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Green Entrepreneurship in London - Barriers and Opportunities

SCOPING REPORT

Prepared for
The London Sustainable Development Commission

By

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THOMSON REUTERS POINT CARBON

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1 INTRODUCTION

This is a scoping report prepared by Thomson Reuters Point Carbon (Point Carbon) for the London Sustainable Development Commission (LSDC). It provides a high-level overview of the state of the 'green' sector in London with a particular focus on the barriers faced by, and opportunities for, green entrepreneurs in the city.

This report was commissioned by the LSDC as the first step towards formulating a focus on green entrepreneurship as part of its work programme for 2013. This initiative from the LSDC has come about from two main factors: 1. The Mayor of London's focus on an increase in jobs and growth in London; and 2. analysis contained in the LSDC's Quality of Life Indicators 2012 report[i], which shows encouraging signs for green growth in the city. This report states that in 2009-10, the low carbon and environmental goods and services (LCEGS) sector in London supported 160,000 jobs compared with 157,000 jobs in 2008-09, despite the economic downturn. Overall, the sector in London was worth £22,979 million in 2009-10, and is forecast to grow to £27,097 million by 2012-13. Further, there is an increasing trend of Londoners with Level 4+ qualifications; and despite a dip in 2007, the level of product and service innovations reported by London businesses is also rising.

Current plans are that this scoping work will inform the LSDC and form part of the preparation for a workshop with green entrepreneurs and related stakeholders. The recommendations from the workshop and the scoping report will be taken forward by a newly-formed Task Force.

The LSDC's specification for the seven-day research work included the following:

a. Defining the term "green entrepreneurs" with a view to recommend to the LSDC what specific area to focus on;

b. Map the current strategic public funding available for green entrepreneurs in London;

c. Map out the current organisations and individuals in London already working in this arena;

d. Detail the current financing mechanisms and options available to green entrepreneurs;

e. The scale of the green entrepreneurs economy – building on the findings in the QoL indicators report; and its potential to drive the jobs and growth agenda in London;

f. Scoping out the barriers to finance as they stand at present;

g. Consider any non-financial barriers where they are material across the green entrepreneur economy

h. Draw a comparison with other UK cities and regions and European countries and what has worked in those areas.

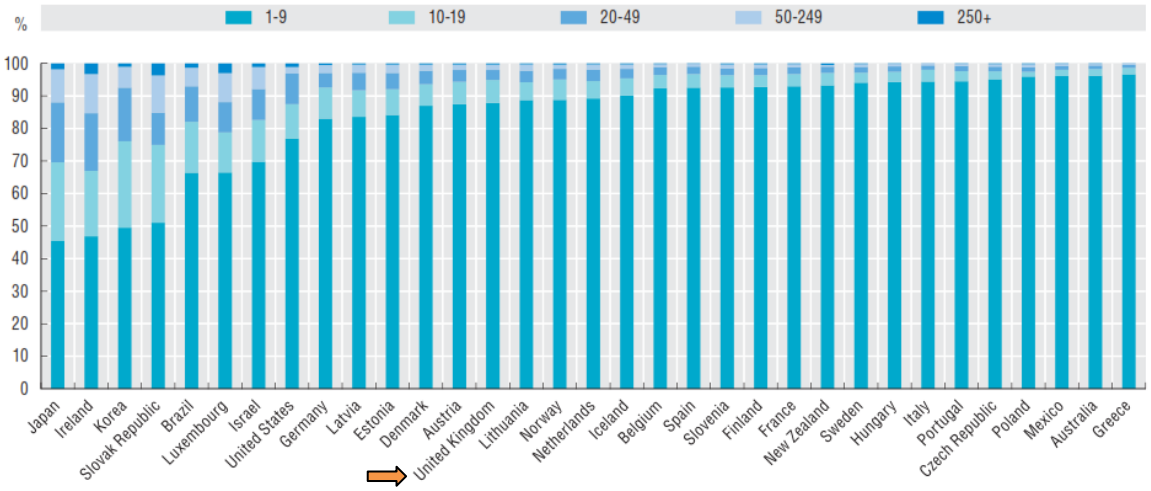
i. Recommendations for the future direction of the GE work programme for the LSDC

This scoping work used a combination of desk based literature and web reviews, supplemented by telephone or face-to-face interviews with entrepreneurs and public and private financiers. Due to the short timescales involved, this research does not purport to be comprehensive in any way – rather, it attempts to provide a high-level overview of the areas outlined in the research specification.

2 SECTOR OVERVIEW

2.1 PROPORTION OF SMALL COMPANIES IN THE UK

Enterprises by Size Class, 2007

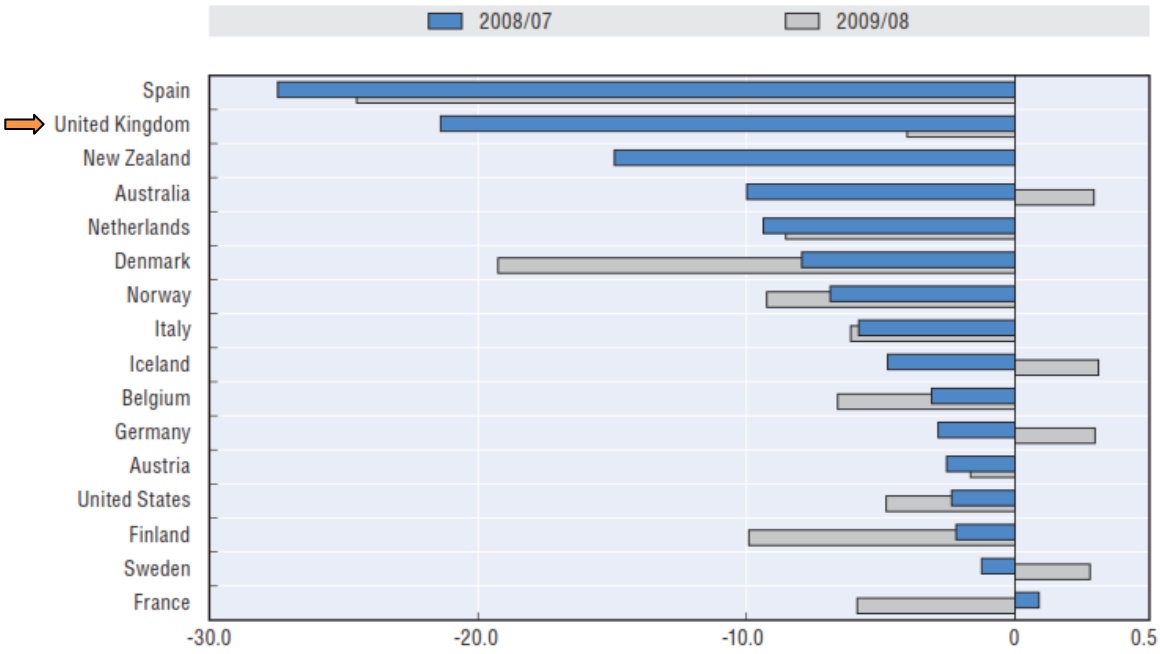


Source: OECD

As shown in the figure above, in 2007 approximately 88 per cent of UK companies had between 1 and 9 employees. This proportion is not dissimilar to Austria, Norway or the Netherlands; however it contrasts sharply with Japan, Ireland and South Korea which this figure is less than 50 per cent. The OECD also reports that while approximately 18 per cent of UK employees worked in such firms in 2007, their value add to the economy was above 20 per cent.

The OECD's data indicates that the recession has had a significant negative effect - the number of new enterprises declined sharply, by 22 per cent, in the UK in 2008 but declined less sharply in 2009.

Number of New Enterprises, Percentage Changes from Previous Year



Source: OECD, Timely Indicators of Entrepreneurship Database

2.2 LONDON'S LOW CARBON AND ENVIRONMENTAL GOODS AND SERVICES SECTOR

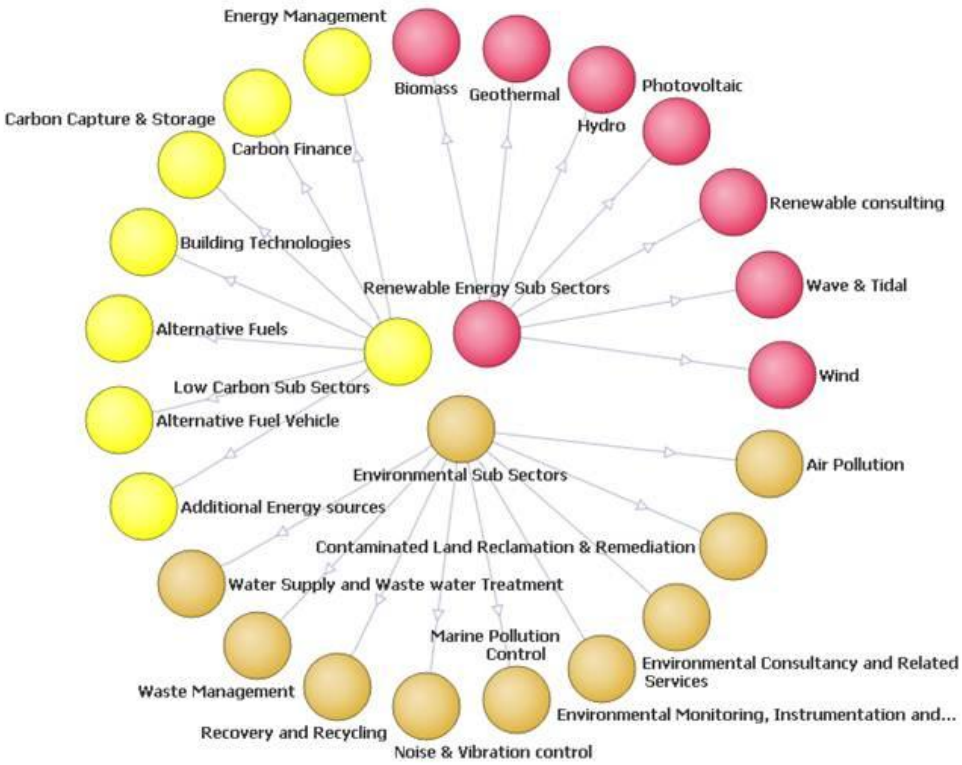
Research conducted for the Greater London Authority[ii] shows that the global Low Carbon and Environmental Goods and Services (LCEGS) market, as defined for a series of national and regional studies, has been estimated as being worth nearly £3.3 trillion in 2010 and is expected to grow to over £3.8 trillion by 2014. In 2010 the UK market was worth £116 billion and is expected to grow to £131 billion by 2014.

In 2010 the London market was worth £23 billion, a 19 per cent share of the UK market. By 2012 it had already grown to over £25.4 billion and it is expected to grow to over $28 billion by 2014. In 2010 London had over 9,200 businesses actively operating in the sector, with 160,000 employees. The average projected annual growth rate for London's LCEGS through to 2020 is 7% - this suggests good potential economic and employment opportunities for London from this sector.

The definition used in the study split the sector into three main areas:

- Environmental Goods and Services – the standard and more mature sub sectors such as waste management and air pollution control – 9 sub sectors
- Renewable Energy Technologies – a mix of mature and new and emerging renewable energy technologies such as wind, solar and biomass – 7 sub sectors
- Low Carbon Technologies – mainly emerging technology areas which previously were considered to be on the fringe of the environmental sector, but which are now a key part of the legislation and policies to deal with carbon emissions – 7 sub sectors

LCEGS sub-sector and sub-sub-sector breakdown



Sub-Sub-Sectors for London 2009/10 by market value, company and employment numbers ranked by market value for 2009/10

Sub Sector - London	2009/10	2009/10	2009/10
	£m	Co	Emp
Carbon Finance	5,723	1,885	23,198
Geothermal	2,474	928	17,929
Alternative Fuels	2,293	990	23,371
Wind	2,224	884	13,922
Building Technologies	2,073	920	15,616
Water and Waste Water	1,491	660	13,568
Photovoltaic	1,261	421	9,520
Alternative Fuel Vehicle	1,254	573	8,947
Waste Management	1,208	480	9,848
Biomass	977	437	8,324
Recovery and Recycling	877	393	6,558
Energy Management	334	181	2,431
Additional Energy Sources	148	62	1,233
Environmental Consultancy	110	99	886
Hydro	106	59	873
Air Pollution	102	32	893
Renewable Consulting	85	29	758
Contaminated Land	85	75	727
Carbon Capture & Storage	59	29	485
Noise & Vibration Control	45	49	290
Environmental Monitoring	23	12	163
Marine Pollution Control	17	7	118
Wave & Tidal	10	8	63
Totals	**22,979**	**9,213**	**159,721**

Source: GLA

The largest overall sub-sectors within the London market are **carbon finance, geothermal, wind, building technologies, and alternative fuels**. London's specific strengths compared to other UK regions have been identified by the GLA-commissioned study as being in **carbon finance, geothermal, photovoltaics and waste management.**

Further detail on the sub-sectors identified as the largest in London, and those with particular strength in London has been provided by the GLA:

- Waste Management includes Waste Treatment Facilities & Equipment, consulting and R&D
- Carbon Finance includes Credits Finance, Fund Management, Trading and Research
- Alternative Fuels includes Main Stream and other Bio Fuels, Batteries and Other Fuels.
- Building Technologies includes Doors, Windows, Monitoring & Control Systems and Insulation/ Heat Retention Materials.
- Wind includes Large Turbines, Small Turbines and Wind Farm Systems.
- Photovoltaic includes Systems & Equipment, Cells and Chemicals.
- Geothermal includes Whole Systems, Specialist Equipment, Consulting and R&D.

London also has inherent strengths as a city that can be capitalised on to ensure it makes a successful and cost effective transition to a low carbon, resource efficient economy. These strengths are: the significant size of its own market; its world leading position in financial and business services; its world class Research and Development sector; and the stated desire of its government to lead by example in the global transition to a low carbon economy.

Constraints in LCEGS definitions

The LCEGS definitions cover most economic activities that lead to environmental gain. However It is important to note that some may not be covered by the definitions as it is virtually impossible to accurately map and classify all such activities. These could include, for example:

- car club services
- car sharing online platform
- taxi service using low carbon vehicles
- sections of the Re-use sector
- sellers of 'green investment products' overseas, such as wood plantations, sustainable agriculture or biofuel production
- vegetable box providers or community farms
- restaurants using only local produce
- 'unwanted' food redistributors
- travel logistics and efficiency software/ solution providers
- sustainable landscaping designers, specifiers and installers

Many of the above examples may be somewhat marginal (in terms of scale), new and not mainstream in the context of the wider economy. However in the context of green entrepreneurs, such activities may appear magnified as opportunities, for precisely the same reasons.

For this reason it is suggested that the LSDC should not depend exclusively on the LCEGS definitions when proceeding with its work on green entrepreneurs; the LSDC's work should be able to encompass all products and services that demonstrably lead to environmental gain.

2.3 MARKET DRIVERS

There are several drivers for business activity in the 'green' space:

- National policy and stimulus
- London policy and stimulus
- National and International market opportunities

2.3.1 National Policy and Stimulus

The government's targets and aspirations (up to 2020) for different sectors are summarised below, along with current mechanisms to help achieve those targets. This summary provides a sense of the major opportunities in the low carbon sector in the coming few years, especially with regard to greenhouse gas reductions.

