



*Creating a Competitive Edge for
People, Places & Organisations*

Low Carbon and Environmental Goods and Services: an industry analysis

Executive summary

Commissioned by:

BERR | Department for Business
Enterprise & Regulatory Reform

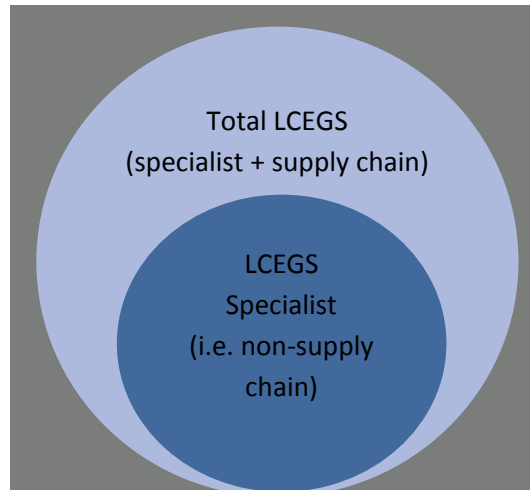
Executive summary

Scope and aims of the report

Environmental issues and activities pervade every aspect of our economic life and performance and are subject to challenging national and international targets, strict monitoring regimes and ongoing discussion and debate in the media.

The environmental goods and services (EGS) sector has traditionally included solutions for problems such as air, noise and marine pollution, land and water contamination, as well as activities such as environmental analysis and consultancy and waste management and recycling. However more recently, the definition of this sector has widened. In addition to these more traditional **Environmental** activities, it now includes a range of rapidly growing **Renewable Energy** technologies (such as hydro, wave and tidal power, geothermal, wind and biomass), as well as a number of other **Emerging Low Carbon** activities (such as reduced emissions from within the transport and construction sectors, nuclear energy, energy management, carbon capture and storage and carbon finance).

This study uses this broader definition of the low carbon and environmental goods and services (LCEGS) sector to provide new market data on the environmental economy in the UK, its regions, and internationally.



The study draws from over 720 sources. It includes activities undertaken by companies across the whole environmental supply chain, from R&D, through manufacturing into distribution, retail, installation and maintenance services. Companies are included in the supply chain where 20% of their turnover is supplied into the LCEGS sector, but importantly only the sales activity relating to this sector is included in this study. This inclusion is akin to the way other sectors of the economy, such as aerospace, are measured. The study uses 'bottom-up' data based on what companies actually do, rather than what they are classified as doing under the SIC system. In doing so, it identifies and measures 2490 Environmental, Renewable Energy and Emerging Low Carbon activities within 23 sub-sectors.

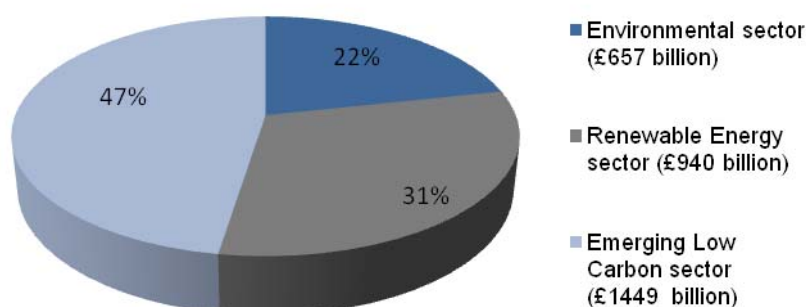
Key findings

The global market

The **global market value of the LCEGS sector was £3,046 billion** in 2007/8. Asia accounts for 38% of this total, Europe 27%, and the Americas 30%.

Globally, traditional Environmental activities account for £657 billion (21.6% of the global total), Renewable Energy for £940 billion (30.9%) and the Emerging Low Carbon activities for £1449 billion, or 47.5%.

Figure 1: Global market value of the LCEGS sector, 2007/8



Of the 23 products and services included in the global analysis, the largest by market value are Alternative Fuels, 18.5% (part of the Emerging Low Carbon sector), Building Technologies, 12.8% (Emerging Low Carbon sector), Wind Power, 11.5% (Renewable Energy sector) and Alternative Fuels for Vehicles, 11.2% (Emerging Low Carbon sector).

