Materials for Oxfordshire Greentech
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Executive Summary

This brief report contains the findings of a study conducted in 2018 of the role of cleantech in the local (Oxfordshire area) and national (UK) economies. It is a companion report and mirrors the structure of a similar report prepared for the Cambridgeshire area, using the same format and national statistics while replacing Cambridgeshire-specific data with those for the Oxfordshire area. It is based on data collected from a variety of sources that helps us draw not only qualitative but quantitative conclusions against which to measure performance of the Low Carbon and Environmental Goods and Service or LCEGS sector broadly, and the cleantech sector more specifically (although as noted in the report, much of the data currently available relates to LCEGS firms rather than cleantech). This provides a baseline that will be used in the future to identify progress towards the goal of increasing the presence and contribution of cleantech in the economy. Key findings are:

- The LCEGS sector, and by extension the Greentech sector, produces high value jobs, with higher Gross Value Added per job than the average for the economy. It is also one of a very few areas of the economy that grew in strength during the recession and recovery.
- LCEGS and Cleantech are also currently leading sectors in creating jobs per £ invested, being 50% higher than the traditionally strong area of defence investment.
- The region containing Oxfordshire is at the leading edge of this LCEGS and cleantech revolution, as measured by expenditure on R&D and number of people employed. In both cases, the region is almost a factor of two higher in *per capita* engagement in this high value area than the national average.
- The South East region is home to upwards of 6,500 LCEGS companies, although the large majority of these supply traditional products as part of a supply chain in firms that deliver low carbon, energy and environmental services and products, and provide waste processing. The number of firms of interest in the current report is closer to 1,200. Focusing down onto the area around Oxfordshire, and considering only direct suppliers of low carbon, energy and environmental services and products (rather than the many firms that are under the LCEGS classification but provide traditional environmental services such as waste removal and processing), the area is home to 60+ high quality LCEGS firms, 50 of which are true innovators. These companies are identified in the database appended to this report.
- Environmental Technology is an area where the UK is slightly lagging behind other developed nations in having a technological advantage in global trade, but the disadvantage is slight and modest investments in this area would turn this into an area of Revealed Technological Advantage in support of the government's Industrial Strategy and Clean Growth Strategy.
- The low carbon sector alone contributes approximately 7% of the Oxfordshire economy, with sales of approximately £1.2B per year, and employing approximately 9,000 people.
- The region is home to a wide range of effective business incubators, business-for-business networks, science and technology parks and academic and research institutions, bringing unmatched capacity to grow firms from ideas to start-ups to market success.

Clearly, cleantech is both a competitive strength of the Oxfordshire area and a wise investment for growth of the economy.

Defining the Cleantech Sector

'Clean', 'green', 'sustainable', 'low carbon' are all terms used to describe activities or products that improve environmental quality and protect human and ecosystem health. Their differences only become important in using databases to estimate the size of these sectors in Britain and in the Oxfordshire area. Three broad distinctions then emerge when considering the size of the business sector engaged in these 'clean' activities:

- Companies that operate using 'clean' activities or products. These do not necessarily produce or innovate clean activities. Nor do they necessarily use or manufacture 'products' in any sense. Their operations do, however, contribute to environmental sustainability.
- Companies that are in the 'Low Carbon and Environmental Goods and Services' or LCEGS sector, defined by the UK Office for National Statistics[1] (ONS) as providing "environmental products and activities, renewable energy and emerging low carbon activities such as alternative fuels, building technologies, nuclear power and carbon finance."
- Cleantech (sometimes called Greentech as in Oxfordshire) companies, which were defined originally by the investment community as an asset class that directly produces 'clean' technology that enables "clean energy, environmental, and sustainable or green, products and services."[2] These companies "Provide superior performance at lower costs, while greatly reducing or eliminating negative ecological impact, at the same time as improving the productive and responsible use of natural resources."

