



# Sustainable Success

## The Commercial Case for Investing in UK Cleantech

A joint publication by Cambridge Cleantech and the University of Cambridge Centre for Climate Change Mitigation Research



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## Executive Summary

Investment and innovation in the cleantech business sector is not only critical to the future of the planet and its people, it also represents a major business development opportunity to drive regional and national economic growth and create more high-value jobs. Cleantech is an increasingly mature industry, with innovations that have developed into organisations poised to deliver on national energy, economic and environmental ambitions.

The Cambridge/Peterborough/East of England region is extremely well-placed to capitalise on this opportunity. It is especially notable that the success of the area around Cambridge – the Silicon Fen – can now be leveraged to bring similar success to the larger region and to support national efforts. But to maximise the potential and step up to world-scale status will require specific policy changes and continuing support from government and business.

There is a very compelling evidence-based case for regional investment in a range of technologies being developed in response to urgent sustainability challenges, including:

- environmental solutions, e.g. to manage air, water, waste and natural resources
- reduced carbon initiatives, e.g. sustainable buildings, smart cities, low carbon vehicles
- energy efficiency activities, e.g. renewables, smart meters, smart-grids, storage

More than 1000 businesses in the Cambridge/Peterborough/East of England region are already active in the cleantech sector, ranging from product development specialists to multinational enterprises with global reach. Collectively their *per capita* GVA is well above the national average. This can be built upon to bring a 'halo effect' for similar success outside this region.

The emerging cluster is supported by a network of world-class universities and research centres, a highly skilled workforce and some of the world's leading technical consultancies.

To ensure that they can fulfil the ambition and make a greater contribution to the UK economy, Cambridge Cleantech members are calling on the government and businesses to deliver:

- **Better defined, more stable government policies** that influence confidence in cleantech investment
- **Support from the government and businesses** that will help innovators and SMEs grow to the point where they can deliver their cleantech solutions at-scale
- **Incorporation of cleantech credentials into the performance measures of procurement policies** that will help drive demand for cleantech solutions
- **Development of incentive programmes** for including cleantech companies in infrastructure provision, both by government and utilities
- **Mandatory monitoring and reporting of cleantech performance**, such as energy consumption, in major building and infrastructure projects at both construction phase and thereafter
- **Identification of the key areas of cleantech where the UK has a strategic global position**, marketing of that position internationally and supplying market intelligence
- **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 BIS

## The Context: three challenges, one solution

The world faces three challenges, the response to which will define the 21<sup>st</sup> century:

- We are reaching the limits of several natural Planetary Boundaries<sup>1</sup> for resources and the quality of the environment (air, water, soil, ecosystems)
- There is growing competition for these resources at the points where goals of sustainable food, energy and water intersect
- Economies are faced with the threat of unreliable energy supplies as old high carbon systems reach the end of their (19<sup>th</sup> century or earlier) design lives

***The solution?*** Meeting these challenges will require changes in economies, businesses, institutions, political will and individual behaviour. But it equally will require technological change, including both innovation and the further growth of mature cleantech businesses. Part of the solution to all of the environmental and energy challenges lies in supporting cleantech technology, and the innovators and companies that provide it.

***The path forward?*** Investment in a future supported by cleantech innovation – whether new or mature - is a wise one, but it requires the creation of networks to identify innovators, growth of SMEs to scale so national and global challenges can be met, and government policies and business practices to make all of this possible. Hence the creation of Cambridge Cleantech and similar business-for-business support networks. Cambridge Cleantech is a membership organisation with a focus on the UK and East Anglia, including Cambridgeshire and Peterborough, but with members from across the globe.

By specifically prioritising our and government's support for 'medium' scale businesses within the SME community, we can expect a higher proportion of globally significant companies to emerge from the cluster, accompanied by stronger GVA growth.

## What is Cleantech?

Cleantech means any company, activity or innovation that contributes to the UK and global goal of meeting the environmental and energy challenges. Cambridge Cleantech identifies 26 business sub-sectors falling within this definition of cleantech, divided between: (1) Renewable Energies, (2) Environmental and (3) Low Carbon.