Taking into account different growth rates for over 220 global economies, it is estimated that overall the **global LCEGS sector grew by approximately 4% in 2007/8**. Growth performance varied across the 23 sub-sectors (but was higher for most Renewable Energy sub-sectors), creating new market opportunities in all global economies. This is forecast to continue, despite the downgrading of growth forecasts due to recent economic circumstances.

Table 1: Market value of LCEGS sector of major countries, 2007/8

Country	Market value, £bn	% global total
United States	629	20.6
China	411	13.5
Japan	191	6.3
India	191	6.3
Germany	128	4.2
United Kingdom	107	3.5
France	93	3.0

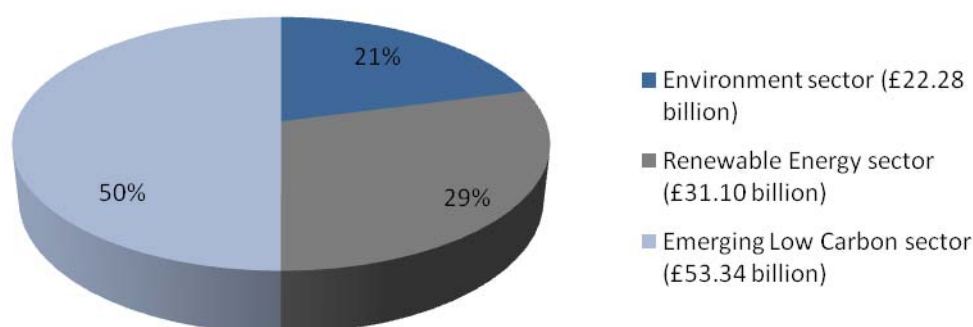
UK market value

The **value of the UK LCEGS sector was £106.5 billion** in 2007/8. In terms of size, this puts the low carbon and environmental economy somewhere between the UK's healthcare and construction sectors.

The UK is the world's sixth largest low carbon and environmental economy, with 3.5% of global market share. As shown in Figure 2, the Environmental sector accounts for £22.3 billion (21%) of total UK market value, Renewable Energy for £31.1 billion (29%), and the Emerging Low Carbon sector for £53.3 billion (50%). The 'newer' sectors of Renewable Energy and Emerging Low Carbon are therefore significantly higher in value than the more established Environmental sector.

Approximately half of the value of the overall LCEGS sector (48%) lies in the extended value and supply chain activities identified as part of this study. The specialist (i.e. non-supply chain) market values for the UK are £10.81 billion for the Environmental sector, £17.89 billion for Renewable Energy Technologies and £26.59 billion for the Emerging Low Carbon sector.