Table: government Carbon Plan targets up to 2020 and current stimulus mechanisms

BUILDINGS
Carbon Plan upto 2020
- All cavity walls and lofts to be insulated. - Government will support up to 1.5 million solid wall insulations and other energy efficiency measures. - Build a functioning low carbon heat market, aspiring to approximately 130,000 low carbon heat installations by 2020. - Begin creating district heating networks especially in dense urban areas
Mechanisms
Meeting the EU's Energy Performance of Buildings Directive: The Directive requires that: • all properties (homes, commercial and public buildings) must have an Energy Performance Certificate (EPC) when sold, built or rented • larger public buildings over 500m² must display a Display Energy Certificate (DEC) - these provide an 'operational efficiency' rating • all air-conditioning systems over 12kW must be regularly inspected by an Energy Assessor *Code For Sustainable Homes:* The code for sustainable homes is the national (although voluntary) standard for the sustainable design and construction of new homes. It aims to reduce carbon emissions and promote higher standards of sustainable design above the current minimum standards set out by national building regulations. The code provides 9 measures of sustainable design: energy/CO_2; water; materials; surface water runoff (flooding and flood prevention); waste; pollution; health and well-being; management; and ecology. *Zero Carbon Buildings*: All new homes will be required to be net zero carbon by 2016 and extending this requirement to all other buildings by 2019 is being considered. *The Green Deal*: This is a funding mechanism to enable homes and businesses to make energy efficiency improvements with some or all of the cost paid for from the savings on their energy bills. *Smart meter rollout*: This aims for all homes and small businesses to have smart meters by 2019. Energy suppliers will be required to install smart meters and take all reasonable steps to install them for everybody. Consumers with smart meters will be offered an in-home display (IHD) that lets them see how much energy they are using and what it will cost. Between now and 2019 energy suppliers will be responsible for replacing over 53 million gas and electricity meters. This will involve visits to 30 million homes and small businesses. *Energy Company Obligation (ECO)*: This obliges energy suppliers to fund and install energy efficiency improvements worth approximately £1.3 billion each year. The programme is focused towards low-income households and areas, and in properties that are harder to treat. It works alongside the Green Deal to give consumers support and funding for energy efficiency improvements in their homes.

TRANSPORT

Carbon Plan upto 2020

- Work to ensure strong EU vehicle emissions standards for 2020 and beyond to deliver improvements in conventional vehicle efficiency and provide certainty about future markets for ultra-low emission vehicles.
- Provide around £300 million for consumer incentives, worth up to £5,000 per car.

Mechanisms

Grants for Ultra-Low Emission Vehicles: Over £300 million is committed to provide grants for: Plug-in cars and vans; chargepoints in residential areas, local authority controlled areas and train station car parks.

Recharging infrastructure – the Plugged-in Places programme: This offers match-funding to consortia of businesses and public sector partners to install electric vehicle charging points. Data from the Plugged-in Places programme about how drivers wish to use and recharge their electric vehicles is intended to provide the necessary evidence base to help the industry create a UK network of recharging points that meets the needs of plug-in vehicle drivers.

INDUSTRY

Carbon Plan upto 2020

- Industry takes up the remaining energy efficiency opportunities and begins to move towards low carbon fuels e.g. biomass to generate heat for industrial processes.
- Other innovations for industry decarbonisation such as Carbon Capture and Storage (CCS) technology research are being strongly supported.

Mechanisms

EU Emissions Trading Scheme (EU ETS): puts a price on greenhouse gas emissions to create financial incentives for industry and businesses to reduce emissions. It also limits emissions from electricity generation and the main energy-intensive industries. The EU ETS accounted for around 40% of total greenhouse gas emissions in the UK in 2011, of which around two-thirds were emissions from the power sector and around one-third from energy-intensive industries.

Climate Change Levy: This is a tax on the taxable supply of specified energy products (e.g. electricity, natural gas, LPG) for use as fuels that is for lighting, heating and power, by business consumers including consumers in industry, commerce , agriculture and public administration.

Enhanced Capital Allowances: lets businesses that invest in certain energy-saving equipment write off the total cost of the equipment against their taxable profit as a 100% first-year capital allowance.

Climate Change Agreements: give energy-intensive industries a discount on the Climate Change Levy (a tax on energy use in industry, commerce and the public sector) as long as they meet government-agreed energy efficiency improvement targets.

CRC Energy Efficiency Scheme: This is a mandatory reporting and pricing scheme to improve energy efficiency in large public and private organisations not covered by the EU ETS.

POWER and HEAT

Carbon Plan upto 2020

- Increasing replacement of coal with gas.
- More generation from renewable sources.
- Demonstration and deployment of major low carbon technologies.
- Help reduce costs of offshore wind.
- Use £1 billion commitment to support development of Carbon Capture and Storage technology.
- £50 million to support innovation in marine and offshore technologies.

Mechanisms

Renewables Obligation (RO): provides incentives for large-scale renewable electricity generation by making UK suppliers source a proportion of their electricity from eligible renewable sources.

Feed-in Tariffs (FITs) scheme: pays energy users who invest in small-scale, low-carbon electricity generation systems for the electricity they generate and use, and for unused electricity they export back to the grid.

Renewable Heat Incentive (RHI): pays commercial, industrial, public, not-for-profit and community generators of renewable heat for a 20-year period.

Renewable Heat Premium Payment (RHPP): gives one-off payments to householders, communities and social housing landlords to help them buy renewable heating technologies like solar thermal panels, heat pumps and biomass boilers.

Renewable Transport Fuel Obligation: makes companies that supply more than 450,000 litres of fuel per year source a percentage from renewable sources.

The government also provides support for other low carbon technologies such as heat networks, and for more efficient and cost-effective ways for new generators to connect to the electricity network.

The government is attempting to catalyse investment in new nuclear power stations by reducing regulatory and planning risks.

The government is also attempting to create a new Carbon Capture and Storage (CCS) industry by:

- running a competition (with £1 billion capital funding available) to support practical experience in the design, construction and operation of commercial-scale CCS
- funding a 4-year co-ordinated research, development and innovation programme
- working with industry to reduce costs of CCS technology, develop supply chains, create storage and help develop CCS infrastructure

AGRICULTURE, LAND USE AND WASTE

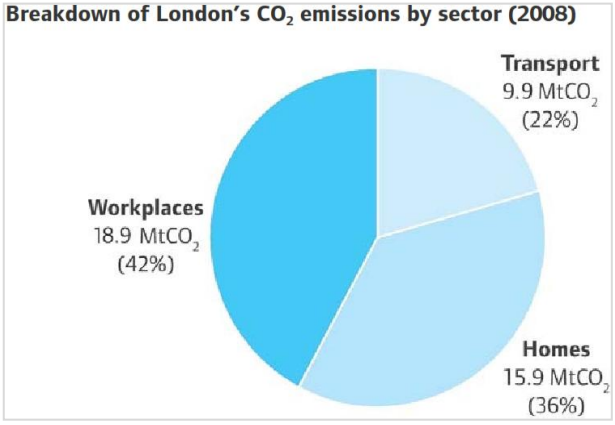
The UK government is encouraging practical efficiencies in these sectors such as improved crop nutrient management and better breeding and feeding practices.

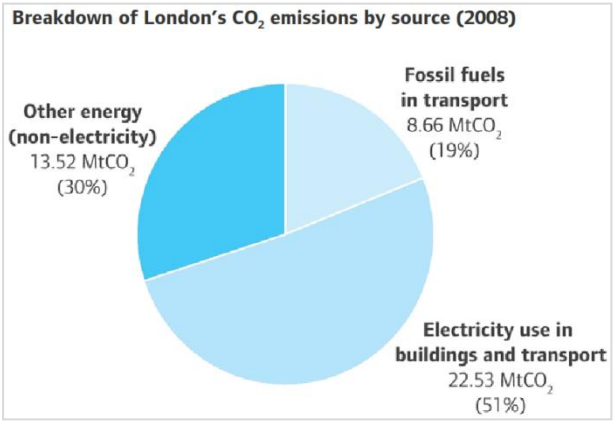
A landfill tax has been in place for a number of years, with annual rises in the levels of taxation. This has been highly successful in reducing waste to landfill and encouraging the development of recycling and waste-to-energy infrastructure.

2.3.2 London Policy and Stimulus Areas

A proportion of environmental business activity in London will be driven by the Mayor's strategies, policies and actions. A 2009 report for the London Development Agency estimated the Mayor's programmes as having, at that time, the potential to attract, on average, £845m p.a. of investment (i.e. approx £14 billion by 2025) and help create 14,000 jobs p.a. to 2025. The total amount of investment required to meet the Mayor's 2025 CO_2 reduction target has been estimated as approximately £40 billion – meaning that approximately £26 billion of investment would need to be catalysed by national government and international policy and markets by 2025.

According to the Mayor's 2011 Climate Change Mitigation and Energy Strategy (CCMES), approximately four-fifths of London's emissions come from energy consumption in, and energy supply to, buildings; the remainder come from transport. This is reflected in the charts from the CCMES below.





The CCMES highlights the following focus areas for the Mayor, where major projects are under delivery or in development often with significant investment; given emissions sources, buildings and transport are unsurprisingly prominent:

- Retrofitting London
  - Commercial buildings
  - Residential buildings
  - Public sector buildings
  - Decentralised energy supply
  - Electric vehicle rollout
  - Further use of ultra low carbon vehicles
  - Using alternative transport modes

- Greening London
    - Tree planting
    - Improvements to parks and open spaces
    - Green grids
- Cleaning London's Air
    - Low emission zones
    - New hybrid buses
    - Electric vehicle charging points
    - Dust suppressant technology
- Maximising low carbon growth
    - Creating a 'green enterprise district'
    - A low carbon skills and employment programme

In addition to the CCMES, the Mayor's Waste strategies put a strong focus on carbon-efficient waste and recycling infrastructure. Food and organic waste have been picked out as a specific focus area and the GLA is planning significant project activity in this area.

2.3.3 National and International Market Drivers

Energy Efficiency and Energy Smart Technologies

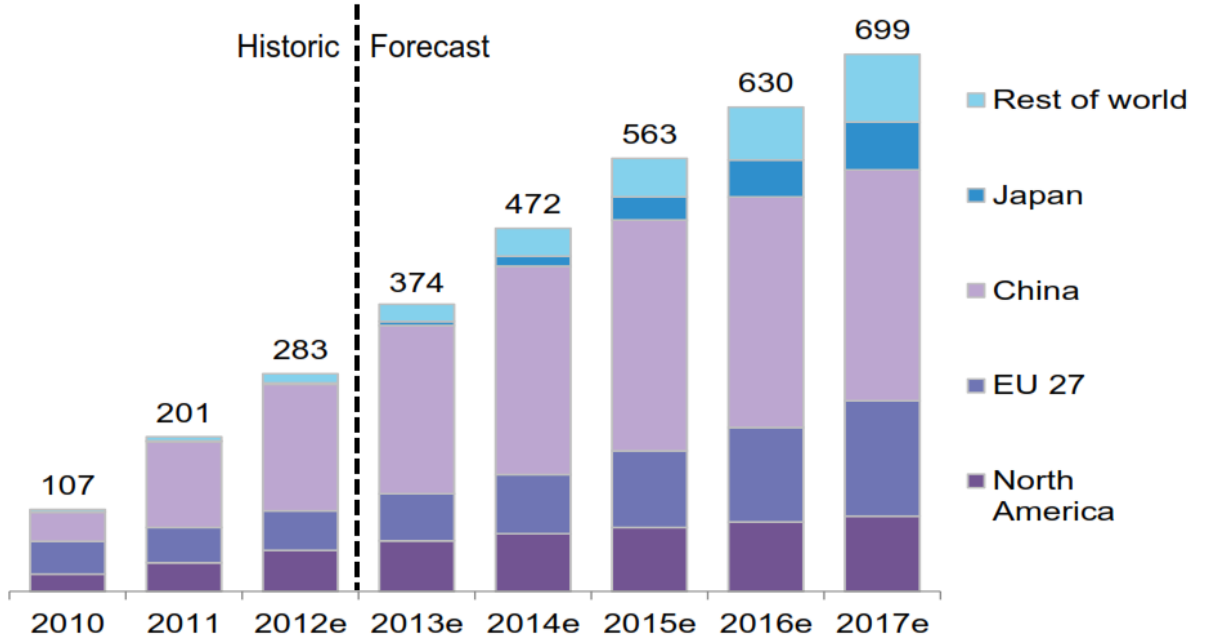
Increasing costs of energy fuel have been driving investment into energy and process efficiencies. Investment in some technologies and measures can provide payback within only a few years and sometimes even months. In the buildings sector for example, loft and cavity wall insulation and lighting, heating and voltage optimisation can all provide quick feedback; while window/ glazing replacement or solid wall insulation typically cannot. The public sector has been attempting to create energy efficiency projects where some of the longer payback measures are blended with shorter payback measures to create projects with reasonable financial returns as well as deep carbon reductions. However, even without public sector stimulus, a high level of energy and process efficiency measures can be expected to continue.

Energy efficiency in the built environment often has a major high-tech component, as information about the amount of energy being consumed is critical to decisions and technologies to use less of it. Nowhere is this truer than in the current explosion of data-driven customer energy management technologies – such as residential "learning thermostats" or sophisticated commercial building energy analysis systems. This combination of clean tech and high tech, under currently used terminology such as Big Data, Soft Grid, and CleanWeb, is starting to make a dent in energy consumption and create opportunities for small startups, large corporate players, and efficiency-minded utilities. Nest Labs, a Silicon Valley startup launched three years ago by two former Apple iPod and iPhone engineers, now sells about 45,000 of thermostats every month; the $250 web-connected devices enable programmable thermostats "learn" from homeowners' usage patterns, motion sensors, weather forecasts, and other data to adjust heating and air conditioning for maximum savings. The programming interface used is a smart phone application.
C3 Energy, founded and run by software industry giant Thomas Siebel, epitomizes Big Data in the building efficiency sector. C3's software-as-a- service aggregates and analyzes millions of energy-use data points for use by residences, small and large businesses, and especially utilities. C3 has completed a project analyzing data from some 500,000 buildings for PG&E, and has a joint venture

with General Electric for grid-scale analytics that Siebel says is trying to solve “petabyte-type problems” (one quadrillion bytes). Global spending on smart building energy management services is projected to grow from $291 million in 2012 to $1.1 billion by 2020.

Figures published by DECC show that the energy efficiency sector in the UK already accounts for approximately 136,000 jobs and had sales of £17.6 billion in 2010/11. Sales in this sector have grown by over 4% per year in the UK since 2007/08, and are projected to grow by around 5% per year between 2010/11 and 2014/15.

