

**LOW CARBON ENVIRONMENTAL
GOODS AND SERVICES (LCEGS)**

Report for 2010/11

MAY 2012

Low Carbon Environmental Goods & Services (LCEGS)

Report for

2010/ 11

**Commissioned by the Department for Business, Innovation and
Skills from**



May 2012

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We welcome feedback on the issues raised by this BIS commissioned study and comments should be sent to:
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Appendices not included with the report:

- B. List of Sources
- C. Global LCEGS Data File
- D. UK and Regions LCEGS Data File
- E. UK Sub-Regions LCEGS Data File
- F. UK LCEGS Import Data File
- G. UK LCEGS Export Data File
- H. LCEGS International Markets Data Files

1. Introduction

This report updates the data available for the Low Carbon Environmental Goods and Services (LCEGS) sector for 2010/ 11 and is the fourth annual assessment of this sector. The report was prepared with the support of, and contributions from, BIS, DECC and Defra.

The focus of this report is UK LCEGS performance in 2010/ 11, but to achieve this comparisons are made with baseline figures from 2008/ 09 and 2009/ 10 and benchmark comparisons are made with other leading global economies. The analysis is quantitative rather than qualitative, emphasising what we believe “is” rather than what it means. The enrichment process of adding context and meaning to the data is quite rightly the prerogative of the industry and its specialist representatives.

The methodology for this study is both traditional and innovatory. It is traditional in that it focuses on key measures of economic performance- sales, growth, companies, employment, importing and exporting- but innovatory in how the evidence base has been assembled and assessed from a very wide variety of public, private, academic, institutional and industrial sources over a five year period.

The research data is global and detailed, with measurement of approximately 2800 different goods and services included. The data is also hierarchically structured which means that analysis can be conducted at global, national, regional and sub regional level and products and services can be disaggregated into a number of different levels of detail, although much of this is summarised at the sub sector level.

While the main purpose of the report is to create an analytical baseline for the LCEGS sector and its performance there are a number of other potential purposes that may be supported by the evidence base. Global data can be used to identify potential new markets and key competitors, growth forecasts can be used to identifying emerging markets and current export trends can be used to increase international sales. To this end, the report has been structured to start with an assessment of global markets, followed by UK and regional performances, import and finally export markets.

2. Methodology

2.1 Sector Definition

The definition of the LCEGS sector is the result of five year’s work with UK National and regional government and UK industry organisations. The definition was designed to fill the gap in current Standard Industry Classification (SIC) codes that has resulted in activities in this area of the economy being consistently over- looked and under- valued. It has also allowed the UK public sector to report, monitor, develop and invest in a baseline of worthwhile activities that was previously ignored, fragmented and highly disputed.

The definition is broad and includes activities that may appear under the overlapping headings of Enviro, Eco, Renewable, Sustainable, Clean Tech, Low Carbon or No Carbon (and any other we might have missed). It has drawn on definitions from the US, Europe and further afield. It is constantly evolving and updating as new activities are identified, reach the market or are assigned one of the above labels. Since 2007/ 08 new activities such as Carbon Finance, Renewable Energy Consulting and, Nuclear Power have been added to the LCEGS dataset. However, we have ensured that data updates are consistent with their previous iterations. In the strictest sense it is not a “sector” but a flexible construct or “umbrella” term for capturing a range of activities spread across many existing sectors such as transport, construction, energy etc. but with a common purpose- to reduce environmental impact.

It is also a very inclusive definition in that, with the 2800 activity headings, we include both supply chain activities (componentry & assemblies) and value chain activities (R&D, Supply & Training). A glossary of economic activities included for each sub sector of LCEGS is included at Appendix A.

The sector has been defined using 24 sub sectors (Level 2 markets). These are sub- divided into three broad categories- Environmental, Renewable Energy and Low Carbon- the addition of each broadly mapping the evolution of the current LCEGS sector definition from its Environmental roots:

Environmental	Renewable Energy	Low Carbon
<ul style="list-style-type: none">• Air Pollution• Contaminated Land• Environmental Consultancy• Environmental Monitoring• Marine Pollution Control• Noise & Vibration Control• Recovery and Recycling• Waste Management• Water Supply and Waste Water Treatment	<ul style="list-style-type: none">• Biomass• Geothermal• Hydro• Photovoltaic• Wave & Tidal• Wind• Renewable Consulting	<ul style="list-style-type: none">• Additional Energy Sources• Alternative Fuel/ Vehicle• Alternative Fuels• Building Technologies• Carbon Capture & Storage• Carbon Finance• Nuclear Power• Energy Management

In turn, these 24 Level 2 markets have been divided into 119 sub sub sectors (Level 3 markets). Most of the analysis in this report is conducted using Level 2 or Level 3 data. Level 3 markets have been sub divided further, creating a total of 791 discrete economic activities (Level 4 markets) for further and future analysis. These, in turn, have been sub divided into the total of approximately 2800 activities.

The definition is designed to provide a baseline for the sector from which future changes and developments can be measured. Given the evolving nature of LCEGS it is likely that new activities and revised definitions of the sector will appear over time.

2.2 Included Activities

The activities included under each of these headings vary according to the structure of the industry/ sub sector. The approach is inclusive (rather than a specialist) and captures as much of the LCEGS sector Value Chain activity as possible. The activities that we have included are: - design/ development, manufacture, supply, distribution, installation, maintenance, operations, R&D, Consultancy, support services and retail.

As well as capturing as broad a cross- sector as possible of the LCEGS Value Chain, activities are captured for companies that are specialist to the LCEGS Sector and also companies that are non- specialist but operate within the LCEGS supply chain. The analysis, therefore, includes:

- Companies that solely provide LCEGS products and services (anywhere in the Value Chain)
- Companies who are 100% providers of components or inputs into sub assemblies or final LCEGS products and services delivered by others
- Companies who (amongst other activities) provide components or inputs into sub assemblies or final assemblies of LCEGS products and services.

The threshold for including a company in the analysis is if at least 20% of sales activity can be directly attributed to the LCEGS Sector (as defined within this report). In the case of larger companies this can often be extracted from financial reports, cross referenced to industry sources. For much smaller companies we may have to extrapolate the percentage of sales based on product range and turnover, tempered by more detailed case materials that we hold about the market performance of similar businesses. The exception to this 20% rule is for large companies where a small proportion of overall sales is a significant contribution to the UK LCEGS sector.

While this is not an exact science, it is as accurate a method as possible for calculating the size and distribution of supply chain activity across a sector. However, because the methodology is not based solely on historical SIC listings etc. it does mean that estimates of Sales Value, Company numbers and Employment may be higher than more traditional estimates.

The threshold for inclusion (>20% of company sales) in this report means that the company numbers and employment figures published in the following sections of this report focus upon the significant value-creating “core” of the LCEGS sector. This core is where true economic value is measured and this focus avoids (as far as is possible) any double counting of sales value within the supply chain. This threshold helps to maintain an overall relationship between sales, companies and employment that can be compared year-on-year both internally and with other countries. It also provides a standard and consistent measure that can be compared with other sectors.

2.3 Levels of Analysis

The data model for the LCEGS Sector is built bottom-up. This means that economic activities are identified at the lowest possible level of analysis (at the equivalent of a six or seven digit SIC code) and then aggregated together so that they can be reported upon more conveniently. In this report we record LCEGS Sector activities at five hierarchical levels but analyse the data at Levels 1 (Sector), 2 (Sub Sector) and 3 (Sub Sub Sector) only.

Each Level of detail has its own analytical benefits and in this report Level 1 is used to select the Top 53 global countries and for sub national analysis, Level 2 for identifying market growth trends and Level 3 for analysing national and regional LCEGS Sector performance.

Levels 1 to 3 are really aggregated “labels” under which activities can be conveniently grouped and assessed, while Levels 4- 5 contain “product group” market intelligence and are the levels closest to LCEGS products and services as companies would understand them.

2.4 Key Measures

In our analysis we concentrate on seven key measures. These are:

- Sales £m
- Imports
- Companies
- Exports
- Employment
- Market
- Growth

Sales is our estimate (in £m) of economic activity by identified companies in a defined region or country. Our estimate of Sales is based upon where economic activity takes place i.e. the location of the business rather than the location of the income earner. In calculating Sales value we consider:

- Turnover by sub sector within postcode sets
- Capital asset adjustment by sub sector within postcode sets
- ONS GDP calculations
- Supply chain procurement value sub sector by sub sector by postcode sets

- Sub sector specific sales reporting where available

Further adjustment is made on a sub sector basis for both head office activities and virtual working organisations so that, *as far as is practical, we report upon where Sales is conducted rather than where it is reported*¹. This applies to both domestic and international sales.

Companies is a measure of the total number of companies in the region that match (or fit within) the activity headings for the LCEGS sector. Because of the limitations in using traditional SIC codes to identify high technology and “new economy” businesses we have used our own unique analytical process to allocate companies to the LCEGS activity headings. The total number of companies in this report has been arrived at by a bottom-up analysis of company stock within the country/ region using such sources as: Companies House, European credit agencies, British Telecom, Institutional listings and UK credit agencies.

Having identified the total company stock in the UK, product and service outputs have been identified and verified by accessing further databases that include: Institutional data sets, Yellow Pages, kMatrix proprietary databases, Euromonitor, Dun and Bradstreet and Thompson.

Employment is a measure of the estimated employment numbers across all aspects of the supply chain. National, regional and other economic data sources have been used to estimate current employment levels for each LCEGS sector activity. Where employment information is scarce, or where we are estimating employment for a proportion of a company’s sales, we rely on our comprehensive case study materials to provide sensible industry- specific ratios and benchmarks. These additional methods and sources for calculating employment are important because, just as SIC codes do not currently cover all LCEGS activities, so ONS Standard Occupational Codes (SOC) do not provide a complete reflection of LCEGS employment.

Following national statistics, our employment figures are disaggregated into four streams- management, supervisory, Administrative and Other. Where we are commissioned for Skills analysis, these four streams are disaggregated into much more detailed occupational groupings.

Our employment figures for LCEGS define the labour intensity of some market activities over others and help to identify the economic activities that are generating the highest levels of employment (but not necessarily value or growth).

Market Growth is our forward looking indicator and has been measured for the short to medium term (five years) where we have a high level of confidence in the growth trend. This indicator enables us to identify the ongoing strength and potential of each economic activity relative to other sector activities within the region/ sub region and

¹ Focussing on where sales are conducted rather than where they are reported counteracts the distortion created by the financial reporting of large corporation whose headquarters may be located in a single location although sales are conducted in multiple locations/ countries.

relative to growth rates across the UK and in other key country markets (See Calculating Market Values for more information on market forecasting). The market growth rates included in this report are, effectively, a snapshot taken in July 2011. In reality market growth forecasts are a constantly changing reflection of market expectations and institutional confidence in economic performance that fluctuate on a monthly basis. Further research is currently examining the rate, range and reasons for change in market forecasting for the LCEGS sector.