Figure 2: UK market value of LCEGS sector, 2007/8

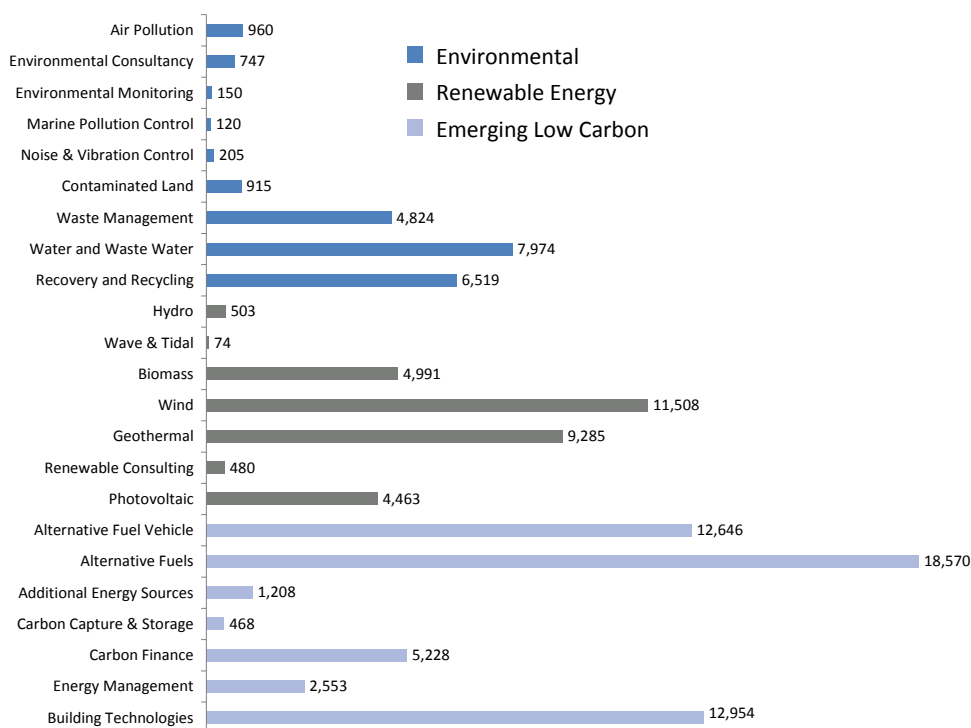


The relative distribution of market value across the sectors is shown in Figure 3. Six of the 23 products and services - Alternative Fuels (17.3%), Building Technologies (12.1%), Alternative Fuels for Vehicles (11.8%), Wind (10.7%), Geothermal (8.7%) and Waste Water Treatment (7.4%) - together account for 60% of total market value.

Other activities, while currently relatively low in market value, have within them the potential for new technologies to be developed and brought to market in full-scale commercialisation. Activities in this sector include Wave and Tidal Power and Additional Energy sources such as hydrogen fuel cells.

Of the 2490 individual products and services analysed in this report, 11 were worth over £1 billion, 100 were worth more than £200 million and 260 worth over £100 million.

Figure 3: UK market value of Level 2 products and services, 2007/8 (£m)



Key: dark blue, Environmental; grey, Renewable Energy; light blue, Emerging Low Carbon

Just under a third (31%) of overall activity in this sector is in manufacturing, with the highest levels of manufacturing in the Wind and Carbon Capture & Storage sectors - the latter a reflection of the current drive to prove the technology through pilot projects. Given the size of the LCEGS sector and its growth rate in both domestic and global markets, environmental activities offer an attractive opportunity for the UK’s manufacturing base to exploit current and emerging technologies.

There are **54,835 companies active in the LCEGS sector in the UK**, of which 17,303 are involved in manufacturing. About 91.5% of the companies in the sector are SMEs.

Employment

There are over **881,000 jobs within the LCEGS sector**, with almost half of these in the Emerging Low Carbon industries. UK employment levels in the LCEGS sector are broadly in line with our global LCEGS market share, and with employment levels for other developed economies. Those employed in the specialist part of the LCEGS sector number just over 445,000.

The products and services employing the largest number of people are all in the Emerging Low Carbon sector (Alternative Fuels, 162,000; Building Technologies, 107,000 and Alternative Fuels for Vehicles, 104,000). Wind Energy is the next largest sub-sector, employing around 87,000 people.

Table 2: Employment in the LCEGS sector, 2007/8

Sector	Total employed	% total	Specialist employed	% total
Environmental	192,000	22	93,000	21
Renewable	257,000	29	147,100	33
Emerging Low Carbon	432,300	49	205,300	46
Total	881,300	100	445,400	100

If the UK environmental employment baseline level grows in line with projected annual growth rates (see Table 3 below), then, potentially, **an additional 400,000 jobs** could be created over the next eight years - representing a 45% increase on today's level. This is a rough estimate based on the growth in market value, where employment levels are calculated on a pro rata basis. Some of this growth in employment might be due to displacement activity, as green goods and services become more acceptable than the alternatives, such as a shift from manufacturing traditional doors/windows to heat and energy efficient ones, or from carbon-based fuels such as coal to renewable energies such as wind. However the majority of the growth in employment, particularly in the Renewable Energy industries, would represent additional economic growth to 2015.

UK growth

The overall **growth forecast for the UK LCEGS sector is 4.7% for 2009/10, increasing to 6.10% by 2014**. Positive growth is forecast across all LCEGS industries in the UK.