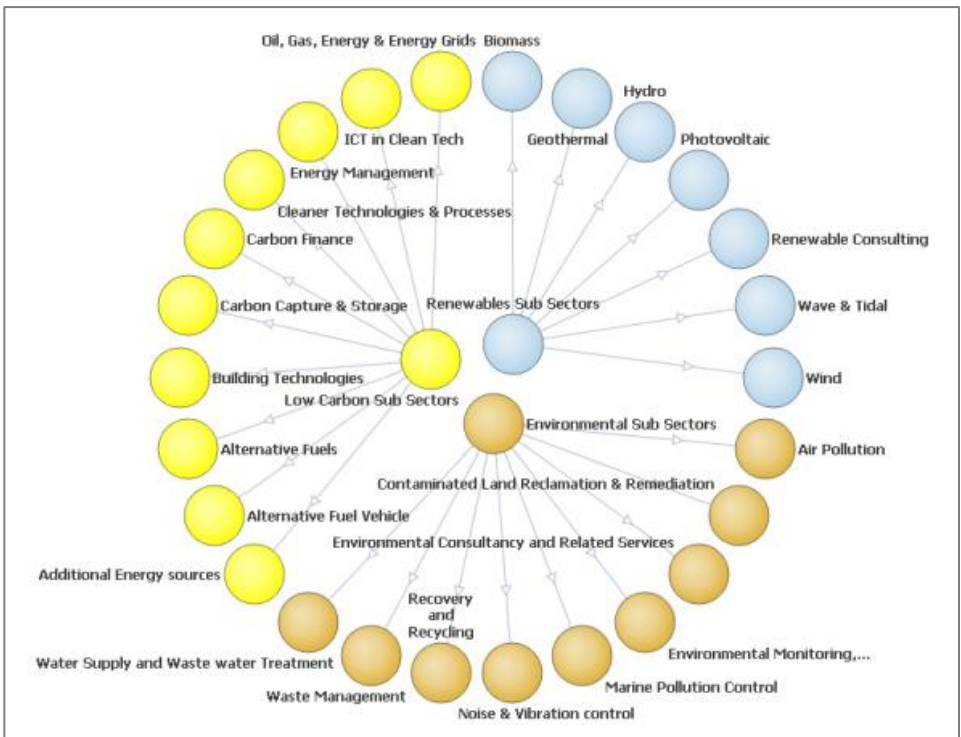


Figure 1: Cleantech sub-sectors

The focus of this report is on companies that see one or more of these aspects of cleantech as their primary mission, meaning we do not count firms that provide more traditional goods and services into the supply chains of cleantech companies, however essential these might be in the delivery of cleantech solutions and in the vitality of the local economy.

## Cleantech – The Return on Investment

The growth of cleantech innovation, and of companies that deliver this innovation to the market, requires both private investment and government policies to make that investment reliable. It also requires that these investments and policies be directed towards regions of the UK where innovations are most likely to be produced and nourished. Data and analyses from the University of Cambridge Centre for Climate Change Mitigation Research, drawing on research conducted throughout the UK<sup>2</sup>, demonstrate that cleantech is a source of significant innovation and economic activity in the area surrounding Cambridge, South Cambridgeshire, Peterborough and the East of England more broadly.

There is a strong base of evidence that:

- Nationally, cleantech is worth approximately £52bn per year in sales of goods and services, which is 3% of the UK total GDP of £1.3tn, employing more than 900,000 people.
- Cleantech produces high value jobs, with more than double the Gross Value Added per job than the average for the economy.
- It is one of a very few sectors of the economy that grew in strength during the most recent recession and recovery, growing by 4.5% per year.
- It is one of the leading sectors in creating jobs per £ invested, being 50% higher than even the traditionally strong area of defence investment.
- The region around Cambridge – the Silicon Fen – is at the leading edge of this cleantech revolution, as measured by expenditure on R&D and number of people employed. In both cases, the region has twice the *per capita* engagement in this high value area than the national average.
- Depending on the definition of ‘cleantech’ used (for example, what percentage of a company’s business must be in cleantech and how much innovation must be involved?), the number of cleantech firms in the region is somewhere

between roughly 1,300 and 4,000. See the DBIS<sup>3</sup> survey results.

- More than 29,000 people are employed in R&D in the region, giving the region one of the highest *per capita* rates of employment in R&D that is so crucial to cleantech innovation and further growth of mature companies in the UK.
- The Cambridge area has particular strengths in controls/IT, building technologies, low carbon vehicles, solar PV, energy systems management, recycling and waste management, and smart cities.