Imports and Exports are calculated using both in- country and out- of- country data. The data sources accessed include those listed (separately) but also include additional data from the logistics and freight forwarding industry (amongst others). National import export data is accessed from either government agencies or other institutions where available. In addition, we track supply chains and networks where we are able to get data, again through many of the data sources already identified for the sales values figures etc, but also through logistics, consumer data, and supply chain management industries. Multi- sourcing import and export data is essential because companies rarely provide accurate or adequate numbers (to protect their competitive position).

Figure 1: Key International Trade Measures



The focus in this report is, to a much greater extent than previously, focused on international trade patterns and markets. As a result much more attention is paid to trade flows and international markets and market share. This is achieved using the key measures illustrated by Figure 1.

Domestic Market is a measure of the overall size of demand for LCEGS sector products and services in a specific country and is calculated using three measures. The simple formula used in this report is Domestic Market = Domestic Sales - Exports + Imports. The “market” is used to estimate the overall potential and opportunity for international sales growth

2.5 Data Sources

We attempt to limit the risk and error behind the numbers that we publish (whether historical or forecast) by multi- sourcing and monitoring a wide range of reliable sources and then making the remaining range of uncertainty explicit. A full list of sources is provided for this report (Appendix B) but within each data template we have calculated and published the number of sources used to compile each of the 2800 lines of market data. On average 85 sources (differing depending upon the market activity) are used for each line of data in the LCEGS study.

For each market we track multiple sources of historical and forecasting data. From these sources we look to select at least seven that are current and that we have routinely tracked and verified (and, therefore, have built confidence in) over a number of years. Sources can be from company, industry, academic, public or

market research sources and national statistics. The sources we reject may be out of date, unreliable, drastically under or overstated or directly derived from another source that has already been included.

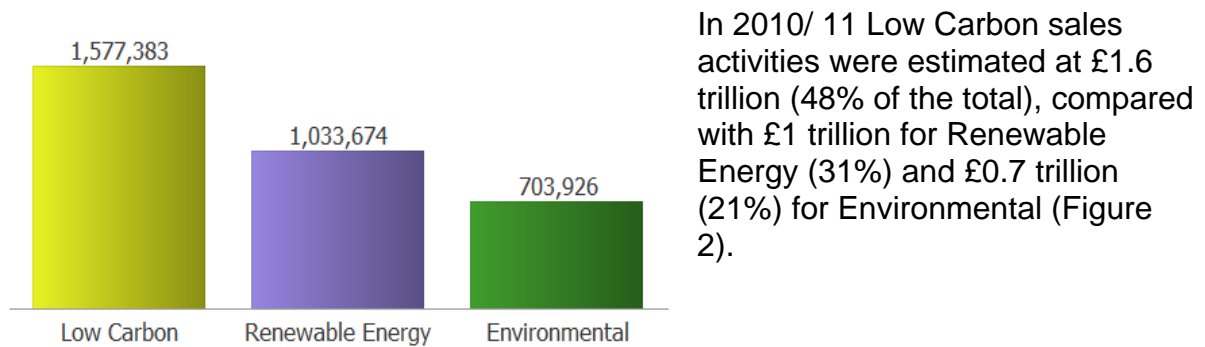
When we have identified a minimum of seven acceptable sources we then take the “average” of the seven figures as our selected figure. We then look at the range of individual responses in relation to the selected figure and if the range of results is within +/- 20% of our selected figure we are generally satisfied. In some cases (where more than seven reliable sources are available) we may look to narrow the range of results by excluding the more extreme results. Where the range of results is greater than +/- 20% we then look for further sources that may be used, until we arrive within the accepted range.

3. Global LCEGS Market

3.1 Global Sales

The total for LCEGS Sales in 2010/ 11 is **£3.3 trillion**. This shows an annual increase from 2009/ 10 of **3.7%**, compared with increases from 2007/8 to 2008/ 9 of 3.1% and from 2008/ 9 to 2009/ 10 of 1.8%².

Figure 2: Global LCEGS Sales for 2010/ 11 in £m



This ratio of value between the three activity groups is the same as in the previous two years.

Figure 3 shows how these sales are distributed across the 24 sub sectors of the LCEGS sector. The largest sub sectors are; Alternative Fuels (16%), Building Technologies (13%), Wind (12%), Alternative Fuel and Vehicles (10%), Geothermal (9%) and Water Supply & Waste Water Treatment (8%).

² The size of the Global LCEGS Environmental Technologies Market has been calculated by global sales across 226 countries using data drawn from Appendix C.

Figure 3: Global LCEGS Sales for 2010/ 11 by Sub Sector in £m

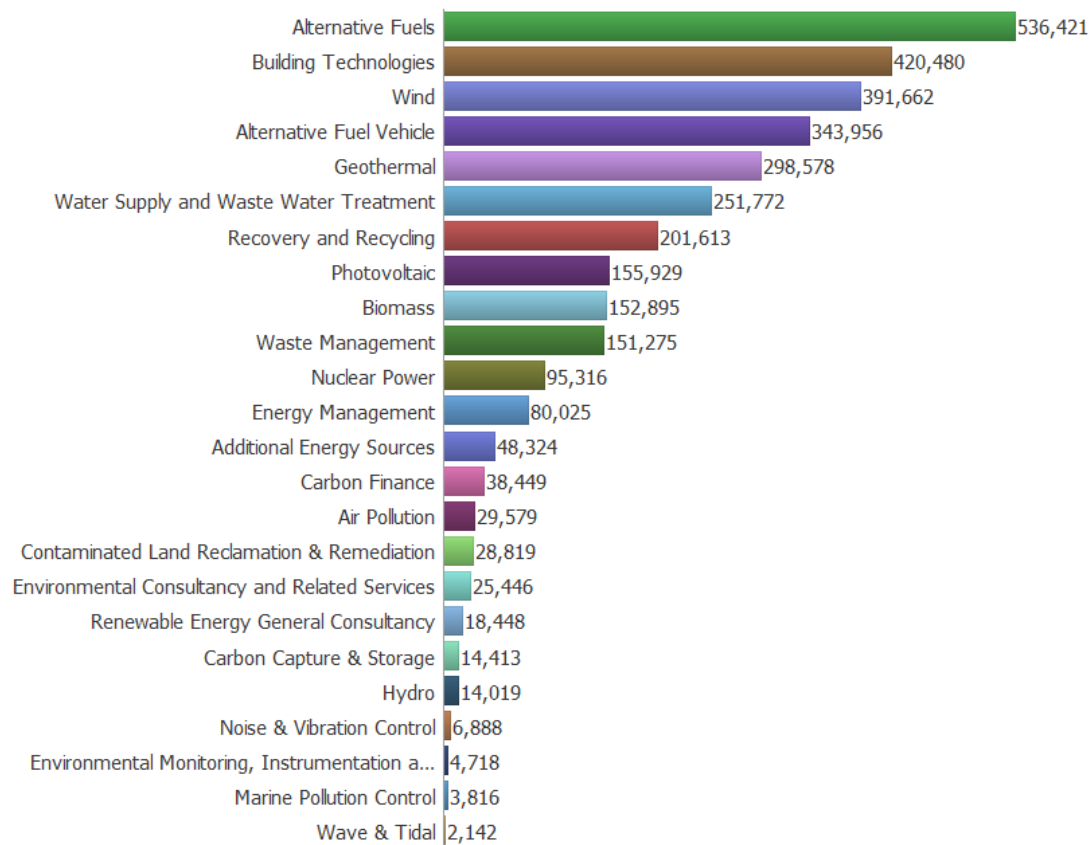
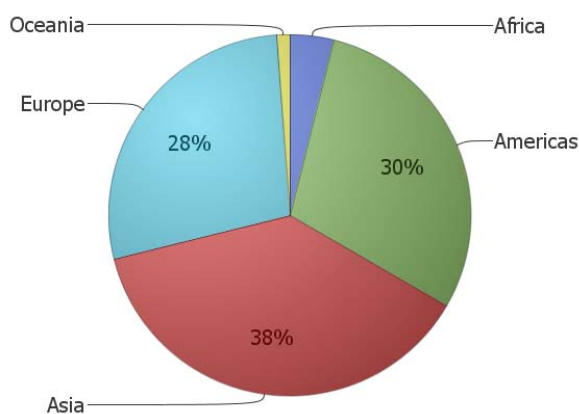


Figure 4 shows that Asia accounts for 38% of global sales, followed by the Americas (30%) and Europe (28%). This ratio of sales value between the global regions has not changed over the past three years.

Figure 4: LCEGS Sales by Global Region 2010/ 11



The breakdown of global sales is shown in more detail in Table 1, where we have ranked the Top 50³ countries, showing columns for sale value (in £m), country sales as a % of the global total and country ranking.

In Table 1 we show that the US accounts for 19.5% of the global total, followed by China (13%), Japan (6%), India (6%) and Germany (4%). The UK is ranked sixth with a market share of 3.7%.

³ The Top 50 Countries are based upon size of LCEGS sales when this data series started in 2007/ 08.

National rankings and share of global sales do not change rapidly. Most rankings have remained the same since 2008/ 09 and the most significant shift in share of global sales is the USA, reduced from 20% in 2008/ 09 to 19.5% in 2010/ 11. Overall, the Top 10 countries account for 64% of global sales and the Top 50 countries (listed below) account for 93% of sales.