Only the Cleantech definition refers to an asset class into which private and public sector investors might want to put resources. This is an important distinction because the current economic databases on the size of activity under these three definitions refer to the broader LCEGS definition. The size of the LCEGS sector is much larger than the size of the Cleantech sector for three reasons. First, LCEGS companies need not use technology in their 'clean' activities. Second, they need not use 'innovative' technologies. Finally, they need not be in the business of creating or diffusing innovative technologies. Therefore, any attempt to estimate the size of the cleantech sector will always be bespoke, as is the case of the Oxfordshire Greentech 'universe' of companies referred to in this report, and contained in the database that accompanies it.

The Cleantech sector in the Oxfordshire area

The following figure shows the 26 categories of cleantech supported by Oxfordshire Greentech, as well as by Cambridge Cleantech as described in the companion report. They are divided into three sub-sectors:

- Renewable energy, providing advances in low carbon, sustainable energy production
- Low carbon, reducing the carbon intensity of community, industry and business operations
- Environmental, improving environmental and ecosystem quality both through pollution reduction and post-operation cleaning of air, water, soil and food

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[1] See the document "Measuring the environmental goods and services sector" by Donna Livesey, Office for National Statistics. It can be found at: https://www.ons.gov.uk/ons/rel/elmr/economic-and-labour-market-review/no--12--december-2010/measuring-the-environmental-goods-and-services-sector.pdf

[2] A good introduction to the topic can be found at Claentech.Org. See www.cleantech.org/what-is-cleantech

All firms considered in this report provide goods and services that fall into the definition of LCEGS and cleantech, although the majority are LCEGS rather than cleantech. This distinction is drawn more fully later.
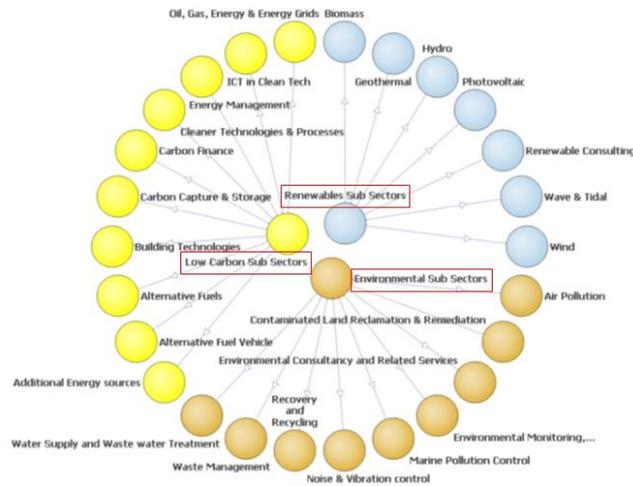
Cleantech and national policy

Two areas of national policy are relevant in identifying the need for cleantech investment. The first is the broad area of environmental and energy policy. It is shown most clearly in the 2008 Climate Change Act[3] of the UK, a world-leading commitment to reduce the carbon intensity of our national energy system and economy. It places the UK onto a trajectory to reduce national emissions of carbon dioxide by 80% as of 2050, with ambitious interim targets. Similar policies can be found in all areas of air, water, natural resources and food protection. They can also be found in UK energy policy, set out by the Department of Business, Energy and Industrial Strategy and defining targets for percentage energy provided by renewables, carbon intensity of the national grid, and energy efficiency in industry, business and the public sector[4]. Meeting any of these targets will require significant innovation and diffusion of clean technologies in the UK.

The second driver for investment in cleantech is the UK Industrial Strategy[5]. It sets four main challenges:

- "AI & Data Economy: We will put the UK at the forefront of the artificial intelligence and data revolution
- Clean Growth: We will maximise the advantages for UK industry from the global shift to clean growth
- Future of Mobility: We will become a world leader in the way people, goods and services move
- Ageing Society: We will harness the power of innovation to help meet the needs of an ageing society"

It will achieve these through five areas of policy:

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[3] See https://www.legislation.gov.uk/ukpga/2008/27/contents

[4] These policies can be found at https://www.gov.uk/government/policies?organisations%5B%5D=department-for-business-energy-and-industrial-strategy

