energy efficiency	1,234	851	1.45	276
Renewables	1,217	1,084	1.12	73
Micro-CHP	1,154	806	1.43	285
Large CHP	1,212	763	1.59	311
Hybrid	1,232	1,402	0.88	321

35. The "Large CHP" scenario achieves the greatest CO_2 savings per pound invested while also securing a high net present value for the investment. It should be emphasised that these figures are for all the borough's buildings meeting the 80% CO_2 reduction – not just municipal buildings, schools etc.

36. The promotion and development of CHP and district heating networks is therefore recommended as the core of Southwark's strategy for tackling CO_2 emissions from buildings. Southwark is in a unique position to exploit the CO_2 savings from CHP/district heating because:-
    - The Council manages almost half the borough's housing stock.
    - Large number of Council dwellings already connected to district heating (as highlighted in paragraph 20 above).
    - Significant regeneration taking place across Southwark provides the opportunity to build CHP/district heating into development energy strategies.
    - The borough is predominantly a dense urban area with mixed use – which is suited to CHP (as explained in paragraph 33).

37. There is policy support at both national and regional levels for increased adoption of decentralised energy. The government report "The Energy Challenge" states that decentralised energy will have an important role to play in tackling climate change and energy security, and sets out a number of policy measures to support its growth. The government has recently launched a consultation on the incentives and barriers that

impact on the development of decentralised energy.

38. The Mayor of London's "Energy Strategy" (2004) provides strong support for decentralised energy, and CHP and district heating in particular. The draft alterations to the London Plan include a number of policies aimed at ensuring that new developments adopt decentralised energy networks (and link to existing networks where appropriate).

39. The Mayor of London created the "London Climate Change Agency" (LCCA) explicitly to develop financial vehicles to invest in decentralised energy and energy efficiency. The LCCA has since established the company "London ESCo" to finance, build and operate CHP schemes. London ESCo is jointly owned by the London Development Agency (19% share) and EdF (81% share).

The current barriers to investment

40. Table 5 indicates that large reductions in CO_2 emissions from buildings will require significant capital investment – whether this is for insulation, wind turbines or CHP and district heating networks. But despite steep rises in energy prices over the last few years, investment in these measures in the UK is still at a relatively low level. While this is understandable for the more costly renewable technologies, it is less so for those that will provide short payback times.

41. There are a number of reasons for this lack of investment:-
    - **Supply side** – Energy supplier's businesses are geared to selling units of energy, it is not in their interest to provide investment for energy saving measures.
    - **Commercial sector** – Even with energy prices being at record high levels, the energy bill for many larger companies is still a small proportion of overall costs. Management time is therefore not focused on reducing energy costs. For smaller businesses, lack of capital can be a barrier, as well as lack of knowledge of costs and benefits of energy saving measures (and lack of time to find information about these).
    - **Domestic sector** – For those on lower incomes, energy costs can be a very significant portion of their expenditure. They will also generally lack the capital to invest in measures to bring down these costs. For all households, lack of knowledge of the costs and benefits of energy efficiency is again a barrier.

42. The government report "The Energy Challenge" states that growth in provision of "energy services" to homes and businesses is the key to reducing energy demand and subsequent CO_2 emissions. Customers ultimately want the services that electricity and gas provide (heating, hot-water, light etc.) not the units of energy themselves. Under an energy services contract, a supplier might provide an agreed level and availability of heating, it would then be in the supplier's interest to ensure that the heat was supplied as efficiently as possible.

43. The government's key mechanism for promoting energy services is the "Energy Efficiency Commitment" (EEC) which obliges licensed energy suppliers to invest in domestic energy efficiency. It is proposed that the EEC will be extended to cover investment in domestic scale renewable energy systems. However, the EEC essentially remains a grant scheme, and suppliers' businesses are still essentially based on selling

units of energy to customers.

44. Government support for businesses to become more energy efficient is delivered through the Carbon Trust. The range of support mechanisms is more limited than in the domestic sector and comprises:-
    - energy advice, free energy audits (for businesses with an annual energy bill above £50k)
    - interest free loans for SMEs
    - enhance capital allowances for investment in 'accredited' energy efficiency measures.