Table 3: Projected percentage annual UK LCEGS sector growth, 2007/8-2014/15

Annual growth (as of Dec 2008)	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Environmental	2.87	2.47	2.49	2.82	3.00	3.03	3.07	3.11
Renewable	6.68	6.13	6.23	7.09	7.61	7.76	7.92	8.09
Emerging Low Carbon	5.41	4.69	4.74	5.34	5.68	5.74	5.79	5.86
Total	5.25	4.66	4.74	5.38	5.76	5.87	5.98	6.10

The UK environmental economy is expected to grow at an average rate of over 5% per year, despite the recent financial crisis. Growth rates have seen a small downward adjustment (so far) in the short term and a reduction in some of the more inflated forecasts from 2010 onwards. But these adjustments are nowhere near as severe as for other sectors, such as construction and retail.

Within this overall picture, the projected growth rates for Environmental, Renewable Energy and Emerging Low Carbon activities are very different. Growth in the Renewable Energy and Emerging Low Carbon sectors is forecast to exceed growth in the more established Environmental sector, where many technologies (for example in Water and Waste Treatment) are already mature.

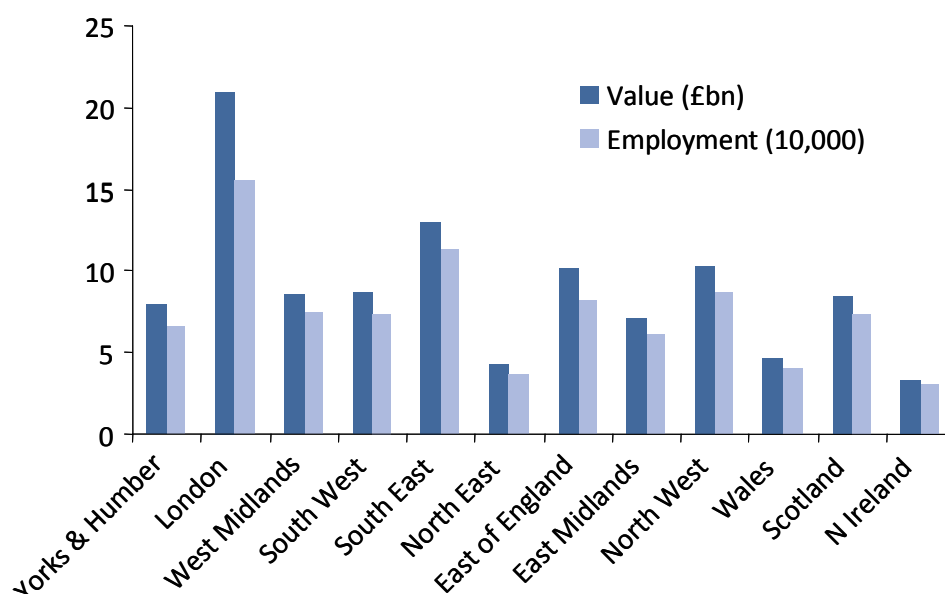
The Renewable Energy and Emerging Low Carbon sectors currently show a much flatter growth than previously forecast for the period 2012 to 2015. It is anticipated that as economic uncertainty is reduced and investment funds start to flow, these growth forecasts will rise once again. The forecasts do not, and cannot, take into account any potential disruptive technology which might arrive on the market in the next eight years.

If these forecasts are correct, **the environmental economy will grow by about 45% over the next eight years**, with much of this growth generated by Renewable Energy activities – a reflection of the drive to reduce carbon emissions under international targets, unstable energy prices and the desire to improve energy security.

UK regions

The UK low carbon and environmental economy across the regions is broadly in line with regional GVA, but shows some variation at the sub-sector level and below.