[5] Industrial Strategy: Building a Britain Fit for the Future, 2017, Department for Business, Energy and Industrial Strategy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664572/industrial-strategy-white-paper-print-ready-version.pdf

"Ideas:

- Raise total research and development (R&D) investment to 2.4 per cent of GDP by 2027
- Increase the rate of R&D tax credit to 12 per cent
- Invest £725m in new Industrial Strategy Challenge Fund programmes to capture the value of innovation

People:

- Establish a technical education system that rivals the best in the world to stand alongside our world-class higher education system
- Invest an additional £406m in maths, digital and technical education, helping to address the shortage of science, technology, engineering and maths (STEM) skills
- Create a new National Retraining Scheme that supports people to re-skill, beginning with a £64m investment for digital and construction training

Infrastructure:

- Increase the National Productivity Investment Fund to £31bn, supporting investments in transport, housing and digital infrastructure
- Support electric vehicles through £400m charging infrastructure investment and an extra £100m to extend the plug-in car grant
- Boost our digital infrastructure with over £1bn of public investment, including £176m for 5G and £200m for local areas to encourage roll out of full-fibre networks

Business Environment:

- Launch and roll-out Sector Deals – partnerships between government and industry aiming to increase sector productivity. The first Sector Deals are in life sciences, construction, artificial intelligence and the automotive sector
- Drive over £20bn of investment in innovative and high potential businesses, including through establishing a new £2.5bn Investment Fund, incubated in the British Business Bank
- Launch a review of the actions that could be most effective in improving the productivity and growth of small and medium-sized businesses, including how to address what has been called the 'long tail' of lower productivity firms

Places:

- Agree Local Industrial Strategies that build on local strengths and deliver on economic opportunities
- Create a new Transforming Cities fund that will provide £1.7bn for intra-city transport. This will fund projects that drive productivity by improving connections within city regions
- Provide £42m to pilot a Teacher Development Premium. This will test the impact of a £1000 budget for high-quality professional development for teachers working in areas that have fallen behind"

The items highlighted in red are especially germane to a discussion of cleantech. Each of these demonstrates a need for significant public and private sector investment in cleantech if the UK is to maintain a strong economy (including our import-export balance) while meeting the ambitions of our environmental and energy policies and stimulating improvements in the sustainability of our communities relating to jobs, housing, transport, energy, food and quality of life.

The role of Oxfordshire Greentech (and its companion Cambridge Cleantech) in supporting these policies is evident in the final bullet under Business Environment. If innovators are to grow from idea, to start-up to a fully developed firm able to supply the innovations needed under the other areas highlighted in red, they must be given support to make this growth possible. This is an area of fruitful collaboration between government and business-for-business support groups.

The size and influence of the LCEGS and Cleantech sectors in the UK and regionally

Macroeconomic data in the UK do not focus down onto the cleantech sector specifically. Instead, they measure the economic activity of the LCEGS sector more broadly. The two sectors – LCEGS and cleantech – are often conflated, but are conceptually distinct. This distinction is important for Oxfordshire Greentech, which focuses on helping grow innovative technology companies (cleantech) rather on the much wider sector of firms that provide a range of environmental, low carbon and renewable energy services but do not necessarily do so with technology (LCEGS). Data are compiled only through 2013 or 2014 at present, so results understate the vitality of the sector given growth in the past four years. The sources of the data can be found in the references of the footnote[6].

Here one finds nationally:

- In the UK, the LCEGS sector is approximately £52B per year in sales of goods and services, which is 3% of the UK total GDP of £1.3T.
- The UK LCEGS sector employs more than 900,000 people, including 460,600 people in the low carbon sector alone as defined by renewable energy and low carbon activities - 60% providing direct services and the remainder in the supply chain - in the latest (2013) reporting period. Even if only firms involved in direct provision of Low Carbon and Renewable Energy generation (LCRE) through use of technology are considered, the employment in the UK is still 208,000 Full Time Equivalents (FTEs)[7].