45. The barriers against investment in CHP and district heating networks are more complex. In new developments, the main barrier is overcoming the standard practice of developers, architects and building services engineers. Typically, a developer will take a building by building approach. Individual building heating and hot water systems will be specified and installed, and the systems will be connected up to the existing gas and electricity infrastructure. The developer then hands over the building with no further involvement – the client being responsible for operation and maintenance of the building's services. In contrast, a multi-site development supplied via CHP and district heating requires the developer to establish an organisation responsible for operating the system and charging individual building occupiers for the heat and electricity supplied.

46. There are currently limited national funding schemes for CHP and district heating. Significant funding was previously available through the government's 'Community Energy' programme. This has now closed and there are currently no plans to replace or extend the programme. The Carbon Trust has established a wholly owned company, "Carbon Trust Pipelines" to finance, own and operate heat distribution networks based on a return on investment of 10%. This is a new venture, and the company currently has no schemes in the ground.

47. CHP and district heating would also need to extended beyond new development sites to supply existing buildings in order to achieve the large reductions required in CO_2 emissions. This is clearly not a role for developers, and there is little appetite among UK licensed energy suppliers to do this – as such schemes would be in competition with their supply businesses.

Role of ESCos

48. Across Europe, there are many cases of ESCos that will design, build and finance CHP and district heating networks. The ESCo makes a return on the investment by selling heat and power to customers. Because of the significant capital investment required in the heat infrastructure, an ESCo will require long term heat supply contracts.

49. There are few examples of district sized ESCos in the UK. This is due to the prevalence of gas used for individual heating, and because the market and regulatory framework for electricity supply does not favour local CHP generation.

50. Most district sized schemes in the UK have been established through local authority leadership in order to meet environmental or social objectives (i.e. providing affordable, low CO_2 heat and electricity). The local authority financial involvement in the ESCos has varied according to what level of control the authority wishes to exercise over the

development of CHP and district heating.

51. An ESCo does not necessarily have to be based around the local supply of heat and/or electricity. Some ESCos provide design and funding services for energy saving measures to clients, their investment is then recovered through receiving a share of the client's energy cost savings. Table 6 sets out the key characteristics of a number of

table 6 : examples of ESCos in the UK

ESCo	initiated by	Ownership / financing	What does it do?
HelpCo	"Greater London Energy Efficiency Network" (GLEEN)	Not-for-profit organisation owned by GLEEN – financing for measures come from a mix of local authority and private sector funds	Offers private and social sector households discounted energy tariffs (from appointed supplier, Scottish Power). Access to interest free loans for energy efficiency measures, free energy audit. Customers repay cost of measures via a single energy invoice – which also provide energy advice.
Aberdeen Heat & Powe Co.	Aberdeen City Council (ACC)	Not-for-profit arms length company limited by Guarantee from ACC, loan from Cooperative Bank. Board comprises representatives from ACC and the local community.	Finances CHP for social housing, sells heat to ACC who then charge tenants, electricity is supplied back to the grid, but sold to a 'consolidator' who offers a discounted tariff to tenants.
Southampton Geothermal Heating Co.	Southampton City Council	Company limited by shares – wholly owned by the scheme operator 'Utilicom'.	Supplies CHP generated heat to public and private sector customers (domestic & non-domestic). The heat network extends 11km. A chilled water network supplies a large shopping centre for cooling. Electricity generated is supplied to the grid.
Thameswey Energy Ltd (TEL)	Woking Borough Council (WBC)	TEL established as a company limited by shares – 19% owned by WBC, 81% private sector. From Dec. 2004 TEL 100% owned by WBC	Supplies heat, electricity via 'private wires' and cooling to a mix of public and private sector clients. 7 CHP sites across the borough supply heat and electricity via private wires. The private wire networks themselves are linked via an "enabling agreement" with the public distribution grid. This allows surplus electricity generated by one private network to be supplied to another in the borough.

ESCos operating in the UK. The HelpCo scheme was established with support from the Council (and other London boroughs) and is open to all households in Southwark.