This base for cleantech companies is supported in the East of England region by some general characteristics that make it the ideal home for cleantech innovation and business growth:

- 10% of the UK total of Low Carbon and Environmental Goods and Services Companies are in the region, which means the *per capita* concentration of companies is more than twice the national average.
- The region has a high employment rate; for example South Cambridgeshire has an employment rate of 82% versus a UK average of 70%. Such high rates of employment are typical of economies based on high levels of education in the workforce and high tech jobs.
- Approximately 29,000 people are in business R&D in South Cambridgeshire alone. This is 20% of the UK total (4 times the percentage of the UK population living here).
- Businesses in the region invest £4bn per year in advanced R&D, with government (including the UK Research Council awards to universities) investing a further £1bn. This is also 20% of the UK total.
- This expenditure on R&D is 5% of the region's Gross Value Added (GVA).
- The cleantech sector in the region generates approximately £55,000 GVA per job, compared to the regional average of £21,000 GVA per job across all sectors.

- Low Carbon Goods and Services sales have grown by approximately 4.5% per year over the past 3 years, despite the more general recession in other sectors. Cleantech is therefore resilient to economic downturns, and may be stimulated by these downturns as businesses seek to reduce their energy use and waste generation to lower their operating costs.

## Moving Forward – Government Support for Cleantech

All of the evidence suggests that cleantech is a sector of the economy worthy of significant national investment, and that the East of England region is a strong candidate for attracting that investment.

- Cleantech is necessary for meeting global environmental and energy challenges, and for the UK to meet its national policy ambitions and requirements. *As an export-focused opportunity there are few sectors better able to address problems across the entire world with ‘made-in-the-UK’ solutions.*
- Cleantech provides high value jobs for local economies when those economies have a highly educated and innovative workforce, as is the case of the area around Cambridge. *Much of the cleantech economy is high-value and IP-rich.*
- Cleantech is a significant part of the East of England economy, with more than 1,000 firms that are directly focused on cleantech and a multiplier effect for firms that are in the cleantech supply chains. *The per capita base of cleantech R&D, innovators, SMEs and more mature firms is unmatched in the UK, creating a vital support network for new innovators and firms.*

Realising this potential of the cleantech sector to both solve the global challenges and create a stronger economy that is more resilient to environmental and resource limits, requires



coordinated government and business actions to attract the needed investments and ensure the already mature cleantech companies find increasing opportunities for their products and services. The innovators, researchers, companies and educators that form Cambridge Cleantech therefore urge the following steps and programmes:

- Better defined, more stable government policies that influence confidence in cleantech investment
- Support from the government and businesses that will help innovators and SMEs grow to the point where they can deliver their cleantech solutions at-scale
- Incorporation of cleantech credentials into the performance measures of procurement policies that will help drive demand for cleantech solutions
- Development of incentive programmes for including cleantech companies in infrastructure provision, both by government and utilities
- Mandatory monitoring and reporting of cleantech performance – such as energy consumption – in major building and infrastructure projects
- Identification of the key areas of cleantech where the UK has a strategic global position, marketing of that position internationally and supplying market intelligence
- 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 BIS

## References

<sup>1</sup> Rockström, J., et al. 2009. Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32. [online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art32>

<sup>2</sup> (i) Cleantech Group LLC and WWF (2012), *Coming Clean: The Global Cleantech Innovation Index 2012*, which you can download at [info.cleantech.com/2012InnovationIndex.html](http://info.cleantech.com/2012InnovationIndex.html); (ii) Spencer, M and Arwas, P (2013), *Nurturing UK Cleantech Enterprise: Four steps to improve low carbon innovation*, which you can download at [www.green-alliance.org.uk/uploadedFiles/Publications/reports/Nurturing%20UK%20cleantech%20enterprise.pdf](http://www.green-alliance.org.uk/uploadedFiles/Publications/reports/Nurturing%20UK%20cleantech%20enterprise.pdf); (iii) 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](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/34607/12-1140-industrial-strategy-uk-sector-analysis.pdf); (iv) 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>; (v) Department for Business Innovation & Skills (2013), *Cambridgeshire's Economic Assessment*, BIS/13/P143; (vi) Department for Business Innovation & Skills (2013), *Low Carbon 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>

<sup>3</sup> NOTE: Reference vi in footnote 2 indicates the region is home to more than 4,000 companies (employing more than 80,000 people) which are part of the supply chains for the Low Carbon and Environmental Goods and Services sector. While many of these firms do not produce cleantech innovation, all of them have more than 20% of their revenues either from cleantech services directly or from supplying those companies that do have a purely cleantech mission.

## Contact us for more information

This report was prepared by Cambridge Cleantech in February 2015 with support and ideas from the 300+ membership base and the University of Cambridge Centre for Climate Change Mitigation Research.

To explore the ideas further, provide additional data into the analysis, or to learn how Cambridge Cleantech is moving the cleantech sector forward, contact:



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