Table 1: Global Value of LCEGS in £m by Top 50 Countries for 2010/ 11

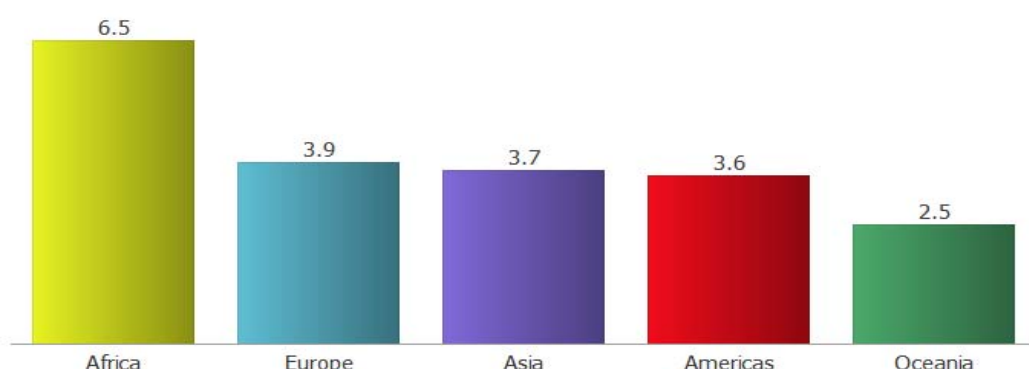
Country	Sales £m	Rank	% of Total	Country	Sales £m	Rank	% of Total
USA	644,769	1	19.5	Pakistan	20,418	26	0.6
China	435,323	2	13.1	Saudi Arabia	20,015	27	0.6
Japan	205,372	3	6.2	Egypt	18,905	28	0.6
India	204,860	4	6.2	Ukraine	18,835	29	0.6
Germany	140,370	5	4.2	Colombia	18,590	30	0.6
UK	122,222	6	3.7	Belgium	18,180	31	0.5
France	101,161	7	3.1	Bangladesh	17,213	32	0.5
Brazil	97,829	8	3.0	Vietnam	16,957	33	0.5
Spain	89,698	9	2.7	Sweden	14,368	34	0.4
Italy	87,339	10	2.6	Hong Kong	14,050	35	0.4
Russian Federation	84,546	11	2.6	Austria	13,999	36	0.4
Mexico	65,848	12	2.0	Switzerland	13,811	37	0.4
Canada	59,307	13	1.8	Malaysia	13,581	38	0.4
South Korea	58,270	14	1.8	Greece	12,867	39	0.4
Indonesia	51,109	15	1.5	Algeria	12,799	40	0.4
Taiwan	35,679	16	1.1	Romania	11,285	41	0.3
Australia	33,011	17	1.0	Chile	10,917	42	0.3
Turkey	31,720	18	1.0	Czechia	10,731	43	0.3
Iran	31,619	19	1.0	Norway	9,848	44	0.3
Thailand	31,400	20	0.9	Portugal	9,779	45	0.3
Argentina	29,448	21	0.9	Peru	9,646	46	0.3
South Africa	28,682	22	0.9	Hungary	9,529	47	0.3
Poland	27,889	23	0.8	Venezuela	9,413	48	0.3
Netherlands	27,483	24	0.8	Denmark	8,982	49	0.3
Philippines	25,693	25	0.8	Finland	8,882	50	0.3

The UK is ranked sixth for the LCEGS sector overall and sixth in 18 of the 24 sub sectors. In each of the 18 cases where the UK is sixth it is ranked behind the US, China, Japan, India and Germany. The six sub sectors where the UK is not sixth are: Carbon Finance (2nd), Alternative Energy (8th); Geothermal (7th), Photovoltaic (7th) and Wave & Tidal (5th).

3.2 Global Growth Rates 2010/11

Global growth in LCEGS in 2010/ 11 was 3.7%. This growth was not evenly spread across the world. Figure 5 shows that growth was highest in Africa (6.5%), although this is high growth from a low base. Growth across Europe was 3.9%, which was ahead of the Americas and Asia

Figure 5: Growth by Global Region % 2010/ 11



Global growth was not evenly spread across the LCEGS sector. Table 2 compares sales values for 2009/ 10 and 2010/11 and calculates the annual growth for each sub sector.

Table 2: Global Growth in Value of LCEGS Sub Sectors between 2009/ 10 and 2010/ 11

	Sector	Sales £m 2009/10	Sales £m 2010/11	£m Increase 2009/10 to 2010/11	% Increase 2009/10 to 2010/11
Environmental	Air Pollution	28,901	29,579	678	2.3
	Contaminated Land	27,845	28,819	974	3.5
	Environmental Consultancy	24,518	25,446	929	3.8
	Environmental Monitoring	4,536	4,718	181	4.0
	Marine Pollution Control	3,673	3,816	142	3.9
	Noise & Vibration control	6,619	6,888	269	4.1
	Recovery and Recycling	194,708	201,613	6,905	3.5
	Waste Management	146,633	151,275	4,642	3.2
	Water Supply and Waste Water Treatment	244,732	251,772	7,041	2.9
Low Carbon	Additional Energy sources	45,204	48,324	3,120	6.9
	Alternative Fuel Vehicle	333,165	343,956	10,791	3.2
	Alternative Fuels	517,354	536,421	19,067	3.7
	Nuclear Power	93,391	95,316	1,925	2.1
	Building Technologies	407,135	420,480	13,345	3.3
	Carbon Capture & Storage	13,863	14,413	550	4.0
	Carbon Finance	35,284	38,449	3,165	9.0
	Energy Management	76,713	80,025	3,312	4.3
Renewables	Biomass	147,163	152,895	5,732	3.9
	Geothermal	288,844	298,578	9,734	3.4
	Hydro	13,657	14,019	362	2.7
	Photovoltaic	149,730	155,929	6,199	4.1
	Renewable Consulting	17,737	18,448	711	4.0
	Wave & Tidal	2,065	2,142	77	3.7
	Wind	373,155	391,662	18,508	5.0
Total	3,196,624	3,314,983	118,359	3.7	

Carbon Finance shows the highest annual growth (9%), followed by Additional Energy Sources (7%) and Wind (5%).

Table 3: Growth in Value of LCEGS Sector by Top 50 Countries between 2009/ 10 and 2010/ 11

Country	£m increase from 2009/ 10 to 2010/11	% increase from 2009/ 10 to 2010/11	Country	£m increase from 2009/ 10 to 2010/11	% increase from 2009/ 10 to 2010/11
US	15,466	2.5	Colombia	-766	-4.0
China	8,713	2.0	Philippines	7,219	39.1
Japan	6,257	3.1	Pakistan	2,611	14.7
India	7,044	3.6	Saudi Arabia	2,302	13.0
Germany	4,693	3.5	Belgium	621	3.5
UK	5,442	4.7	Egypt	1,363	7.8
France	2,932	3.0	Ukraine	2,549	15.7
Spain	-2,815	-3.0	Vietnam	770	4.8
Brazil	10,484	12.0	Sweden	297	2.1
Italy	2,077	2.4	Austria	268	1.9
Russian Federation	2,662	3.3	Hong Kong	368	2.7
Mexico	4,015	6.5	Switzerland	306	2.3
Canada	1,772	3.1	Malaysia	766	6.0
South Korea	3,150	5.7	Greece	377	3.0
Indonesia	2,748	5.7	Algeria	697	5.8
Taiwan	619	1.8	Romania	620	5.8
Australia	769	2.4	Portugal	-427	-4.2
Argentina	-441	-1.5	Chile	835	8.3
Iran	1,819	6.1	Czechia	1,247	13.1
Thailand	1,689	5.7	Norway	649	7.1
Turkey	3,624	12.9	Denmark	-130	-1.4
South Africa	756	2.7	Peru	629	7.0
Netherlands	554	2.1	Hungary	676	7.6
Poland	1,511	5.7	Finland	34	0.4
Bangladesh	-7,049	-29.1	Venezuela	770	8.9

Table 3 shows that annual growth varies greatly across the Top 50 countries. The highest growth occurs in the Philippines (39%), Ukraine (16%), Pakistan (15%), the Czech Republic (13%), Saudi Arabia (13%), Turkey (13%) and Brazil (12%). The more mature economies show lower annual growth trends but from a higher economic base. This means that their contribution to growth in the value of global Low Carbon Environmental Goods and Services is greater.

3.3 Global Growth Trends from 2010/11

In Figure 6 we show the forecast global growth rates⁴ for the LCEGS sector from 2011/ 12 to 2014/ 15. Growth for LCEGS as a whole demonstrates a steady and sustainable trajectory with forecasts increasing from 3.9% to 4.0%. Figure 6 also

⁴ Global forecast growth rates are an aggregate of forecast growth rates for each LCEGS activity and for each country in the data set. The figure is based upon the mean of all values, weighted by the size of sales for each value

shows that growth rates are variable between Environmental (lower growth at 3.4%) and Renewable Energy (higher growth at 4.5%) activities.

Figure 6: Global Growth Forecasts 2011/ 12 to 2014/ 15 (%)