52. The Southampton and Woking schemes outlined in table 6 provide a comparison of the risks and benefits associated with a local authority exercising greater or less control over an ESCo. The Southampton Geothermal Heating Company (SGHC), was formed in 1986 by Southampton City Council (SCC) and Utilicom Ltd. under a Joint Co-operation Agreement between the two parties. Utilicom is the sole owner of the

company and operates the city CHP and district heating scheme. SCC provides the central site for the CHP plant at a low rent to Utilicom, and has a long term agreement to purchase heat from the scheme.

53. SCC has provided additional assistance to the development of SGHC by using its planning powers to ensure connections are made to the system. SCC did originally consider establishing SGHC as a joint venture ESCo but considered that the exposure to risk was too high for the authority. However, the drawback is that SCC does not have any direct influence over SGHC to drive further expansion of the CHP/district heating network. SCC wished to provide CHP and district heating to 3,400 homes (primarily council owned dwellings), businesses and schools in the Milbrook area of the city. An agreement with SGHC could not be achieved, and SCC has had to establish a new special purpose vehicle (an ESCo limited by guarantee from SCC) to deliver this scheme.

54. The Woking scheme emerged from work to reduce energy and associated emissions from 1990. WBC established a revolving fund of £250k to invest in energy saving measures across the Council's buildings (energy cost savings being returned to the fund). However, in the late 1990s, WBC realised that significant additional investment would be required to achieve the borough's ambitious targets for CO_2 cuts. WBC established Thameswey Ltd in 1999 as a wholly owned company with the objectives:-

- to promote energy efficiency, energy conservation and environmental objectives by providing energy and/or environmental services
- to develop and implement technologies for the production and supply of energy
- to produce and supply energy (and any related by products) in all its forms
- to acquire and hold interests in the share capital or loan capital of any company or corporation and in particular in companies engaged in energy and/or the environmental business;
- to provide financial, managerial and administrative advice, services and assistance
- to make facilities and services available for its customers and customers of companies in which it holds an interest.

55. At the same time, WBC established Thameswey Energy Ltd. (TEL) which was 19% owned by Thameswey Ltd, the remaining 81% being owned by a Danish pension company. The level of ownership by WBC was selected to avoid TEL being treated as a local authority controlled company and subject to the previous central government financial controls. WBC's 19% share in TEL was financed by the funds established by the energy efficiency revolving fund. In 2004, WBC bought out the private sector shares in TEL to own 100% of the company.

56. WBC accepted a certain level of risk in investing in TEL, and subsequently in the economic performance of projects financed through TEL. However, through its ownership of Thameswey and TEL, WBC is able to work toward achieving its energy and CO_2 targets. Thameswey and TEL projects have achieved:-
    - 75% reduction in CO_2 from WBC property and housing from 91/92 – 02/03
    - 15% reduction in total borough emission over the same timescale
    - energy savings to the council of £924,000 per annum

Regeneration, energy networks & planning policy

57. Regeneration schemes provide the ideal circumstances for starting development of CHP and district heating. An energy strategy based on CHP and district heating can be adopted as part of the Supplementary Planning Guidance (SPG) for the scheme. Obligations for site developers to connect to the district heating network can form part of land sale agreements, or Section 106 agreements. This provides the ESCo with the long term heat sales revenue that it would require to finance the investment in the heat infrastructure.

58. Once district heating networks have started to grow, further development of these networks can be supported through planning policies. For example, developments could be obliged to connect to an existing district heat network where they are within a threshold distance from the heat main (and provided the network has the capacity to supply the additional heat).

Recommendation to explore borough-wide ESCo

59. Borough wide adoption of CHP/district heating has been highlighted as the most cost effective means of achieving significant reductions in CO_2 emissions. However, this area based approach falls between the interests of individual building operators and the existing licensed energy suppliers. In addition, there are further barriers to the implementation of CHP/district heating in new developments (set out in paragraph 45).

60. Paragraphs 48 – 56 describe how ESCos can help overcome these barriers by providing the finance and technical expertise to develop and operate CHP/district heating schemes. These paragraphs also highlight that the majority of district level ESCos have been initiated by local authorities, largely to meet environmental and social (tackling fuel poverty) objectives. In addition, local authorities are in a good position to support and guide the development of CHP/district heating through their development planning duties.