Fig: Smart meter deployment worldwide



Source: Bloomberg New Energy Finance

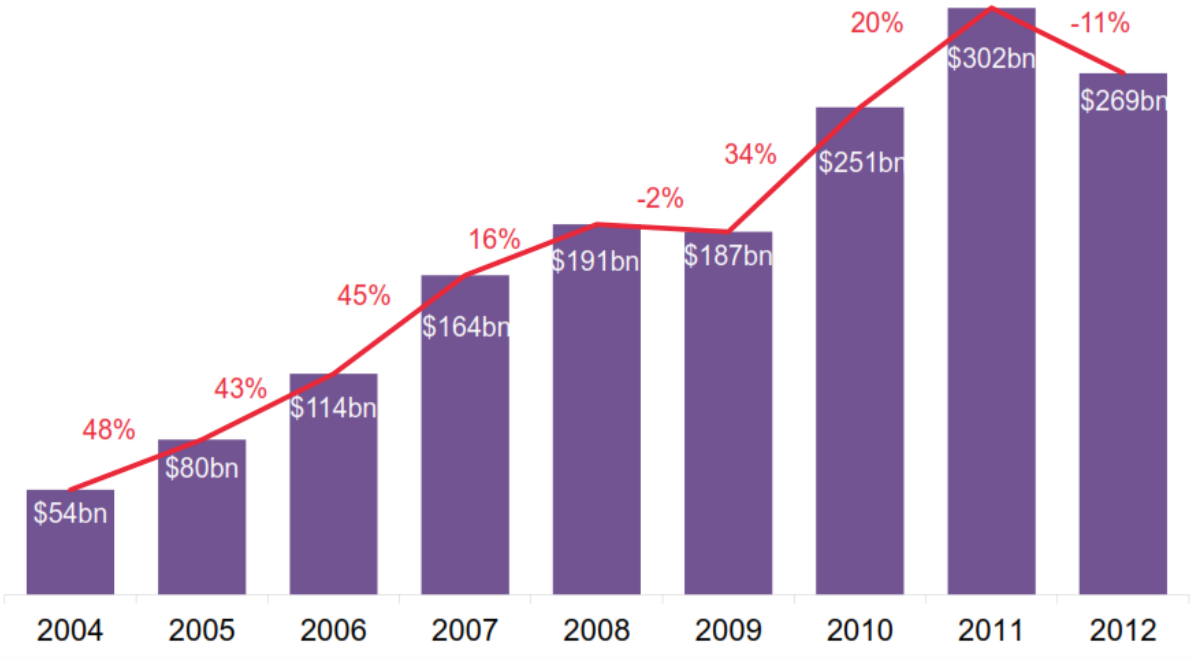
Industrial Process Efficiency

The UK has over 1,000 participating entities in the EU ETS, accounting for approximately 40% of UK emissions. The EU Emissions Trading Scheme (EU ETS) has brought about significant industrial process efficiencies and this is set to continue in the long term even though the EU ETS price signals in the short term are not very encouraging due to oversupply of credits.

Clean Energy

Investment in renewable energy globally has been growing steadily. Due to dramatic falls in the price of solar technologies and a small fall in costs of wind turbines, investment in 2012 fell for the first time in years. However deployment rates continued apace and the long term trends in renewable and clean energy generation remain very positive.

Figure: Global Clean Energy Investments 2004-2012



Source: Bloomberg New Energy Finance

2012 investment figures for the largest clean energy sub-sectors are as follows (source: Bloomberg New Energy Finance):

- **Solar** technology deployment has been growing the fastest in recent years and was once again the dominant sector in terms of overall clean energy investment in 2012. It accounted for $142.5bn, down 9% on its 2011 record.
- **Wind** saw investment of $78.3bn, down 13%, while the third-largest sector, energy-smart technologies such as smart grid, energy efficiency and electric vehicles, suffered a 7% drop to $18.8bn.
- **Biomass** and **waste-to-energy** was the fourth largest sector, at $9.7bn in 2012, but this was 27% down on the previous year's figure.
- **Biofuels**, the second largest sector back in 2006, saw investment fall 38% to $4.5bn, while **geothermal** experienced a 39% drop to $1.8bn.
- The only sector to show growth in 2012 was **small hydro** (projects of less than 50MW). This saw a 17% rise in investment to $7.6bn.

Although investment fell in 2012, solar, wind, and biofuels deployment continued to rise. As a result, combined global revenue for solar PV, wind power, and biofuels grew year-to-year – albeit only slightly – from $246.1 billion in 2011 to $248.7 billion in 2012. This marginal growth does not however reflect the industry's true expansion, as solar PV revenues fell considerably even as installed capacity grew – one of many consequences of fast-declining prices for solar power technologies.

Often overshadowed in the public eye by wind and solar energy, **geothermal** is still the only renewable electricity resource besides hydroelectric that provides baseload power. With an average plant uptime of 98 percent, it is most often more reliable than nuclear or coalfired power plants, both of which require more downtime for maintenance. After a couple of down years, the U.S. geothermal market – the world's largest – bounced back in 2012 and, thanks to positive developments in

technology, policy, and capital, is poised to continue the upswing. Outside the U.S., geothermal is rising rapidly in those countries promoting the power source through national energy policies. The World Bank approved $300 million in Indonesian geothermal investment in 2012. It considers geothermal one of the few viable replacements for coal in many East Asian countries, and member countries are making large loans available to make a positive impact on climate change. East Africa in particular is working to claim more of its geothermal potential. Only about 217 MW of an estimated 15,000 MW of accessible geothermal resources have been developed in Kenya and Ethiopia, but Kenya plans to double geothermal generation by 2020, when it predicts geothermal will provide 30 percent of the country's electricity. By 2030, it aims to have 5,000 MW of geothermal power online. Indonesia has 27,510 MW in potential geothermal resources; its goal is to quadruple capacity from a current level of 1,200 MW to 5,000 MW by 2025. More than 40 geothermal projects are currently in development there. Elsewhere in Asia, the Philippines aims to grow its operating geothermal capacity from 1,972 MW currently to 3,447 MW by 2025.

2.4 POTENTIAL PRIORITY SECTORS AND BUSINESS TYPES

From the discussions above it becomes clear that there is growth in many green sectors: building retrofit, energy smart technologies, low emission vehicles, carbon capture and storage, solar, wind, geothermal etc. In a global city like London, entrepreneurs can and should develop products and services to cater to domestic as well overseas markets. While all green sectors offer opportunity, the following discussion offers views on which sectors may offer more opportunity than others.

- As pointed out in the GLA/ Innovas LCEGS study, the largest overall sub-sectors within the London market are carbon finance, geothermal, wind, building technologies, and alternative fuels.
    - Carbon finance and indeed cleantech finance is a clear opportunity area for London entrepreneurs as London is the pre-eminent finance capital of the world. London entrepreneurs can and do facilitate investment to green projects and companies globally and this will continue.
    - Geothermal is a clear opportunity within urban areas (small scale) and within some developing countries such as Kenya, Indonesia and the Philippines. This sector has been identified as a strength for London.
    - Solar is the fastest growing clean energy technology globally and photovoltaics have been identified as a London strength.
    - Building technologies are clearly an area of growth, with both national and London government identifying it as a priority. In addition to supporting start-ups with innovative building or energy management technologies, the proposition here could also be to mainstream innovation by training local builders in Green Deal, FIT and other schemes so that these can be built into their regular offerings.
- Energy smart technologies are an emerging area and one where a number of innovative start-ups internationally as seeing success and high growth. Many investors invest in digital and smart

technology start-ups in the knowledge that most of them may not quite succeed however with the hope that one or two may go on to become, in the words of one investor, 'ballistic'. There seem to be a few investors and facilitation services in this space however there is more than enough space for the LSDC to also intervene. Digital start-ups could work in any green sector, although the majority seem to be working in energy management, energy distribution and transport. One particular opportunity to repeat here is that 53 million gas and electricity meters are due to be replaced by smart meters by 2019 in the UK.

- The low carbon energy generation sector is seen as a long-term opportunity with projections of ever-rising costs and demand and supply shortfalls. From a London perspective decentralised electricity and heat can become significant opportunities in future although the present opportunities for start-ups may be more in support of large scale generation. For example, there are small companies in the UK gathering very specialised weather and wave data from various sources worldwide to build power generation models for global investors in large scale solar, wind, wave and tidal generation. From an international perspective, geothermal, solar and wind appear to offer the largest markets with solar being the fastest growing.

- 'Collaborative consumption' is seen as an area of emerging potential by some investors interviewed as part of this study. The term describes the shift in consumer values from ownership to access. There are consumers around the world using network technologies to rent, lend, swap, barter, gift and share products on a large scale. Car sharing is a good example of this with companies like GoCarshare present in London.

- Food and related 'waste' is seen as an opportunity area by some interviewees as well as in the Mayor's waste strategies. Specifically, new business models for localised and distributed waste collection and recycling/ re-use, and for brokerage of unwanted waste, could be developed in the coming years. Although the economic margins here may not be as high as other sectors there may be opportunities for employment generation.

3 BARRIERS AND OPPORTUNITIES FOR GREEN ENTREPRENEURS

There are various factors, or determinants, that influence the work of entrepreneurs anywhere, as shown in the diagram below. London is no exception, and neither are green entrepreneurs. This section contains a discussion of these determinants in the context of London's green entrepreneurs. The discussion has been informed by literature review as well as interviews with a selection of entrepreneurs, investors and facilitators in the sector.

Determinants in the entrepreneurial landscape[iii]

Regulatory Environment	Administrative burdens to entry	Resolving insolvency	Enforcing contracts	Trading internationally	Income, business and capital taxes	Court and legal framework	Registering property	Patent system; standards
Policy, Support and Market Conditions	National green policy	Local green policy	Business support availability	Access to markets	Public procurement	Degree of public involvement	Anti-trust laws	
Access to Finance	Access to debt financing	Business Angels	Access to VC	Access to other types of equity	Stock markets	Public funding		
Knowledge / Technology Creation & Diffusion	R&D Investment	University/ industry interface	Technological cooperation between firms	Technology diffusion				
Entrepreneurial Capabilities	Training and experience of entrepreneurs	Business and entrepreneurship education	Entrepreneurship support infrastructure					
Culture, Intermediation, Information	Risk attitude in society	Attitudes towards entrepreneurs	Business support information clarity	Level of intermediation available				

The following sub-sections of this report discuss each determinant in some detail, with access to finance discussed in most detail. After discussion, each aspect of each determinant is colour-coded to indicate the level of barrier it represents:

Opportunities	Neutral	Some barriers	Significant barriers

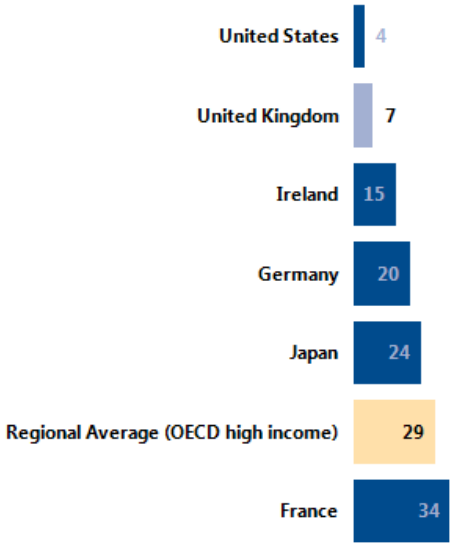
If it is felt that the LSDC can influence any of these barriers, this is indicated with a highlight around the particular barrier. The thickness of the highlight indicates the perceived likelihood of LSDC influence; where it is strongly felt that the LSDC can make a difference, the highlight is thicker.

Opportunities	Neutral	Some barriers	Significant barriers

3.1 REGULATIONS AND INSTITUTIONS

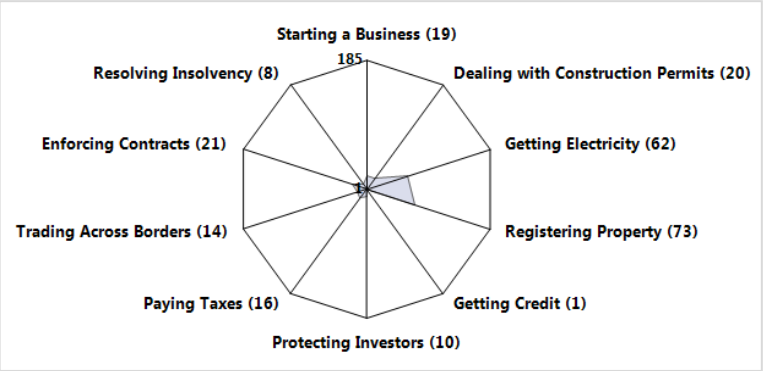
Regulatory Environment	Administrative burdens to entry	Resolving insolvency	Enforcing contracts	Trading internationally	Income, business and capital taxes	Court and legal framework	Registering property	Patent system; standards

The World Bank's *Doing Business* workstream sheds light on how easy or difficult it is for a local entrepreneur to open and run a small to medium-size business when complying with relevant regulations. Comparing 185 economies, it measures and tracks changes in regulations affecting 11 areas in the life cycle of a business: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts, resolving insolvency and employing workers.



The 2013 version of the UK report[iv] places the country as the **7th easiest economy to do business**. The rankings of comparable economies are shown alongside. As can be seen from the figure below, the UK is particularly strong compared with other economies on securing credit, resolving insolvency and protecting investors; however it does not compare well on registering property or getting electricity.

UK rankings on *Doing Business* topics



Source: Doing Business

None of the entrepreneurs spoken to identified the overall regulatory environment as a barrier, in fact they regard this aspect as a strength. The only concern expressed was the level of taxation and charges – such as capital gains tax (CGT) on investments and especially National Insurance contributions. While it was felt that microbusinesses benefit significantly from the Seed Enterprise Investment Scheme (SEIS) which provides tax relief to encourage investment in risky companies, it was also felt that charges such as NI could be reduced for smaller businesses.

Most aspects of this determinant were found to be very positive, and overall the regulatory environment can be seen as a facilitator rather than a barrier.

3.2 POLICY AND MARKET CONDITIONS

UK national government policy is seen as an international leader in some respects. Long-term targets and strategies such as the Climate Change Act and the Carbon Plans are considered good practice internationally and provide a general sense of support for green business practices.

However, in the shorter term, **policy uncertainty** is one of the most significant barriers expressed by the stakeholders interviewed. According to the interviewees, it almost does not matter what the policy is, as long as there is commitment to not change it. It was stated that sudden policy changes in the past few years (the speedy Feed-in-Tariff changes being the example quoted most) have caused significant monetary and job losses. They have also led to a real and continuing draining of investor confidence, and/ or worsening investment conditions as investors seek to hedge against policy risk. In an international market, capital can easily flow to other places where there is more certainty. Germany was cited as an example where the firm decision to discontinue nuclear power has reportedly led to a significant amount of activity in the renewable and clean energy sectors[1]. Interviewees felt that the LSDC could help in this aspect by influencing the Mayor to lobby government to make policy more robust and more certain.

Government schemes are seen as (perhaps necessarily) **complicated**, with smaller companies and start-ups unable to find the capacity to engage with them and benefit, especially when compared with larger companies who are seen to possess the human resources and in-house funding to do so. The Green Deal was cited repeatedly in this regard where the experience has been that there are many forms to fill and boxes to be ticked before any action can be taken. More than one person stated that the complications were such that "you may as well borrow money on your mortgage to make the improvements." The perception also is that big companies have Green Deal services "all sewn up". It was pointed out that to mainstream residential retrofit, small builders needed to be trained up so that they could incorporate retrofit into their normal conversations and work for clients – however the perception is that small builders are not able to engage and therefore this mainstreaming opportunity is being missed.

There is therefore a need for national schemes to be simplified, and for training and support offered to small businesses for them to understand these schemes and create new innovative products and services to benefit from them. There is also a sense among some interviewees that government is unable and/ or unwilling to engage with small companies and involve them in the design and implementation of green schemes.