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[6] The sources of the evidence are diverse, since economic data are collected with different purposes and using different ways of classifying economic activity. The most recent data are from 2012-2014, as the 2018 data have not been fully complied and published. The data sources used here of two kinds:

- Primary data from the Office for National Statistics (ONS). These form the basis for macroeconomic assessments by DBEIS and HM Treasury. We have used the United Kingdom Standard Industrial Classification of Economic Activities (SIC) 2007 codes as defined by the most recent Companies House classification.

- A variety of organisations have used bespoke analyses to produce a more detailed picture of the LCEGS and cleantech sectors. These studies are:

  a. Cleantech Group LLC and WWF (2012), Coming Clean: The Global Cleantech Innovation Index 2012, which you can download at info.cleantech.com/2012InnovationIndex.html.
  b. Spencer, M and Arwas, P (2013), Nurturing UK Cleantech Enterprise: Four steps to improve low carbon innovation, which you can download from the Green Alliance at www.green-alliance.org.uk/uploadedFiles/Publications/reports/Nurturing%20UK%20cleantech%20enterprise.pdf
  c. Department for Business Innovation & Skills (2012), Industrial Strategy: UK Sector Analysis, BIS Economics Paper No. 18, which you can download at www.gov.uk/government/uploads/system/uploads/attachment_data/file/34607/12-1140-industrial-strategy-uk-sector-analysis.pdf. This assessment is restricted to LCEGS, not cleantech specifically.
  d. Office for National Statistics (2012), Regional Gross Value Added (Income Approach), December 2012, which you can download at http://www.ons.gov.uk/ons/rel/regional-accounts/regional-gross-value-added--income-approach-/index.html. Again, this source examines LCEGS rather than cleantech.
  e. Department for Business Innovation & Skills (2013), Low Carbon and Environmental Goods and Services (LCEGS), Report for 2011/12, which you can download at http://www.bis.gov.uk/assets/biscore/business-sectors/docs/l/12-p143-low-carbon-environmental-goods-and-services-2010-11.pdf

[7] See the summary by James Murray in "Official: UK low carbon sectors growing at almost treble the rate of the wider economy", found at www.businessgreen.com/bg/news/3025699/official-uk-low-carbon-economy-growing-at-almost-treble-the-rate-of-the-wider-economy

- The Low Carbon component of the LCEGS sector generated approximately £45B in Gross Value Added (GVA) for the UK in the previous measurement period by the ONS. If one extrapolates to today using the year-on-year rate of growth of the sector, the GVA in 2018 is slightly over £50B per year. This number increases by more than 50% if other, non-low carbon, environmental goods and services are included.
- The LCRE sector – and by implication the LCEGS sector - is growing at more than three times the rate of the overall UK economy.

Drilling down to regional level for the Oxfordshire area, which is the South East region as the ONS database does not allow for a more narrowly defined geographic area, one finds:

- 6,585 companies are listed as being in the region's LCEGS sector. This is 14% of the UK LCEGS total, which means the regional *per capita* concentration of LCEGS companies regionally is more than twice the national average. If the national average of the ratio of 'Low Carbon' (renewable energy and low carbon firms, but not environmental) to all LCEGS firms is used, this translates to approximately 3,300 LCRE firms in the region. And if companies in the supply chain of firms that actually provide the low carbon business activities are further removed, there is a total of approximately 1,800 firms directly providing LCRE goods and services in the region. However, caution should still be exercised here as these numbers include waste processing firms (up to 33% of the total), a sub-sector not included in the bespoke Oxfordshire area database analysis given later. The total number of relevant, direct supply, firms for the current report is probably slightly above 1,200 for the Oxfordshire area, or more properly for the South East region overall.
- The low carbon sector alone contributes approximately 7% of the Oxfordshire economy, with sales of approximately £1.2B per year, and employing approximately 9,000 people[8]. The same report highlights the fact that Oxfordshire is "amongst the top five 'technology innovation ecosystems' in the world, and is home to 1,500 high tech firms employing around 43,000 people; including 6,400 in Research & Development in knowledge intensive businesses".
- Businesses invest £4.7B per year in advanced R&D[9], with government investing a further £0.6B (raised to £1.9B if investment in R&D within higher education more generally is considered). This is also 20% of the UK total, demonstrating the strength of the region in attracting research operations to locate here.
- This expenditure on R&D is 3% of the region's total GVA[10]. It is particularly significant that the job creation per £ invested is higher in LCEGS than other sectors, being 50% higher than defence (historically strong in creating jobs).