61. A number of existing Council projects have proposed the establishment of ESCos specifically to bring in private sector finance to invest in CHP and district heating infrastructure. These are described in detail in Appendix B, and comprise:-
    - "Multi-utility services company" (MUSCo) – to deliver a CHP based district heating and private wire network, sustainable water supply and modern data networks
    - Draft "Insulation & CHP" strategy – proposal to establish a 'not-for-profit' ESCo to invest in CHP and district heating infrastructure in the Council's estates
    - Heat from SELCHP - proposal to establish an ESCo to finance the heat infrastructure to connect housing estates in the north east of the borough to the waste heat from the waste incinerator.

62. Each of the three projects above envisages the establishment of some form of ESCo vehicle to:-
    - provide the necessary capital investment by securing third party finance
    - provide the technical skills to design, build and operate the plant (or just the heat network, and associated back-up heat plant, in the case of the SELCHP project)

    In each case, finance is raised against the projected income from heat and electricity sales, and long-term heat sales agreements are required.

63. As an essential element of the Elephant & Castle regeneration, the MUSCo proposal is currently at the initial procurement stage. No decision has been made as to what the level of Council ownership or involvement will be in the vehicle.

64. It is recommended that the Council explore the feasibility of, and options for, establishing an ESCo that would deliver investment in decentralised energy schemes across the borough. It is also recommended that this study is integrated with the MUSCo procurement process, and should also explore whether the MUSCo vehicle could structured to act as a borough wide ESCo without adversely affecting the successful delivery of the specific scheme at the Elephant & Castle.

Transport

65. Road transport is responsible for 12% of the direct CO_2 emissions across the borough (with only 2% emissions arising from rail use). Over half of the road transport emissions arise from car use, with only 9% of road transport emissions coming from buses and coaches.

66. The Mayor of London is responsible for overall transport planning across London. The Mayor's transport strategy is largely implemented through Transport for London and through the boroughs' Local Implementation Plans (LIP) which must set out how the Mayor's transport objectives will be achieved locally. The Council's LIP covers a wide range of policy objectives, from improving accessibility and safety of local transport, to reducing energy used in transport.

67. The basic approach to reducing CO_2 emissions from transport is similar to the approach to reducing emissions from buildings:-

Reduce the need for travel	Regeneration projects – plan mixed-use developments, promote home working and tele-conferencing.
Switch to low CO_2 transport modes	Liquid petroleum gas (LPG) and diesel fuelled vehicles typically result in lower CO_2 emissions than equivalent petrol vehicles. Depending on method of fuel production, bio-diesel can offer significant CO_2 reductions – e.g. bio-diesel manufactured from waste sources (e.g. reclaimed vegetable oil from catering). Public transport moves people around more efficiently and results in lower CO_2 emissions per distance travelled per person than private car transport.
Switch to zero CO_2 transport modes	Promotion of walking and cycling – e.g. in development planning. Zero CO_2 transport fuels are not currently economically viable. Electric or hydrogen fuel-cell vehicles are only zero CO_2 if the original source of energy (to charge the batteries, or produce the hydrogen) are also zero CO_2.

68. The main opportunities for the Council to directly affect reductions in CO_2 emissions from transport are through:-
    - Vehicle fleet : 350 service vehicles, a further 320 company cars leased to staff
    - Contractor vehicle fleets – e.g. school transport, taxi service
    - Staff travel to and for work
    - Land use planning

69. The adoption and implementation of the Council Fuel Policy (agreed 10/11/04) for fleet vehicles has already begun to reduce CO_2 emissions. The Council has around 80

vehicles running on a 20% mix of bio-diesel (with diesel) sourced from reclaimed vegetable oil, and 150 vehicles running on LPG. The fuel policy has two overall aims:-

- to reduce emissions that impact local air quality
- to reduce CO_2 emissions

While modern LPG and diesel fuelled engines have similar emissions of CO_2 per distance travelled, LPG results in lower emissions of particulates and nitrogen oxides – which both impair local air-quality. Hence, where the vehicle type is appropriate, LPG is the recommended fuel.

