



London Energy
Partnership

Financing London's low carbon future:

Options for a Low Carbon Leasing Company

Written by ESD Ltd

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The views in this report are the authors' own and do not necessarily
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Acronyms

BBP	Better Buildings Partnership
BEEP	Buildings Energy Efficiency Programme
CERT	Carbon Emissions Reduction Target
CHP	Combined Heat and Power
CO ₂	Carbon Dioxide
DE	Decentralised Energy
ECAs	Enhanced Capital Allowances
ESCo	Energy Services Company
GLA	Greater London Authority
LCBP	Low Carbon Buildings Programme
LCLC	Low Carbon Leasing Company
LDA	London Development Agency
LEP	London Energy Partnership
PV	Photovoltaics
SWH	Solar Water Heating

Executive Summary

Introduction

While there are a large number of central, regional and local government energy initiatives and incentive schemes operating in London targeted at reducing the capital's carbon dioxide (CO₂) emissions, the penetration of energy efficient and low carbon installations within London's building stock is still relatively low. This report, commissioned by the London Energy Partnership (LEP)'s Finance Task Group, explores the model of a Low Carbon Leasing Company (LCLC). Such a company would address this implementation gap by leasing low carbon measures to building owners and occupiers in London.

Targeting the commercial sector within London

The proposed market focus for the LCLC is the provision of boiler replacement and energy efficiency installations to commercial sector organisations in London. Energy efficiency measures are generally the most commercially viable and lowest risk products upon which to base the business plan for the LCLC because:

- They are cost effective thereby enabling a lower leasing fee than for renewables so that customers can enjoy a reduction in energy costs in the longer term.
- They have the largest market due to potential for all organisations to install energy efficiency measures of some sort whereas only a proportion of buildings are suitable for solar photovoltaics (PV) or solar water heating.

The commercial sector is suited to the leasing approach and the LCLC's services for a number of reasons including:

- Interest of commercial sector organisations in leasing rather than purchasing assets so as to take them off their balance sheets.
- Interest of commercial sector organisations in low cost finance (they have less access to low cost finance than public sector).
- Good credit rating of large business (excellent customers for leasing arrangement).
- Very large number of businesses and commercial premises located in London and many of these are very large buildings and energy consumers - and thereby large carbon saving potential.
- Fewer support initiatives targeting commercial sector than for public sector (eg Salix).
- Good ability for the Greater London Authority (GLA) group to effectively work in partnership with large businesses in London.
- Existing GLA initiatives could be an excellent route to customers for the LCLC. For example, the Better Building Partnership is working with approximately 25% of London's commercial estate, which could be a very large market for the LCLC.

Business plan for the LCLC

The market potential for the LCLC operating in the commercial sector is approximately 500,000 tonnes of CO₂ per year (assuming 25% technical potential savings from a package of standard energy efficiency measures - as illustrated by Carbon Trust experience - and a market reach of 13%). A total investment of approximately £250 million is required to achieve this market potential, based on a capital cost of £500 per tonne of CO₂ delivered through a package of key measures including boiler replacement, heating controls and zoning, voltage optimisation, variable speed drives, and lighting upgrades and controls.

Our modelling suggests that investment in the LCLC and in leasing energy assets, generates positive financial returns. Modelled discounted cashflows over a 15 year period illustrate that the net present value (NPV) of the investment in the LCLC would be £2.2 million with an Internal Rate of Return (IRR) of 21%. The most sensitive parameters within the business model are the size of the annual management costs faced by the LCLC and the size of the administrative fee that can be levied on customers.

Under the model's assumptions, customers in the commercial sector would obtain greater financial benefits from purchasing the services of the LCLC as compared to directly implementing the energy installations and undertaking the investment themselves.

The LCLC could either consist of a joint venture between key parties such as a leasing company, an energy management company and the LDA, or simply as a contractual relationship between key parties such as a managing company, a leasing company and a contract energy management company.

Proposed next steps

To progress the LCLC, the following steps would need to be taken:

- Testing the LCLC concept and business plan through informal meetings with key stakeholders including leasing companies, contract energy management companies and potential customers in the commercial sector.
- Refinement of the LCLC offering and the business model.
- Decision on whether to further develop the LCLC and bring it to market.
- Formal request for proposals (RFP) and LCLC partner selection.
- Construction of partnership and contractual relationships.
- Establishing the LCLC including the process of actually tendering the services of the LCLC and launching the venture.

THE LCLC concept was developed in 2007 before the full scale of the credit crisis became apparent. Under current market conditions its further development will be challenging and will require public sector leadership. The LEP is continuing to work with stakeholders to examine ways to take the work forward.

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1 Introduction

This report was commissioned by the London Energy Partnership's (LEP) Finance Task Group, with funding from DEFRA's Sustainable Development Innovation Fund. Over the last three years, the LEP has undertaken a significant body of work investigating the financial barriers to sustainable energy implementation, and potential policies and mechanisms to overcome these obstacles. The January 2008 LEP report 'Implementing delivery mechanisms for financing London's low carbon future'¹ developed this body of work into 3 key delivery mechanisms:

- Low Carbon Advisory Service
- Green Mutual
- Rental ESCo (also referred to as a Low Carbon Leasing Company, although this is still a working title)

The LEP Finance Task Group opted to further develop the concept of a Low Carbon Leasing Company (LCLC) that can overcome financial, informational and delivery market failures to facilitate the installation of sustainable energy measures in existing buildings within London. This options appraisal and business model for a London LCLC assesses the main market opportunities for a leasing vehicle and the optimum business structure for most effectively delivering low carbon products and services.

According to the 'Implementing delivery mechanisms' report, the definition of a LCLC or rental ESCo is as follows:

Installation of equipment is likely to be made in return for a rental payment to the Rental ESCO. Long term contracts may be formed with the local authority tenant management organisations and housing associations for the installation of low carbon products in their properties. The Rental ESCO would agree to supply equipment and energy efficiency measures in return for a guaranteed payment for servicing as well as leasing/hire purchase. Banks and commercial lease providers may be willing to lend directly to the Rental ESCO on the basis of these long term contracts, thus avoiding significant capital outlay by these bodies, which is often cited as a barrier to projects by these types of organisations.

Owner-occupiers and independent landlords may simply procure equipment through the Rental ESCO. In this case, the Rental ESCO installs low carbon technologies in dwellings and may or may not arrange a service contract with the user. Whilst the individual would be able to source their own funds to pay for the installation, the Rental ESCO could offer financing directly to the individual to pay the upfront capital costs. The Rental ESCO would need to have a consumer credit licence in order to offer such finance, and would need to partner with an established consumer credit provider (e.g. HFC Bank) to arrange this.

The following sections provide a detailed mapping of the existing initiatives within London and the potential markets for the LCLC so as to identify a key focus for the LCLC. The report then develops a business model for the proposed market focus and structure of the LCLC, and models the potential cashflows of the LCLC with a sensitivity assessment of the business model. The report finishes with conclusions and recommendations for progressing the LCLC concept and business model.

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<http://www.lep.org.uk/uploads/Implementing%20Delivery%20Mechanisms%20for%20Financing%20Londons%20Low%20Carbon%20Future.pdf>

2 Mapping existing energy initiatives in London

2.1 Overview

In general, energy initiatives and programmes across the UK primarily provide financial support and informational support in order to stimulate or enable the installation of energy efficiency and low carbon technologies. Informational support comes in many different guises from technical guidance about how low carbon products work to information on grants available or reliable installers.

There are a large number of energy schemes operating within London and these have varying degrees of success in overcoming these financial and informational barriers. The following overview of existing energy initiatives operating in London aims to identify general successes and failures, and to identify where a LCLC could add value in an already crowded market place.

2.2 Housing sector

The housing sector consists of two very different segments - private housing and social housing - each having quite distinct characteristics. Private housing is further divided into the rented and owner occupied sectors with their own specific characteristics. The design of housing energy efficiency initiatives needs to take into account the unique features of these different housing divisions so as to successfully target measures. The general measures outlined below address both private and social housing unless specified.

Energy efficiency measures

- Carbon Emissions Reduction Target (CERT) - obligation on energy suppliers, used to fund cavity & loft insulation and some other low carbon measures.
- London Warm Zone - not-for-profit organisation facilitating home energy efficiency improvements, in particular in fuel poor households. Works in partnership with a number of local authorities and EDF Energy.
- Green Homes Concierge programme - this scheme is run by the LDA and provides a Green concierge service to households that are willing to pay a small fee (£199) for a bespoke energy audit and intensive follow up support for one year including procurement and project management support. However, the concierge service is not providing financing solutions and therefore the LCLC might be able to provide a useful product for its customers.
- HelpCo is a not-for-profit ESCo that provides energy efficiency measures for member households that are financed through grant payments from a partner energy company through CERT, as well as some interest-free loans.

Microgeneration and decentralised energy (DE) support

- Low Carbon Buildings Programme (LCBP) - main government funding programme for small-scale renewable energy installations. The LCBP provides up to 50% of the installation costs, with the remaining costs covered by the building owner.
- Solar for London - provides a full hand-holding solar water heating service for householders and housing associations. It has provided bulk purchase discounts, works through accredited installers and obtains LCBP grants on behalf of customers but does not provide low interest loans to cover remaining costs. Only a small number of installations have been delivered through Solar for London, with fewer than 50 installations per year.
- Small scale CHP scheme provided by Creative Environmental Networks - CEN has provided a financing (zero interest loans) and installation package to social housing providers for a number of years, but the uptake has been low.

- The Decentralised Energy Delivery Unit (DED) in the London Development Agency implements local generation projects at a macro level, particularly for regeneration projects that includes housing and other buildings. It seeks to bring pre-commercial schemes to the market.

ESCos working with housing in London

- There are a number of CHP installation and operation projects delivered through local ESCos such as Barkantine Heat & Power in Tower Hamlets, St Pancras Housing and the Greenwich Millennium Village. The London ESCo is working with developers to install CHP and other forms of decentralised generation in new developments.

2.3 Public sector organisations

The public sector in London includes the London boroughs, NHS trusts, universities and colleges, the central government estate and other smaller public sector institutions such as the police and fire service. There is a range of building types within this sector, but they are characterised by the fact that they tend to be owner-occupiers which eases the provision of energy services to this sector.

Energy efficiency measures

- Carbon Trust - Local Authority Carbon Management Programme, free energy audits and Salix Finance provides an interest-free loan to local authorities and other public sector.
- Buildings Energy Efficiency Programme (BEEP) - currently being piloted by the GLA group, with bulk purchase to reduce costs, undertaken through a long-term framework agreement with Dalkia and Honeywell. The Mayor plans to expand this to other public sector buildings.
- Green 500 - a programme by London Development Agency, aimed at helping 500 of London's leading organisations to collectively cut their carbon emissions by 1.5million tonnes over 2½ years. Includes both the public and commercial sector.

Microgeneration and decentralised energy (DE) support

- Low Carbon Building Programme - also available to the public sector for part-funding of renewable energy schemes on buildings.
- The Decentralised Energy Delivery Unit in the London Development Agency (LDA) which implements larger scale combined heat and power schemes and heat networks.
- Carbon Trust and Salix Finance - provide support for low carbon generation in the same way as for energy efficiency.

2.4 Commercial sector

There is a huge commercial sector building stock within London and it is extremely varied. However, office accommodation is extensive due to so many businesses having their administrative services based in London and this sub sector represents a particular opportunity area within London.

Energy efficiency measures

- Carbon Trust interest free loan scheme and free energy audit and information.
- LDA Green Organisations initiative - includes the Green 500 programme (see above) and the Better Building Partnership which works with large commercial property owners in London to implement energy efficiency improvements.

- Business Link Environmental Support, and many similar local schemes across London, for e.g. LESS and Green Mark.
- Enhanced Capital Allowances scheme (ECA).