When questioned about general regional and local policy in London, interviewees picked out two barriers. The first was the often complex and very lengthy **planning processes** which are seen as a

[1] Even if a debate over costs to the public purse is now raging in Germany.

major barrier to small businesses who do not have the significant resources or time opportunity required to deal with them. Interviewees felt that the LSDC may be able to help with this barrier in some way, perhaps by encouraging London's planning authorities to provide more support to smaller businesses, providing firm and consistent planning stipulations, or simplifying the planning process in some way. The "Merton Rule", LB Merton's stipulation that any new development needed 10 per cent renewable energy generation on-site, was cited as an example of planning certainty – where, while developers may feel additionally cost constrained, the certainty is still seen as beneficial.

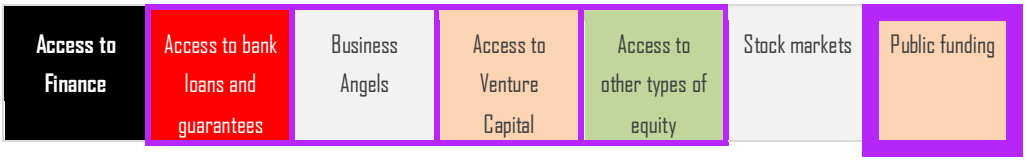
The second barrier was **public procurement**, where interviewees felt that procurement processes 'favour' established and large companies who can show years of existence, strong balance sheets and high levels of insurance cover. In this environment start-ups and small businesses feel shut out and unable to compete. This was true of national as well as local government procurement. It was felt that the LSDC may be able to assist by 1. influencing procurement processes; and 2. facilitating entrepreneurs in meeting high-level decision-makers in government bodies (such as in TfL, the Metropolitan Police, the London Fire Brigade) to demonstrate how new and innovative services and products may add value.

Other suggestions included:

- Exploring if public procurement rules can be relaxed in areas where there is technology risk. This exemption may help start-ups access public contracts more quickly than a wholesale change of the rules. This has not been explored as part of this research however may be worth a preliminary investigation by the LSDC.

- Examining the idea of setting up a panel of experts to review new innovative products and services and provide a 'stamp of approval' – in order to help entrepreneurs get recognised. This is similar to the London Leaders programme in some respects, however this would be a rolling assessment process rather than an annual one and with the potential to provide this 'stamp' to a large number of products and services.

3.3 ACCESS TO FINANCE



3.3.1 Corporate Finance

3.3.1.1 Traditional Sources

Pre-seed phase

Entrepreneurs typically use their personal savings, release equity from assets, and use the support of friends and family to take their business from idea stage through to the first stages of development e.g. registering a business or patent and conducting initial market and product assessments.

Seed phase - Angel investment

They may then need between a few months to a couple of years, and a raise of between a few thousand to several hundred thousand pounds of external finance, to develop their start-up/ early stage business into a realisable small business. For such amounts and for this stage of an organisation, business angels are the traditional and most popular route to access finance and expertise. Angels provide equity finance, using own personal disposable finance and making their own investment decisions. They normally also seek to bring their experience and knowledge to help the company achieve success. Angel investors typically seek to secure a return on their investment over a period of 3-8 years. Angels can invest on their own or with a syndicate. They follow their deal actively supporting the business e.g. by taking up a board position, or may act passively as part of a group with a lead angel taking this role on their behalf. For Angel investors, the capacity, experience, drive and skills of the entrepreneur and management team are most significant aspects when making an investment decision. Other important aspects include: the product, technology or service; market opportunities; and financial and commercial models. An example of investment criteria is shown in the box below.

Example of Angels' standard investment criteria

The *London Business Angels* Network has operated since 1982. Their standard investment criteria are listed on their website as follows:

1. UK Registered Company
   We seek opportunities from across the UK - unfortunately we cannot consider international companies at this time.

2. Seeking between £100k and £1m equity finance
   In return for a negotiable equity stake.

3. Eligible for EIS/SEIS tax relief
   This is essential - please visit www.hmrc.gov.uk/eis to find out if your business qualifies.

4. Most Stages/Sectors Considered

5. Attractive market
   A significant and growing addressable market, and an international expansion strategy if appropriate.

6. High Growth Business
   With an innovative and scalable business model.

7. Sustainable competitive advantage
   A clear competitive advantage, scalability and high barriers to entry, for example through intellectual property protection or exclusive commercial arrangements.

8. Potential for explosive growth
   Your company should have the potential to become a market leader in the near term.

9. Strong management team
   An experienced management team with relevant operational/sector experience.

10. Validation within the market place

11. Can be taken to market with little or no further development
    Past the initial concept stage or for hi-tech investments beyond 'Proof of Concept'.

12. Seeking an Exit in the medium term
    Normally via acquisition/trade sale of stock market flotation, generating a significant return for both company directors and investors.

Even though Angels provide support and advice while carrying out their own assessments, many entrepreneurs find this sort of scrutiny very challenging as this due diligence process can take time, expertise, research, knowhow etc – much of which the entrepreneur may not have. The issue of entrepreneur capacity is dealt with later in this report.

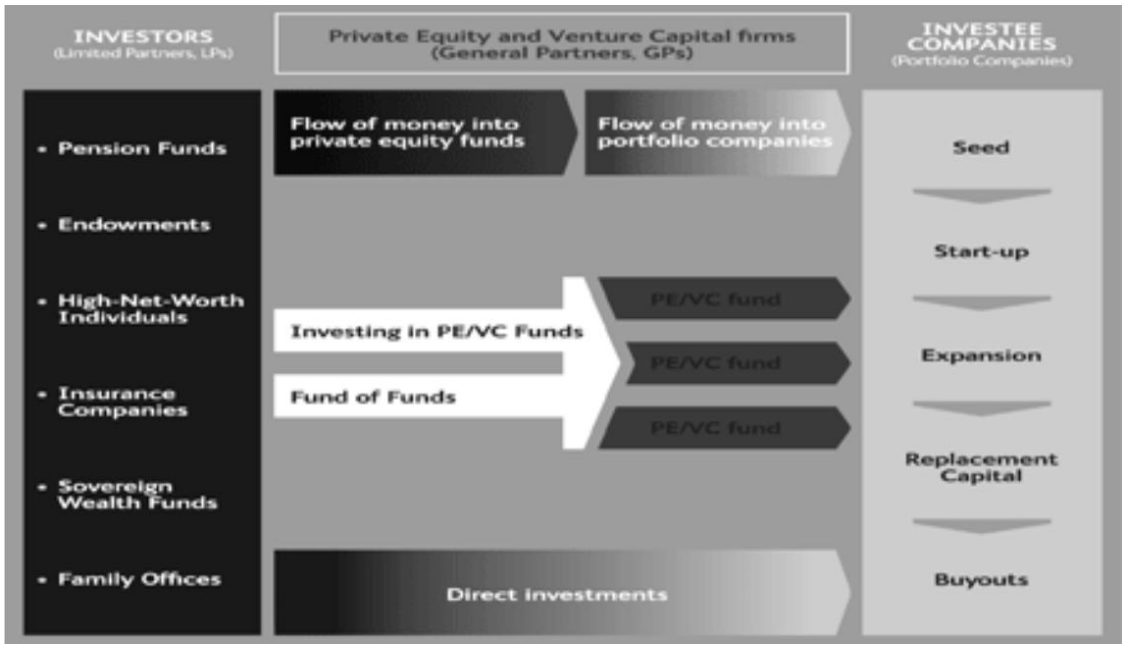
At the moment there are fewer Angel investors and Angel investment networks focusing on green business than there are in traditional high-potential sectors such as medicine and bio-tech. Despite this, most green entrepreneurs spoken to had successfully raised finance from Angel investors, with SEIS playing a critical part in this.

Venture Capital and Private Equity

Venture capital firms back concepts or ideas brought to them by entrepreneurs, or young companies looking for financing to help them grow. Since businesses at the concept stage are nascent, venture capital investors take a disciplined approach to evaluating not only the viability of the business idea, but also the motivation and background of the entrepreneur. Ultimately, venture capitalists look for bright ideas and intelligent entrepreneurs who they believe will see their idea through to success, in exchange for a proportion of equity which fits the risk of the investment and amount of capital required.

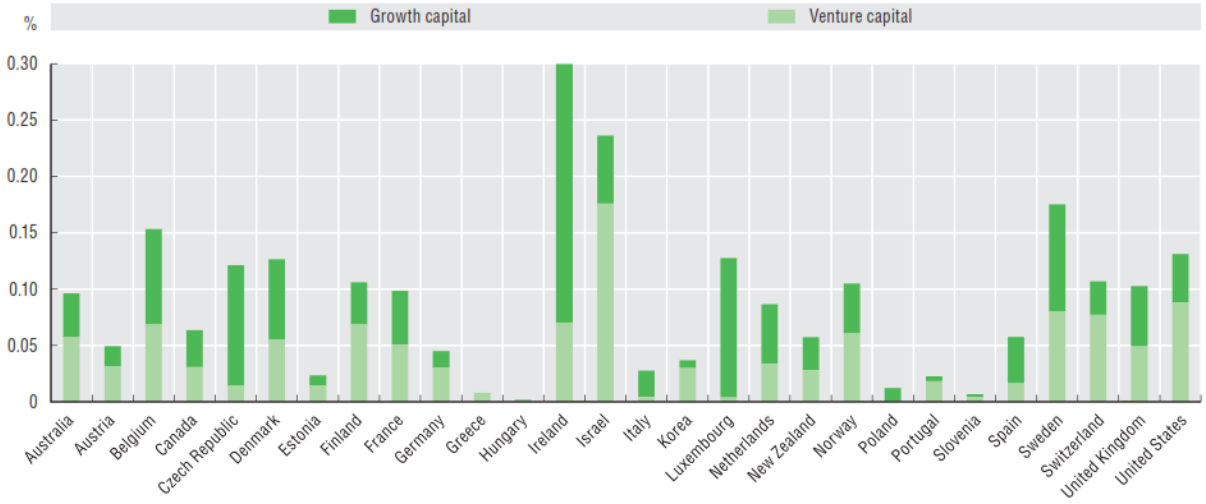
Private equity is medium to long-term finance provided in return for an equity stake in potentially high growth companies, which are usually, but not always, unquoted. Generally speaking, regardless of whether a private equity fund is listed or not, their activities are similar. Investment opportunities are sourced and screened by private equity firms (also known as general partners, or GPs) in order to arrive at a valuation. The transaction will be financed using equity provided by investors (also known as limited partners, or LPs) and in some cases debt raised from banks. The GP will actively manage the investment for the holding period (typically five to ten years), seeking to generate operational improvements in order to increase the value of the company. In many private equity transactions, the managers at the portfolio companies will be retained and offered an equity stake in the company, in order to align the interests of both parties. Returns are realized for investors through exiting the deal; this can be through floating the company on a public stock exchange (IPO - initial public offering) or a secondary buyout, whereby the portfolio company is sold to another private equity firm.

VC and PE stages explained



Source: British Venture Capital Association website

Venture Capital as a percentage of GDP, 2009



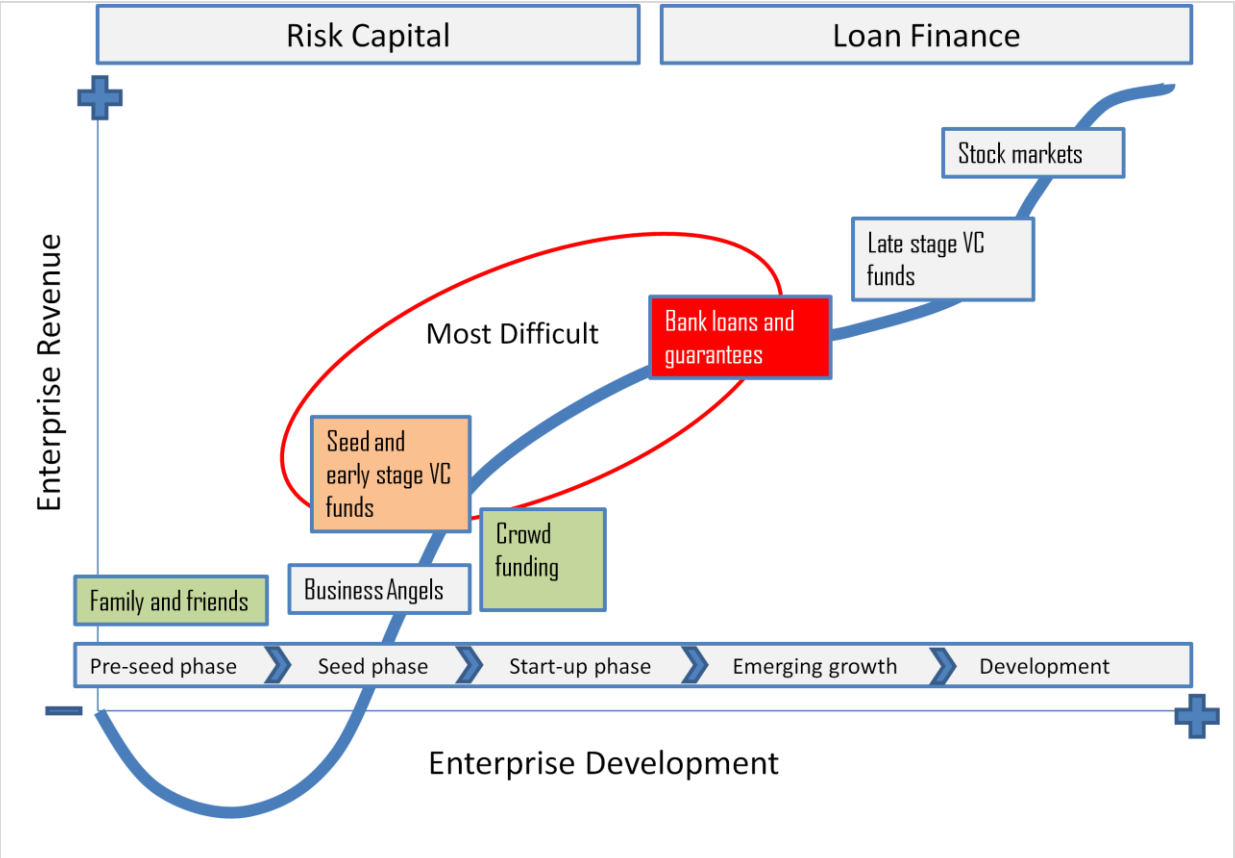
Source: OECD

None of the interviewees had yet raised venture capital as risk and return profiles were incompatible with their particular businesses. Some of the interviewees saw VCs as aggressive and impatient investors when compared with other providers. The perception of the interviewees was generally that securing finance from Angels was relatively easier than from VCs.

Bank Debt and Guarantees

None of the interviewees felt that bank debt was an option for start-ups or non-established businesses as: 1. their risk profiles tend to be too high; and 2. they lack assets for debt securitisation. Bank loans were seen as difficult to secure even for established businesses. This is despite the existence of the *Enterprise Finance Guarantee* (EFG) loan guarantee scheme to facilitate additional lending to viable small and medium size enterprises lacking adequate security or proven track record for a normal commercial loan. Open to companies with turnover upto £41 million, loans from £1,000 up to £1 million are accepted where government guarantees 75 per cent of initial capital provided.