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[8] The most recent compilation of data is in the 2013 report of the Environmental Change Institute at Oxford University and Low Carbon Oxford, Oxfordshire's Low Carbon Economy, available at www.eci.ox.ac.uk/research/energy/downloads/olce-report-oct2014.pdf

[9] See Office of National Statistics, Gross domestic expenditure on research and development, UK: 2016, available at https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/ukgrossdomesticexpenditureonresearchanddevelopment/2016#south-east-and-east-of-england-continue-to-spend-most-on-rd

[10] Total GVA for the region can be found at (see Table 1):
https://www.ons.gov.uk/economy/grossvalueaddedgva/bulletins/regionalgrossvalueaddedbalanceduk/1998to2016

- This trend is also seen in the reverse: GVA per job created. The LCEGS sector in the UK (which is representative of the Oxfordshire area) generates approximately £90,000 GVA per job, compared to the average of approximately £50,000 GVA per job across all sectors[11].
- LCEGS sales have grown by approximately 4.5% per year over the past 3 years, in contrast to the significantly slower growth in other sectors.

Defining the size of the cleantech sector in the Oxfordshire area more specifically requires a bespoke process for collecting and interpreting data, since the ONS and related databases are valid only for the LCEGS and LCRE sectors broadly, and for the entire South East region. That process is necessarily subjective, as it requires separating companies into several categories based on judgments concerning the extent to which their businesses involve cleantech innovation. The current study is based on available information on firms in the defined geographic area (one hour's drive from Oxfordshire primary offices) using web searches, company profiles, membership in related organisations, and phone directories, identifying firms in any of four categories:

- Those that provide low carbon environmental goods and services directly to consumers as a significant percentage of their business (this report uses the ONS definition). These goods and services need not be technology-based, nor need they have any feature of innovation. The sector includes a wide range of traditional environmental services such as water treatment, waste collection and recycling.
- Those that are in the supply chain of technology solutions offered by LCEGS firms, but do not provide the technologies or assessments directly to the final consumer.
- Those that provide assessments of environmental and energy impacts, such as environmental consultancies.
- Those that are fully cleantech firms, meaning they are engaged in technology innovation at some stage between idea, prototype design and market development and deployment.

All four of these categories are included in the definition of LCEGS used by the ONS.

The firms are given in the associated database for this report, with the first three categories above collapsed into a single LCEGS category since most firms perform some mixture of these three business activities. To qualify as an LCEGS firm, they must be judged to (1) provide superior service in some area of renewable energy, energy efficiency or environmental protection with large potential for market adoption (perhaps at lower cost, although not necessarily), (2) reduce or eliminate environmental and ecological impacts of a product or process and/or (3) improve efficiency of use of natural resources. To qualify further as a cleantech firm within the LCEGS sector, companies must also provide their goods and services through an innovation for which they have been the primary innovator, with a demonstrated growth potential for the market in which they operate. As might be expected, the number of truly cleantech firms is significantly smaller than the LCEGS sector, with the number of cleantech firms representing only 10% or less of the LCEGS firms.

The database excludes firms that provide goods or services using common technologies that were not developed primarily for the LCEGS sector, but still find applications in that sector. An example is a firm based on skip hires, or one selling ladders that might be used on the sides of wind turbines. The reader should keep in mind that such firms are a significant part of the ONS LCEGS sector. This

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[11] Data can be found in Table B3 at:
https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/datasets/subregionalproductivitylabourproductivitygvaperhourworkedandgvaperfilledjobindicesbyuknuts2andnuts3subregions

bespoke database identifies approximately 60+ firms advancing the state of LCEGS, with 50 providing those goods and services through technology innovation.