Microgeneration support

- Low Carbon Building Programme - also available to the commercial sector for part-funding renewable energy schemes on buildings.
- Carbon Trust
- Enhanced Capital Allowances scheme (ECA).

Table 1: Existing Energy Initiatives in London

SECTOR	ENERGY EFFICIENCY	MICROGENERATION/DE
Housing (social & private)	CERT funded and other projects, eg British Gas/ Mayor of London insulation scheme, London Warm Zones, London borough schemes	Low Carbon Buildings Programme
	HelpCo	Solar for London (although not active at present)
	Green Homes Concierge	Other CHP, includes Barkantine, St Pancras Housing Trust etc
Commercial	Green 500	Low Carbon Buildings Programme
	Better Building Partnership	LDA G500 + BBP
	Business Link Environmental Support, and many similar local schemes across London, eg LESS, Green Mark etc	ECAs
	Carbon Trust advice service and loans	London ESCo
	ECAs	
Public sector	Carbon Trust - energy audits, local authority carbon management programme	Salix Finance
	Salix finance	Low Carbon Buildings Programme
	BEEP	Solar for London
	Many energy information sources, eg Energy Saving Trust, Local Government Association	

2.5 Gap analysis of support for low carbon measures in London

Overview of London energy initiatives

Having mapped the main low carbon initiatives targeted at existing buildings in London, it is clear that the market place is fairly crowded. The existing measures generally address one of three market failures or needs:

- Funding - generally in the form of grants provision, but interest-free loans are also provided alongside a few schemes. Also reduced prices through bulk discount schemes (eg insulation schemes and Solar for London).
- Information - general information about energy efficiency & low carbon technologies, but also detailed technical and business information to assist with energy installations.

- Time availability/ ease of installation - provision of one stop shop approach to installing energy efficiency measures or hassle-free installation products.

Most financing support takes the form of grants, and therefore a gap potentially exists in terms of a 'top-up' loan (low or zero interest) or a leasing agreement to cover the financial gap between grants and project viability. Generally, the provision of loans to overcome poor access to credit is fairly limited - possibly because it is perceived (or proven through past schemes) that the uptake will be small. A LCLC could fill this financing provision gap, and by combining it with a tailored installation package, could also overcome the lack of time & information barriers - a complete package like this could potentially benefit all sectors (housing, public and commercial). However, this approach would still suffer from the general stop/ start nature of grants and the difficulty of basing low carbon installation schemes on grants programmes that have a limited lifespan and significant uncertainty. The business case for the LCLC should not be based upon a grant programme as this would make the LCLC very vulnerable to changes in the grant programme - nonetheless the sensitivity analysis of the business models undertaken below considers the impact of grants upon the viability of the LCLC business plan.

Measures to stimulate action in the large commercial sector

Although low cost finance is available to large public sector organisations, through the Salix programme and their own sources of capital, the same facility does currently not exist for large commercial organisations. Leasing could provide a solution by providing a means of financing energy measures within commercial organisations whilst also removing assets from commercial organisations' balance books.

3 Assessment of potential low carbon products and markets

3.1 Key barriers to the uptake of low carbon measures

a) Long payback period

Micro-generation and advanced energy efficiency technologies suffer from a low uptake across all sectors due to the high initial capital cost involved in purchasing the equipment and the long payback periods in reclaiming this investment.

b) Information failures

The general failures in the energy efficiency market place mean that even cost effective energy efficiency measures are not always implemented. The Carbon Trust estimates that businesses in the UK waste £1 billion a year through poor control of heating and ventilation, and leaving on appliances with similar wastage in other sectors. The Carbon Trust is seeking to address this failure through a large ongoing advertising campaign about energy saving opportunities and financial benefits.

Other energy programmes, such as CERT, address the failure of householders to implement cost effective insulation measures simply by giving them a grant to partially or fully cover the cost. In theory, grants should only be used to fill the funding gap for measures that are not cost effective or commercially viable, in both households and commercial organisations.

Many energy efficiency or low carbon initiatives fail due to small marketing budgets and a corresponding lack of awareness amongst the target audience about the product on offer, as well as complex grant programmes. This problem is so severe that some grant schemes fail to distribute all of their available funding, and for example, some London Boroughs that provided additional grants alongside the Solar for London offering still did not achieve an increase in the take-up, partly due to poor marketing of their offer.

c) Ownership and installation issues

The other key barrier is that households and businesses have not traditionally had a role in energy generation but instead simply purchase fuel and electricity for an energy supply company. Hence there has been no pressing need for a householder or building owner to install their own energy generation technologies and it would require a change of culture to do so. A key question for the microgeneration industry is whether microgeneration technologies should be delivered by the large utility companies or smaller ESCos or building owners themselves - if any of these approaches are to move forward more successfully then improved incentives and a more rewarding market place is required. To some extent this issue may be addressed by the introduction of the feed-in tariffs introduced through the 2008 Energy Bill.

Table 2: Key barriers to the installation of microgeneration technologies

BARRIER	POTENTIAL POLICY RESPONSES
High capital cost/ long payback period	<ul style="list-style-type: none"> • provide upfront capital investment, eg interest free loans • reduce capital costs (grants) • increase revenue streams (subsidies/ feed-in tariffs/ carbon finance etc).
No traditional energy generation role for householders & businesses	<ul style="list-style-type: none"> • incentivise householders and building owners to own & operate microgen technologies.
Low interest from big energy companies	<ul style="list-style-type: none"> • incentivise energy utilities to own & operate micro-gen technologies.
Informational - technical, lack of market knowledge	<ul style="list-style-type: none"> • provide technical/ maintenance support • provide a complete package of measures for seamless, hassle-proof delivery • marketing schemes advertising low carbon delivery vehicles.
Poor maintenance industries	<ul style="list-style-type: none"> • provide a complete package of measures for seamless, hassle-proof delivery • improve/ stimulate green maintenance industries.

Key lessons learned from previous & existing schemes include:

- Well established and proven energy saving technologies lead to the most successful energy installation schemes.
- Essential to achieve economies of scale to ensure that costs are reduced - if the scheme is small then the transaction costs are proportionally too high.
- Need to ensure that scheme is well marketed/ advertised.

3.2 Pros and cons of microgeneration technologies

Table 3: Pros & cons matrix of potential renewable energy products that the LCLC could provide to customer

TECHNOLOGY	PROS	CONS
Solar Water Heating	<ul style="list-style-type: none"> • one of the cheaper renewable energy technologies, with a manageable payback period - especially if combined with a partial grant • reliable technology - assured energy savings • simple to install and fairly simple to maintain • substantial opportunity to increase SWH installations and output across London • a high volume SWH installation programme has yet to be achieved in existing housing in London 	<ul style="list-style-type: none"> • fairly limited energy savings - 60% of domestic hot water needs • needs water tank and therefore does not work with combi boilers which are typical in flats • does not capture people's imagination as much as power generating technologies

Photovoltaics (PV)	<ul style="list-style-type: none"> • reliable technology - assured energy savings • simple to install and fairly simple to maintain • substantial opportunity to increase PV installations and output across London • a high volume PV installation programme has yet to be achieved across London 	<ul style="list-style-type: none"> • difficult to establish a sustainable financing mechanism due to high cost • very expensive, with extremely long payback period - needs grants and revenue subsidies/ feed-in tariffs in order to provide through an ESCo • tends to deliver limited carbon reductions due to high cost
Small scale wind	<ul style="list-style-type: none"> • a very visible technology that demonstrates green commitment • 6kW turbine more reliable than micro-turbines for individual homes - and could fit on commercial or public sector buildings 	<ul style="list-style-type: none"> • not well established or proven carbon saving technology • limited wind resource in London & turbulence due to buildings • expensive with long (& uncertain) paybacks • questions about size of market in London - probably limited in dense urban environment
Biomass boilers	<ul style="list-style-type: none"> • is becoming a mainstream, proven carbon saving technology • saves a lot of carbon • potentially large market place, particularly if installed in social housing blocks, schools etc 	<ul style="list-style-type: none"> • air quality impacts could limit the scope within London • requires access for fuel delivery • difficult for a leasing vehicle to deliver large enough schemes for biomass CHP • wood fuel supply chain in London needs development
Small scale CHP	<ul style="list-style-type: none"> • a mainstream, proven technology that can save carbon at low cost • potentially large market available in large commercial and public sector buildings. • micro-CHP systems suitable for households and small businesses are expected to be launched in 2009 and may offer opportunities for cost-effective carbon savings. 	<ul style="list-style-type: none"> • off-the-shelf package is difficult to develop for CHP as its success is very dependent on specific circumstances regarding heat load profile - however, appropriate characteristics can be defined • carbon saving varies from application to application • not such a simple package - requires highly involved long term maintenance support - which might raise extra costs for the leasing vehicle business plan • already companies providing CHP installation and maintenance with long term payment contracts
Ground source heat pumps	<ul style="list-style-type: none"> • proven, reliable technology and not too high cost 	<ul style="list-style-type: none"> • not a simple retrofit technology - can be very disruptive to install and difficult in high density & commercial development • market in London could be fairly small - not much space for installing pipework • does not reduce carbon as effectively as biomass boilers or CHP

3.3 Pros and cons of energy efficiency measures

Table 4: Pros & cons of potential energy efficiency products that the LCLC could provide to customer

MEASURE	PROS	CONS
Condensing boiler replacement	<ul style="list-style-type: none"> • reduces carbon emissions by 20% (compared to older boilers) • brings forward replacement - thereby removing inefficient boilers • potentially very large market - lots of old inefficient boilers in range of sectors across London 	<ul style="list-style-type: none"> • not a very innovative technology • this measure only brings forward carbon savings that will happen anyway - the boilers will be replaced within the next 15 to 20 years. However, the recent IPCC report outlines the need to begin reducing emissions immediately - peak by 2015 and 60% reduction by 2050. • are condensing boilers the lowest carbon heat supply option? Should the LCLC roll out a sub optimal low carbon solution? • what about the embodied energy/ carbon within the old waste boilers? But would this be the case even if CHP units were installed?
External wall insulation	<ul style="list-style-type: none"> • potential solution to improving energy performance of London's solid walled housing • CERT funding not able to cover high costs - could a top-up loan cover the rest of the costs 	<ul style="list-style-type: none"> • very expensive installation with long payback • not possible in conservation areas or installing on period housing • not suitable for a rental agreement - would need to be hire purchase as ownership would need to transfer to customer
Internal wall insulation	<ul style="list-style-type: none"> • potential solution to improving energy performance of London's solid wall housing • CERT funding not able to cover high costs - could a top-up loan cover the rest of the costs 	<ul style="list-style-type: none"> • very expensive installation with long payback • disruptive installation process - difficult to persuade residents/ homeowners to participate
Heat recovery ventilation	<ul style="list-style-type: none"> • important part of super insulated buildings but only as a package with high levels of insulation 	<ul style="list-style-type: none"> • would be installed as part of package with other efficiency improvements
Triple glazing	<ul style="list-style-type: none"> • this is the type of radical energy efficiency measure that is needed for achieving significant carbon reductions • no other schemes are taking this forward 	<ul style="list-style-type: none"> • very expensive - difficult to obtain via payback as part of a retrofit scheme

3.4 Access and routes to markets

Retrofit & refurbishment programmes

Working with retrofit and refurbishment programmes to install energy efficiency measures and heating improvements, such as condensing boilers and biomass boilers is a very efficient approach that provides access to buildings and also reduces installation costs.

Housing

It may be difficult to access private sector housing customers and there is a high transaction cost in dealing with a large number of small customers. Domestic customers also tend to have a high credit risk compared to large organisations due to the high levels of debt associated with domestic customers and their general lack of capital/ credit. If the LCLC were to target housing, then it would need to work with social housing providers so that it could deal with large number of housing units at a time to reduce transaction costs and also improve credit worthiness. The social housing sector represents 26% of London's housing stock: this could potentially be a very large market for the LCLC.