Typical stages for different financing sources



Adapted by author from various sources

3.3.1.2 Alternative Sources of Corporate Finance

Innovative and context-specific sources

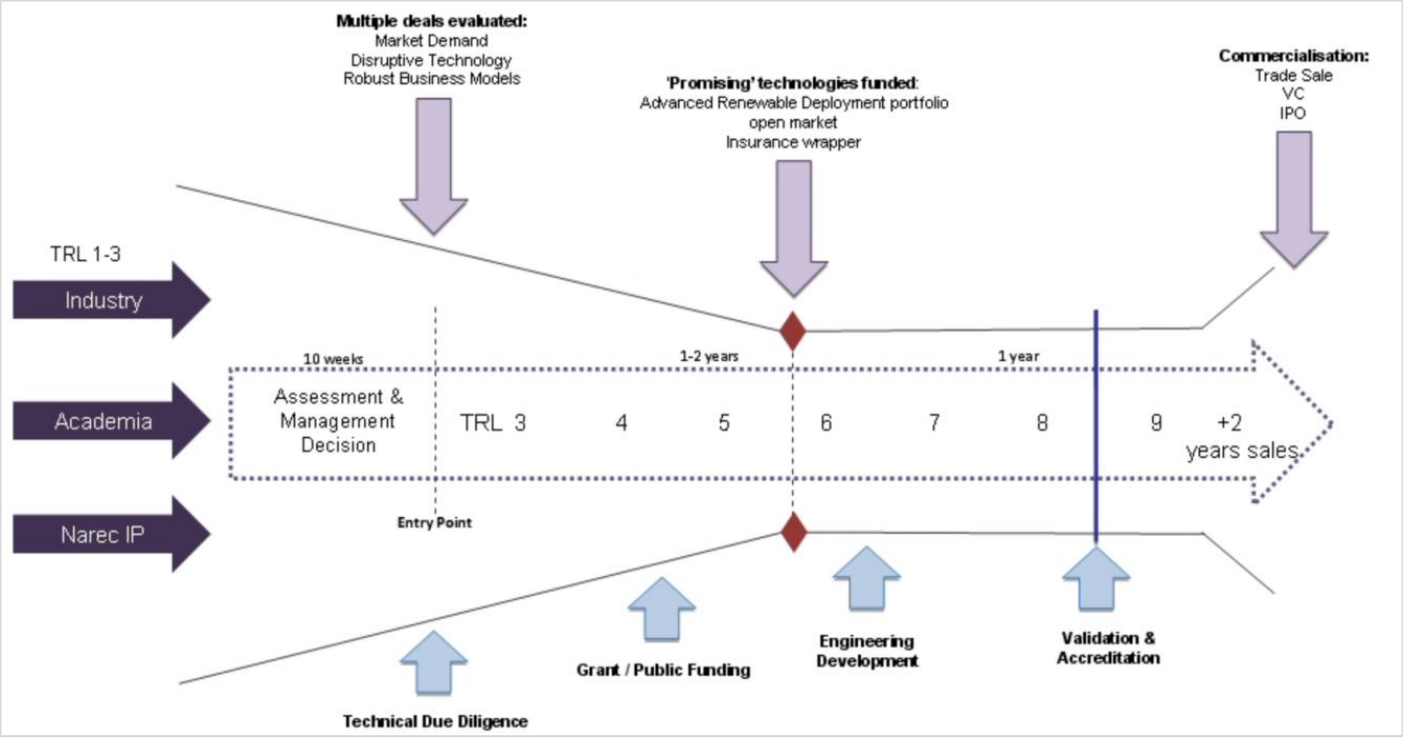
Out of sheer necessity, entrepreneurs often come up with innovative mechanisms for raising finance. One entrepreneur actually bought a company on 'credit' which is being paid back in-kind through the

products this purchase has enabled him to create. He also mentioned that due to lack of time, knowhow, contacts and his own perception of his business as a 'fit' he had never explored Angels for the seed investment he needed. His perception, although just a hunch, was that he needed an investor who could take a longer view than Angels – allowing revenues to be ploughed back into the business for a number of years to achieve scale before receiving any return. This entrepreneur has managed to agree, in principle, such seed funding from a large corporate client who will be making the investment more from a CSR than a purely commercial perspective.

Incubators and Accelerators

Incubators and accelerators provide a range of services to start-ups and early-stage businesses. For example, *Narec Capital* (http://www.nareccapital.com/incubation.htm) is a public-private initiative that among other services provides an incubation facility for start-ups and early stage ventures. According to their website, "technologies enter the incubator and undergo a rigorous selection process, at which time engineering market appliGrowthcation and commercial readiness is assessed. Those technologies that exhibit game changing aptitudes will then benefit from the use of Narec and other Centres of Renewable Excellence test facilities; leading engineering and market experts, operations and general business specialist as well as gaining access to funding sources to take them through to commercialisation."

Narec Capital Support Process Diagram



Source: Narec Capital website

Another example is *Wayra* which is a Latin-American and European seed-stage startup funding firm, established in April, 2011 as a division of the Spanish telecommuncations provider Telefónica. It provides financing, mentoring, access to technology expertise within Telefónica and use of purpose-built Wayra Academies to technology start-ups. Successful projects initially spend six months in a

Wayra Academy, receiving help to accelerate their business and technical support to further develop their ideas. In exchange, they take an average of about 10% of the company's equity. To date Wayra has received over 8,000 submissions internationally, and provided financing to over 100 start ups.

NESTA is an independent charity which invests to create positive social and environmental outcomes with a focus on innovation. The investments are enabled through a Big Lottery endowment. Nesta's workstreams include:

- Venture investments where they provide direct finance; their direct investments include a number of cleantech firms in the areas of recycling, industrial process efficiency as well as energy efficiency.
- Impact investment, where they:
    - support the creation of new funds and products, such as Bridges Ventures Social Entrepreneurs Fund or Big Issue Invest's Social Enterprise Investment Fund.
    - fund the strengthening of social venture intermediaries who provide incubation, business support or corporate finance advice to innovative social ventures. One of these is *Bethnal Green Ventures* which blends Nesta's funding with Cabinet Office and other funding to provide up to £15,000 to social, environmental and technology companies, for a six per cent equity share. They are a 'patient investor' and provide limited support to entrepreneurs at both selection phase and in business plan development.

Crowd Funding

Crowd funding is an emerging phenomenon and has the potential to change how many seek finance and engage. Traditionally, financing a business, project or venture has involved asking a few people for large sums of money. Crowdfunding switches this idea around, using the internet to reach thousands – if not millions – of potential funders.

Typically, those seeking funds will set up a profile of their project on a crowdfunding website. They can then use social media, alongside traditional networks of friends, family and work acquaintances, to raise money.

There are three different types of crowdfunding:

- Donation crowdfunding where people invest simply because they 'believe in the cause'.

- Debt crowdfunding where investors receive their money back with interest. Also called peer-to-peer (p2p) lending, it allows for the lending of money while bypassing traditional banks.

- Equity crowdfunding: People invest in an opportunity in exchange for equity. Money is exchanged for shares, or a small stake in the business, project or venture.

Crowdcube, Seedrs and Abundance Generation are three prominent crowdfunding platforms. These platforms also encourage start-ups to ensure their offers are SEIS-eligible as SEIS is a powerful incentive for investors.

3.3.2 Project Finance

In some cases, green entrepreneurs may seek project finance as well as corporate finance – for example, an anaerobic digestion technology provider is currently seeking project finance to install a number of small-scale digesters – however the technology is unknown in the UK and the sums are small, so securing this finance is proving to be a problem. Another example may be a small scale solar farm or wind project developer seeking to develop a small urban project.

Securing project finance for any project developer can be challenging, but this is especially so where there is an innovative technology brought in by a start-up. There can be high project development costs such as finding partners, conducting due diligence, finding funders, gaining planning permissions design etc., and public project development funding is hard to come by.

Due to high project assessment costs (legal and technical due diligence included) there is little appetite among the traditional finance community for small projects. Crowdfunding has emerged as a potential alternative. Abundance Generation for example raise debt finance up to £4 million for on-shore wind, and solar projects. Banks such as Triodos and the Coop may consider projects typically above £10 million. There seems to be a debt financing gap between approximately £4m and £10m.

In the waste sector the London Waste and Recycling Board has been able to catalyse small amounts of debt finance by offering mezzanine debt and other forms of bespoke financial products suited to different risk levels and investment size; this model can be explored for adoption in other sectors as well. More detail on this is provided below.

3.3.3 Government Funding, and Financial Incentives

The government provides corporate finance, project finance and a variety of tax incentives and other forms of support to start-ups and small businesses. The main sources of public funding mentioned by interviewees were the Technology Strategy Board, the European Regional Development Fund and other European Funds such as FP7 – although none had actually received any funding from these particular sources. All the entrepreneurs found public sources of funding, and especially European funding, extremely difficult to understand and engage with due to highly complicated prospectus documents as well as application procedures and implementation conditions – an example being requirement for collaboration between various organisations from several countries.

On the other hand, the SEIS tax advantageous legislation (described below) was mentioned by a majority of interviewees as being very effective in unlocking Angel finance.

The most significant funding sources and programmes identified by this research are described below.

3.3.3.1 Tax Advantageous Investment Legislation

When evaluating funding sources, it is important to consider the legislative landscape available to facilitate such investment. The government already has several tax advantageous incentives to encourage investment into qualifying UK companies. The Enterprise Investment Scheme (EIS) and Seed Enterprise Investment Scheme (SEIS) are summarised below.

Enterprise Investment Scheme

The Enterprise Investment Scheme (EIS) is a programme designed to encourage individuals to invest in smaller, higher-risk trading companies by offering a range of tax reliefs to individuals who purchase new shares in those companies.

EIS relief is available where a qualifying company issues new shares. The purpose of issuing these shares, and any others issued at the same time, must be to raise money for a qualifying business activity. The EIS shares must be subscribed wholly in cash (which includes payment by cheque and other means) and the cash must be paid in full by the time the shares are issued. In order to benefit from the relief, the relevant shares must be held for at least three years after issue or, if later, three years after the company begins to trade.

The relief consists of an initial 30% income tax saving and exemption from capital gains tax when the EIS shares are disposed of. It may be possible for EIS shareholders to defer an existing capital gains tax liability by rolling it into the EIS shares – this is known as EIS reinvestment relief. Shareholders may also be able to obtain further income tax relief if the shares are later sold at a loss.

Seed Enterprise Investment Scheme (SEIS)

The qualifying conditions for SEIS are based very closely on EIS. However, the amount of investment qualifying for SEIS relief is £150,000 in total for the company, compared to £5 million for EIS from 2012-13. Qualifying investors will be able to claim income tax relief worth 50% of the cost of buying shares in the company under certain circumstances (compared with 30% under EIS).

Qualifying SEIS investors will also be exempt from paying capital gains tax on gains on shares within the scope of the SEIS and would also benefit from not having to pay CGT for the year 2012-13 on gains realised from disposals of assets in that period where the gains are reinvested through the new SEIS in the same year. However, investors can only invest a maximum of £100,000.

Venture Capital Trust (VCT) scheme

This scheme encourages individuals to invest in small, unlisted higher-risk trading companies indirectly through the acquisition of shares in a VCT. VCTs are similar to investment trusts and must have HMRC approval. The maximum investment in VCT shares by any individual in any year is £200,000, which will qualify for relief against income tax at a rate of 30% of the amount invested. Shares must be held for at least five years from the date of their issue by the VCT. There is an exemption for capital gains tax on disposal of shares in a VCT, and dividends on VCT shares are exempt from income tax. VCTs invest their funds into eligible small companies. Eligible companies can receive both debt and equity investment from a VCT.

At the time the VCT invests an eligible company must: not be listed on the London Stock Exchange or any other recognised stock exchange; have assets of no more than £15m; have fewer than 250 full-time equivalent employees; and be preparing to carry on, or carrying on, a ‘qualifying trade’ as defined by HMRC. There are further requirements which the company must meet for a continuous period from the issue of the shares. Companies can raise a maximum of £5m in any 12-month period from the government’s three venture capital schemes – the EIS, SEIS and VCTs.

3.3.3.2 Public funding

ANGEL CO-FUND

The £50m Angel CoFund was launched in November 2011. The fund has been created with a grant from the Regional Growth Fund and invests alongside business angel syndicates from across England. The fund has been designed and established by a consortium of private and public bodies with expertise in business angel investment. It is a private sector body with clear objectives to boost the quality and quantity of business angel investing in England, and to support long-term, high quality jobs in growing companies.

The fund is able to make initial equity investments of between £100K and £1M in to SMEs alongside syndicates of business angels, subject to certain geographical restrictions, and an upper limit of 49% of any investment round. Investment decisions will be made by the independent Investment Committee of the fund based on the detailed proposals put forward by business angel syndicates. The fund is not open to direct approaches from individual businesses and those seeking investment will first need to secure the interest of the business angel syndicate or network.

TECHNOLOGY STRATEGY BOARD (TSB)

http://www.innovateuk.org/

The TSB describes its role thus: "to stimulate technology-enabled innovation in the areas which offer the greatest scope for boosting UK growth and productivity. We promote, support and invest in technology research, development and commercialisation. We spread knowledge, bringing people together to solve problems or make new advances.[v]

Innovation Vouchers

TSB's Innovation Vouchers are grants of up to £5000, designed to encourage businesses to look outside their current network for new knowledge that can help them to grow and develop. These are available to businesses to work with a supplier for the first time and are used to pay for knowledge or technology transfer from that supplier. An Innovation Voucher should stimulate a company to explore bringing new knowledge into the business, enhancing its ability to develop innovative products, processes and services and explore new markets.

Smart – SME R&D grants

Smart is an SME grant scheme for R&D projects in science, engineering and technology. Three types of grant are available:

- Proof of market – to help assess commercial viability through market research, competitor analysis, IP position assessment and commercialisation planning. Maximum grant £25k, up to 60% of total project costs funded.
- Proof of concept - to explore the technical feasibility and commercial potential of a new technology, product or process through: initial feasibility studies; basic prototyping; specialist testing and/or demonstration; IP protection; investigation of production and assembly options. Maximum grant £100k, up to 60% of total project costs funded

- Prototype development - to develop a technologically innovative product, service or industrial process through: small demonstrators; IP protection; trials and testing; market testing; marketing strategies; identifying routes to market; product design work. Maximum grant £250k, up to 45% of total project costs funded for small and micro enterprises; and up to 35% for medium enterprises

Small Business Research Initiative (SBRI)

SBRI enables small businesses to access public contracts where innovation is required: public bodies identify a specific need for an innovative technology, product or service; this is then turned into an open competition. A few companies may be initially selected for a 2-6 month feasibility phase, with contracts typically being up to a maximum of £100k; following assessment, a subset of these ideas may be awarded a second phase contract which can be for up to 2 years and a maximum of £1M. After completion of the second phase, companies are expected to commercialise the resulting product or service which is taken to market and open to competitive procurement.

Knowledge Transfer Partnerships

A mechanism to enable companies to employ recent graduates to help expand their businesses, where between 33 per cent and 50 per cent of costs are subsidised by the TSB.

Knowledge Transfer Networks (KTNs)

A KTN brings people together to stimulate innovation –businesses, research organisations, universities, technology organisations, government, finance and policy. There are 15 KTNs, all available from _connect at ktn.innovateuk.org – an online networking platform. All KNs may be helpful to green entrepreneurs however two are particularly relevant – the ”Energy Generation and Supply” KTN and the ”Environmental Sustainability” KTN.

Competitions

The TSB manages funding competition programmes for innovation across a wide range of areas, these are advertised on their website www.innovateuk.org.