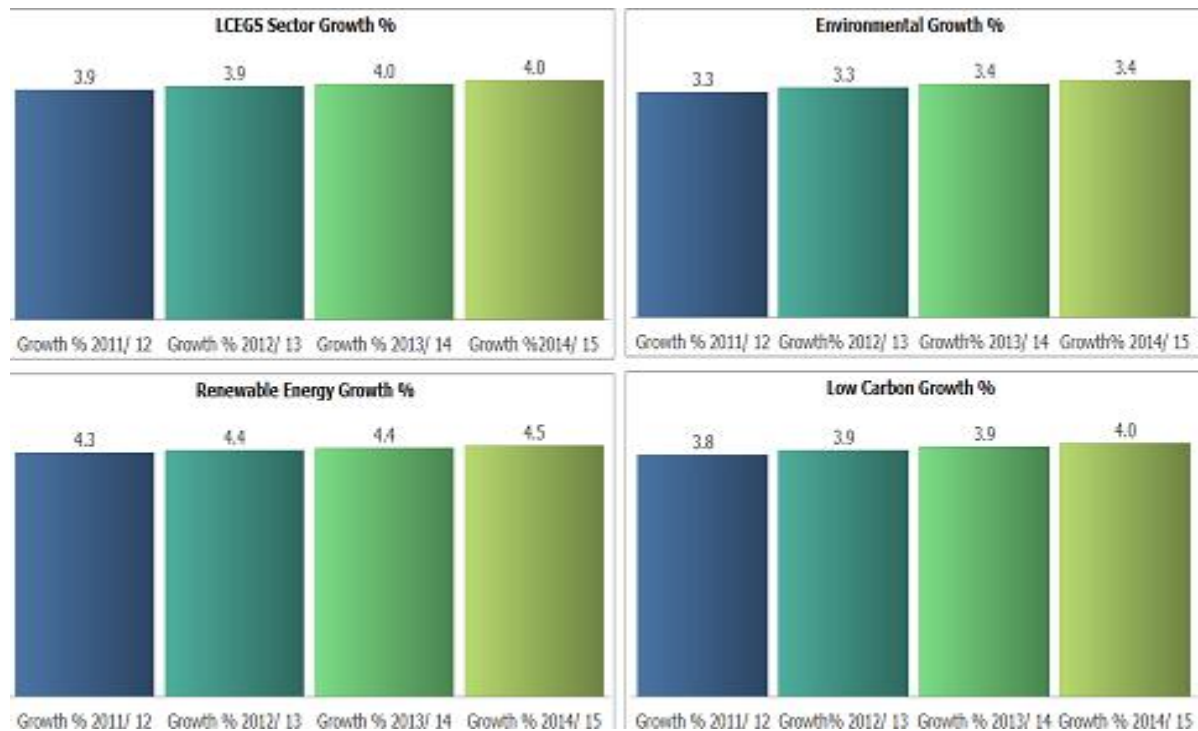
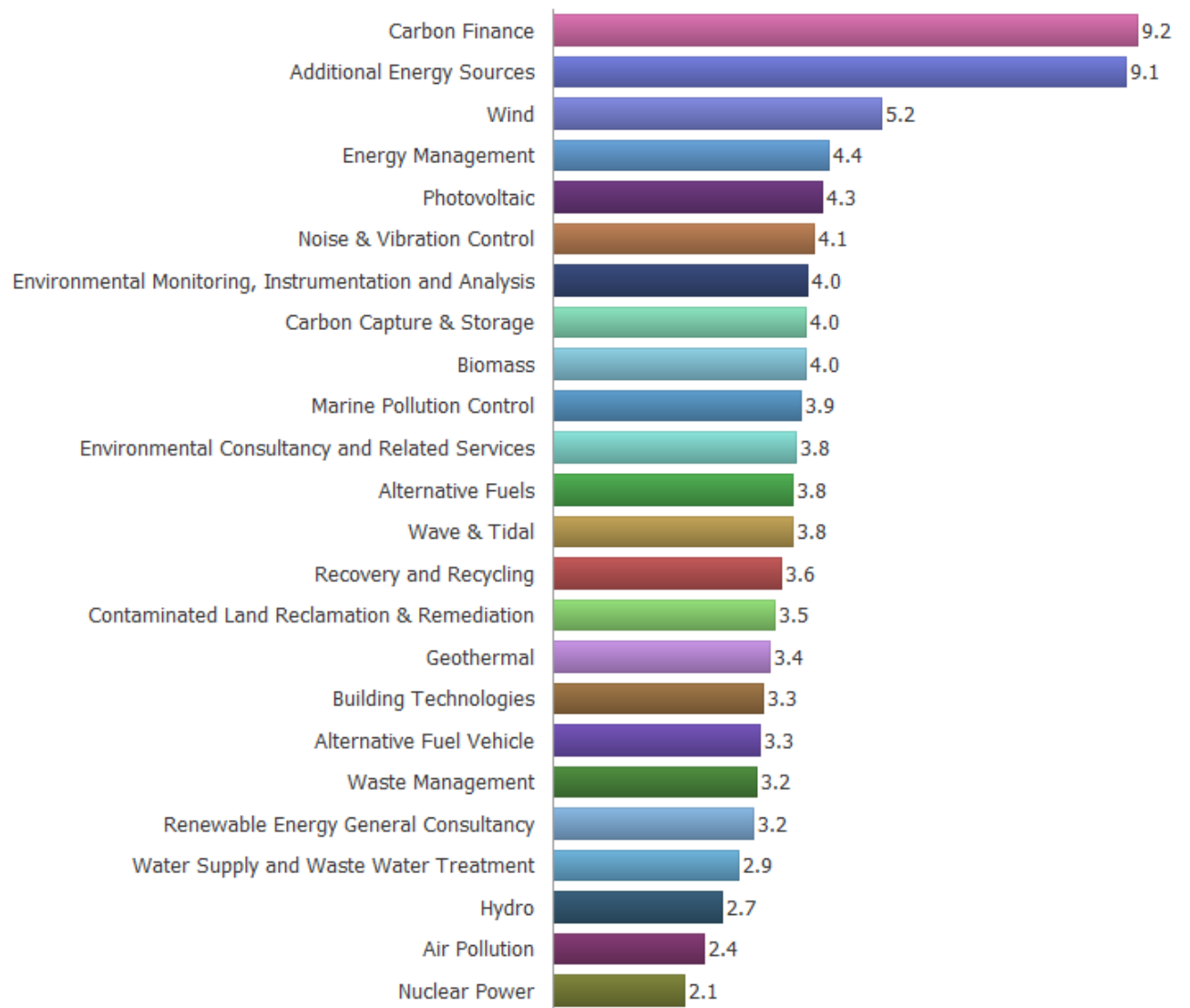


Figure 7 shows that at the sub sector level the highest global growth rates for 2010/12 are forecast to be Carbon Finance (9.2%), Additional Energy Sources (9.1%) and Wind (5.2%). The lowest growth rates will be for Nuclear Power (2.1), Air Pollution (2.4%) and Hydro Power (2.7%).

Figure 7: Global Growth Forecasts 2010/ 11 (%) by Sub Sector



4. UK LCEGS

4.1 Introduction

Section 4 briefly positioned the UK LCEGS Sector in relation to global markets. This section now looks at the UK in more detail against each of our four key measures - sales, companies, employment and growth. The data for this section is drawn from Appendix D.

4.2 UK LCEGS Headlines

UK LCEGS Sales in 2010/ 11 is £122.2bn. This compares with the 2009/ 10 figure of £116.8bn and shows a £ 5.4bn increase at 4.7% annual growth. Annual growth in previous years had been £4.8bn or 4.3% (2008/ 09) and £4.7bn or 4.3% (2007/ 08). This shows consistent growth since 2007/ 08.

The number of UK LCEGS Companies in 2010/ 11 is 51,682. This compares with the 2009/ 10 figure of 51,611 and shows 0.1% annual growth. Annual growth in previous years had been -1.2% (2008/ 09) and 0% (2007/ 08).

The volume of UK LCEGS Employment in 2010/ 11 is 939,627. This compares with the 2009/ 10 figure of 914,273 and shows 2.8% annual growth. Annual growth in previous years had been 0.5% (2008/ 09) and 0.2% (2007/ 08). *This is the first really positive sign of employment growth in the sector since the recession in 2008.*

4.3 UK LCEGS Sales

Table 4 shows sales by sub sector for the UK for the last three years.

Table 4: UK LCEGS Sales in £m for 2008/ 09 to 2010/ 11

	Level 2	Sales £m 2008/09	Sales £m 2009/10	Sales £m 2010/ 11	Growth % 2008/9 to 2009/10	Growth % 2009/10 to 2010/11
Environmental	Air Pollution	978	997	1,018	2.0	2.1
	Contaminated Land	939	963	990	2.6	2.8
	Environmental Consultancy	770	794	821	3.1	3.4
	Environmental Monitoring	155	160	166	3.3	3.7
	Marine Pollution Control	124	129	133	3.7	3.5
	Noise & Vibration Control	212	220	229	3.9	4.0
	Recovery and Recycling	6,724	6,936	7,174	3.2	3.4
	Waste Management	4,946	5,071	5,210	2.5	2.7
	Water Supply and Waste Water Treatment	8,101	8,230	8,373	1.6	1.7
Low Carbon	Additional Energy Sources	1,251	1,297	1,347	3.7	3.9
	Alternative Fuel Vehicle	13,113	12,915	13,430	-1.5	4.0
	Alternative Fuels	15,678	17,176	18,107	9.6	5.4
	Nuclear Power	3,727	3,798	3,873	1.9	2.0
	Building Technologies	13,526	14,129	14,794	4.5	4.7
	Carbon Capture & Storage	483	497	515	2.9	3.6
	Carbon Finance	5,640	5,925	6,319	5.0	6.7
	Energy Management	2,634	2,718	2,812	3.2	3.4
Renewables	Biomass	5,216	5,454	5,728	4.6	5.0
	Geothermal	9,722	10,186	10,701	4.8	5.1
	Hydro	516	529	544	2.5	2.8
	Photovoltaic	4,721	4,997	5,315	5.8	6.4
	Renewable consulting	492	505	520	2.7	2.9
	Wave & Tidal	78	82	86	4.7	5.3
	Wind	12,258	13,070	14,017	6.6	7.2
	Total	112,004	116,780	122,222	4.3	4.7

As with the global pattern for sales (Figure 3), the largest sub sectors are Alternative Fuels (15%), Building Technologies (12%), Wind (11%), Alternative Fuel and Vehicles (11%) and Geothermal (9%).

In columns 6 and 7 of Table 4 the year-on-year increases are shown from 2008/ 09 to the current year. The difference in growth rates in Alternative Fuels is accounted for by a change in the definitions, where Nuclear Power was split to form its own sub sector in the dataset. This skews the growth figures 2008/ 09 to 2009/ 10 and corrects itself in the annual growth rates for 2009/ 10 to 2010/ 11.

The highest year-on-year increase in growth rate is for Carbon Finance, followed by Wind, Wave & Tidal, Carbon Capture & Storage and Photovoltaic.

At Level 3 (the next level of disaggregation) the 2010/ 11 UK LCEGS Sector includes 29 activities worth over £1bn per annum in terms of turnover.

They account for 23% of Level 3 activities and 83% of UK Sales. They are listed in ranked order in Table 5, by value and by percentage of the UK total.

Table 5: UK LCEGS Sales, Top Level 3 Activities (£m) for 2010/ 11

Level 2	Level 3	Sales £m	% of Total
Alternative Fuels	Other Bio Fuels	12,889	10.5
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	11,697	9.6
Water Supply and Waste Water	Water Treatment and Distribution	5,957	4.9
Wind	Wind Farm Systems	5,681	4.6
Building Technologies	Window s	5,428	4.4
Carbon Finance	Carbon Credits Trading	4,925	4.0
Building Technologies	Insulation and Heat Retention Materials	4,445	3.6
Wind	Large Wind Turbine	4,403	3.6
Geothermal	Whole Systems Manufacture	4,280	3.5
Wind	Small Wind Turbine	3,933	3.2
Building Technologies	Doors	3,345	2.7
Recovery and Recycling	Waste Collection	2,782	2.3
Biomass	Biomass Energy Systems	2,370	1.9
Geothermal	Suppliers of Systems	2,368	1.9
Photovoltaic	Systems & Equipment	2,361	1.9
Geothermal	Manufacture and Supply of Specialist Equipment	2,270	1.9
Alternative Fuels	Other Fuels	2,179	1.8
Water Supply and Waste Water	Engineering	2,172	1.8
Waste Management	Construction & Operation of Waste Treatment Facilities	2,141	1.8
Alternative Fuels	Main Stream Bio Fuels	1,998	1.6
Biomass	Boilers and related Systems	1,843	1.5
Waste Management	Equipment For Waste Treatment	1,748	1.4
Alternative Fuel Vehicle	Other Fuels and Vehicles	1,734	1.4
Geothermal	Consulting & Related Services	1,646	1.3
Building Technologies	Monitoring and Control Systems	1,576	1.3
Nuclear Pow er	Nuclear Pow er Plant Operations	1,523	1.2
Photovoltaic	Photovoltaic Cells	1,390	1.1
Photovoltaic	Other Related Equipment and Chemicals	1,252	1.0
Recovery and Recycling	Glass Stock Processing	1,070	0.9

4.4 UK LCEGS Companies

Table 6 shows companies by sub sector for the UK for the last three years.