Public Sector

Larger organisations and therefore lower transaction costs for the LCLC in terms of dealing with clients. However, there are a number of other initiatives targeted at public sector organisations across London as is outlined in Table 1 above. In addition, public sector organisations already have access to low interest financing and so don't face the same capital constraints as households and SMEs. Therefore the public sector is most likely to be interested in the benefits of a hassle-free low carbon product that eases implementation problems than they are in low cost finance.

Commercial sector

The commercial sector is a very diverse consisting of SMEs and large corporations. Accessing SMEs has similar challenges to the household sector with significant marketing difficulties and high transaction costs. Larger businesses are easier to access and may have more time and interest in climate change issues. There is also a high density of large commercial organisations within London - and accessing them in London is simpler due to the number of business partnerships and also the recent low carbon initiatives developed by the GLA group, details below. There are may also be tenancy problems with little incentive for either tenants or landlords to install low carbon technologies - but the LDA's Better Building Partnership aims to overcome these issues.

Marketing through GLA group initiatives

The GLA group has a number of climate change awareness and carbon reduction initiatives. Initiatives such as the Green 500 and Better Buildings Partnership (BBP) provide a substantial opportunity to promote a well-designed, carbon reduction product to significant numbers of large energy consuming organisations in London - and indeed the whole of the UK due to the number of headquarter buildings in London. However, there is also the risk of 'energy initiative overload' with the potential for confusion or irritation amongst London's commercial organisations.

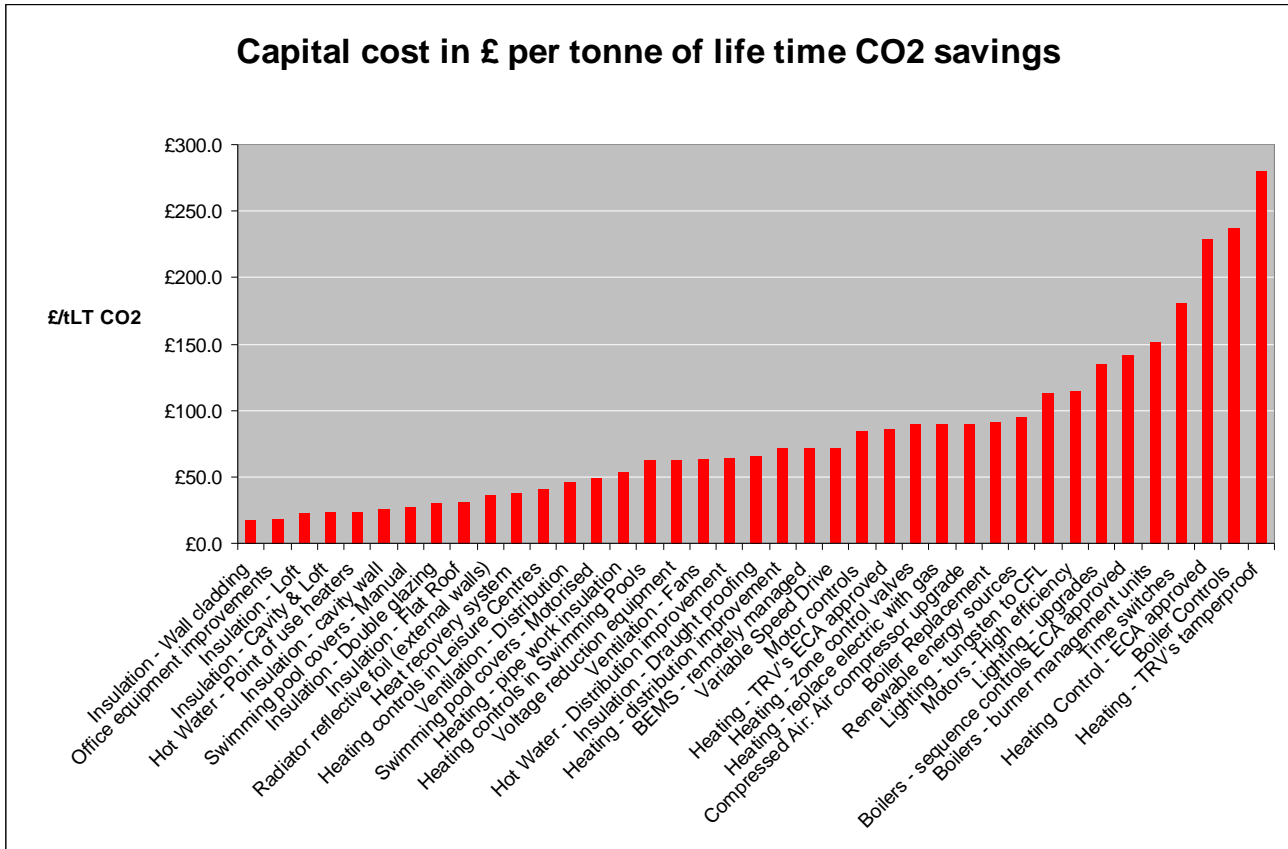
3.5 Key selection criteria for a suitable low carbon leasing product

Cost effectiveness of measure

In order to develop a viable business case for a LCLC, it will need to install low carbon technologies that repay their investment costs within a maximum of 5 to 7 years, in line with commercially acceptable returns on investment. If technologies with a longer payback are included then the LCLC will need to obtain grants or other forms of subsidy in order to create a sustainable business model. In general the most successful energy schemes have focused on energy efficiency products that are simple to install and have a fairly quick payback period (and also therefore tend to have the best carbon saving impact). The technologies with the quickest

paybacks tend to be the simpler energy efficiency measures, such as loft insulation and heating system improvements. Conversely, most renewable energy technologies have a long payback period and would require some form of subsidy in order to successfully be taken forward through a leasing vehicle. Figure 1 outlines the cost per tonne of CO₂ saved for a wide range of energy efficiency measures (data from Salix Finance projects). These measures have an average payback of 5 years.

Figure 1: Cost of reducing carbon for various efficiency measures



Carbon saving potential of measure

The Mayor of London's Climate Change Action Plan (CCAP) aims to reduce carbon emissions across London by 20 million tonnes by 2025 - these reductions are divided between housing (39%), commercial & public sectors (39%) and transport (22%). The technology and sector specific targets in the CCAP include:

- A 2.2 million tonnes CO₂ reduction through an increase in CHP so that CHP provides a quarter of London's energy by 2025.
- A 0.5 million tonnes CO₂ reduction through PV and micro wind.
- A 1.1 million tonnes CO₂ reduction from energy from waste.
- A 1.5 million tonnes CO₂ reduction from energy efficiency improvements in commercial & public sector buildings. and,
- A 2.5 million tonnes CO₂ reduction from energy efficiency improvements in housing.

The LCLC should aim to implement a low carbon technology or package that is able to play a significant role in contributing to London's carbon reduction targets. As outlined above, the measures with the quickest financial paybacks tend to also deliver the greatest carbon savings. The total carbon saving achievable across London also depends on the scale of the opportunity for installing a particular measure - for example, although a swimming pool cover saves a lot

more energy than cavity wall insulation in a single home, there are far more homes across London than there are swimming pools, and therefore cavity wall insulation has a greater carbon saving potential.

Simplicity of implementation/ deliverability

The simpler the offering and installation, the more likely the success of the scheme. 'Plug and play' is a far simpler approach than a more involved, complex and costly installation. The LCLC will need to keep maintenance support down to a minimum to keep costs manageable, and the business case viable.

Value added

The product provided by the LCLC would need to add value or go beyond the existing initiatives on the market place - it will need to fill a gap within the existing support mechanisms for low carbon installations. Although the main value added service provided by the LCLC will need to be that of overcoming finance barriers (and particularly the lack of upfront credit for building owners), the LCLC will provide the equally important service of reducing complexity for the customer -the plug-in and play concept - and the benefit of a no-hassles, off-the-shelf product.

Market/ policy failure corrected

In assessing the value added benefit of the scheme - overcoming market and / or policy failures will be key to the success of the LCLC. These market failures include poor information and lack of time to install sustainable energy activities and the low value allocated to carbon reductions.

High 'replicability' potential

The scope to replicate the scheme and learn from its performance is an important criterion when determining the product and approach for the LCLC.

Marketability & access to markets

The success of the LCLC will significantly depend on its ability to access its potential market. Targeted advertising and delivery through partner organisations will definitely be key to this market. Are some products easier to market than others, and what are the key success criteria for effective marketing of energy schemes and ESCos?

3.6 Lessons from existing initiatives in London

Lessons from the Solar for London scheme

Overview of Solar for London

The Solar for London (SfL) scheme is an important case study for the LCLC as it sought to overcome the barriers to solar water heating (SWH) in London. SfL was launched by the Mayor of London in 2003 and was managed by SEA/Renue (now Carbon Descent). The scheme was designed to overcome the barriers to SWH in London and to stimulate installations of domestic SWH, primarily focusing on private sector housing. Key issues identified:

- Although interest in the scheme was initially high with a large number of enquiries, these failed to materialise into installations with fewer than 50 installations per year.
- The business plan for SfL was unsustainable as the managing agents (SEA) only received £100 for every successful referral, and this was not enough to cover administration costs of running the scheme.

- Householders are generally not willing to pay the whole installation cost for SWH as they don't perceive the benefits to be large enough.
- SEA are looking to review the scheme and to evaluate its future - following the experience of SfL they are acutely aware of the significant challenges involved in implementing a retrofit SWH programme on existing homes within London.
- SfL did not work with commercial and public sector organisations (other than working with a few schools), and focused on private rather than social housing, and so has not tested these other markets.
- They did not provide a zero interest loan to supplement the partial grant from Low Carbon Buildings Programme and people were put off by the need to contribute their own investment - a leasing approach could potentially overcome the need for any upfront investment by the householder/ building owner and thereby overcome this barrier.
- They did not have a large-scale promotion for the scheme but worked in partnership with London boroughs for publicity and access to householders, and ran adverts in local newspapers - 40% of respondents heard about the scheme through local newspaper adverts.

Review of report, 'Barriers to Installing Domestic Solar Hot Water Systems'

In 2005 SEA used SfL as a case study to undertake an assessment of the barriers to domestic SWH. Key findings of the research, and potential ramifications for the LCLC, include:

- Installation cost is a key barrier and householders are unwilling to invest any money in a SWH installation, and therefore low or zero interest loans - or leasing - should be considered to overcome this barrier.
- Costs and inertia barriers are reduced if SWH is installed at the same time as boiler replacement is needed or other refurbishment (hence the concept of a boiler replacement and SWH package could work very well).
- Grouping together of installations to reduce costs - again this will be the approach adopted by the LCLC, particularly through targeting social housing where multiple installations can occur.
- Good customer care is needed - this struggled when left to the installers, but the LCLC will always maintain a long term relationship with the customer through the leasing approach.
- Marketing partners, such as energy efficiency advice centres did not do a good enough job, and themselves do not have a big enough profile with the public.
- The private homeowners most interested in paying for SWH are in the age bracket of 45 to 65, and of high socio-economic status.
- Potential customers trust a public sector endorsed scheme far more than a private company approaching them directly - again this favours a LCLC that is established by the public sector.
- The cost of SWH, even with the LCBP grant, is too high for most householders to consider. Most householders stated that they'd be prepared to pay up to £1,000 for SWH but fewer than 50% of householders would pay more than this, falling down to just 15% willing to pay up to £2k. However, the average price that SfL is able to supply SWH is £3k.
- Householders stated that the upfront investment cost was the key barrier, and much more so than payback - hence, even with a much quicker payment they still would not want to fork out £2k to £3k upfront.