Eurostars

The EUREKA's Eurostars Programme is the first European funding and support programme to be specifically dedicated to SMEs. Eurostars attempts to stimulate SMEs to lead international collaborative research and innovation projects. It provides funding and support for market-oriented research and development specifically with the active participation of R&D-performing SMEs (The Eurostars definition of research performing SMEs is a company that invests 10% or more of turnover or full-time equivalent to research activities). Projects can address any technological area and should be aimed at the development of a new product, process or service.

Other

The TSB runs ‘Catapult’ centres offering expertise in manufacturing processes, test facilities, type approval and accreditation or supply chain development in the following ‘focus areas’ -

High value manufacturing; Cell therapies; Offshore renewable energy; Satellite applications; Connected digital economy; Future cities; and Transport systems.
The TSB also promotes a number of international programmes and provides other forms of guidance and support.

EUROPEAN REGIONAL DEVELOPMENT FUND (ERDF) AND EUROPEAN SOCIAL FUNDS (ESF)

The Greater London Authority manages London's European Structural Funds programmes, which are "the main instrument for supporting social and economic cohesion across the European Union". They account for over one third of the EU budget and are used to tackle regional disparities and support regional development.
For 2007–2013 London was awarded over £1 billion from two Structural Funds:

- *The European Social Fund (ESF) - £840 million including match funding*
- *The European Regional Development Fund (ERDF) - £330 million including match funding*

Grants programme for business support

ERDF provides grants to public, private and third sector organisations to in turn provide business support to SMEs in priority areas including environment and climate change. The London ERDF programme secretariat is based at the GLA and is looking to commit up to approximately £6 million of funding in 2013. Under this grant scheme, start-ups and SMEs would typically not apply direct for ERDF funding; rather they would be provided with support by an ERDF-funded organisation.

£22 million Equity Fund

An equity fund was announced in April 2013 to provide financing for early stage businesses with a particular focus on software for financial services; creative industries; the 'digital economy'; leisure; education; and healthcare. Entrepreneurs working on 'greening' within any of those sectors should be eligible. Core funding of £10m has been provided by London government including ERDF funds. Equity fund manager MMC Ventures has been appointed to run the initiative and attract further private funding to grow the total value of the funding pot to at least £22million.

EUROPEAN SEVENTH FRAMEWORK PROGRAMME (FP7)

The Seventh Framework Programme (FP7) bundles all research-related EU initiatives together under a common roof playing a crucial role in reaching the goals of growth, competitiveness and employment. The broad objectives of FP7 have been grouped into four categories: Cooperation; Ideas; People and Capacities.

EU member states have allocated €1.34 billion to SME support programmes. Some of these programmes provide funding to national or regional agencies, which then provide support to SMEs. One of the more direct programmes is under the FP7's 'Research for the Benefit of SMEs' workstream under their 'Capacities' programme. This supports SMEs in different ways,

one of which is supporting SMEs to purchase between €0.5 million and €1.5 million of specialised research and development services. However SMEs must apply in partnerships of at least 3 independent SMEs based out of three different member states. http://cordis.europa.eu/fp7/capacities/research-sme_en.html

DECC ENERGY ENTREPRENEURS FUND
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/206636/Phase_2_Guidance_notes_June_2013.pdf

The objective of the Energy Entrepreneurs Fund (EEF) is to support, through capital grants, the development and demonstration of innovative technologies and/or processes in: (1) energy efficiency and building technologies; and (2) power generation and energy storage. The scheme seeks the best ideas in these areas from the public and private sector. However, the scheme particularly aims to assist small and medium sized enterprises, including start-ups, and those companies that are selected can receive additional funding for incubation support.

In Autumn 2012, two calls were launched under the first phase of the Entrepreneurs Fund. Thirty projects to develop innovative, low carbon products across a broad range of technologies have since been funded to a value of c. £16m. The remaining £19m has been made available for funding of innovative development and demonstration projects on a rolling, competitive basis with calls for projects every four to six months from June 2013 until the full funding has been allocated. Further Calls will be announced at https://www.gov.uk/innovation-funding-for-low-carbon-technologies-opportunities-for-bidders#the-energy-entrepreneurs-fund-scheme.

During the application process, applicants will be expected to demonstrate a robust evidence based case for funding, that will include but not be limited to:

- the potential impact of the innovation on 2020 and/or 2050 low carbon targets or security of supply
- the technical viability of their innovation and coherent development plan that will commercially progress the innovation
- value for money
- the size and nature of the business opportunity

For the purposes of this scheme, there are two categories to define development and demonstration projects:

- *Industrial Research*, defined as 'the planned research or critical investigation aimed at the acquisition of new knowledge and skills for developing new products, processes or services or for bringing about a significant improvement in existing products, processes or services. It comprises the creation of component parts to complex systems, which is necessary for the industrial research, notably for generic technology validation, to the exclusion of prototypes'.

- *Experimental Development*, defined as 'the use of existing scientific, technological, business and other relevant knowledge and skills gained from research and practical experience to produce new, altered or improved products, processes or services'.

LONDON ENTERPRISE PANEL (LEP)
http://www.london.gov.uk/priorities/business-economy/london-enterprise-panel

According to its webpages, the London Enterprise Panel "has been set up as a consultative and advisory body rather than a funding or business support body". Its membership is drawn from London's business community and local authorities. Its purpose is to advise the Mayor of London on action to:

- Provide strategic investment to support private sector growth and employment;
- Promote enterprise and innovation and the acquisition of skills for sustained employment in London;
- Protect and enhance London's competitiveness.

The London Enterprise Panel published its "Jobs and Growth Plan for London" in early May 2013. According to this, one of its four man priorities is providing critical support to SMEs. Within this priority area, it will provide support in the following four areas:

1. **Access to finance**

- map and identify the current provision of SME finance across London. This will ensure effective mobilisation of what is currently available, whilst also identifying any gaps that the LEP could fill

- assess the need, potential, and possible mechanism for a finance scheme using public funding of up to £25 million to leverage funding to assist London SMEs with potential to grow and that are having difficulties accessing capital

- seek to learn lessons from public and private schemes to enable SMEs to access appropriate finance e.g. work being undertaken by the London Food Board on micro-loans to community based food SMEs.

2. **Increasing trade and export**

- design and implement the Export Programme, co-funded by European Regional Development Fund and Growing Places Fund. The programme will be delivered in partnership with key stakeholders like London & Partners and UKTI, and will support London-based SMEs by providing them with expertise, support and funding to start trading in new markets.

- explore the benefits of E-commerce as a starting point for some SMEs and microbusinesses as a model to initiate their export adventure to new markets.

- explore the development of a network, building on the work of the 'London Business Club', to support peer to peer learning, marketing of London businesses to inward missions and the maximisation of trade events hosted in London.

3. **Workspace**

- commission research on incubators and accelerators in London. The research will analyse the economic impact of incubators and accelerators among start-ups and small companies based at these type of premises and define how their successes (or failures) are supported and encouraged. The research will also attempt to map the different models of existing

incubators and accelerators across London. It will identify geographical, sectoral or other gaps in the provision of incubators and accelerators and provide recommendations on what could be the role of the LEP and the Mayor in this agenda in partnership with the private sector.

- consider work towards identifying the implications of change of usage in planning regulations of employment areas and what impact this has on medium enterprises that want to move premises and their growth potential. This will identify, and consider what actions might be taken to remove other constraints within workspace provision for growing businesses once they move beyond the incubator and accelerator stage.

4. Business support and networks

- facilitating coordination: the LEP will look to assist support organisations together so that they can better co-ordinate their service provision to SMEs. This may initially take the form of workshops for service providers to ensure that they are aware of other initiatives and disseminating best practice between them.

- sign posting tool: the LEP's ambition is to maximise available resources and networks and encompass a wide range of quality information and business support providers that is easily accessible and friendly to use. This will include an overview of the products and services available in London via BIS, enterprise support agencies and the private sector. Before agreeing the type of tool to be used, the LEP will analyse what shape and form is most relevant for this market and explore a range of options.

- campaign: the LEP will deliver a small business campaign tying together some of the strands outlined above. The campaign will put specific emphasis in supporting different groups, like women, BAME or sectors like creative industries, food or science and technology among others.

- ambassadors and mentoring: LEP members' knowledge and experience of working with SMEs are a great asset to these activities and when relevant they will become champions for this area of work. Furthermore, business to business mentoring is being identified by certain size businesses as a useful mechanism to address the challenges faced by their companies as well as a practical way to obtain advice on how best to grow their companies. The LEP will consider the availability of mentoring in London in particular at key moments such as receiving finance and explore the possibility of greater a coordination of mentoring programmes for London SMEs.

- make the GLA the 2014-20 European Regional Development Fund (ERDF) Managing Authority. This would make the GLA, along with the LEP, directly responsible for ERDF programme design and administration in the capital. This will ensure that all ERDF provision meets the LEP's SME objectives, supporting access to SME finance, new market, networks and workspace.

LONDON GREEN FUND

The London Green Fund (LGF) is a £100 million fund set up in 2009 to invest in projects that will cut London's carbon emissions. The London Green Fund (LGF) provides funding for two Urban Development Funds (UDFs) that invest directly in waste and energy efficiency projects.

Waste UDF: The waste UDF, known as the Foresight Environmental Fund, was established in March 2011 with £35 million allocated to it from the LGF. It is being managed by Foresight Group LLP and provides finance via equity or equity-type investments for the construction or expansion of:

- Waste to energy facilities
- Value added re-use, recycling or reprocessing facilities
- Other facilities displacing fossil fuel such as 'waste to fuel'.

Foresight Group LLP is required to attract further investment into the UDF from other investors, which will increase the amount available to invest in projects.

Energy Efficiency UDF: The Energy Efficiency UDF, called London Energy Efficiency Fund (LEEF), was set up in August 2011 with £50 million allocated from the LGF. It is being managed by Amber Infrastructure Ltd which will secure additional funding and decide which projects are funded. LEEF provides primarily debt financing (where applicable, equity can be provided) to projects involving:

- The adaptation or refurbishment of existing public and voluntary sector buildings to make them more sustainable and environmentally friendly; and
- Energy efficiency improvements to existing social housing (up to the limit of £11m of the LGF contribution).

In theory, the public investment funds above are supposed to help deal with market failures blocking the creation of optimal environmental infrastructure – such as very low risk appetite amongst private investors especially where unfamiliar or new technology is being considered. However, the fund managers are also asked to attract and blend private investment into their investments; also, neither of these funds is specifically mandated to give preference to start-ups or SMEs. As a result, the risk appetite of these funds may not be significantly different to other, fully private, funds and this will need to be kept in consideration by project developers who have new and innovative companies, products and technologies within their projects.

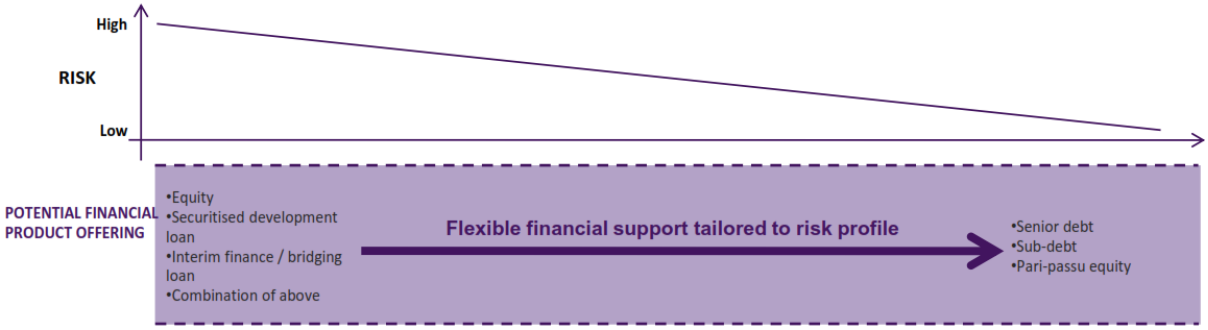
LONDON WASTE AND RECYCLING BOARD (LWARB)

www.lwarb.gov.uk

The London Waste and Recycling Board was established by the GLA Act 2007 to promote and encourage the production of less waste, an increase in the proportion of waste that is re-used or recycled and the use of methods of collection, treatment and disposal of waste which are more

beneficial to the environment in London. LWARB has a fund made up of money from central Government (DEFRA) to achieve these objectives.

LWARB recognises that "[A]ccess to finance is a critical barrier to infrastructure delivery in London" and aims to help ensure that "London's [waste] infrastructure requirements are delivered ahead of the economic curve such that the opportunity for early landfill diversion is not missed". Towards this, LWARB has previously provided mezzanine financing to projects which has helped secure equity as well as other debt finance. Over the past year LWARB has refined its strategy further and its business plan for 2013-15 suggests that it can provide tailored equity and debt products depending on project risk levels, as suggested in the diagram below from its business plan.



As with the London Green Fund, LWARB is not specifically mandated to support SMEs or start-ups and the authors of this report do not suggest that their specific funding models are entirely or directly transferable. However, the authors do suggest that the tailored funding approach can be explored by LSDC for small scale projects in other sectors. The first steps towards this may be:

- working with other project finance providers and with entrepreneurs to develop a selection of investment models
- identification of suitable capital sources from within the GLA family and from London local government bodies
- facilitation of funding strategies and project pipeline development.

Mezzanine finance

As its name implies, this type of lending sits between senior debt and the equity ownership of a project or company. Mezzanine loans take more risk than senior debt because repayments of the mezzanine loans are made after those for senior debt, however, the risk is less than equity ownership in the company as providers of mezzanine finance have a preferential call on their money before equity holders. Mezzanine loans are usually of shorter duration and more expensive for borrowers than senior debt . A cleantech project may seek mezzanine finance if the amount of bank debt it can access is insufficient: the mezzanine loan may be a cheaper way of replacing some of the additional equity that would be needed in that situation, and therefore can improve the cost of overall finance (and thus the rate of return for owners). In addition, mezzanine finance provided by a public body can help draw in senior debt from banks and other financial institutions, as shown by LWARB.

3.3.4 Challenges in Accessing Finance

The main barrier to accessing finance is the lack of capacity and skills to create a good business model, conduct market research, create a marketing strategy and other general business skills. These capacity issues are described in more detail later in this report.

A second major issue is the lack of knowledge of funding options – public, private and blended; grant, debt and equity. There seems to be an air of frustration amongst entrepreneurs that there appears to be a lot of funding 'around' however they find it very difficult to find it and then fulfil the funding conditions.

Chances of accessing funding from avenues would be increased by training and facilitation in business skills. Further, with public funding, simplification and centralisation of information along with some guidance and facilitation is seen as very desirable. These aspects are also explored later in this report.

3.4 KNOWLEDGE/ TECHNOLOGY CREATION AND DIFFUSION

Knowledge / Technology Creation & Diffusion	R&D Investment	University/ industry interface	Technological cooperation between firms	Technology/ knowledge diffusion

It is generally agreed that a significant amount of R&D is required to create innovative products and services; and that London universities and research institutions carry out a significant amount of R&D. However it also generally accepted that the UK is not very strong when it comes to commercialising R&D to create new products and services. For example, one interviewee stated that while Imperial College is widely recognised as the best at commercialisation in the UK, only 12 businesses were spun out last year. One reason for the lack of businesses coming out of universities may be that universities often prefer to license new innovations to existing businesses.

Regardless, universities have managed to expand their activities in the green space over the past few years and there are good examples: UCL runs a carbon research unit; LBS and UCL run an annual 'Cleantech Challenge' where cash prizes and other support are offered to new and innovative cleantech business ideas. The GLA has run a 'Mayor's Low Carbon Prize' for students for the past two years and this is advertised in university networks.