Figure 4: UK LCEGS sector value (£bn) and employment by region, 2007/8

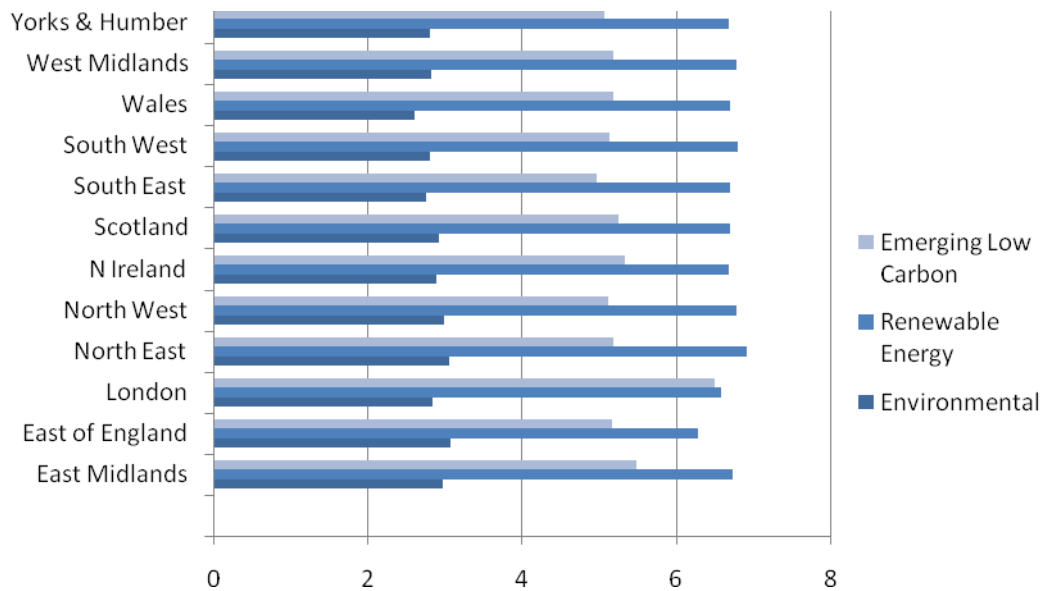


London and the South East account for just under 32% of value and just over 32% of employment. However compared to their overall contribution to the UK economy, the East and North East of England, Northern Ireland and Wales perform relatively well in terms of their contribution to the UK's LCEGS sector.

- In the Environmental sectors, the regions generating the most impact in terms of value, employment and growth are London, the South East, East of England and the North West.
- In Renewable Energy, the regions generating the most impact are London, the South East, West Midlands and Scotland.
- In Emerging Low Carbon products and services, the highest regional impact comes from London, the South East and the North West.

Overall, growth is consistent across the regions (see Figure 5) and confirms the finding that the Renewable Energy and Emerging Low Carbon sectors are enjoying higher growth than traditional Environmental products and services.

Figure 5: UK LCEGS percentage growth by region, 2006/7-2007/8



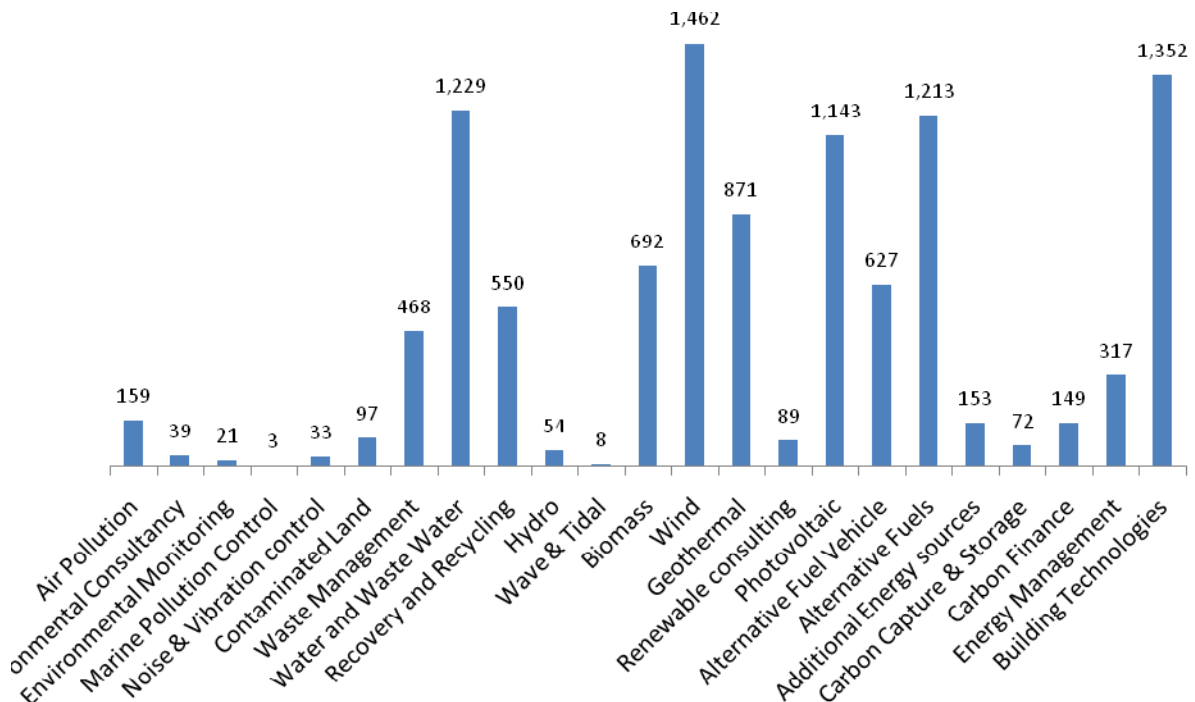
The most noticeable difference is in the high levels of forecast growth in the Emerging Low Carbon sector in London. This is attributable to the UK’s leading position in Carbon Finance, where it represents 16.53% of the total global market value in this sector.