Lessons from small scale CHP package for social housing

Creative Environmental Networks provides a mini-CHP installation and financing service for a range of potential clients including social housing providers, public sector organisations and businesses for both retrofit schemes and installations in new build projects. This includes provision of an interest free loan which has had a very low take-up. There are multiple barriers to CHP and financing is only one of them. Approximately 12 systems have been installed over the three and a half years that the service has been running, and a number of these were installed outside London. Most clients have tended to opt for self-financing and to use the service to help overcome other issues involved in installing CHP, such as technical and management challenges.

3.7 Opportunities for embedding the LCLC within existing initiatives led by the GLA family

The Building Energy Efficiency Programme

The programme was launched in 2006 and aims to make available financing for energy efficiency measures in London's public sector buildings. The first project is the energy efficiency programme being implemented by Transport for London (TfL) (who have an agreement with Honeywell) and the Metropolitan Police Authority and London Fire (MPA) and Emergency Planning Authority (LFEP, who have a contract with Dalkia). TfL, MPA and LFEP are financing the measures themselves and a payback period of up to 10 years is likely to be allowed.

The potential market for the LCLC within the BEEP is likely to be small due to the fact that it already makes available low cost financing (allowing payback of 10yrs) and the LCLC may struggle to compete with this other source of financing. Organisations participating in the BEEP might be interested in an off-the-shelf installation package that takes the hassle out of developing and executing a low carbon technology project but are less likely to be interested in a financing product.

Although the LCLC could offer its services to members of the GLA family and other organisations that participate in the BEEP, it would not be sensible to include this market as a key element within the LCLC business plan.

LDA programmes

Green 500 - the LCLC could potentially provide a financing and installation package to the Green 500 providing a low carbon technology such as accelerated boiler replacement and solar water heating. At present the number of participating organisations is fairly small - although they are all large organisations with potentially large energy consumption - and although the Green 500 could be a useful customer stream they should not necessarily be considered a key customer base for the LCLC. It is not clear whether the Green 500 project managers, or any of the other GLA led initiatives, would promote the LCLC to participating organisations over and above any other products offered by energy service suppliers on the market place.

BBP - the BBP has not yet progressed to the implementation stage of energy reduction measures. Potentially, the LCLC could work well with the BBP to provide an installation and financing package for landlords.

Green Homes - at the time of writing, the Green Homes Concierge Service had not been running for long enough to provide the data that argues for or against the need for a delivery vehicle for solar water heating or PV. However, the ethos of the service is that the householders themselves will exercise choice over what type of system and installers that they use. If a LCLC scheme was in operation it would be identified as an option along side any other similar offers that fit

the house in question. Some customers however, may not be interested whether it is endorsed or operated by the GLA family. The concierge service delivery agents could however make customers aware of the solar water heating leasing vehicle as one option amongst others, such as householders purchasing outright a solar water heating system from a range of potential suppliers & installers.

The general conclusion is that customers of the Green Homes Concierge Service could potentially utilise a solar water heating leasing product, but the key concern is whether they would constitute a large enough customer base upon which to structure the business plan for the LCLC - for example, would 1,000 customers a year constitute a large enough economy of scale to generate low cost financing and procurement of low carbon kit and installers?

3.8 Consideration of other potential financing approaches

Potential partnership with a major utility following March 08 budget announcement

The March 08 budget stated that government will,

'develop voluntary agreements with all energy suppliers to promote the market for energy services. Suppliers will be expected to develop, trial and promote innovative service packages, commit to better data sharing and monitor their impact'.

The requirement on energy suppliers to develop energy services packages could present an opportunity for the LCLC, as a utility could be a partner within the LCLC and provide the financing for the measures. However, as yet there is no policy or legislation behind the government's stated desire for energy services to be developed, and CERT remains the main potential financing instrument for involvement from energy suppliers.

'Re-charge' financing scheme for domestic micro renewables

Kirklees Metropolitan Council is in the process of allocating £3 Million to a 'recharge' financing scheme for renewables energy installations on homes in the borough. The council will provide financing of up to £10,000 per household, and this sum (plus inflation) only has to be returned when the house is sold - at which time it is re-invested in the general renewables pot and made available to other households. The loan is made available to householders in return for a guarantee on their home or a 'second charge' on the home in addition to the mortgage. As the turnover of homes is fairly quick, with people moving home every 7 years on average, the loans will be repaid on average within 7 years and then the money is available to other householders. Kirklees previously operated an interest-free loan scheme for renewables installations and found take-up to be low, hence they are launching this new approach. The scheme is strongly backed by the Renewable Energy Association.

4 Evaluating potential options and structures for the LCLC

4.1 General approach of the LCLC

Business & financial approach

As the analysis above makes clear, the market place for energy initiatives in London is fairly saturated and the LCLC will need to be clear in how it adds value to the existing initiatives and brings something new to the energy arena. The general approach of the LCLC would be to provide a solution to the lack of capital for energy efficiency measures or microgeneration units through leasing low carbon assets and to use its strategic position to reduce expenditure costs and access a large market so as to develop a sustainable business model. Approaches for reducing expenditure and increasing revenues include:

Reducing expenditure

- bulk discount prices for both products & installation
- low cost finance provided through the leasing company (at a 10% interest rate as compared to more commercial borrowing rates of 15% or more)
- reduced marketing costs due to access to markets through existing GLA family initiatives & partnerships.

Increasing revenues

- lease payment from customers
- carbon finance from feed-in tariffs or offset funds if government policy changes to allow this.

Suitable market sectors for the LCLC

The LCLC needs to focus on accessing large numbers of customers at minimum transaction cost, to whom it can deliver tailored, low-hassle packages. We therefore recommend that the LCLC should avoid working directly with householders or small businesses, and instead will communicate through representative organisations. If the LCLC concentrates on specific technology packages such as conventional heating system improvements or solar water heating installations, then the financial & delivery model could be slightly adjusted depending on whether the LCLC focuses on the housing sector or non-domestic buildings. The LCLC could therefore focus on working with a specific number of partnership organisations to access large markets in a number of sectors where the low carbon products / package could be targeted, such as:

- for social housing - G17 partnership of London Housing Associations
- for commercial buildings - business/ commercial partnerships, such as the BBP or Green 500
- for the public sector - London boroughs through the energy managers group or Carbon Trust local authority programme.

4.2 Overview of short-listed 'products' for the LCLC

In this section three potential product options for the LCLC are considered. These are:

- micro renewables installations for mix of sectors
- accelerated boiler replacement and package of energy efficiency measures for mix of sectors
- small scale CHP installation for mix of sectors.

The key difference between these options is that the micro renewables package carries the greatest financial risk, followed by the CHP installation service, with the need for additional external funding sources (capital or revenue) in order to create a viable business model for leasing or hire purchase. Although the provision of boiler replacement services deals with a mainstream and conventional technology, through speeding up the replacement of old inefficient boilers with modern high efficiency boilers the scheme would deliver significant carbon savings and help address an existing market failure. The strengths and weaknesses of these three potential options are evaluated in more detail below.

4.3 Micro renewables installations

The micro renewables installation option could take the following permutations:

- micro renewables installations for social housing - providing solar water heating, photovoltaics, small scale wind turbines, biomass boilers.
- micro renewables installations for social housing and commercial and public sector buildings.
- micro renewables and radical energy efficiency package to one or all three of the sectors above.

Table 5: Potential approach and product for microgeneration technologies

DELIVERING MICROGEN PRODUCTS TO HOUSEHOLDS AND COMMERCIAL & PUBLIC SECTOR	
Description (and market sector)	<p>Providing a financing and installation package for solar water heating, PV, small scale wind and biomass boilers for social housing, public sector and commercial sector buildings. The financial package includes:</p> <ul style="list-style-type: none"> • bulk discount on technologies and installations • grant collection (from LCBP & if possible others eg CERT) • low interest loans used by LCLC to cover investments - returned through rental payments • obtaining carbon finance to top-up short fall • customers sign the rental agreement & the installation is provided. If they renege on rental payment, then the LCLC can remove the installation.
Carbon saving & size of market	<p>Each technology saves differing amounts of carbon, and it depends on the size of installation. However, general carbon saving potential for each technology in London are (from London Carbon Scenarios to 2026, LEP):</p> <ul style="list-style-type: none"> • SWH - 37ktCO₂ pa • PV - 110ktCO₂ per annum • biomass boilers - 90,000ktCO₂ pa <p>Although the potential market size is larger for biomass boilers, the many site-specific restrictions will reduce this - and make it more difficult to realise (see deliverability section below). SWH and PV are less complicated in terms of ease of installation to realise these targets.</p> <p>Installation of PV and SWH on existing buildings is still very limited. However, SWH is mainly appropriate for housing and has a small benefit for commercial buildings due to the low demand for hot water.</p>

Cost effectiveness	Higher cost approach to carbon saving - dependent on additional sources of finance in order to cover investment costs £2000/tCO ₂ for SWH or £8000/tCO ₂ for PV. The LCLC would need to bring in other revenue sources, such as carbon finance, in order to balance books - maybe future support from feed-in tariffs or the Carbon Reduction Commitment.
Deliverability	High risk - both financial and technical. Perceived risk - this has important consequences for micro-renewables as customers are more wary of products they are less familiar with. Off-the-shelf package would work well for PV and SWH. Biomass boilers are more complex due to need for fuel store and wind turbines would need greater site investigation.
Added value	Bridges the credit gap (through rental approach and carbon finance) and aims to partner with high level organisations for large scale roll-out. Solar for London and other renewable energy initiatives already provide information & advice, and a one-stop-service for renewables installations. However, although they provide reduced costs (through bulk discounts and grants) they still require the customer to pay the remaining capital costs, and they have not partnered with major refurbishment or partnership initiatives for a major roll-out programme.
Replicability	Large potential for replication across all sectors in London and the UK.
Market failure corrected	Corrects several market failures: <ul style="list-style-type: none"> • information - general & technical about renewable installations • lack of time - provides complete package, so that customers do not have to spend time developing the project • carbon externality - carbon finance/ subsidy internalises the carbon value so as to make renewable energy installations economically viable.

4.4 Accelerated boiler replacement with energy efficiency package

The accelerated boiler replacement and energy efficiency package could take the following permutations:

- condensing gas boiler replacement with accompanying energy efficiency measures such as voltage optimisation, heating controls, variable speed drives and lighting upgrades
- condensing gas boiler replacement with SWH
- biomass boiler replacement if suitability of the site permitted biomass boiler and supply.

Table 6: Potential approach and product for accelerated boiler replacement with energy efficiency package

ACCELERATED BOILER REPLACEMENT WITH ENERGY EFFICIENCY PACKAGE	
Description (and market sector)	Providing boiler upgrades for commercial and public sector buildings, and social housing - that is replacing existing old inefficient boiler that are over 25 yrs old with a modern efficient condensing boiler. The active replacement of old boilers will speed up the slow natural replacement process. Bulk purchase of boilers & installers will reduce costs, and the complete off-the-shelf package will make it simple for the customers.
Carbon saving	Typically a 20% carbon reduction for condensing boiler and potentially a 100% reduction for biomass boiler. Accompanying energy efficiency measures such as voltage optimisation and variable speed drives could reduce heating and power consumption by a further 5 to 10%. SWH could further reduce carbon emissions by up to 10% for housing, but less for commercial & public sector buildings. Potential market is larger in commercial and public sector buildings than social housing which is more likely to have improved heating systems through Decent Homes etc. ESD's experience of the age of boiler plant in public & commercial buildings leads us to estimate that approximately 50% of boilers are at replacement age, and therefore could benefit from this scheme. If the customer would like to deliver greater carbon savings then they can opt for gas CHP with solar water heating or biomass boilers if circumstances are appropriate.
Cost effectiveness	Replacement of old boiler has average payback period of 5 years Capex cost per tonne of CO ₂ saved is £800/tCO ₂ .
Deliverability/ Risk	Low risk, both technical and financial. Installation process is routine - i.e. replacing old boiler with new Off-the-shelf package eases the process
Added value	Lots of old inefficient boilers throughout London's commercial and public buildings which building owners are slow to replace. CIBSE recommendation that maximum life of a boiler should be 25 years but many boilers in commercial and public sector organisations are far older than this, at up to 40 years. Although Salix provides public sector bodies with the finance (an interest free loan) to invest in a cost effective measure such as boiler replacement, this LCLC package would undertake the financial assessment on behalf of the customer and thereby stimulate projects that might not otherwise happen.
Replicability	Could be replicated throughout all sectors across London, and elsewhere in the UK. Condensing boiler replacement schemes in the past focused on housing, and not commercial & public sector buildings.
Market failure corrected	Addresses market failures of poor information and lack of time - all customer has to do is sign the leasing contract as opposed to setting up the project, undertaking the cost/ benefit analysis and selecting the best boiler.