70. The Council's Travel plan, which was agreed at the Executive 07/11/06, has the overall objective of reducing the use of the car for staff travel to and for work. The plan has a target of reducing the proportion of staff arriving to work by car from 32% to 25% over 3 years. The travel plan report also recommends that the Council should seek through the Southwark Environment Forum and Southwark Alliance to ensure that other organisations adopt green travel plans.

71. The Council's fuel policy and travel plan will continue to be the instruments through which the Council's own CO_2 emissions from transport will be reduced. Progress in implementing the travel plan will be monitored through an annual survey of staff travel. It is therefore recommended that the survey is designed to collect sufficient data for the CO_2 emissions resulting from staff travel to be estimated. CO_2 emissions from the Council fleet can be derived from the fuel consumption data.

72. In the long term, land use planning is likely to be the means by which Southwark can have the greatest influence on emissions from transport in the borough. It is also an important source of funding for transport and infrastructure improvements through Section 106 agreements with developers. Car-free developments should be continued to be encouraged in areas with good public transport facilities, in conjunction with secure cycle storage for residents, car club spaces and improved pedestrian facilities.

Additional action

73. Table 2 identifies a number of areas where action to tackle climate change needs to be reinforced. These include some sectors which are significant sources of CO_2 emissions, but are hard to influence – such as existing private sector housing and businesses.

74. It is therefore recommended that the following actions are implemented.

- <u>Environment & Leisure, 'HECA' team</u>
  Enhance the existing information for residents on the Council website – indicating energy advice, funding sources and links to external agencies. The existing energy advice page on the website is difficult to access, propose that a dedicated climate change web page is set up.
- <u>Regeneration, Economic Development Team</u>
  Establish new information service for businesses on the Council website – indicating energy advice, funding sources and links to external agencies. Ensure that energy advice is integrated into existing (and future) support initiatives for businesses. Work with Business Link to incorporate energy advice into their services. Explore the use of "Business Improvement Districts" to establish easier access to free

energy audits and funding (e.g. interest free loans from the Carbon Trust).

- Education, BSF team
  Ensure that minimum energy and CO_2 performance standards are established for BSF new-build schools. Ensure that new-build energy strategies are integrated with the Council 'decentralised energy strategy' (e.g. CHP, opportunity for multi-site supply etc.)

- Environment & Leisure, Street Improvement Team
  Enhance energy & climate change issue within "Eco-Schools" programme

- Environment & Leisure, Energy Team
  The previous "Housing" energy team will manage the following for municipal buildings and housing estates (central boiler plant and landlord supplies):-
  - centralised management of energy (and water) billing
  - provision of energy (and water) monitoring and setting of performance targets
  - targeted provision of energy audits, economic appraisal of efficiency measures

- Regeneration, Property
  Establish common energy performance standards for municipal building refurbishment projects

- Strategic Services, Procurement
  Adopt and implement "Sustainable Procurement Strategy" – ensure that this is mainstreamed into procurement practice & corporate contracts

- "Sustainability Forum" members
  Undertake a scoping study on what action and policies will need to be put in place across the Council's services to adapt to the predicted effects of climate change. There has already been limited action in some areas (e.g. drought resistant planting in parks, planning policies to prevent rainwater run-off causing 'flash floods').

- Environment & Leisure, Director's Office
  Re-establish the Council "Green Champions" scheme to ensure that sustainable practice is adopted across the Council's operations. This will include ensuring energy saving 'good housekeeping' is being adopted – e.g. turning equipment off rather than leaving on standby etc.

75. It is recommended that the officers "Sustainability Forum" (made up of key officers from across Council departments) be responsible for co-ordination and review of the actions outlined in paragraph 74. It is also recommended that this Forum should identify further projects that will ensure that the CO_2 emissions sources set out in table 2 are sufficiently addressed.

Monitoring implementation

76. It is recommended that progress in reducing CO_2 emissions across the borough is monitored annually. The selected baseline will be the 2003 data, shown as figure 1.