Table 6: UK LCEGS Number of Companies for 2008/ 09 to 2010/ 11

	Level 2	Companies 2008/09	Companies 2009/10	Companies 2010/ 11	Growth % 2008/9 to 2009/10	Growth % 2009/10 to 2010/11
Environmental	Air Pollution	496	496	496	0.0	0.0
	Contaminated Land	445	442	441	-0.7	-0.2
	Environmental Consultancy	375	375	375	0.0	0.0
	Environmental Monitoring	72	72	71	0.0	-1.4
	Marine Pollution Control	56	56	56	0.0	0.0
	Noise & Vibration Control	104	104	104	0.0	0.0
	Recovery and Recycling	3,136	3,153	3,149	0.5	-0.1
	Waste Management	2,281	2,290	2,293	0.4	0.1
	Water Supply and Waste Water Treatment	3,771	3,755	3,750	-0.4	-0.1
Low Carbon	Additional Energy Sources	577	582	582	0.9	0.0
	Alternative Fuel Vehicle	6,374	6,078	6,087	-4.6	0.1
	Alternative Fuels	7,418	7,775	7,799	4.8	0.3
	Nuclear Power	1,802	1,828	1,829	1.4	0.1
	Building Technologies	6,229	6,323	6,321	1.5	0.0
	Carbon Capture & Storage	231	232	232	0.4	0.0
	Carbon Finance	2,648	1,946	1,963	-26.5	0.9
	Energy Management	1,221	1,221	1,224	0.0	0.2
Renewables	Biomass	2,384	2,336	2,337	-2.0	0.0
	Geothermal	4,478	4,465	4,471	-0.3	0.1
	Hydro	259	261	261	0.8	0.0
	Photovoltaic	2,135	2,085	2,086	-2.3	0.0
	Renew able consulting	226	230	231	1.8	0.4
	Wave & Tidal	33	33	33	0.0	0.0
	Wind	5,507	5,473	5,491	-0.6	0.3
Total	52,258	51,611	51,682	-1.2	0.1	

As for UK sales, the largest company counts by sub sector are Alternative Fuels, Wind, Building Technologies, Alternative Fuel & Vehicles and Geothermal. Together they account for 58% of the total.

In columns 6 and 7 of Table 6 the year-on-year increases are shown from 2008/ 09 to the current year. There is little variation in the sub sector growth rates for 2009/ 10 to 2010/ 11, but there is significant one- off variation in the previous year for Carbon Finance, showing a 26% reduction in the number of companies involved in this sub sector.

At Level 3 the 2010/ 11 UK LCEGS Sector includes 28 activities with more than 500 companies. They account for 82% of the total and are listed in ranked order in Table 7, by value and by percentage of the UK total.

Table 7: UK LCEGS Company Numbers, Top Level 3 Activities for 2010/ 11

Level 2	Level 3	Companies	% of Total
Alternative Fuels	Other Bio Fuels	5,681	11.0
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	5,347	10.3
Water Supply and Waste Water Treatment	Water Treatment and Distribution	2,653	5.1
Building Technologies	Window s	2,348	4.5
Wind	Wind Farm Systems	2,199	4.3
Geothermal	Whole Systems Manufacture	1,942	3.8
Building Technologies	Insulation and Heat Retention Materials	1,925	3.7
Wind	Large Wind Turbine	1,674	3.2
Wind	Small Wind Turbine	1,618	3.1
Carbon Finance	Carbon Credits Trading	1,466	2.8
Building Technologies	Doors	1,450	2.8
Recovery and Recycling	Waste Collection	1,197	2.3
Water Supply and Waste Water Treatment	Engineering	991	1.9
Biomass	Biomass Energy Systems	989	1.9
Waste Management	Construction & Operation of Waste Treatment Facilities	944	1.8
Geothermal	Manufacture and Supply of Specialist Equipment	936	1.8
Photovoltaic	Systems & Equipment	903	1.7
Alternative Fuels	Other Fuels	900	1.7
Geothermal	Suppliers of Systems	870	1.7
Alternative Fuels	Main Stream Bio Fuels	792	1.5
Waste Management	Equipment For Waste Treatment	778	1.5
Nuclear Pow er	Nuclear Pow er Plant Operations	759	1.5
Biomass	Boilers and related Systems	743	1.4
Alternative Fuel Vehicle	Other Fuels and Vehicles	740	1.4
Geothermal	Consulting & Related Services	680	1.3
Building Technologies	Monitoring and Control Systems	598	1.2
Photovoltaic	Photovoltaic Cells	527	1.0
Photovoltaic	Other Related Equipment and Chemicals	517	1.0

4.5 UK LCEGS Employment

Table 8 shows employment by sub sector for the UK for the last three years.

Table 8: UK LCEGS Employment for 2008/ 09 to 2010/ 11

	Level 2	Employment 2008/09	Employment 2009/10	Employment 2010/ 11	Growth % 2008/9 to 2009/10	Growth % 2009/10 to 2010/11
Environmental	Air Pollution	9,157	9,186	9,466	0.3	3.0
	Contaminated Land	8,211	8,233	8,504	0.3	3.3
	Environmental Consultancy	7,052	7,100	7,313	0.7	3.0
	Environmental Monitoring	1,449	1,449	1,491	0.0	2.9
	Marine Pollution Control	1,017	1,025	1,055	0.8	2.9
	Noise & Vibration Control	1,951	1,933	1,994	-0.9	3.2
	Recovery and Recycling	54,440	54,629	56,309	0.3	3.1
	Waste Management	43,834	43,571	44,827	-0.6	2.9
	Water Supply and Waste Water Treatment	70,802	70,841	72,932	0.1	3.0
Low Carbon	Additional Energy Sources	10,491	11,331	11,320	8.0	-0.1
	Alternative Fuel Vehicle	106,173	101,072	104,453	-4.8	3.3
	Alternative Fuels	133,242	140,098	143,422	5.1	2.4
	Nuclear Power	34,514	35,914	35,910	4.1	0.0
	Building Technologies	110,507	109,187	112,634	-1.2	3.2
	Carbon Capture & Storage	4,691	4,695	4,685	0.1	-0.2
	Carbon Finance	23,580	24,146	24,487	2.4	1.4
	Energy Management	22,410	22,648	23,333	1.1	3.0
Renewables	Biomass	46,555	47,485	48,994	2.0	3.2
	Geothermal	78,857	79,012	81,417	0.2	3.0
	Hydro	5,017	4,955	5,100	-1.2	2.9
	Photovoltaic	39,177	39,152	40,398	-0.1	3.2
	Renewable Consulting	4,519	4,865	4,856	7.6	-0.2
	Wave & Tidal	622	552	570	-11.3	3.3
	Wind	91,514	91,194	94,157	-0.3	3.2
Total	909,782	914,273	939,627	0.5	2.8	

The largest employment counts by sub sector are Alternative Fuels, Wind, Building Technologies, Alternative Fuel & Vehicles and Geothermal. Together they account for 57% of employment.

In columns 6 and 7 of Table 8 the year-on-year increases are shown from 2008/ 09 to the current year. There is little variation in the sub sector growth rates for 2009/ 10 to 2010/ 11 (most sub sectors show positive growth), but there are wider variations in the previous year, although these are mostly restricted to the smallest sub sectors.

Table 9: UK LCEGS Employment, Top Level 3 Activities for 2010/ 11

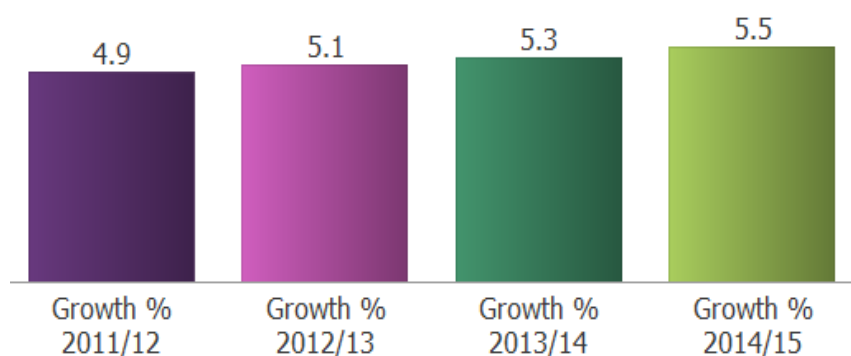
Level 2	Level 3	Employment	% of Total
Alternative Fuels	Other Bio Fuels	101,192	10.8
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	90,934	9.7
Water Supply and Waste Water Treatment	Water Treatment and Distribution	50,582	5.4
Building Technologies	Window s	41,820	4.5
Wind	Wind Farm Systems	38,226	4.1
Building Technologies	Insulation and Heat Retention Materials	34,801	3.7
Geothermal	Whole Systems Manufacture	32,580	3.5
Wind	Large Wind Turbine	31,064	3.3
Building Technologies	Doors	25,032	2.7
Wind	Small Wind Turbine	24,866	2.6
Recovery and Recycling	Waste Collection	22,976	2.4
Biomass	Biomass Energy Systems	22,028	2.3
Water Supply and Waste Water Treatment	Engineering	20,244	2.2
Geothermal	Suppliers of Systems	18,525	2.0
Waste Management	Equipment For Waste Treatment	17,806	1.9
Photovoltaic	Systems & Equipment	17,213	1.8
Alternative Fuels	Main Stream Bio Fuels	17,189	1.8
Alternative Fuels	Other Fuels	16,941	1.8
Geothermal	Manufacture and Supply of Specialist Equipment	16,908	1.8
Waste Management	Construction & Operation of Waste Treatment Facilities	16,827	1.8
Carbon Finance	Carbon Credits Trading	16,445	1.8
Biomass	Boilers and related Systems	14,086	1.5
Alternative Fuel Vehicle	Other Fuels and Vehicles	13,519	1.4
Geothermal	Consulting & Related Services	12,602	1.3
Nuclear Pow er	Nuclear Pow er Plant Operations	12,453	1.3
Building Technologies	Monitoring and Control Systems	10,981	1.2
Photovoltaic	Photovoltaic Cells	10,902	1.2
Nuclear Pow er	Nuclear Safety Engineering Services	10,041	1.1

At Level 3 the 2010/ 11 UK LCEGS Sector includes 28 activities with more than 10,000 employees. They account for 22% of activities and 81% of sector employment They are listed in ranked order in Table 9, by value and by percentage of the UK total.