4.5 Small scale CHP installation package

The small scale CHP installation would need to be carefully tailored to the application in hand, and would need to be sized correctly in order to ensure cost effective operation. The CHP installation is unlikely to be able to be installed in conjunction with a solar water heating panel as both will compete for the hot water demand - the CHP unit needs to be based on the base

heat load for the building / application which will be its hot water demand. Small scale CHP could be installed in public and commercial buildings and also in social housing where it could supply a housing block/s.

Table 7: Potential approach and product for installation of small scale CHP

SMALL SCALE CHP INSTALLATION	
Description (and market sector)	Providing CHP installations for commercial and public sector buildings, and social housing - i.e. replacing existing old inefficient boilers with CHP units and supporting gas condensing boilers. The replacement of gas boilers with CHP will lead to carbon savings though only in circumstances that can support CHP - i.e. fairly large and constant heat demand. Bulk purchase of CHP units, boilers & installers will reduce costs, and the complete off-the-shelf package will make it simple for the customers.
Carbon saving	Typically a 10 to 20% carbon reduction for replacement of an old boiler with CHP across both heat and power needs of a building. Potential market is largest in commercial and public sector buildings which have large heat demand and the scope for a mixed heat load. However, social housing on communal heating schemes could also be a substantial opportunity.
Cost effectiveness	Replacement of old boiler with CHP has an average cost of £1200/tCO ₂ capex.
Deliverability	Medium risk - mainly financial rather than technical. Installation process is fairly routine but maintenance and management is more complex. Off-the-shelf package eases process .
Added value	Lots of potential for installing small scale CHP in the large commercial & public buildings across London. Although Salix provides public sector bodies with the finance (an interest free loan) to invest in a potentially cost effective measure such as CHP installation, this LCLC package would undertake the financial assessment on behalf of the customer and reduce the financial and technical risk. In the same way as for simple boiler replacement, the GLA family is being provided with low cost finance and energy management expertise through the BEEP, but this has yet to penetrate the wider public sector or the commercial sector.
Replicability	Could be replicated in commercial & public buildings in other cities, and in social housing blocks. Some CHP installation schemes in the past have focused on social housing blocks, but have failed to stimulate many installations.
Market failure corrected	Addresses market failures of poor information, lack of time and carbon externality - particularly if financial support is needed to boost revenue streams.

5 Developing the preferred option for the LCLC

5.1 Proposed market focus for LCLC

Large commercial sector organisations

The review of existing initiatives, market analysis and consideration of alternative options for the LCLC undertaken above, suggests that the large commercial sector is where the LCLC might most effectively provide leasing services. The key arguments for focusing on the large commercial sector include:

- Interest of commercial sector organisations in leasing rather than purchasing assets so as to take them off their balance books.
- Interest of commercial sector organisations in low cost finance (they have less access to low cost finance than public sector).
- Good credit rating of large business (excellent customers for leasing arrangement).
- Very large number of businesses and commercial premises located in London and many of these are very large buildings and energy consumers - and thereby large carbon saving potential.
- Fewer support initiatives targeting commercial sector than for public sector (eg Salix).
- Potentially an opportune time to provide assistance to commercial organisations through the LCLC as the legislative drivers are beginning to put pressure on commercial sector, eg the CRC and the EPBD.
- Good ability for the GLA group to effectively work in partnership with large corporates in London.

It is interesting to note that whilst the BEEP has stimulated activity within the public sector through the energy management contracts between Dalkia and Honeywell and TfL, MPA and LFEPA, there is no similar activity in the commercial sector. The BBP and the Green 500 are both forging important relationships with the owners of a large proportion of London's commercial estate, and the LCLC could play a useful in helping both these initiatives to progress to the stage of implementing physical measures. The BBP is working with approximately 25% of London's commercial estate, which could be a very large market for the LCLC. A comparison of the market characteristics of the large commercial sector with housing, SMEs and the public sector is illustrated in table 8 below.

Table 8: Comparison of different sectors for suitability of low carbon leasing services

Market Sector	Drivers	Characteristics	Current Initiative
Homeowner	Feel good factor, limited grants, cost savings.	Small projects, high transaction costs, high credit risk. volume market.	Solar for London. CEN micro CHP, Green Concierge.
Small and Medium Enterprises	Feel good factor, limited grants, cost savings	Don't own buildings, short term leases, higher credit risk, smaller energy users.	Business Link Energy Advice & Carbon Trust interest free loans.
Large business	Corporate social responsibility, Carbon Reduction Commitment, possible mandatory reporting.	Some large portfolios + long term leases, high cost of capital, credit worthy, large energy users.	BBP Green 500
Public sector	Public sector targets, leading by example, easiest access to grants.	Large estates / portfolio + long term assets, low cost of capital, large energy users.	BEEP Green 500

The benefits to commercial organisations of leasing assets

Commercial organisations are likely to be most interested in leasing energy assets rather than purchasing assets because this keeps the assets off their balance sheets. This is particularly true for commercial landlords who purchase property purely as an investment and do not make money available to invest in property improvements. In the current economic climate, in particular, commercial organisations will be acutely appraising investments in energy efficiency measures to convince themselves that it is a good use of scarce capital. Leasing would offer the opportunity to match annual savings against annual lease repayments, thereby reducing the need to secure debt and equity to bring about improvements to the building stock.

Energy efficiency measures package

The low carbon technology analysis has highlighted that energy efficiency measures are generally the most commercially viable and lowest risk product upon which to base the business plan for the LCLC. This is due to energy efficiency measures:

- Being the most cost effective - thereby enabling rental fee to be lower than for renewables so that customers can enjoy a reduction in energy costs in the longer term.
- Having the largest market due to potential for all organisations to install energy efficiency measures and products, for example all buildings have boilers that could be replaced or have better controls, whereas only a proportion of buildings are suitable for PV or solar water heating.
- Ability to develop a simple yet complete package combining installation, maintenance, operation and financing for basic energy efficiency improvements, such as boiler replacement.

The commercial benefits of energy efficiency services are highlighted in table 9 below.

Table 9: Comparing commercial characteristics of energy efficiency measures, CHP and renewable energy

Technology Focus	£/tonne CO ₂	Size of Market	Current Initiative
Renewable Energy	High	Small	Solar for London
CHP	Medium	Medium	CEN - micro CHP
Energy Efficiency	Low	Large	BBP Green 500

The energy efficiency package implemented by the energy management company and financed through a leasing approach, reduces the customer's energy bill by up to 25% and their leasing payments will be lower than the savings from the energy efficiency measures. This net positive financial arrangement could not be delivered with renewable energy installations which would require a far higher leasing payment than the associated savings in energy bill resulting from the installations.

Energy efficiency package for commercial organisations

The Carbon Trust has worked with hundreds of organisations through its carbon management programmes to identify carbon saving opportunities in portfolios of existing buildings. This has provided a wealth of useful data on the likely emission reductions that can be achieved in a cost effective manner, given a range of property types, ages and uses. Local Authorities participating within the Carbon Trust's Local Authority Carbon Management programme have typically set carbon reduction targets of 25% within a five year period. However, the ease for businesses of implementing measures in partnership between landlord and tenants may be lower than that which is achievable by local authorities with direct control of all buildings. Furthermore, investment and fund managed properties are constantly being bought and sold which would lead to a changing carbon baseline and present a barrier to investment.

The package of energy efficiency measures delivering a 25% carbon reduction typically include the following:

- boiler replacement
- heating controls and zoning
- insulation
- voltage optimisation
- variable speed drives
- lighting upgrades and controls.

These typical energy efficiency measures can be implemented on behalf of commercial organisations by energy contract management companies, who typically offer energy management in return for a share of the financial savings in the organisation's energy bill - this is referred to as 'energy contract management' and the contract is based around certain energy performance standards that the energy management company needs to achieve. They could also offer their services through a leasing arrangement that pays for the capital and installation cost of the measures - this may increase their penetration into commercial sector organisations within London and also increase the breadth of measures going beyond only those that pay back the very quickest. Of the energy efficiency measures outlined above, boilers, variable speed drives and voltage optimisers are particularly suited to leasing as they are largely self contained pieces of kit which can be installed and replaced fairly simply.

5.2 Size of potential market within the commercial sector

The data available from the London CCAP aggregates the commercial and public sectors, and therefore the following analysis considers the market size across both sectors. The commercial and public sector is responsible for 17.9 million tonnes of CO₂, which is 40% of London's total emissions.² There are 110 million square metres of commercial and industrial floor area in London³ consisting of:

- warehouses & factories - 24%
- offices including government - 26%
- retail - 16%
- hotels -14%
- education - 10%
- health - 5%
- sport & leisure - 4%

Table 10 calculates the market potential for carbon savings through energy efficiency measures within the public & commercial sectors in London. This in turn illustrates that the market potential for the LCLC operating within the commercial sector is 500,000 tCO₂ per year. The total emissions for the sector are 17.9 million tCO₂ and assuming 25% technically potential savings from a package of standard energy efficiency measures (as illustrated by Carbon Trust programmes) and a market reach of 13% in terms of accessing these technical savings, then the market potential is approximately 3% of the total, which is 500,000 tonnes of CO₂ per year.

Table 10: Assessing the carbon reduction potential for a LCLC targeting the commercial and public sector

	% total area	Area (m ²)	Benchmark emissions (kg CO ₂ /m ²)	Normalisation factor	Baseline emissions (tCO ₂)	Technical potential (%saving)	Market potential (% market reach)	Carbon saving potential of LCLC (tCO ₂)
Warehouses & factories	24	26,400,000	24	2	1,267,200	25%	15%	47,520
Offices including government	26	28,600,000	73	2	4,175,600	25%	10%	104,390
Retail	16	17,600,000	144	2	5,068,800	25%	10%	126,720
Hotels	14	15,400,000	108	2	3,326,400	25%	15%	124,740
Education	10	11,000,000	45	2	990,000	25%	10%	24,750
Health	5	5,500,000	101	2	1,111,000	25%	10%	27,775
Sport & leisure	4	4,400,000	174	2	1,531,200	25%	15%	57,420
			CALCULATED TOTAL		17,470,200			513,315
			REFERENCE TOTAL		17,900,000			

² London Climate Change Action Plan, February 2007

³ London Climate Change Action Plan, February 2007

6 Proposed business model for the LCLC

6.1 Assessing the costs of achieving the market potential for the LCLC

The Salix Finance programme for local authority investments provides a useful benchmark which shows that the approximate capital cost of achieving carbon savings in existing large buildings is around £500 per annual tonne of CO₂ and less than £100 per lifetime tonne of CO₂. In order to achieve a saving in annual emissions of 500,000 tonnes (the market potential for a LCLC focused on the commercial sector as outlined above), a total capital investment of around £250 million (500,000 multiplied by £500) would therefore be required. It is assumed that the delivery of these measures would be spread over 10 years and that the lifespan of the LCLC in delivering an energy efficiency package of measures to commercial organisations totalling 500,000 tonnes of CO₂ would be spread over 10 years.