UK export performance

Exports in the LCEGS sector stand at just under 10% of sales (£10.5 billion). This figure is low compared with other, more mature, UK industries partly because some Renewable Energy and Emerging Low Carbon activities are relatively new and have yet to generate significant export volumes.

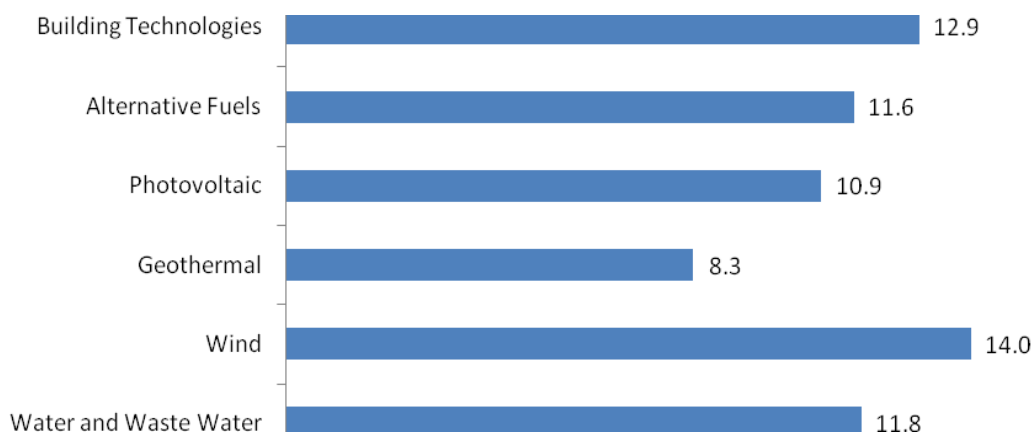
Only six of the 23 products and services achieve export levels close to or above the overall 10% mark. Two (Building Technologies and Alternative Fuels) lie within the Emerging Low Carbon sector; three (Wind, Photovoltaic and Geothermal) are Renewable Energy; and one (Water and Waste Water) is within the Environmental sector

Figure 6: UK Level 2 LCEGS industry exports, 2007/8 (£m)



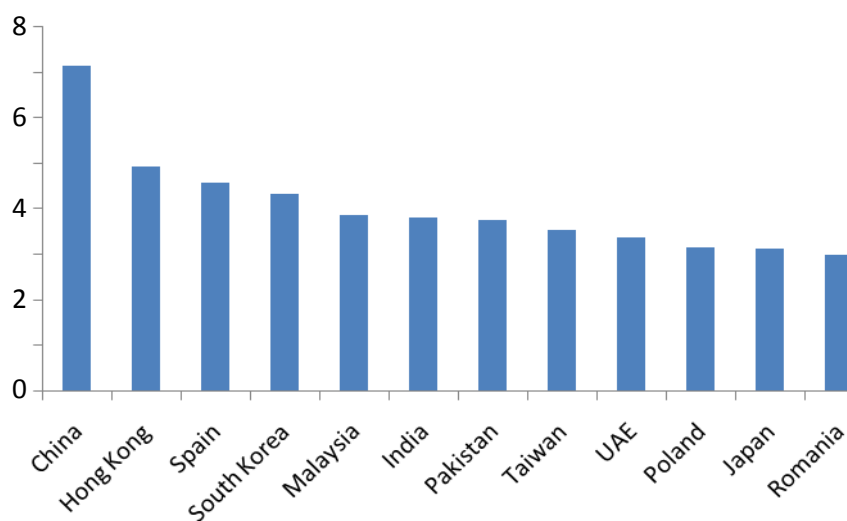
A detailed analysis of all 2490 individual products and services reveals that some of the highest concentrations of export value are in Water Treatment and Engineering, Wind Farm Systems and Turbines, Geothermal System Manufacture, Biomass Energy Systems and Window, Door and Insulation Technologies.