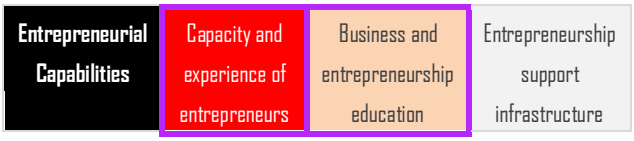
Generally, commercialisation happens best when there are effective networks connecting universities with industry and when industry influences and funds the work of universities and other research institutions. The US was cited as a good example of how to do this – primarily through public support of, and partnerships with existing industry players who in turn support product commercialisation.

The now-closed London Technology Network was cited as an example of a publicly funded body that usefully facilitated university/ industry interface – its closure has left a noticeable gap and the LSDC may wish to explore how it can facilitate the replacement of some of its functions.

There are many ways in which technology and knowledge diffusion takes place – such as networks and event providers such as ecoConnect; business clusters such as The Hub, or Google Campus and Modern Jago in Shoreditch Tech City. Such initiatives provide physical space, training workshops, information events etc for all kinds of entrepreneurs.

Within the green sector, in some cases many critical business factors are new – technology, markets, regulation, policy etc. There is therefore a very significant need for technology and knowledge diffusion to occur in a way that is efficient for entrepreneurs. It is no surprise then that the demand for this sort of facilitation seems to be ever-increasing and some of the interviewees suggested that a specialist green business cluster would be very useful. The LSDC may wish to consider how it can support existing initiatives or even explore the creation of a new, specialised green cluster.

3.5 ENTREPRENEURIAL CAPABILITIES



One of the most significant barriers identified in this research has been the capacity and experience of entrepreneurs. On the one hand, it requires willingness to take risks, creative thinking and understanding of when to grasp an opportunity. On the other, a basic understanding and skill level of areas such as relevant legislation, basic accounting, investment planning and sales and marketing is also required.

Virtually all interviewees identified lack of capacity and skills as a major barrier to making their business work. This is compounded by a 'lack of time' to learn and apply new skills, as entrepreneurs try to keep their head above water running a new business.

Many entrepreneurs in the green space come from a 'tech' or engineering background and do not possess the required business skills to begin with; typically finding marketing the most difficult area to grasp. Other entrepreneurs from a 'green lifestyle' angle may be able to quickly connect with potential customers e.g. through social media, however some may lack the skills to create a commercially viable or scalable business.

While they need to involve other experts, many entrepreneurs are understandably unwilling to share control over their business due to the hard graft they have done on its creation. When they do not have the overall skills required to run the business successfully, this can hold their business back significantly.

LSDC members have also pointed out there is insufficient knowledge of 'whole-life costs' in running a business; or creating and selling a product or service. Whole life costing takes account of the total cost of a product or service over its life, from determining the need for it through to its eventual disposal and replacement. For equipment, for example, it includes the costs of maintaining and operating the product, as well as the outright purchase, hire or lease price; the cost of consumables, utilities, training; and the cost of disposal or potential sale value at the end of its life. In some cases the elements, which are difficult to calculate (life expectancy, accuracy, ease of use, speed etc), are of paramount importance in making the final choice. For services, costs such as full budget costs, overtime, staff training, perhaps redundancy or re-location (should the unit close at some future time) need to be considered when evaluating in-house costs against those of buying in the service from an external provider.

There are several 'accelerator' and incubator programmes, some of which have been mentioned earlier. These provide training and education services for accepted companies. There are private companies such as ecoConnect which try to provide hands-on exposure via 'boot camps' and intensive interaction sessions with investors. However there are not enough of such programmes as only between 5 and 10 per cent of applying companies are typically accepted. Examples from other countries such as China and the US were provided by interviewees where there are now large scale 'incubation' support structures.

One of the most significant accelerators is the *GrowthAccelerator*, a £200m government-backed programme to provide business coaching to English SMEs. A private sector consortium of business growth specialists, delivers the scheme led by Grant Thornton. GrowthAccelerator focuses on four main areas:

- commercialising innovation – teaching business leaders how to commercialise their ideas, develop innovation strategy and generate profitable intellectual property.
- business development – helping business owners to develop and execute a clear growth strategy in line with their specific needs
- access to finance – this provides an assessment of business suitability and potential for raising finance; it helps create a business that is investible, and introduces a business to potentially suitable investors.
- leadership and management – GrowthAccelerator provides grants for training courses that will enable senior managers and chief executives to create an effective management structure and run their business better.

In addition to business coaching, GrowthAccelerator fast tracks clients to trusted providers of business advice. It introduces businesses to networks of investors. It also connects them to similar businesses.

Mentorsme.co.uk is a mentoring gateway that links businesses to mentoring organisations across the UK and can help find a mentor that suits the business, including those offering specialist financial support. The British Bankers' Association (BBA), the hosts of the portal, has provided 1000 volunteer bank mentors recruited from the business community who can offer expert financial support and all are accessible via the website.

ICAEW Business Advice Service: The Institute of Chartered Accountants in England and Wales (ICAEW) runs a business advice service for SMEs in England, Scotland and Wales. The scheme offers businesses a free advice session with an ICAEW-qualified chartered accountant. Businesses can visit www.businessadviceservice.com to find the nearest office participating in the scheme. BAS offers to help SMEs overcome the challenges of:

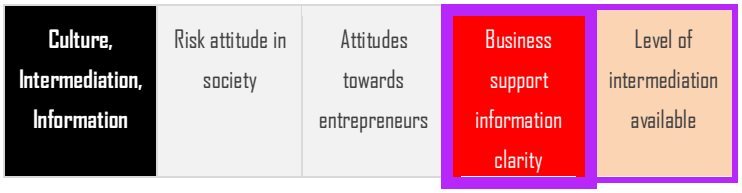
- how to grow a business;
- securing loans, capital and finance;
- keeping staff and creating new jobs;
- meeting tax and regulatory requirements;
- export planning;
- planning for long-term sustainable growth;
- debt management; and
- legal issues.

Other interesting new models of business support exist – such as the 'Pop-up Business School' which typically runs one or two week-long boot camps in partnership with Housing Associations. According to their marketing materials, "[I]t is designed to deliver advice, help and to support tenants or people within the local community who want to change their current situation, start a business, earn more money or move away from claiming benefits." Initial reported results of their work are promising.

Business and entrepreneurship skills are not perceived to be covered very well in schools and universities. With the possibility for good connections with the Mayor's Education Adviser and networks such as Eco-Schools, LSDC may have a natural advantage in being able to connect with the education system to try and improve this.

All business skills are important to green entrepreneurs however if only a couple of specialisms were to be focused upon they would need to be market assessment, and sales and marketing – as most entrepreneurs said these areas were where they most struggled.

3.6 CULTURE, INTERMEDIATION, INFORMATION



Some interviewees regarded the risk culture in the UK as quite positive while others felt it was lower than that seen elsewhere - especially the US. General attitudes towards entrepreneurs though are very positive.

There is some level of intermediation available – through incubators, accelerators, facilitation companies etc. - however typically only 5 or 10 per cent of businesses that apply to these get accepted. Therefore there is a call for more intermediation and facilitation.

The most significant barrier mentioned here was the lack of a 'centralised' repository of information on all types of support and guidance available to green entrepreneurs. A 'portal', where an entrepreneur could quickly and easily get the information relevant to themselves, was mentioned by several interviewees as being a potentially significant catalyst for success. An added bonus would be an expert at the end of a phone who was able to direct entrepreneurs to the right place.

The now-closed Regional Development Agencies were identified by many interviewees as a useful source of information and intermediation. London's replacement is the **London Enterprise Panel** which has set up a **Micro and Medium Enterprise Working Group** charged with "championing micro, small and medium enterprises in London". This working group consists of representatives from the investor and business communities, and from government.

As outlined earlier, the London Enterprise Panel plans to provide significant support in various aspects of intermediation and information. For example, the LEP plans to:

- Assess the need and potential for a £25 million public financing scheme to leverage funding to SMEs
- develop a sign-posting tool which will lead businesses to relevant information
- design and implement an export programme for SMEs
- explore the development of an SME network

The LEP's work has the potential to be very significant and their objectives are very complementary to the LSDC's – it will be critical for the LSDC's work to be conducted in coordination with the London Enterprise Panel to ensure efficiency. As the LSDC's work is specific to the low carbon economy while the LEP's work covers all economy sectors, there may be the potential for a partnership between the two bodies on sustainability issues, including green entrepreneurship.

3.7 SUMMARY TABLE OF BARRIERS AND OPPORTUNITIES

The table below highlights the barriers and opportunity areas for London's green entrepreneurs as gathered by this very brief research work[2]. We have also attempted to draw indications about the areas the LSDC may want to consider further in the context of potential future intervention. Of course, further work and engagement with the sector will be required to develop these opportunities further as these are simply high-level indications.

Summary of barriers, opportunities and areas for LSDC to consider further

Regulatory Environment	Administrative burdens to entry	Resolving insolvency	Enforcing contracts	Trading internationally	Income, business and capital taxes	Court and legal framework	Registering property	Patent system; standards
Policy, Support and Market Conditions	National green policy	Local green policy	Business support availability	Access to markets	Public procurement	Degree of public involvement	Anti-trust laws	
Access to Finance	Access to bank loans and guarantees	Business Angels	Access to Venture Capital	Access to other types of equity	Stock markets	Public funding		
Knowledge / Technology Creation & Diffusion	R&D Investment	University/ industry interface	Technological cooperation between firms	Technology/ knowledge diffusion				
Entrepreneurial Capabilities	Capacity and experience of entrepreneurs	Business and entrepreneurship education	Entrepreneurship support infrastructure					
Culture, Intermediation, Information	Risk attitude in society	Attitudes towards entrepreneurs	Business support information clarity	Level of intermediation available				

Note on public procurement

Following a review of the first draft of this report, the LSDC members have had a robust discussion on the merits or otherwise of intervening in public procurement. All members agreed that the 'problem was not fixed', however the following views were presented:

- The LSDC should not intervene as several others have tried to fix this issue over the years, exploring all possible intervention avenues – however intervention has met with limited success thus far

[2] The constraints of limited research scope, time and the small interviewee sample size must be noted however the quality and relevance of the interviewees was very high and every effort has been made to ensure robustness even within the research constraints.

- The LSDC should explore intervention as the problem is clearly not solved and there may be a way to build on past work while avoiding potential pitfalls

- The LSDC should not look to support entrepreneurs in gaining access to high-level decision makers in government as those are the wrong audience; small entrepreneurs typically fit into supply chains of larger companies who hold large public sector contracts and as such the entrepreneurs should approach these companies instead

- The LSDC should support entrepreneurs in gaining access to high-level decision makers in government as many of these entrepreneurs have radically innovative ideas that may provide great benefits to the public sector but may not fit into business as usual (e.g. so called 'disruptive' or 'radical' technologies); the only way for innovative ideas to be properly considered is if senior ultimate client audience is secured.

No consensus has yet been reached on this issue as yet and it is understood that the discussion will be taken forward to the next phase of the LSDC's work in this area.

3.7.1 Case Studies from Other Geographies

Our research found that many cities, regions and countries attempt to provide some information and facilitation series. They also provide in-depth support across business cycles through 'accelerators' and mentoring.

For example, the US federal government runs the "Startup America" initiative, and as part of this aims to support more than 1,000 startup and early-stage firms across the country. As part of the clean energy component of this, four accelerators are initially being funded: CleanTech Open (Bay area and New England); CleanTECH San Diego (Southern California and the Southwest); Clean Energy Trust (Midwest); and Nevada Institute for Renewable Energy Commercialization (Mountain Region).

National governments are also taking action of various kinds to:

- Unlock capital
- Speed up "lab to market" research
- Facilitating Open data to fuel innovation. As an example, the National Oceanic and Atmospheric Administration (http://noaa.gov) in the USA has been making weather data available for free electronic download by anyone. Entrepreneurs have utilised these data (http://data.gov) to create weather newscasts, websites, mobile applications, insurance, and much more. Today, entrepreneurs are using freely available government data and building apps and services that help citizens in a number of ways – e.g., to help people find the right health care provider for their family, identify the college that provides the best value for their money, save money on electricity bills through smarter shopping (http://wh.gov/REo), keep their families safe by knowing which products have been recalled etc.
- Running challenges and competitions much like the TSB's
- Supporting networks, such as the Startup America Partnership (http://s.co) which has mobilized well over $1 billion in private-sector commitments to help support startups and has launched entrepreneur-led coalitions in Startup Regions (http://www.s.co/regions/map) across the country.

3.7.1.1 City-level initiatives

City governments also provide local versions of the support that national governments provide. However, our research has found two main types of initiatives unique to city governments, which specifically support green start-ups and SMEs.

1. Provision of city government assets for technological testing

New York
The Municipal Entrepreneur Testing Service (M.E.T.S.) in New York will allow tech startup companies to test products like solar panels and energy efficient light bulbs in thousands of city-owned buildings. The rationale for this real-world testing is to allow these companies to prove the market-readiness of their products and get to market quicker than they would otherwise would. The city government's hope is that these companies will start creating jobs for city residents who manufacture, sell and install the new technologies.
In 2011 the NYC Department of Citywide Administrative Services issued a request for applications (for METS participants. Product companies were required to provide cost-effective improvements in the following areas:

- Lighting
- HVAC and lighting controls and sensors
- Meters, sub-meters, and related measuring and monitoring software
- HVAC and service hot water systems
- Building management systems
- Energy and plug load management systems
- Renewable energy (e.g. solar PV, solar heating, wind geothermal)
- Envelope technologies, including roof, wall, fenestration, foundation, and assembly systems
- Clean distributed generation, including combined heat and power
- Lab and fume hood technologies
- Interior finishes and/or furnishings that reduce toxic indoor gases
- Water efficiency, including recycling systems and uses
- Storm water management in buildings and sites
- Analytical tools and software

Following selection by a panel of experts, the City matched four municipal sites with green tech companies, and is seeking placement for two additional projects.

San Francisco
In October 2012 the Mayor of San Francisco launched a green business support programme including one workstream where City properties, buildings and other public assets would be used to pilot and evaluate a broad-array of innovative new products and design concepts including those from the clean technology sector.

This is already being done in a small way in London e.g. part of the TfL Dial-A-Ride fleet recently underwent trials using enhanced biodiesel blends. However the idea of providing GLA group assets for piloting by a variety of start-ups could be considered by the LSDC.