6.2 Developing the cashflow analysis for the LCLC

An illustrative breakdown of set up costs, operating costs and revenues for the LCLC is shown in Figure 2, and this illustrates that the LCLC could be a viable business with positive cashflows. The discounted cashflows over a 15 year period illustrates that the net present value (NPV) of the investment in the LCLC would be £2.2 million with an Internal Rate of Return (IRR) of 21%. Investment in the LCLC and in leasing energy assets generates positive financial returns with a small surplus which could be re-invested in the LCLC to enhance marketing and other cost areas. Sensitivity analysis of the key input parameters and market testing to build confidence in the modelled costs has been undertaken in subsequent pages.

Defining the key parameters in the business model

The assumptions behind the key parameters in this high level business model are as follows:

- An annual investment of £25 million is undertaken through the LCLC by the leasing company and the energy management company over a 10 year period - this is a 10 year spread of the overall £250 million that is the identified market potential for the LCLC.
- Annual leasing payments from customers to the leasing company cover the repayment costs for the energy assets over 10 year period and include a 10% interest rate levied by the leasing company - the 10% interest rate levied by the leasing company is an estimated market rate for leasing assets.
- A management fee to cover the LCLC's administrative costs is levied at 1% of the total annual leasing amount paid by customers to the leasing company - which should be large enough to generate adequate revenue to cover the LCLC's management costs whilst being small enough not to harm the competitiveness of the LCLC service.
- A fixed annual administration and management cost for the LCLC of £1.25 million that covers staff costs, marketing costs and administrative costs of operating the LCLC - this equates to 5% of the total annual investment sum that the LCLC will oversee each year and takes reference from other ESCOs in terms of management costs relative to capital expenditure.
- The size of the LCLC customer base is considered essential to the strength and viability of the business case, and if the reach of the LCLC is far below the market potential identified then the management costs will become proportionally too large and the economy of scale benefits will not be realised.

Any surplus that the LCLC might generate - which is shown as £2.2 million in our business model over a 15 year period - could be used to further develop the internal operations or market reach of the LCLC. This is discussed in more detail in section 7.4 below that considers the potential organisational and legal structures for the LCLC.

LOW CARBON LEASING VEHICLE - DRAFT BUSINESS MODEL

Updated 12-Jun-08

dummy variable

£	1	% change	Sensitivity
500,000		0%	-18.72%
£ 500		0%	-18.72%
£ 250,000,000		0%	-18.72%
10		0%	48.00%
£ 25,000,000		0%	-18.72%
10.00%		0%	51.49%
0.75%		0%	-18.72%
£1,250,000		0%	23.76%
10.00%		0%	

NPV	2,259,158
IRR	21%

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discount Factor	1.00	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.39	0.35	0.32	0.29	0.26	0.24
Setup costs																
Partner selection	£ 75,000															
Financial arrangements	£ 50,000															
Legals	£ 75,000															
Recruitment of staff and set up of systems	£ 50,000															
Marketing	£ 50,000															
Total	£ 300,000	0%	753.05%													
Capital Expenditure																
	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000	£ 25,000,000
Annual Payments from customer to Leasing Company																
Annual Repayments to leasing company (y1 investments)	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y2 investments)		-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y3 investments)			-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y4 investments)				-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y5 investments)					-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y6 investments)						-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y7 investments)							-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y8 investments)								-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y9 investments)									-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Annual Repayments to leasing company (y10 investments)										-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635	-£ 4,068,635
Total Repayments to Leasing company	-£ 4,068,635	-£ 8,137,270	-£ 12,205,905	-£ 16,274,539	-£ 20,343,174	-£ 24,411,809	-£ 28,480,444	-£ 32,549,079	-£ 36,617,714	-£ 40,686,349	-£ 44,754,984	-£ 48,823,619	-£ 52,892,254	-£ 56,960,889	-£ 61,029,524	-£ 65,098,159
Operating Costs																
Operation and maintenance costs (£/a)	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000
Total costs	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000	£ 1,250,000
Revenue																
Management fee	£ 305,148	£ 610,295	£ 915,443	£ 1,220,590	£ 1,525,738	£ 1,830,886	£ 2,136,033	£ 2,441,181	£ 2,746,329	£ 3,051,476	£ 2,746,329	£ 2,441,181	£ 2,136,033	£ 1,830,886	£ 1,525,738	£ 1,220,590
Total revenue	£ 305,148	£ 610,295	£ 915,443	£ 1,220,590	£ 1,525,738	£ 1,830,886	£ 2,136,033	£ 2,441,181	£ 2,746,329	£ 3,051,476	£ 2,746,329	£ 2,441,181	£ 2,136,033	£ 1,830,886	£ 1,525,738	£ 1,220,590
CASHFLOW																
discounted cashflow	-£ 300,000	-£ 944,852	-£ 639,705	-£ 334,557	-£ 29,410	£ 275,738	£ 580,886	£ 886,033	£ 1,191,181	£ 1,496,329	£ 1,801,476	£ 1,496,329	£ 1,191,181	£ 886,033	£ 580,886	£ 275,738
Cumulative discounted cashflow	-£ 300,000	-£ 1,158,957	-£ 1,687,638	-£ 1,938,996	-£ 1,959,083	-£ 1,787,872	-£ 1,459,977	-£ 1,005,302	-£ 449,607	£ 184,983	£ 879,530	£ 1,403,984	£ 1,783,531	£ 2,040,183	£ 2,193,148	£ 2,259,158

NPV Over 15 years	£	2,259,158
Internal Rate of Return (IRR)		21%

Figure 2: DRAFT BUSINESS MODEL FOR LCLC

6.3 Sensitivity analysis of the LCLC business model

Introduction

In the context of business models, sensitivity analysis is useful to demonstrate the key factors that will influence the project outcome, usually measured in terms of NPV or IRR. Although simple in concept and with the limitation that only one parameter is changed one at a time, the sensitivity analysis does reveal both the sensitive parameters and indicates the materiality of changes in input parameters. Whilst sensitivity analysis is useful, it should be used only to supplement the understanding of the risks inherent to the proposed business project.

The sensitivity analysis looks at changes in three key parameters one at a time as illustrated in Table 11 below. For each parameter it considers what increase or decrease can be tolerated before the LCLC project is not viable - that is when the NPV is reduced to zero. The sensitivity values in Table 11 illustrate the percentage changes that each of the three relevant parameters can tolerate before the NPV is zero.

Table 11: Sensitivity analysis of key parameters in the LCLC business model

<i>Sensitivity for when NPV = 0</i>		
Parameter	Value in model	Sensitivity
Interest rate to leasing company	10.00%	51%
Management fee paid to LCLC Admin/ management costs for the LCLC	0.75%	-19%
	£ 1,250,000	24%

Increased costs for the LCLC (such as due to larger marketing costs or more significant administration costs)

The business model allocates an annual management cost of £1.25 million for the management and operation of the LCLC (related to an annual investment cost of £25 million on the purchasing and installation of energy efficiency assets). The sensitivity of the business case to a variation in this cost of 20% above and below has been tested, and the result highlights that the management costs faced by the LCLC will be very significant in terms of the viability of the venture. If the annual management costs were to increase above £1.5 million then the NPV of the business venture will fall below zero.

Levying a management fee on customers

The business model has allocated an annual management fee on its customers so as to cover administrative costs. In the standard model this is set at 1% of the value of the annual leasing repayment amount that customers are paying to the leasing company. If the management fee is increased beyond 1% then the business is improved - the key question is whether the customers will be willing and able to pay an increased fee. The business assessment in section below suggests that customers would be willing to pay more as they still save money. The most sensitive is the LCLC management fee. This analysis signifies that if management fees were reduced by more than 19%, then the project will not be viable and result in a NPV below 0. This is not surprising as the management fee represent the main revenue stream for the LCLC.

Alternative interest rates for the leasing company

The least sensitive parameter of the three tested, is the interest rate to the leasing company, which can be increased by 51% before the NPV goes down to zero.

Impact on IRR of a 10% change in value of these key parameters

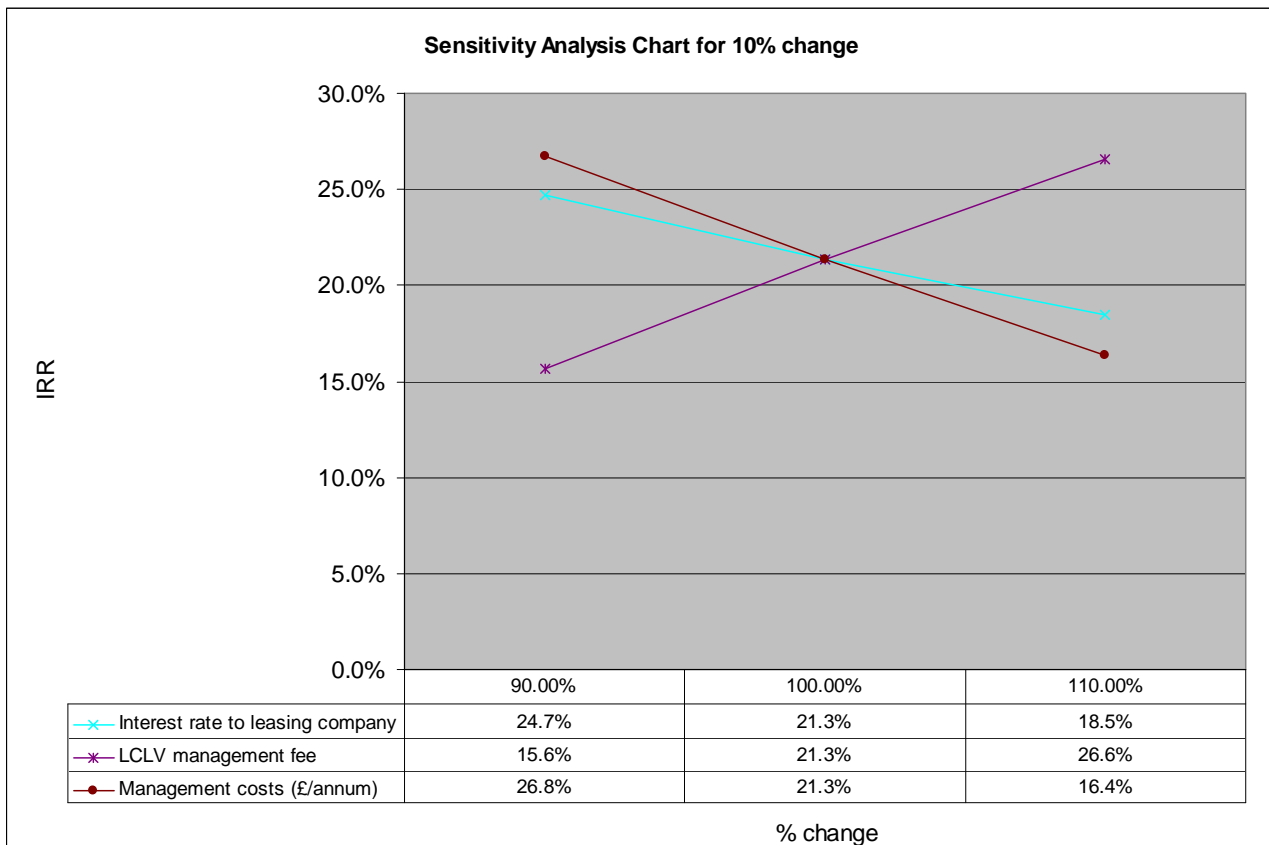
An alternative way of communicating the sensitivity of these parameters to changes in value, is to measure the impact of a 10% value change on the IRR of the LCLC as illustrated in figure 4. Figure 4 illustrates the changes to the internal rate of return (IRR) when the relevant parameters experience a 10% increase and 10% decrease.

The steep slope of the lines representing:

- The management fee levied by the LCLC to cover administrative costs and
- the assumption regarding the LCLC's actual management costs

illustrates that these are more sensitive to the business viability than the size of the interest rate charged by the leasing company which has a shallower line.