Figure 7: Key UK Level 2 LCEGS industry exports as percentage of total LCGES exports, 2007/8



The study examined UK exports to the 50 largest global environmental economies. Of these, only twelve accounted for more than 3% of global exports for the UK (see Figure 8).

Figure 8: Major destination countries for UK exports, 2007/8 (% total)



China (including Hong Kong) is, by a significant margin, the largest export market for the UK, with £1,261 million and 12.06% of the overall export total. Some of the largest export markets are in smaller economies, such as the United Arab Emirates and Romania, rather than other major environmental economies such as the USA and Germany.

Conclusions and recommendations

This industry analysis has found that:

- At £106.5 billion, the UK's overall environmental economy is much larger and has much greater economic and employment impact than is generally recognised.
- Even taking account of some dampening of expectations from the current economic slowdown, the UK LCEGS sector is forecast to increase in value by up to £45 billion in the eight years to 2015. Positive growth is forecast across all LCEGS industries in the UK with initial forecasts on some of the key international markets showing a similar trend. This will create new domestic and international opportunities for both new and existing UK companies.
- There is significant export potential for companies across most industries in the LCEGS sector, based on the current forecasts for global growth rates. With exports currently only 10% of sales, there is a real opportunity for the UK to increase its global market share from 3.5%. Every 0.1% added to UK global market share equates to over £3 billion growth to the domestic economy.
- The UK market is well positioned to develop and gain comparative advantage in key areas of the environmental supply chain, such as water and wastewater treatment, through exporting to developing nations looking to upgrade their current infrastructure.
- Market growth in Renewable Energy and in fuels within the Emerging Low Carbon sector is likely to be sustained throughout and beyond the current economic downturn, with these sectors forecast to experience much higher long-term growth rates in comparison to the traditional Environmental sector.

- The high level of manufacturing content in the environmental economy (31%), particularly in the Renewable Energy sector, creates opportunities for manufacturing companies to diversify into new and potentially profitable activities.
- The forecast growth of the LCGES sector suggests that employment in this sector could grow by to 400,000 jobs over the next eight years, many of these in the Renewable Energy and Emerging Low Carbon industries.

Environmental challenges act as a spur to invention and innovation. R&D will continue to be important as companies and investors seek disruptive technology solutions that can change the economics of, and rewards from, new environmental products or processes. Significant private and public funds have already been established, many of which are still investing despite the current economic slowdown. The short-term challenge is to ensure that these funds continue to flow and to sustain future growth.

National and international environmental targets are likely to focus the public and investment spotlight on low carbon sector technologies and performance. At the same time, rising energy demand from developing nations and fluctuating energy prices are likely to increase the international focus on energy security and encourage continued investment in new energy technologies.

The opportunities are significant. However, a number of other countries share the UK's capacity to address environmental challenges and to exploit the future potential of the global environmental economy. The UK must continue to develop policies, exercise initiative and build its capability to ensure it retains its position in the forefront of the global low carbon goods and environmental services sector.

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We welcome feedback on the issues raised by this BERR commissioned study and comments should be sent to: **berr.economics@berr.gsi.gov.uk**

6 March 2009

John Sharp: Innovas Solutions Ltd

R1-2 Verdin Exchange High Street Winsford Cheshire CW7 2AN

Main Office: 01606-551122 Mob: 07771-545-870 Website: www.innovas.co.uk E-mail: john.sharp@innovas.co.uk

Department for Business, Enterprise and Regulatory Reform
www.berr.gov.uk/lowcarbon

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