77. Building CO_2 emissions are derived from actual energy supply data for the borough. However, this data is only provided at post code level, and is only broken down into domestic and commercial end use. A more detailed picture of energy and emissions is

required for the Council to monitor and review the impact of its emissions reduction strategies. In principle, it would be possible to provide the consumption of every electricity and gas meter in the borough, as this data is held on national databases. However, the energy suppliers have objected to the release of any more detailed data than the currently available post code level data. The Council should lobby the appropriate government departments (DTI and DEFRA) for better data, in partnership with the GLA and LGA.

Engagement and communication

78. While the Council can affect significant cuts in CO_2 emissions directly, it will need to engage the whole community in taking action if the proposed tough emissions reductions are to be secured. A climate change communications and engagement strategy will be developed by the Council.

79. There are a wide range of organisations, both at national and local level, that promote action to tackle climate change. The main focus of these groups range from general sustainable development to tackling 'fuel poverty' among low income households. The Council should harness these existing channels of communication to spread awareness of climate change across all sectors of the borough.

80. There is also a bewildering array of funding and grant schemes that can effectively be used to tackle CO_2 emissions. The Council should review these schemes with the objective of ensuring that Southwark residents and businesses can gain maximum benefit from them.

Nottingham Declaration on Climate Change

81. The declaration was launched at a climate change conference hosted by the City of Nottingham in October 2000. The declaration is a voluntary pledge to address the issues of climate change, signed by the Leader and Chief Executive of a council. So far, over 100 local authorities have signed the declaration. The declaration commits councils to:-

- Work with central government to contribute, at a local level, to the delivery of the UK climate change programme.
- Prepare a plan with their local communities to address the causes and effects of climate change and to secure maximum benefit for their communities.
- Publicly declare, within the plan, the commitment to achieve a significant reduction of greenhouse gas emissions from the authority's own operations - especially energy sourcing and use, travel and transport, waste production and disposal and the purchasing of goods and services.
- Encourage all sectors in the local community to take the opportunity to reduce their own greenhouse gas emissions and to make public their commitment to action.
- Work with key providers, including the health community, businesses and development organisations, to assess the potential effects of climate change on their communities, and to identify ways in which they can adapt.
- Provide opportunities for the development of renewable energy generation within their area.

- Monitor the progress of the plan against the actions needed and publish the results.

82. All these actions will form part of the implementation of the climate change strategy. It is recommended therefore that the Council signs the declaration as a public statement of its intent to take action.

KEY ISSUES FOR CONSIDERATION

Policy implications

83. The Council's Sustainability Policy, which the Executive agreed on 02/11/04, highlights twelve areas for action. Almost all of these areas are either affected by climate change, or drive climate change. This climate change strategy does not replace the Sustainability Policy. However, further detailed development of the climate change strategy will update and amend the CO_2 and energy targets contained within the Sustainability Policy.

84. The only area addressed by the Sustainability Policy that has targets related to climate change is "Issue 3 : Energy usage", these are:-
    - to improve the energy-efficiency of domestic properties by 30% from 1995 levels by 2010 (this target is the existing HECA programme target for the borough's housing stock).
    - improve the energy-efficiency of council premises by 20% from a 2000 baseline by 2010.
    - to further reduce the Council's CO_2 emissions to 10% below 2000 levels by 2010.

85. Detailed development and implementation of this strategy will have direct implications for other service areas. For example, planning policies related to supporting CHP and district heating will need to be developed. However, such policies will need to be adopted through their respective formal consultation and approval processes.

Community Impact Statement

86. The impacts of climate change will affect all sections of the community. In general, initiatives that reduce CO_2 emissions also reduce energy consumption and therefore also reduce customer's energy bills. However, households with lower incomes may not be able to afford the initial capital investment that is usually needed to reduce energy consumption. This is why the majority of available grant schemes for energy efficiency measures are targeted at the less well-off. The Council's HECA programme will continue to ensure that lower income households in Southwark receive such grants.

87. Evidence also shows that the use of CHP/district heating is one of the most cost-effective methods of providing 'affordable warmth' to households. This strategy would increase such provision of heating across the borough. In addition, lower cost supplies of electricity would be available to residents where 'private wire' electricity networks are installed as part of CHP/district heating.

Resource implications

88. This report does not itself commit the Council to using any resources. Implementation of the overall climate change strategy would require significant investment by all sectors across the borough, as indicated by the capital costs in table 5. It should be emphasised that these capital costs are for the whole borough – not the Council.