Figure 3: Impact on the IRR resulting from a 10% change in key parameter values



Alternative discount rates for the LCLC business model

The discount rate used in the business model is 10% which reflects a typical public sector discounting rate. If the LCLC were to be entirely operated by private sector partners, then they might choose a higher discount rate to reflect the opportunity cost of investing finance in other projects that might generate higher returns. The IRR represents the value of the discount rate when the NPV of the investment is zero and therefore the IRR

sensitivity analysis in figure 4 illustrates that even if the discount rate were as high as 21% the LCLC would still represent a positive investment.

6.4 Potential organisational structures for the LCLC

Option 1 - LCLC undertaking a brokering role

The LCLC could consist of a contractual relationship between a managing company, a leasing company and an energy management company with the LCLC managing company undertaking a brokering role. The structure is illustrated in figure 5 below.

In terms of regulatory matters, the Consumer Credit Act 1974 (CCA) requires most businesses that offer goods or services on credit or for hire, or that lend money to consumers, to be licensed by the Office of Fair Trading (OFT). The CCA also applies to brokers and other intermediaries. This includes companies who simply arrange credit for their customers using the services of a leasing or finance company. The categories of activity that require a credit licence are as follows:

- Category A: Consumer credit business
- Category B: Consumer hire business
- Category C: Credit brokerage
- Category D: Debt adjusting
- Category D2: Non-commercial debt adjusting
- Category E: Debt counselling
- Category E2: Non-commercial debt counselling
- Category F: Debt collecting
- Category G: Debt administration (from October 2008)
- Category H: Provision of credit information services (various) (from October 2008)
- Category I: Credit reference agency

If, as proposed, LCLC will only target large commercial sector organisations then to the extent that the LCLC carries on an activity licensable under the CCA it will be exempt. This means that it will not be necessary for the LCLC to obtain a licence under the CCA.

If the LCLC was to target retail consumers (e.g. homeowners) or smaller businesses such as sole traders or small partnerships then it would be necessary for LCLC to become licensed under CCA. Failure to do so would be a criminal offence.

As the cost of obtaining a consumer credit licence is relatively low (there is currently a yearly fee of £725.00 per licence) the LCLC may wish to consider applying for a licence irrespective of the target customer base to ensure that the LCLC has an appropriate credit licence in place. This would minimise the risk for the LCLC in the event that the LCLC targets a homeowner or small partnership accidentally. It is worth noting that it takes around 4 - 8 weeks to obtain a licence so if the LCLC does decide to widen its target base it should factor in the time required to obtain a licence.

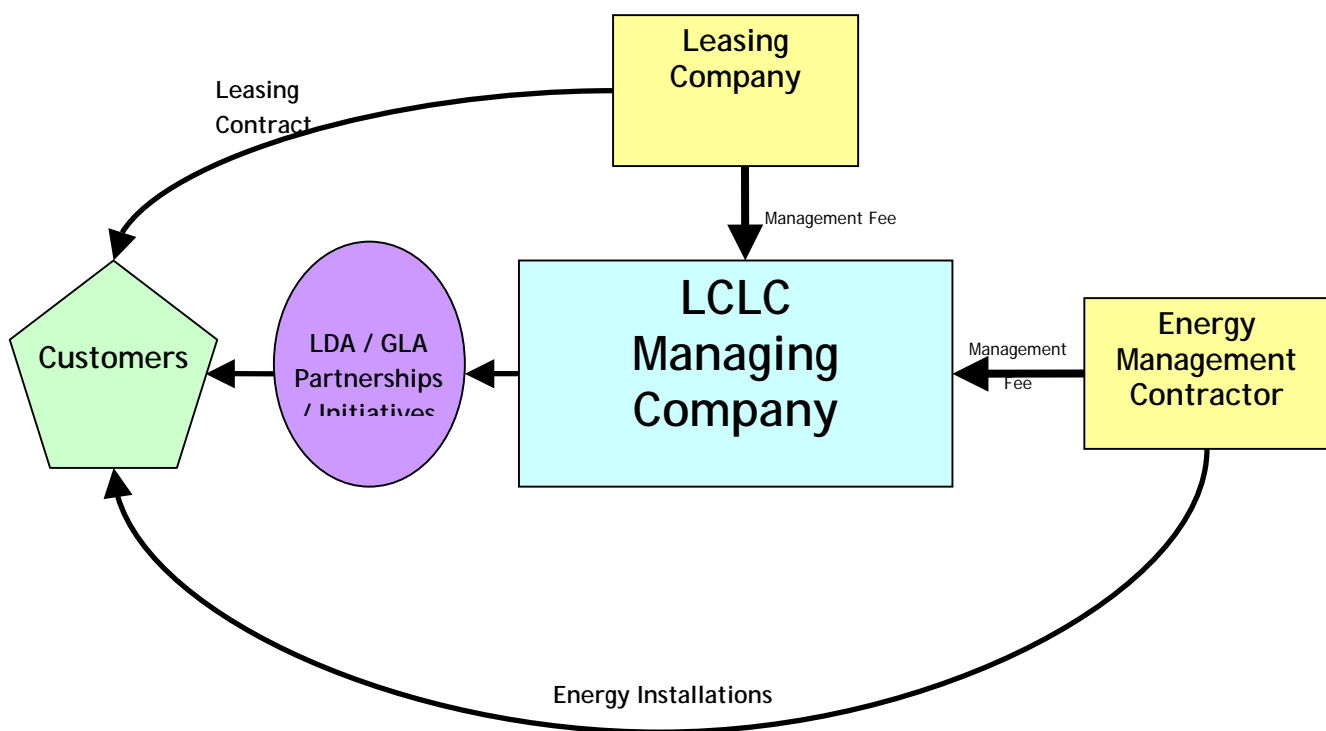
We assume that the LCLC will not make any arrangements in relation to insurance for the equipment leased by businesses nor will the LCLC effect any introductions between businesses and any insurance companies, as insurance arrangements will be covered by the leasing company. If this is not the case then it may be necessary for the LCLC to become authorised by the Financial Services Authority (FSA). As a result, the LCLC would require a certain amount of liquidity to be maintained at all times and there would be ongoing compliance obligations. Similarly, if the LCLC were to broaden its scope to include any

arrangements in relation to energy investments, greenhouse gas emissions allowances or tradeable renewable energy credits, it may require to be authorised by the FSA.

Under this option, there is no particular legal form that the LCLC should ideally take. It may be appropriate for it to be owned by members of the GLA family, with its management contracted out through a tender process. If (though this is unlikely after the management fee is taken into account) it had any surplus revenues, then these could either be ploughed back into furthering the business aims of the LCLC or distributed to members for other low carbon uses. The former situation might suggest a company limited by guarantee with an appropriate asset lock, while the latter might suggest a company limited by shares. Overall, and as a general point, perception of the LCLC may be enhanced if it is seen to be "in" the public sector, whether or not it is actually being managed by the private sector.

We would suggest that some thought be given to any tax considerations that might impact on the structure of the vehicle to be used.

Figure 4: Potential structure of the LCLC undertaking a marriage brokering role between the key contractual parties



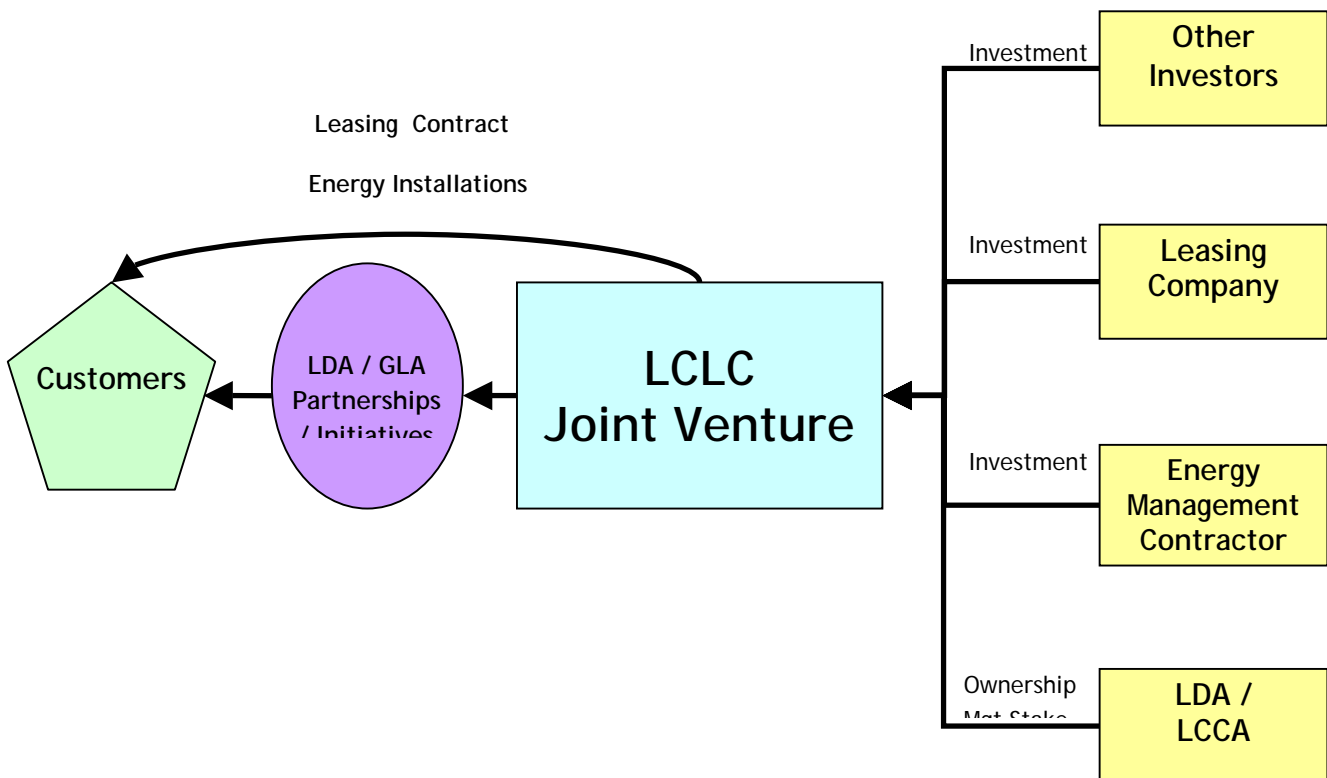
Option 2 - LCLC as a joint venture

The LCLC could consist of a joint venture between a leasing company, an energy management company and the LDA, illustrated in figure 6 below. There is no difference in the regulatory analysis of Option 2 and Option 1. We assume that the joint venture company would not be offering its shares to any party other than the partners to the joint venture. In terms of legal structure, the LCLC, being a joint venture, should have a structure that accommodates the aspirations of its different members and investors. The

suggested structure envisages that actual ownership would be retained in the public sector but that investment through the provision of services would be made by a leasing company, an energy management contractor and potentially other service providers. The arrangements in respect of the provision of these services would need to be appropriately documented in contractual terms.

Within the LCLC, there would likely be more activity and additional financial management, given that the LCLC would be the direct interface with end customers both in respect of energy installations and leasing contracts. That may present a more challenging role for any entity tasked with the management of the LCLC. Given that the relationships with the leasing company, energy management contractor and other service providers would be addressed contractually rather than through ownership (ie membership of the joint venture company) there is again no need for any particular form of entity to be used. As with option 1, the LCLC could be structured either as a company limited by guarantee with an asset lock or as a company limited by shares. As with option 1, we would suggest that some thought be given to any tax considerations that might impact on the structure of the vehicle to be used.

Figure 5: Potential structure of the LCLC as a joint venture company



Legal Issues

Apart from the issues already referred to, consideration needs to be given to procurement issues in relation to the LCLC. These arise at two levels. The first is in the procurement of arrangements with preferred partners, whether leasing companies, energy management companies or other service providers. If ownership of the LCLC rests with the public sector and any seed-corn funding comes from the public sector, then the making of arrangements with these service providers will either be subject to full Official Journal of the European Union public procurement process or will be subject to general EU Treaty

obligations requiring public sector procurement to be conducted on an open and transparent basis.