2. Creating physical green business clusters

Chicago Green Exchange

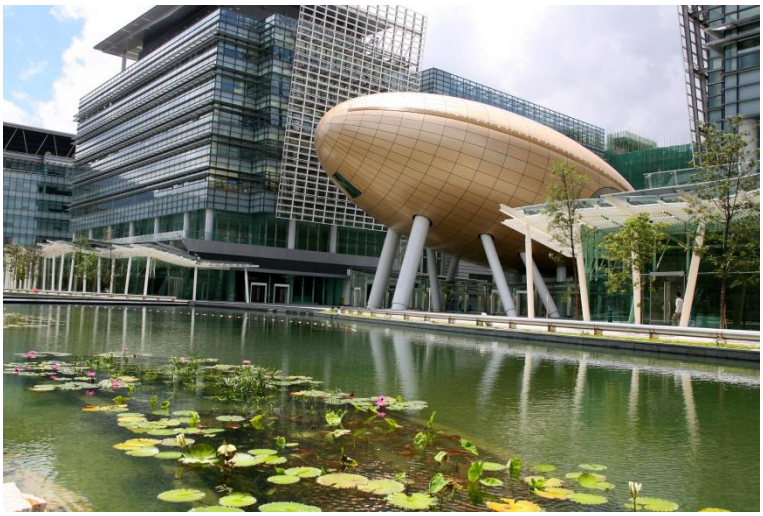
The Chicago Green Exchange is a sustainable and green retail and office development project designed to house more than one hundred eco-friendly businesses and organizations within a single building. Developers of the building are seeking LEED Platinum status for their rehabilitation of a historic landmark four-story manufacturing facility originally built in 1914. Once completed, the retail and office space will be open to the public. Developers Baum Development worked with the Commission on Chicago Landmarks and the National Park Service to win protection for the building. Ninety-six percent of the original building structure will be rehabilitated and maintained to preserve this landmark structure.
Green Exchange is reportedly the country's largest sustainable business community that will only house tenants offering green products and services. According to David Baum, one of the developers, "In order to be a tenant in Green Exchange, you must be doing something to advance the green marketplace." Chicago Mayor Richard M. Daley has described the project as "a great example of the public-private partnerships that are working together to help make Chicago one of the most environmentally friendly cities in the nation."

Berlin Climate-KIC Green Garage

The Green Garage opened on 24 April 2013 in Berlin-Schöneberg as the first start-up incubator in Germany that exclusively targets climate innovations. The new incubator is designed to significantly accelerate the development of innovative products and services in the area of climate change.

The Green Garage offers 280 square metres of working space for six start-ups, as well as space for workshops and seminars for up to 60 people. The new incubator is located on the EUREF (EURopean Energy Forum) Campus, a former industrial site now reconstructed and remodelled for business, research and education purposes. The character of the building was preserved during the conversion and is an example of climate-friendly conversion of existing buildings. The building is heated with biogas, and the electrical systems have been connected to the EUREF campus smart grid. Historic wooden garage doors have been retained, and modern facade insulation and a solar roof have been installed.

Hong Kong Science Park



The Hong Kong Science and Technology Parks Corporation (HKSTPC) was established in May 2001 to offer one-stop infrastructural support services to technology-based companies and activities. It offers a comprehensive range of services to cater for the needs of industry at various stages, ranging from supporting technology start-ups through an incubation programme, providing premises and services in the Science Park for applied R&D activities, to providing land and premises in the industrial estates for production.

The 22-hectare Hong Kong Science Park located in Pak Shek Kok is an important part of the infrastructure in support of the Government's mission to turn Hong Kong into a regional hub for innovation and technology. It provides a conducive environment to nurture world-class clusters, through making available suitable buildings for lease to technology-based enterprises to carry out R&D work. Its target sectors are electronics; information technology and telecommunications; biotechnology; precision engineering; and green technology (including renewable energy and environmental technology). The Science Park provides state-of-the-art laboratories and shared facilities which help reduce the capital investment of R&D companies in product design and development, and enable rapid entry of new products onto the market at lower cost. The facilities include the Integrated Circuit (IC) Design and Intellectual Property Servicing Centre, Reliability Laboratory and IC Failure Analysis Laboratory, Probe and Test Development Centre, Material Analysis Laboratory, Wireless Communications Test Laboratory, Solid State Lighting Test Laboratory, Biotechnology Support Centre and Solar Energy Technology Support Centre.

The HKSTPC operates three industrial estates and provides land therein at land development cost to both manufacturing and services companies with new or improved technology and processes which can broaden Hong Kong's industrial base and upgrade its technology levels. The HKSTPC nurtures technology-based start-up companies through its incubation programme which provides low-cost accommodation as well as management, marketing, financial and technical assistance in the critical initial years of these start-up companies. Each incubatee has access to a financial aid package of value up to $860,000 during the incubation period.

APPENDIX 1: DEFINITION OF A "GREEN ENTREPRENEUR"

As is sometimes remarked, an entrepreneur is easy to recognise but hard to define. In general, entrepreneurs are individuals who conceive new business opportunities, and who take on the risks required to turn those opportunities into reality.[vi]

The Oxford English Dictionary[vii] defines an entrepreneur as "a person who sets up a business or businesses, taking on greater than normal financial risks in order to do so".

While the term usually refers to an individual, it is also possible to find whole organisations that can also be classified as entrepreneurial in the way they do business and seek to grow. There are also individuals and teams within large organisations who tend to innovate and create new products, services and sub-businesses – these are sometimes referred to as 'intrapreneurs'.

According to the OECD[viii], a green entrepreneur can be either making her business "green" or simply entering a "green business". In other words, green entrepreneurship could be defined in terms of the technology used for production in any sector of the economy, or in terms of the sectors firms are active in, in which case attention is restricted to parts of the economy producing specific types of output. The former is sometimes referred to as a process approach in defining green business, while the latter as an output approach.

Complementary definitions can also help. For example, the Commission for a Sustainable London 2012 sets out[ix] a definition of a sustainable job as being: "One that improves an individual's life chances and benefits the community – environmentally, socially and economically." A green business, on the other hand, can be defined as one that:

- Focuses on using business as a tool for positive social change
- Is "values driven" as well as profit driven
- Is socially and environmentally responsible
- Is committed to and employs extraordinary and innovative practices that benefit workers, communities, and the environment[x]

The OECD provides the following as illustrations of the broad range of possible interpretations of the green entrepreneur concept:

- Isaak (2005) An ecopreneur is a person who seeks to transform a sector of the economy towards sustainability by starting business in that sector with a green design, with green processes and with the life-long commitment to sustainability in everything that is said and done.

- Volery (2002) There exist two types of ecopreneurs: 1) "environment-conscious entrepreneurs", are individuals who develop any kind of innovation (product, service, process) that either reduces resource use and impacts or improves cost efficiencies while moving towards a zero waste target. 2) "green entrepreneurs", are those who are both aware of environmental issues and whose business venture is in the environmental marketplace. Such entrepreneurs pursue environmental-centered opportunities which show good profit prospects.

- Anderson (1998) Both Entrepreneurship and Environmentalism are based on a perception of value. The attitudes which inform environmental concern create areas of value that can be exploited entrepreneurially. “Environmental Entrepreneurs” not only recognize opportunity, but construct real organisations to capture and fix change in society.

From the above discussion, and from the interviews conducted as part of this research, we propose the following definition for a green entrepreneur:

An individual or organisation taking on greater than normal financial risk to set up a business or businesses which brings environmental benefits.

APPENDIX 2: LIST OF INTERVIEWEES

- John Spindler, CEO, Capital Enterprise
- Benjamin Kott, CEO, EnergyDeck Ltd.
- Sue Riddlestone, Executive Director, BioRegional Development Group
- Stephen Hurton, Managing Director, Proper Oils
- Martin Orrill, Head of Energy Technology and Innovation at British Gas Business Services
- Ashley Blackmore, Director of Strategic Partnerships for 2degrees and various other positions
- Drummond Gilbert, Founder, goCarShare
- Bruce Davis, Abundance Generation
- Paul Miller, Bethnal Green Ventures
- Robert Hokin, ecoConnect

APPENDIX 3: RELEVANT RESOURCES AND ORGANISATIONS

This appendix details resources, organisations and individuals in London and elsewhere, who offer some form of support to green entrepreneurs. It must be noted that this report by no means provides a comprehensive listing or even a representative sample of resources and supporting organisations – we have simply listed a few prominent ones here.

Most organisations listed here would be suitable for invitation to an LSDC workshop on this issue. Where an individual has expressed interest in contributing further we have named them below.

A selection of entrepreneurs will also need to be invited. The entrepreneurs interviewed have all expressed interest in contributing further. Other entrepreneurs from within the London Leaders programme and LSDC itself could be invited. Point Carbon would be happy to suggest others at a later stage as appropriate.

INVESTORS AND INVESTMENT TRADE ASSOCIATIONS

UK Crowd Funding Association (UKCFA) (www.ukcfa.org.uk). Set up recently, the UKCFA is a useful source of information on this new funding source.

Capital for Enterprise (CfEL) http://www.capitalforenterprise.gov.uk/home. According to its website, CfEL is the UK Government's centre of knowledge, expertise and information on the design, implementation and management of finance measures to support Small and Medium Size enterprises ('SMEs') across the UK. It has around £1 billion committed to venture and loan funds - the largest single investor in UK venture capital funds; and £2 billion in loans to small businesses arranged through guarantee programmes.

Abundance Generation – crowd funding provider. **Bruce Davis** bruce@abundancegeneration.com

Bethnal Green Ventures– patient investor. **Paul Miller**. paul@bethnalgreenventures.com

UK Business Angels Association (http://www.ukbusinessangelsassociation.org.uk/). The UK Business Angels Association is the national trade association representing angel and early stage investment in England, Wales and Northern Ireland.

London Business Angels (LBA) (http://www.lbangels.co.uk/) connects innovating fast growth technology companies to equity finance through their membership of experienced angel investors. Although based in London, LBA is interested in all UK opportunities.

The British Private Equity & Venture Capital Association (BVCA) (http://www.bvca.co.uk) is the industry body and public policy advocate for the private equity and venture capital industry in the UK.

HSBC Bank. **Alexander Pohl**, Director, Renewable Energy and Infrastructure Finance, Corpoate Capital Origination. alexanderpohl@hsbc.com

Martin Orrill, Head of Energy Technology and Innovation at British Gas Business Services

UnLtd (http://unltd.org.uk). According to its website, UnLtd is the leading provider of support to social entrepreneurs in the UK and offers the largest such network in the world. UnLtd resources hundreds of individuals each year through its core Awards programme. UnLtd operates a unique model by investing directly in individuals and offering a complete package of resources; from Awards of funding, to ongoing advice, networking and practical support. UnLtd supports individuals who have their ventures firmly rooted in delivering positive social change.

NESTA (www.nesta.org.uk) According to its website, Nesta is an independent charity with a mission to help people and organisations bring great ideas to life. NESTA provides investments and grants and mobilises research, networks and skills.

Other existing and potential investors already described in detail elsewhere in this document:

- Technology Strategy Board
- ERDF/ ESF officers from the GLA
- Narec Capital
- Crowdcube
- Seedrs
- London Enterprise Panel
- London Waste and Recycling Board
- London Food Board representatives providing micro-loans

FACILITATORS/ INFORMATION & TOOLS PROVIDERS

The **Government website www.gov.uk**, provides information and guidance on many aspects of setting up a business and accessing finance. For example the webpage https://www.gov.uk/browse/business/setting-up provides links to information on writing business plans; securing specific advice over the phone (through the Business Link Helpline); growing a business; choosing a legal structure; setting up as a sole trader, a private limited company, or a partnership; choosing business premises; avoiding cash flow problems, selling routes and a variety of other issues.

Capital Enterprise (capitalenterprise.org) is a membership body for providers of enterprise support services in London. Their website states that they "exist to support entrepreneurs and businesses in London". Capital Enterprise and its members provide support services including advice, training, mentoring, accelerator programmes, specialist technical expertise, networking, soft loan finance and incubator accommodation to both pre-start and trading entrepreneurs and small businesses in all 33 London Boroughs. **John Spindler**, CEO. john@capitalenterprise.org

UK Trade & Investment (UKTI) (http://www.ukti.gov.uk) supports UK-based businesses in international markets, and works to attract promising overseas companies to the UK. **Dr. Malcolm Cohen**, International Trade Adviser. malcolmcohen@uktilondon.org.uk

ClearlySo (www.clearlyso.com) helps social entrepreneurs raise capital and introduce investors to exciting investment opportunities. They support businesses at all stages – early-stage, mid-size as well as large businesses.

Maximpact (www.maximpact.com) is a web-based portal designed to increase the depth and effectiveness of impact investment across the globe. It operates as a secure listing service that allows entrepreneurs, intermediaries and funders to share information about impact investment deals online

The Carbon Trust (www.carbontrust.co.uk) runs innovation funding and support services on behalf of government and private organisations; current examples include: the Offshore Wind Accelerator; Marine Renewables Proving Fund; Marine Renewables Commercialisation Fund; Polymer Fuel Cells Challenge; Industrial Energy Efficiency Accelerator.

EcoConnect (www.ecoconnect.org.uk)– green industry business network – **Robert Hokin**

The London Cleantech Cluster (LCC) (www.londoncleantechcluster.co.uk) brings together the initiatives, activities and programmes undertaken by organisations in the Greater London area developing new clean technologies and innovations, facilitating the deployment of sustainable alternatives and rolling out sustainability across the region.

LCC provides a platform to assist with the promotion of these activities, a means by which they can be effectively coordinated and a range of programmes to identify where gaps exist in the support that is needed to effect a successful cleantech sector in a leading sustainable region.

Venture Hothouse: company providing cloud-based business planning tools for entrepreneurs, start-ups and established businesses who have developed a suite of comprehensive on-line tools for entrepreneurs and existing businesses to enable them to build a full investment opportunity profile / business case comprising of: full 5 year financials, business plan, executive summary, financial assumptions, management presentation, investor letter and all relative files and documentation. The tools produce cash flow reports, IRR tables, overheads analysis, P & L, balance sheet etc. Reports are also available to view immediately via the 'online reports' section. **Paul Clarke, co-founder.**

The Long Run Venture – supports SMEs in exporting services and products; their staff advise TSB in this area.

Pop-up Business Schools - Ashley Blackmore. ashley@ashleyblackmore.com

London regional and sub-regional business support organisations exist such as the East London Small Business Centre which according to its website provides 'last resort' loans to start-ups and small business up to £25,000.

Free websites such as "Start Your Own Business" http://www.syob.net/

Commercially available business start up packages such as NewBizExpress http://www.newbizexpress.co.uk/ provides business plan support, website design and hosting, logo design, marketing, accounting and other support as a package.

The **British Library Business and IP Centre** (http://www.bl.uk/bipc/) helps with business planning, market research, IP protection and business networking.

UKSIF (http://uksif.org/): The UK Sustainable Investment and Finance Association (UKSIF) is the membership network for sustainable and responsible financial services. We promote responsible investment and other forms of finance that support sustainable economic development, enhance quality of life and safeguard the environment.

ENDNOTES

[i] http://www.londonsdc.org/documents/research/LSDC_QoLindicators_2012_Evidence%20Report.pdf

[ii] Published and unpublished reports for Greater London Authority by Innovas. Published report retrieved from http://www.london.gov.uk/priorities/environment/publications/the-london-low-carbon-market-snapshot-2011

[iii] Compiled by author from various sources including Philipps, S et al (2013) *Leverage Points for Low Carbon Entrepreneurship in Wuxi*, and OECD

[iv] http://www.doingbusiness.org/~/media/giawb/doing%20business/documents/profiles/country/GBR.pdf

[v] http://www.innovateuk.org/aboutus.ashx retrieved 01-05-2013.

[vi] http://ic.ucsc.edu/~rlipsch/EE80S/Ecopreneur.pdf

[vii] Concise Oxford English Dictionary, 10th edition, Oxford University Press.

[viii] http://www.oecd-ilibrary.org/docserver/download/3011021e.pdf?expires=1365359585&id=id&accname=guest&checksum=074618016D9E41A2F0C48067CFE15B42

[ix] http://www.cslondon.org/wp-content/uploads/downloads/2009/01/2009_Employment_and_Skills_Review.pdf

[x] http://wrdc.usu.edu/files/publications/publication/pub__3818278.pdf

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