89. This report does recommend that the Council explore the feasibility, and options of establishing a borough ESCo to design, build, finance and operate CHP and district heating networks. As highlighted in paragraphs 48 – 56 there are a number of existing models for such an ESCo and the Council's participation could vary from:-

- agreeing to purchase heat on a long-term basis (for buildings managed by the Council) and agreeing to use planning and development powers to secure connections to ESCo services: to
- having an active shareholding interest in the ESCo

90. Any subsequent recommendation for the Council to participate in an ESCo vehicle (whether based on the existing MUSCo proposal or a separate vehicle) will have to be justified by a full business case which sets out the associated risks and benefits. The Finance Director will be fully consulted on the procurement of any external financial consultants to advise on the options for establishing an ESCo.

91. It is likely that the initial projects set out in table 7 will highlight need for additional resources. These may range from:-

- investment for energy (or water) saving measures in municipal buildings
- resources for enhanced energy advice and support services for residents and businesses.

Consultation

92. The Corporate Management Team have been fully consulted on the development of this strategy. The internal cross-departmental officers "Sustainability Group" has also been consulted on the development of this strategy.

93. This climate change strategy recommends action by all sectors within the borough. Should Executive be minded to agree the recommendations set out in this report, the strategy will be taken forward for consultation with the Southwark Environment Forum, and subsequently with the Southwark Alliance.

SUPPLEMENTARY ADVICE FROM OTHER OFFICERS

Finance Director

94. Although this report does not seek any additional financial resources at this stage, it should be noted that the detailed development and implementation of this strategy will have direct implications for services across the council. The three key energy projects referred to in paragraph 61 are at various stages of development and would involve setting up some of form of joint venture or company (referred to as ESCos) to finance capital investment and provide technical skills. The investment will be recovered through energy supply contracts and may commit the council for long term contracts. Inevitably a number of risks are associated with projects of such ambitious targets and

therefore, a full business case including a full risk assessment will be brought back to the Executive before committing the Council to any contracts or resources.

BACKGROUND DOCUMENTS

Background Papers	Held At	Contact
Energy and CO_2 emissions schedules	Environment & Leisure, Chatelaine House	Bob Fiddik, 53804
"Southwark Climate Change Strategy – How to achieve an 80% carbon reduction by 2050" – technical report by SEA/Renue	Environment & Leisure, Chatelaine House	Bob Fiddik, 53804
Sustainability Policy	Environment & Leisure, Chatelaine House	Stuart Robinson-Marshall, 50703
Elephant & Castle, MUSCo documents	Regeneration, Elephant & Castle Team, Coburg House	Tony Moseley, 54903
Draft Housing insulation and CHP strategy	Housing Renewal, 9 Blenheim Grove	Pat O'Reilly, 56250

APPENDIX A

Audit Trail

Lead Officer	Gill Davies
Report Author	Bob Fiddik
Version	Final
Dated	01/12/06
Key Decision?	Yes

CONSULTATION WITH OTHER OFFICERS / DIRECTORATES / EXECUTIVE MEMBER		
Officer Title	**Comments Sought**	**Comments included**
Chief Finance Officer	Yes	Yes
Executive Member	Yes	Yes
Date final report sent to Constitutional Support Services		01/12/06

APPENDIX B

Elephant & Castle MUSCo

The regeneration plans for the Elephant & Castle will result in a tripling of building floor space in the area. However, the energy strategy for the development, adopted in the Supplementary Planning Guidance, has the ambitious target of keeping CO_2 emissions of the completed scheme at current levels.

The energy strategy was developed through detailed analysis of how the total heat and power requirements will evolve over the phasing of the development. In order to meet the CO_2 target, an integrated energy strategy is required with:-

- best practice standards in energy efficiency applied to new building (to minimise energy requirements)
- installation of combined heat and power (CHP) generation with a district heating network and local 'private wire' electricity network
- a minimum contribution of 10% renewable energy sources

The original intention was that this utilities services package would be delivered through the procurement process for the lead development partner. However, the bidders did not sufficiently address this aspect of the procurement in their submissions. This reinforces the view that this integrated, area based approach to low carbon energy services is still an emerging market in the UK. The nature of the regulated utility market also means that this approach to energy supply is also not attractive to the existing licensed utility companies.