4.6 UK LCEGS Sales Value Forecast

LCEGS growth between 2009/ 10 and 2010/ 11 was 4.7%. The average growth rate for the period 2007/ 08 to 2010/ 11 (the full period of this data set) is 3.5%. Forecast growth rates for the UK to 2014/ 15 are shown in Figure 8.

Figure 8: UK LCEGS Forecast Growth 2011/ 12 to 2014/ 15



The sector shows a steady increase in growth from 4.9% in 2011/ 12 to 5.5% by 2014/ 15.

In Table 10 forecast growth is shown by sub sector. Forecast growth rates vary significantly between high growth (Wind and Carbon Finance) and low growth (Water/ Waste Water Treatment, Air Pollution and Nuclear Power). Low growth tends to reflect the maturity of the sub sector.

Table 10: UK LCEGS Forecast Growth by Sub Sector

	Level 2	Growth % 2010/11	Growth % 2011/12	Growth % 2012/13	Growth % 2013/14	Growth % 2014/15
Environmental	Air Pollution	2.1	2.1	2.2	2.2	2.4
	Contaminated Land	2.8	2.9	3.0	3.1	3.1
	Environmental Consultancy	3.4	3.5	3.6	3.6	3.7
	Environmental Monitoring	3.3	3.5	3.6	3.8	3.8
	Marine Pollution Control	3.8	3.9	4.0	4.2	4.3
	Noise & Vibration Control	3.9	4.1	4.2	4.4	4.4
	Recovery and Recycling	3.5	3.6	3.9	4.0	4.2
	Waste Management	2.8	2.8	3.0	3.1	3.2
	Water Supply and Waste Water Treatment	1.7	1.8	1.9	2.0	2.0
Low Carbon	Additional Energy Sources	3.8	4.0	4.1	4.2	4.5
	Alternative Fuel Vehicle	4.0	4.0	4.2	4.2	4.4
	Alternative Fuels	5.6	5.3	5.9	5.9	6.3
	Nuclear Power	2.1	2.4	2.7	3.0	3.1
	Building Technologies	4.7	4.8	4.9	5.1	5.4
	Carbon Capture & Storage	3.4	3.7	3.7	3.7	3.9
	Carbon Finance	8.1	9.3	8.9	9.5	10.4
	Energy Management	3.4	3.5	3.6	3.8	3.9
Renewables	Biomass	5.0	5.1	5.2	5.3	5.6
	Geothermal	5.2	5.4	5.4	5.7	5.8
	Hydro	2.8	3.0	3.0	3.1	3.3
	Photovoltaic	6.2	6.4	6.7	6.9	7.0
	Renew able Consulting	2.6	2.9	2.9	3.0	2.9
	Wave & Tidal	5.6	5.7	5.9	6.2	6.2
	Wind	7.2	7.5	7.5	7.8	7.9

4.7 LCEGS Activities and the Supply Chain

All LCEGS activities have been assigned a simple code that reflects the type of activity undertaken. This is important when trying to understand the comparative value of activities across the LCEGS value chains.

Figure 9: UK LCEGS sales by Activity Code (£m) for 2010/ 11

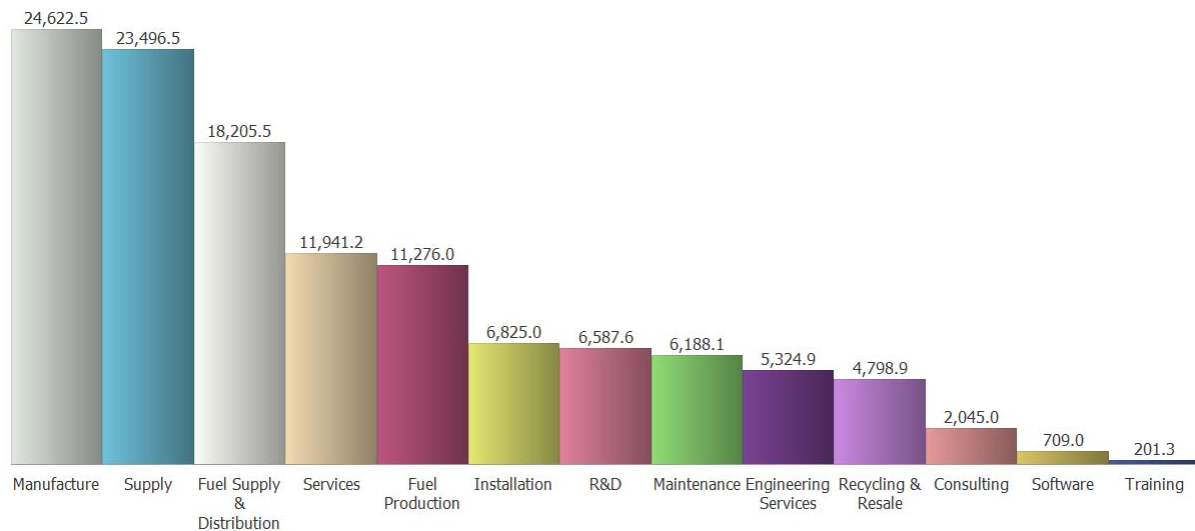


Figure 9 shows the distribution of value (£m) across the 13 activity headings. Manufacturing accounts for 20% or £25bn of the total and R&D for 5% or £7bn.

Figure 10: UK LCEGS Employment by Activity Code for 2010/ 11

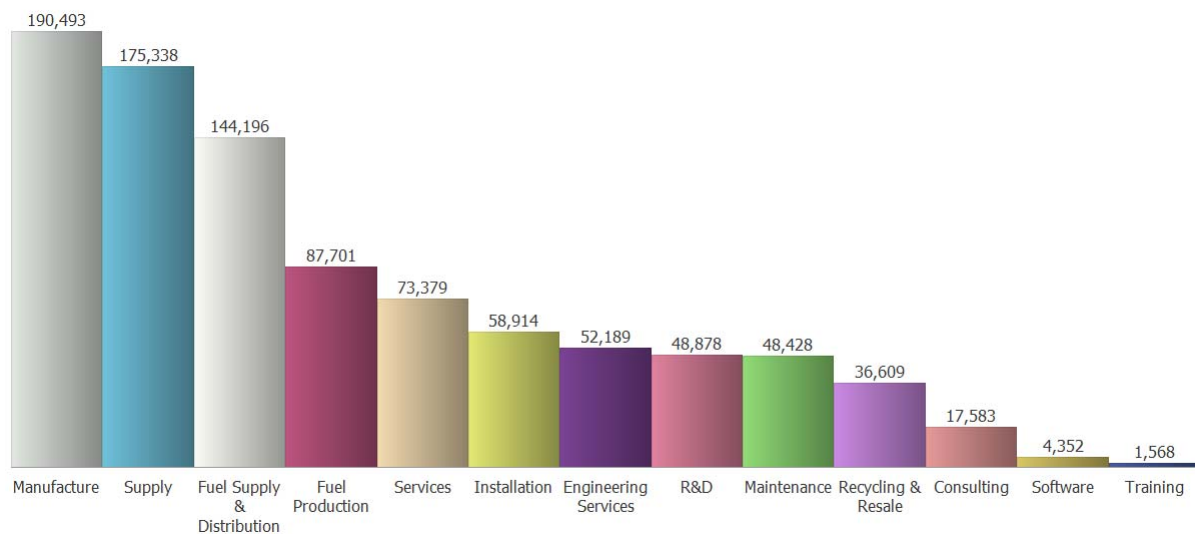


Figure 10 shows the distribution of employment with Manufacture accounting for 20% or 190,000 and R&D accounting for 49,000 or 5%.

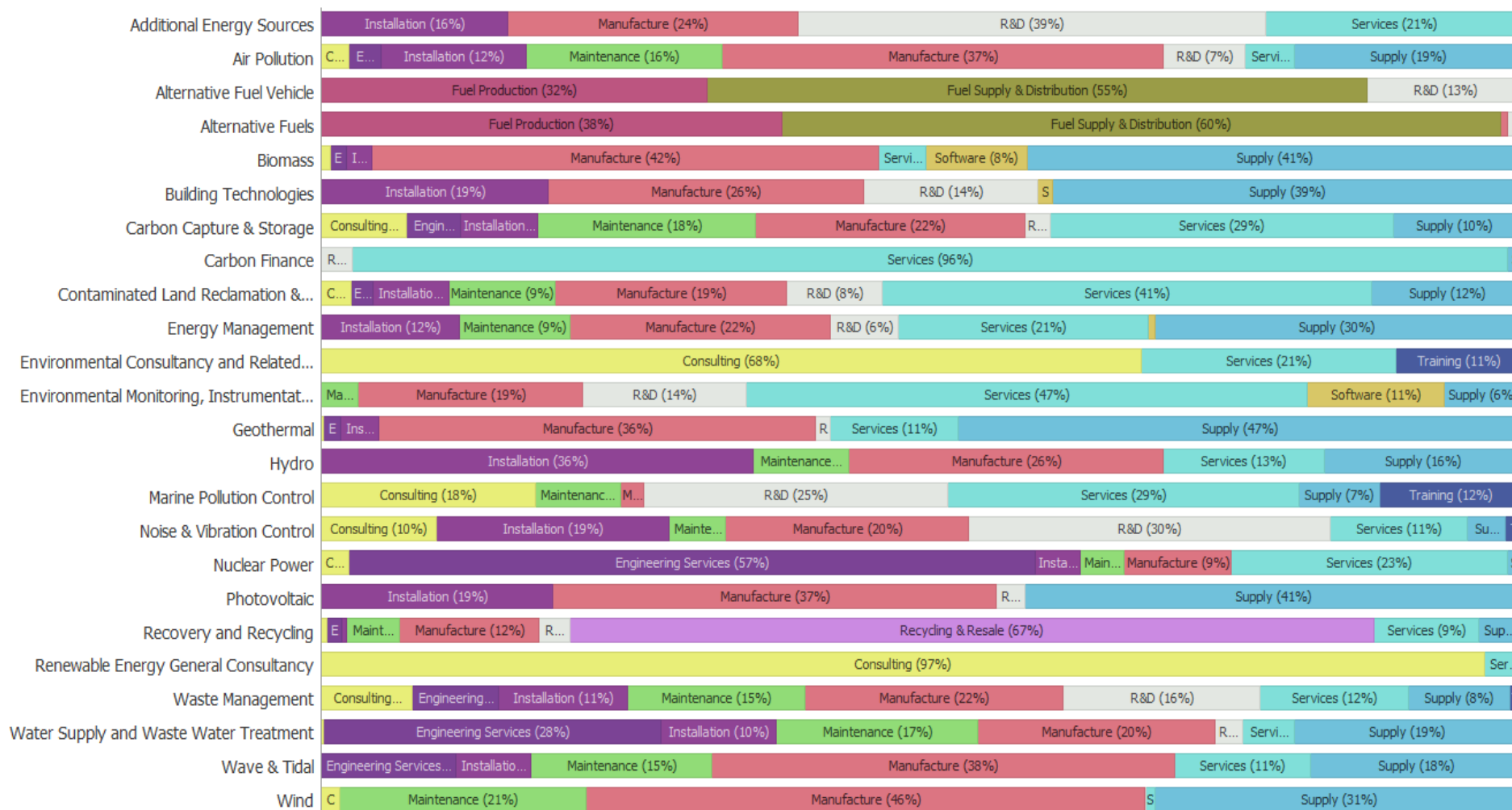
For both Sales and Employment, the manufacturing and R&D percentages are slightly down on the previous years 21% and 6%.