Unless the LCLC is going to assess the appropriateness of particular service providers on a case by case basis (which we would not recommend given the cost and time involved), then it would make sense to enter into framework arrangements with particular service providers for an appropriate period (four years), so that necessary services can be called on as and when required. Competing the arrangements in this way has potential additional benefits, of course, in terms of price and other terms and conditions.

Secondly, unless there is in-house resource within the GLA family to take forward the operational activities of LCLC, there will be a need to obtain management services in respect of those activities. Again, this should be openly procured on the basis of a contract of appropriate length such as (as a suggestion only) a term of two years with an option to extend for a third year. There would of course need to be a form of contract between the LCLC and the management agent and it would be important for this to spell out in detail the duties of the managing agent, particularly in respect of reporting to the Board of the LCLC.

That reporting function to the board is important, as we would expect the directors of the LCLC to be drawn from the public sector and not to be directly involved in the day-to-day management activities. Given their duties as directors, however, they would need to be fully aware of and engaged with the activities of the LCLC.

If option 2 (joint venture) is taken forward, then procurement issues still arise in relation to the selection of joint venture partners. It may be that the joint venture would carry out more of the administration in-house (i.e. through employees rather than through procured contractors) and if so, then the procurement step of selecting a managing agent would not need to be followed.

There is one other legal point that should be raised. The types of asset likely to be leased are slightly different from those more usually dealt with in this way (eg photocopiers, computer equipment, furniture, vehicles and the like). This is because boilers, reconfigured wiring and the related apparatus and insulation tend to be, by their very nature, fixtures to property (and therefore become the property of the owner of that property) rather than chattels (ie purely moveable items). This does not by any means rule out the leasing option but may add to the legal issues which will need to be addressed in any leasing contracts entered into with end customers. For example, there may need to be exchanges of letters documenting the rights in property with owners (eg landlords), the businesses and the leasing company.

Stimulating the leasing market for energy assets

In theory there is no reason why a leasing company and an energy management contractor should not come together of their own volition to provide this business model, without the need for an LCLC managing company as a brokering agent. However, this is not currently happening in a significant way, possibly due to the fact that leasing companies are not aware of the potential business opportunity, whilst energy management companies may be more interested in keeping financing solutions in-house through loan provision or performance contracts. The LCLC managing company would not only bring together a leasing company and an energy management contractor, but also provide access to customers through its relationship with the GLA's energy initiatives, in particular the BBP

and the Green 500. Under current market conditions, it may be necessary to bring in public sector funding to support the business plan.

The general benefits of leasing assets

Commercial organisations are likely to be interested in leasing energy assets rather than purchasing assets because this keeps the assets off their balance sheets. This is particularly true for commercial landlords who purchase property purely as an investment and do not make money available to invest in property improvements. In the current economic climate, in particular, commercial organisations will be acutely appraising investments in energy efficiency measures to convince themselves that it is a good use of scarce capital. Leasing would offer the opportunity to match annual savings against annual lease repayments, thereby reducing the need to secure debt and equity to bring about improvements to the building stock.

Testing the benefits for a potential customer

Introduction to the market testing

To test the benefit to customers of utilising the services of the LCLC, we have compared the provision of energy efficiency installations through the LCLC with the alternative approach of the customer directly implementing the energy installations and undertaking the investment themselves. We have developed two business models to identify the financial implications for potential target customers in utilising the LCLC services as opposed to undertaking the activity themselves.

The example analysed below considers an energy efficiency package of boiler replacement in conjunction with voltage optimisation and variable speed drive installations as installed in a typical large office building with an old inefficient boiler. Table 11 outlines the estimated costs and savings for the energy efficiency improvement package, with an initial capital cost of £95,000 and annual savings of £25,000. Although the exact costs and savings will vary from building to building, these figures were developed for an energy survey of a large office building in London and therefore provide a useful basis for an example project that is likely to be adopted by a commercial client. The energy efficiency package therefore has a payback period of 4 years, and these are cost effective energy measures.

Table 12: Costs and savings of package of efficiency measures in a commercial office building

Measure	Capital cost	Annual Savings
Boiler	£45,000	£9,000
Variable Speed Drive	£4,000	£1,300
Voltage Optimisation	£46,000	£15,000
TOTAL	£95,000	£25,300

Customer's own investment in energy efficiency package

The customer has two main options for implementing the measures themselves. They could either:

- invest their own capital in the measures or
- borrow the money to finance the measures.

We have assumed that the customer has invested their own capital in the measure in the analysis below, although if they borrowed the money then the effect would be similar in terms of the cost of the capital (as explained below).

Modelling cashflows of LCLC service

To compare a leasing approach through the LCLC with a customer self financing the measures, we have modelled the cash flow (savings minus costs) of installing the energy efficiency package under both approaches. We have modelled the cash flow over a ten year period, thereby assuming that the leasing contract runs for ten years and the repayment of the capital investment is spread over ten years.

The capital cost of £95,000 is repaid to the leasing company over a 10 year period with a 10% interest rate and 0.75% management fee. Due to economies of scale and the excellent credit rating of leasing companies (as financing is their core business), we have assumed that the leasing company has access to fairly low cost capital and therefore is able to offer a low interest rate of 10%. Although a customer of the LCLC faces an annual leasing cost, they benefit from annual savings in their energy bill, and as outlined above the simple pay back period is 4 years. In the modelled example, the leasing costs are less than the energy bill savings because even with the interest accrued by the leasing company and the management fee of the LCLC, the cost effectiveness of the measures ensures that the activity is financially worthwhile. The annual leasing fee for the customer is £16k with a maintenance fee of £200, whereas the annual energy bill saving is £25k.

Modelling cashflows of customer financing & installing their own measures

The cash flow analysis for customers financing their own measures assesses the upfront investment of £95,000 versus the benefit of the energy savings each year for the subsequent 10 years. The cost of the finance for the customer utilising the LCLC service is represented by the 10% interest payment taken by the leasing company. When undertaking their own investment the cost of finance for the commercial organisation would be the opportunity cost of investing money in energy efficiency measures, rather than other commercial opportunities for the company. This is represented in the business modelling through a 15% discount rate, which is higher than the 10% interest rate charged by the leasing company. Commercial organisations evaluate investment decisions based on potential returns, and will typically require returns of 15% or more. Investments in energy efficiency measures will need to compete with these alternative investment opportunities, and are likely to miss out to project investments that yield higher returns. Even if the commercial organisation borrowed the finance rather than investing its own money, it would face borrowing rates at commercial levels typically at 15% or even more.

Operation and maintenance costs

The LCLC is able to provide maintenance at lower cost than a customer would face if purchasing their own maintenance services. This is due to the economies of scale provided by the LCLC and its ability to achieve bulk discounts on both installation and maintenance contracts. We have assumed annual maintenance costs are one third lower under the LCLC service as opposed to if a customer procures maintenance services on the general market place.

Comparing the financial benefits of the two approaches

We have compared the costs and benefits of both approaches by calculating their NPV, which is the sum of the discounted cashflows over the 10 year period. The leasing scenario demonstrates a more beneficial outcome, with a greater cumulative discounted cash flow of £56k over the 10 year lifetime of the contract compared with an NPV of £30,000 for a company undertaking their own investment in installing the same energy efficiency measures.

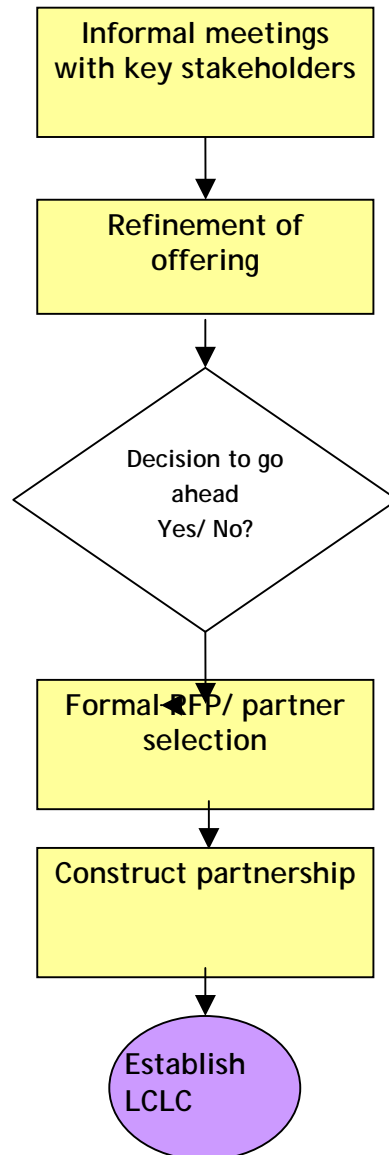
Table 13: Differences in the input parameters and NPV for the comparison of LCLC service versus customer's own implementation

	LCLC	Own investment
Discount/ interest rate	10.75% - the interest rate taken by the leasing company and a 0.75% management fee to cover costs of LCLC admin	15% - represents a higher cost of capital or the opportunity cost of investing the capital in other activities
O & M Costs	lower costs - modelled at £200	higher costs - modelled at £300
NPV	£56,000	£30,000

7 Next Steps

7.1 Introduction

Figure 6: Flow diagram of key steps involved in bringing the LCLC to the market



7.2 Market testing the business case

Discussions with leasing companies

The views and opinions of leasing companies will need to be solicited through informal discussions. The two key areas for gauging interest relate to the general leasing of energy assets (as a new market area for asset leasing), and specifically their interest in the LCLC and entering into a partnership or contract arrangement to form the LCLC. Opinions will need to be harnessed regarding the soundness of the whole concept of the LCLC and leasing companies can also help in identifying potential barriers or risks to leasing energy assets and the development of the LCLC. There are a number of large leasing companies with whom initial discussions could be held, such as CSA Financial or Lombard Leasing.

Discussions with contract energy management companies

It will also be important to sound out the contract energy management companies in terms of their opinions regarding the value that the LCLC can bring to delivering energy efficiency measures within commercial organisations in London, and their interest in bidding to be a partner within the LCLC. Initial discussions could be held with Dalkia and Honeywell who are providing energy management services to the MPA, LFEPa and TfL under the BEEP.

Discussions with customers

The LCLC's services will need to be informally tested with potential customer commercial organisations, such as members of the BEEP.

Discussions with GLA group

As identified above, the LCLC can add the greatest value through providing a service to customers of the GLA's existing initiatives such as the BBP or Green 500. This will also help in providing the LCLC with access to a potentially large commercial organisation customer base within London. If the LCLC were to be taken forward to the delivery stage by the LDA, then they would need to review its role and purpose, and assess how it compliments and enhances the existing GLA group energy initiatives. This can most effectively be progressed through their active involvement in the market testing process, so that they take ownership of developing the LCLC concept.

7.3 Developing the business plan further

Following the informal soundings of the LCLC concept and high level business plan, the business plan can be developed further. The key steps will include:

- preparation and issuing the Request for Proposals (RFP)
- reviewing RFP responses
- interviewing and selecting preferred partners.

The LCLC partnership or LCLC joint venture can then be further developed through:

- developing the Memorandum of Understanding (MOU)
- developing Heads of Terms with further agreement/ development of the Business Plan
- issuing formal contracts.

Alongside the development of the partnership and company arrangements, the LCLC can begin to be marketed and potential customers & projects can be prospected, with development of MOU with these initial customers. Bringing on stream initial customers at this stage will help in developing and underpinning the business plan as its is firmed-up and finalised.

7.4 Establishing the LCLC

The establishment of the LCLC will involve:

- securing resources
- establishing the company

- mobilising for set-up
- tendering for the LCLC managing agents/ company or the establishment of the joint venture.