Therefore the Council proposed leading the establishment of a "multi-utility services company" (MUSCo) which will design, install and operate the energy supply infrastructure. The Council will oblige site developers to connect to the MUSCo service through land sale and planning agreements.

The MUSCo services will largely be provided to commercial and residential (private and RSL) customers, the MUSo is therefore to be established as a concession. Executive agreed the procurement process to secure a private sector partner to form the MUSCo on 18/07/06. Fifteen consortia have responded to the initial pre-qualification stage, the aim is to award the contract by June 2007.

Housing : draft CHP & insulation strategy

A draft strategy for installing CHP and insulation across the Council's housing stock has been developed following an environmental audit of the Housing department. The strategy recommends a programme based on the three measures which would achieve the highest saving in CO_2 per pound invested:-

- Cavity wall insulation – Around 39,000 Council dwellings would benefit from this measure.
- Loft insulation – Most loft spaces are already insulated, but it is cost effective to top-up insulation depths to 250mm where current levels are below 100mm. Around 13,000 dwellings would benefit from this.
- CHP – The Council manages central boiler plant which supplies around 22,000 dwellings via district heating networks, four estates are currently supplied via CHP. The strategy proposes a programme of converting all the remaining centralised boiler houses

to CHP. The strategy also recommends planning policies to support the development of CHP and district heating networks across the borough.

The 'Standard Assessment Procedure' (SAP) is the government's approved method of assessing the energy efficiency of dwellings (expressed in energy cost terms). The Council reports the average SAP rating of its own housing as BVPI 63 – the current value is 64, and is on a scale of 1 to 120, where the highest value is the most efficient dwelling. The Council has set itself the target of increasing BVPI 63 by one point per year.

The strategy recommends that Southwark adopts a programme to complete the following insulation measures in its own stock by 2011:-

- all unfilled cavity walls are insulated
- all lofts with 100mm or less insulation are topped up to 250mm.

These measures would increase the BVPI 63 by 7 points and would cost £10m. It is estimated that around £3m funding for these measures could be obtained from the "Energy Efficiency Commitment" (the government scheme that obliges licensed energy suppliers to invest in energy efficiency). It is also recommended that the Council's district heating schemes are converted fully to CHP by 2015. It is estimated that this would increase the BVPI 63 by 5.8 points for a minimum capital cost of £7.1m.

It should be emphasised that the draft strategy does not include any costs associated with the renewal of the existing district heating schemes. The draft strategy points out that a study was completed by Capita Greatorex in 1999 of the state of the Council's community heating systems. This estimated that a total investment of around £100m would be required to renew all heating mains and associated boiler plant.

The strategy proposed that an 'Energy Services Company' (ESCo) is established by the Council to secure private sector investment in CHP plant, and district heating infrastructure. The ESCo would design, build and operate the CHP plant and heat infrastructure. This investment would then be financed through heat sales - either to the Council or directly to the tenants – and sales of electricity.

Heat from SELCHP

The draft CHP & Insulation Strategy also recommends that Southwark enter into negotiations with "South East London Combined Heat & Power" (SELCHP) to connect the waste heat from the incinerator to the Council's district heating system. This proposal emerged from a London wide analysis[4] of the potential for CHP and district heating commissioned by the GLA and several London boroughs, including Southwark.

SELCHP was designed to operate as a combined heat and power facility, but the plant has generated electricity only, while dumping the heat generated at the same time, ever since the plant began operation. The initial development phase would connect up Southwark estates to the north of SELCHP. This would supply around 2,700 dwellings with heat, and would result in a reduction of around 7,700 tonnes of CO_2 per year.

The infrastructure cost for this initial phase is estimated at £3.03m – the additional modifications to the SELCHP plant are estimated at £1.925m (which would be financed by SELCHP). The study proposed that Southwark should establish a not-for-profit ESCo to

[4] "London Community Heating Development Study" GLA, May 2005

finance the infrastructure, the ESCo would then finance this investment through a long term heat sales agreement with Southwark.