Figure 11 shows all sub sector activities using a 100% bar chart. This obscures the relative financial value of activities but does give a sense of how activities are distributed across the sector by showing each sub sector split by activity code. While this is a very simplistic way of displaying the LCEGS sector, it does at least show the

relative importance and ratio of manufacture and service activities across the different sub sectors⁵.

⁵ Activity codes were assigned to each LCEGS activity based upon a "best fit" analysis using 13 agreed codes that could accommodate most of the important value chain activities for the sector. They are primarily designed to separate manufacturing and service activities, but can also be used to identify R&D intensity across different sub sectors of LCEGS.

Figure 11: UK LCEGS Sales by Activity Code for 2010/ 11

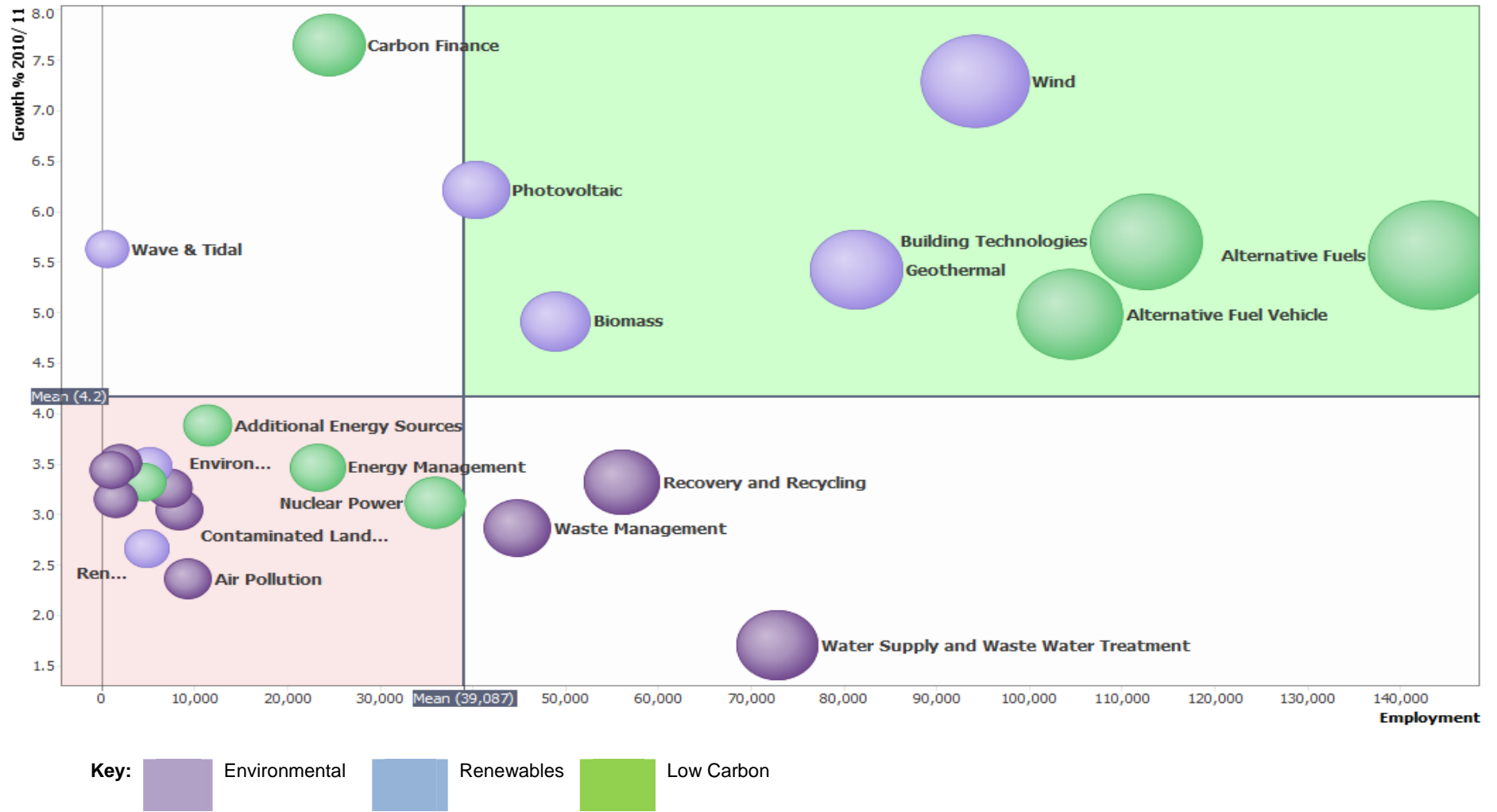


4.8 UK LCEGS Summary

In Figure 12 a Bubble Chart is used to display three of the four measures- Employment (horizontal axis), Current Year Sales Growth rate (vertical axis) and the size of each sub sector bubble to represent the value of sales. In a Bubble Chart the ideal positioning for a sub sector is top, right and large. Figure 12 confirms that the LCEGS sector is dominated by three Low Carbon sub sectors- Alternative Fuels, Alternative Fuel & Vehicles and Building Technologies- and two Renewable Energy sub sectors- Wind and Geothermal. Many of the Environmental sub sectors fall into the bottom left quadrant⁶ which represents (comparatively) lower growth/ lower employment.

⁶ Quadrants are formed using the intersection of mean values for both the X and Y axes.

Figure 12: UK LCEGS Sector Summary



5. UK LCEGS by Regions

5.1 Introduction

As an extension of the UK LCEGS analysis, the national figures were disaggregated for the UK Government Office regional boundaries and Devolved Administrations (Appendix D) and for the UK sub regions (Appendix E). This section provides a brief comparison of LCEGS across the UK, using the four key measures

5.2 UK LCEGS Regional Measures 2010/11

Figure 13 shows that London (20%), the South East (12%) and the North West (10%) are the largest LCEGS regions by sales.

Figure 13: UK LCEGS Regional Sales (£m) 2010/ 11

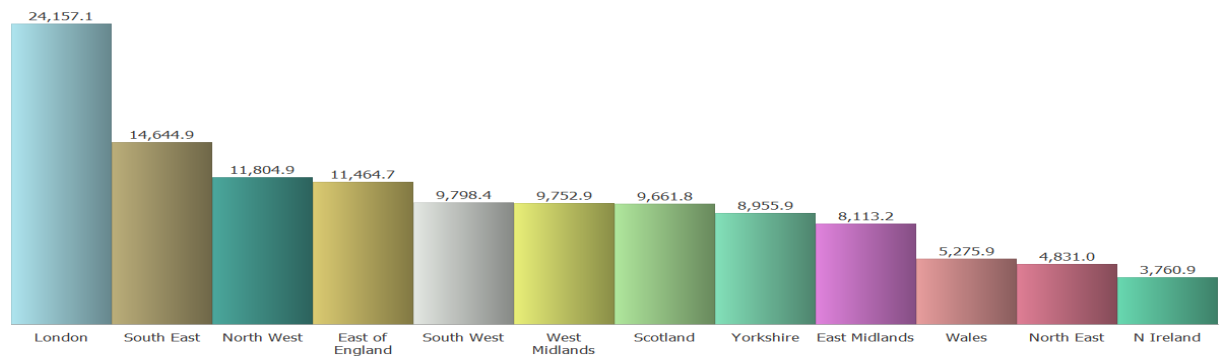


Figure 14 shows that London (18%), the South East (13%) and the North West (10%) have the largest number of LCEGS companies.

Figure 14: UK LCEGS Regional Company Numbers 2010/ 11

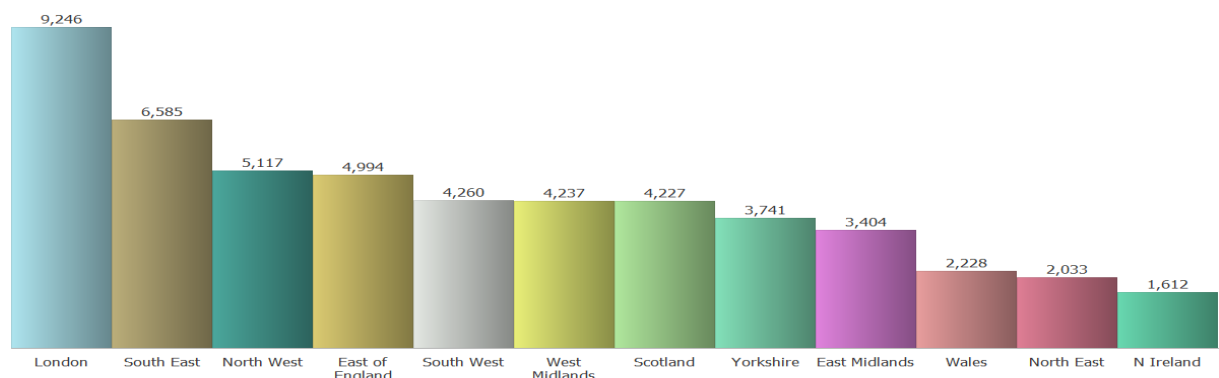


Figure 15 shows that London (18%), the South East (13%) and the North West (10%) have the largest number of LCEGS employees.