The global picture

The global cleantech market – dominated by clean energy technology into which the UK companies might be expected to sell their goods and services as exports - is estimated to be 280B USD or £210B per year[12]. A recent report by the University of Cambridge and PwC for the National Bank of Abu Dhabi indicates that for the past 4 years, more than 50% of global investment in new energy generation has been in renewables[13], with a market size of up to half a trillion USD per year if one includes energy efficiency projects. This is an immense market that will be defined by firms that differentiate themselves by innovation, especially if they are willing to open offices local to the areas purchasing the innovations, a requirement of countries in the 'West-East Corridor' who will be the largest consumers of these low carbon and sustainable innovations.

How does the UK compare to other nations in cleantech innovation? The Global Cleantech Innovation Index[14] developed by the Cleantech Group shows the UK in 7th place, behind (in order) Denmark, Finland, Sweden, Canada, USA and Israel. The index is based on both inputs to innovation (for example, government policies) and outputs of innovation (technology advances). The UK slips to 9th globally if the efficiency of innovation is calculated, which is the ratio of scores on outputs over inputs. Germany ranks first due to ambitious government policies (inputs to innovation). If outputs, defined as 'emerging cleantech innovations' is considered, the UK ranks 5th globally, behind Finland, Israel, USA and Canada. The strength of the UK is attributed by the authors to a strategy of early stage investment activity and support, with more than 75% of cleantech start-ups being created in only four countries: (USA, UK, Germany and Canada). Clearly the culture of cleantech innovation in the UK is strong, providing a sound base for further investment.

Where to invest in cleantech within the UK?

All of the technology categories currently supported by Oxfordshire Greentech are viable areas of support nationally as part of an industrial strategy for economic development as the UK moves towards increasing its role in the international LCEGS and cleantech market. The UK will develop global leadership in innovation especially in four areas where we already have a strong base of innovation as set out in the government's Clean Growth Strategy as a supplement to the broader Industrial Strategy:

- Improving business and industry efficiency
- Improving our homes
- Accelerating the shift to low carbon transport
- Delivering clean, smart, flexible power

These four examples of technology innovations – already at the heart of the cleantech sphere in the Oxfordshire area - should attract national investment and other forms of support to grow start-ups. There is an equally strong case that the Oxfordshire and Cambridgeshire areas in particular are the

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[12] Statista, The Statistics Portal, available at www.statista.com/topics/3001/clean-technology-investments.

[13] Financing the Future of Energy, Cambridge Centre for Climate Change Mitigation Research, Cambridge Institute for Sustainability Leadership and PwC, 2015.

[14] See the Index at www.cleantech.com/2017-global-cleantech-innovation-index-a-look-at-where-entrepreneurial-clean-technology-companies-are-most-likely-to-emerge-from-over-the-next-10-years-and-why. Their report can be found at info.cleantech.com/rs/151-JSY-946/images/Global_Cleatech_Innovation_Index_2017_FINAL.pdf

geographic areas into which much of that investment might flow. This is evident from several lines of evidence:

- As shown previously, the East of England and South East regions are home to several thousand companies that are classified by the ONS as LCEGS. These firms contribute several tens of billions of pounds per year in GVA to the regional and national economy, employing tens of thousands of people in relatively high value jobs.
- The Oxfordshire area is home to 60+ and the Cambridgeshire area is home to 200+ LCEGS firms that are direct suppliers of high quality environmental and energy services and products (in contrast to the larger set of LCEGS companies in the ONS analysis, many of which provide traditional products as part of a supply chain to actual low carbon, energy and environmental companies). Approximately 100 of these in the Cambridgeshire area and approximately 50 of these in the Oxforshire area can be considered as cleantech innovators. These are contained in the LCEGS and Cleantech database appended to this report.
- In this regard, the Oxfordshire and Cambridgeshire areas have a *per capita* concentration of both LCEGS and cleantech firms that is well above the national average, contributing strongly to the local economies and creating UK science and technology brand awareness globally.
- Focusing on Oxfordshire, the area is home to the University of Oxford and Oxford Brookes University, which together bring world class expertise in all aspects of cleantech from fundamental research to market development to business growth. The University of Oxford in particular is a well-recognised global brand for technology innovation, with the University consistently appearing in the top 5 of universities globally, and often as the number one institution. Oxford Brookes has developed a national reputation for research into energy efficiency and low carbon innovation more generally.
- The area has a high *per capita* number of start-ups and scale-ups, significantly higher than for the UK generally.
- The area houses a full complement of well-developed technology and business incubators to support creation of ideas and movement of these to viable companies. These can be divided into four groups.
    - o Oxfordshire Greentech, Oxfordshire Business Support, Willow Innovation, Oxfordshire Social Enterprise Partnership, Oxford Brookes Environmental Information Exchange, and the Harwell Business Support Campus provide business-for-business networking and support for emerging companies, including linking these companies to more established LCEGS firms in which they might participate as supply chain partners.
    - o The Said Business School of Oxford University and the Oxford Brookes Business School provide access to students and faculty to advise firms on business strategies and assess market potential, resources rarely available to start-ups. Both participate extensively in Knowledge Transfer Partnerships.
    - o Business and innovation incubators provide space and resources to the community of innovators, founders and entrepreneurs[15]. These include Oxford Innovation (focused on innovations from the University of Oxford, and housing the Startup

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[15] Workspaces and community spaces for startups are plentiful in the Oxfordshire area. The more significant ones are 1a Newtec Place; Begbroke Science Park; Clarendon Business Centres; Connect TVT; Easy Offices Oxford; Ethical Property; Grove Business Park; Hub Ventures; Milton Park Business Park; Oxford Centre for Innovation; The Mix of Wantage; Oxford Hackspace; Oxford Innospace; Oxford Science Park; Pure Offices; Point of Living in Bicester; Regus Offices; The Wheelhouse Oxford; The Workstation; Wattlington Business Centre; Workspace Oxford.

Incubator); Science and Technology Facilities Council (including the Innovations Technology Access Centre); Oxford Trust's Wood Centre for Innovation (with strong ties to Oxford Brookes University); Oxford Foundry (accelerating entrepreneurial activities of Oxford university students); Bethnal Green Ventures; Biostars; eit Climate KIC and Greenhouse; Entrepreneur First; FAB Accelerator; Founders Factory; and Satellite Applications Catapult's Spin-Up Factory. Also included in this category albeit with a purely networking function is the Oxford University Research and Innovation Support Network, and the Enterprise Europe/Bicester Vision.
- o Science and Technology parks such as Oxford Science Park, Milton Park, Begbroke Science Park, Oxford Technology Park and Culham Science Centre provide a vibrant atmosphere of cutting edge research and development, facilitating growth of start-ups into businesses capable of delivering at scale to technology sectors.
- Strong links have been formed with cleantech clusters in Cambridgeshire, Nottingham and Perth, greatly increasing the range of contacts that can be formed by firms originating in the Oxfordshire area. The emerging Oxford-Cambridge corridor will further such links.

What government policies are needed to grow the sector?

Government policy will be critical in supporting LCEGS and cleantech both as vibrant economic sectors in themselves and as an adjunct to other sectors whose growth requires cleantech advances if national environmental and climate targets are to be met while industry develops and the economy grows. There are six ways in which government policy can support the LCEGS and cleantech sectors:

1. Identify and provide support to the key areas of cleantech where the UK has a strategic global position and marketing of that position internationally to support global exports.
2. Provide funding support to help innovators and SMEs grow to the point where they can deliver their cleantech solutions at-scale and thereby enhance UK productivity.
3. Incorporate cleantech requirements into the performance measures of public procurement policies that will help drive demand for cleantech solutions
4. Develop incentive programmes for including cleantech companies in infrastructure provision, including for transport, both by government and utilities.
5. Require monitoring and reporting of cleantech performance, such as energy consumption, in major building and infrastructure projects at both construction phase and thereafter.
6. Create with ONS a significantly improved and reliable database of cleantech firms in the UK, including cleantech as a better defined category in, for example, revised SIC coding by DBEIS.