Figure 15: UK LCEGS Regional Employment 2010/ 11

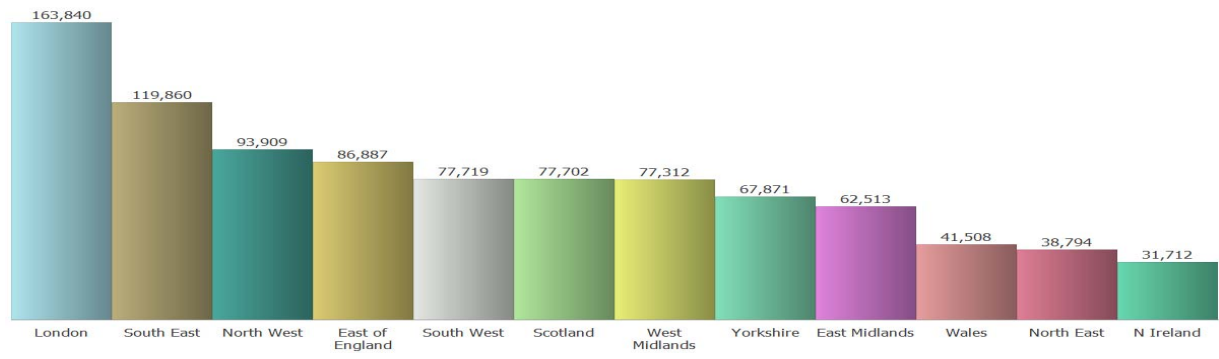


Table 11: UK LCEGS Regional Sales (£m) 2010/ 11

	Level 2	East Midlands	East of England	London	N Ireland	North East	North West	Scotland	South East	South West	Wales	West Midlands	Yorks & Humber	Total
Environmental	Air Pollution	56	116	104	44	60	136	132	99	92	34	42	104	1,018
	Contaminated Land	89	123	88	19	55	162	115	82	97	28	45	87	990
	Environmental Consultancy	78	56	114	35	21	98	65	103	50	29	98	75	821
	Environmental Monitoring	10	20	24	7	6	15	12	34	10	8	11	10	166
	Marine Pollution Control	9	9	17	5	7	13	13	22	12	4	8	14	133
	Noise & Vibration Control	11	23	47	11	8	19	12	25	21	15	13	23	229
	Recovery and Recycling	308	1,101	907	206	217	802	785	832	660	259	524	574	7,174
	Waste Management	318	466	1,240	212	125	305	433	683	506	128	347	446	5,210
Water Supply and Waste Water Treatment	350	595	1,516	290	168	602	733	984	831	628	743	933	8,373	
Low Carbon	Additional Energy Sources	104	152	154	39	76	198	128	103	83	65	107	140	1,347
	Alternative Fuel Vehicle	476	1,799	1,307	442	926	1,512	569	1,702	1,118	441	1,672	1,466	13,430
	Alternative Fuels	1,801	2,174	1,999	510	864	1,995	1,813	2,164	1,845	592	1,643	708	18,107
	Nuclear Power	154	420	400	54	143	580	461	700	439	162	190	169	3,873
	Building Technologies	1,096	1,217	2,175	359	709	1,586	1,071	2,531	1,185	817	780	1,269	14,794
	Carbon Capture & Storage	38	79	61	12	32	93	61	1	41	11	29	55	515
	Carbon Finance	17	25	6,103	6	9	25	22	39	22	11	21	19	6,319
	Energy Management	268	185	346	88	168	306	143	279	319	146	305	258	2,812
Renewables	Biomass	414	578	1,029	126	168	447	730	634	471	293	489	348	5,728
	Geothermal	672	1,008	2,601	528	375	801	728	1,016	736	637	716	882	10,701
	Hydro	48	54	109	21	16	39	30	78	33	17	64	34	544
	Photovoltaic	397	358	1,347	157	217	457	327	523	302	361	596	271	5,315
	Renewable Consulting	34	51	88	12	17	53	41	82	42	19	41	39	520
	Wave & Tidal	4	10	11	2	4	8	9	9	8	5	7	8	86
	Wind	1,364	846	2,371	574	438	1,552	1,226	1,918	874	567	1,260	1,025	14,017
	Total	8,116	11,465	24,158	3,759	4,829	11,804	9,659	14,643	9,797	5,277	9,751	8,957	122,222
% Of Total	7	9	20	3	4	10	8	12	8	4	8	7		

Table 11 shows regional sales compared by sub sector⁷. The final row shows the regional percentage of the UK total. These percentages do not change radically year-by-year, but over time the share held by London and the South East has increased.

⁷ Because of the way that the rounding of figures is managed, there are some small differences between graphics and table totals for the regions

Table 12: UK LCEGS Regional Company Numbers 2010/ 11

	Level 2	East Midlands	East of England	London	N Ireland	North East	North West	Scotland	South East	South West	Wales	West Midlands	Yorks & Humber	Total
Environmental	Air Pollution	12	57	32	5	9	145	118	59	19	2	6	32	496
	Contaminated Land	44	50	75	10	14	91	37	27	30	10	13	40	441
	Environmental Consultancy	23	16	99	3	3	68	16	53	8	3	57	26	375
	Environmental Monitoring	0	11	12	0	0	0	0	49	0	0	0	0	71
	Marine Pollution Control	0	0	7	0	0	1	3	33	1	0	0	11	56
	Noise & Vibration Control	0	6	49	0	0	3	49	29	11	0	0	6	104
	Recovery and Recycling	125	554	394	80	91	387	316	388	264	103	226	222	3,149
	Waste Management	145	201	481	101	64	142	189	324	228	62	158	198	2,293
	Water Supply and Waste Water Treatment	162	277	656	135	79	262	325	447	388	283	327	410	3,750
Low Carbon	Additional Energy Sources	45	68	62	25	32	78	53	45	36	31	40	68	582
	Alternative Fuel Vehicle	203	773	581	194	430	707	253	770	539	190	804	643	6,087
	Alternative Fuels	764	896	823	234	380	842	871	941	805	252	692	300	7,799
	Nuclear Power	71	199	173	32	69	259	238	310	224	87	90	78	1,829
	Building Technologies	468	558	923	161	295	635	438	1,078	546	356	339	523	6,321
	Carbon Capture & Storage	11	40	29	7	10	46	29	7	17	7	7	22	232
	Carbon Finance	6	7	1,899	1	2	7	7	12	6	2	6	5	1,963
	Energy Management	99	73	183	45	63	130	57	121	153	59	132	109	1,224
Renewables	Biomass	152	232	438	46	60	168	321	291	189	106	205	130	2,337
	Geothermal	295	446	930	221	163	310	314	487	326	284	315	380	4,471
	Hydro	21	22	59	9	8	16	13	48	15	9	28	13	261
	Photovoltaic	182	139	419	70	95	201	130	224	120	145	251	110	2,086
	Renewable Consulting	13	23	29	9	12	28	18	30	18	12	19	19	231
	Wave & Tidal	0	9	8	0	0	1	3	11	1	0	0	0	33
	Wind	564	336	886	224	154	589	477	801	317	225	520	398	5,491
	Total	3,405	4,993	9,247	1,612	2,033	5,116	4,226	6,585	4,261	2,228	4,235	3,743	51,682
% Of Total	7	10	18	3	4	10	8	13	8	4	8	7		

Table 12 shows regional company levels compared by sub sector. The final row shows the regional percentage of the UK total which show some differences to the regional sales figures.

Table 13: UK LCEGS Regional Employment 2010/ 11

	Level 2	East Midlands	East of England	London	N Ireland	North East	North West	Scotland	South East	South West	Wales	West Midlands	Yorks & Humber	Total
Environmental	Air Pollution	659	1,004	919	533	613	1,134	1,055	853	827	427	545	895	9,466
	Contaminated Land	741	963	750	280	551	1,279	876	737	788	323	484	732	8,504
	Environmental Consultancy	649	513	910	385	292	802	580	873	484	364	763	697	7,313
	Environmental Monitoring	100	148	168	85	65	137	121	224	111	103	120	109	1,491
	Marine Pollution Control	79	79	121	53	60	107	94	158	90	38	75	102	1,055
	Noise & Vibration Control	132	184	300	123	119	157	123	203	181	152	134	186	1,994
	Recovery and Recycling	2,557	8,537	6,759	1,877	1,864	5,682	6,271	6,700	5,190	2,253	4,133	4,486	56,309
	Waste Management	2,657	4,102	10,102	1,879	1,252	2,576	3,804	5,970	4,326	1,219	3,022	3,918	44,827
	Water Supply and Waste Water Treatment	3,169	5,106	13,934	2,580	1,623	4,911	6,606	8,659	7,353	5,225	6,170	7,596	72,932
Low Carbon	Additional Energy Sources	825	1,185	1,230	349	588	1,742	1,138	974	738	569	791	1,192	11,320
	Alternative Fuel Vehicle	3,801	13,293	9,300	3,397	6,874	12,364	4,329	13,573	9,121	3,331	15,344	9,726	104,453
	Alternative Fuels	13,285	15,107	19,326	3,678	6,166	16,936	15,630	18,640	14,215	4,575	10,741	5,121	143,422
	Nuclear Power	1,670	3,782	4,284	491	1,301	5,048	3,928	5,951	4,296	1,509	1,883	1,767	35,910
	Building Technologies	8,226	9,173	16,074	2,998	5,758	11,468	8,267	20,073	8,979	6,268	6,314	9,036	112,634
	Carbon Capture & Storage	392	569	500	169	386	752	531	32	402	149	306	499	4,685
	Carbon Finance	66	109	23,538	26	44	112	123	190	108	35	71	66	24,487
	Energy Management	2,118	1,531	2,507	893	1,506	2,445	1,202	2,503	2,586	1,304	2,629	2,106	23,333
Renewables	Biomass	3,335	4,941	8,591	1,250	1,612	3,908	6,501	5,596	3,687	2,550	4,155	2,868	48,994
	Geothermal	5,151	7,508	18,527	4,785	2,942	6,325	4,969	8,560	5,601	4,208	5,773	7,068	81,417
	Hydro	518	485	901	280	186	369	308	643	340	202	568	301	5,100
	Photovoltaic	3,043	2,698	9,890	1,388	1,674	3,327	2,558	4,138	2,253	2,628	4,559	2,242	40,398
	Renew able Consulting	316	478	753	135	183	463	418	770	383	182	353	423	4,856
	Wave & Tidal	32	65	65	19	28	60	58	60	52	36	48	47	570
	Wind	8,991	5,325	14,392	4,061	3,106	11,805	8,213	13,778	5,610	3,856	8,330	6,689	94,157
Total	62,512	86,885	163,841	31,714	38,793	93,909	77,703	119,858	77,721	41,506	77,311	67,872	939,627	
% Of Total	7	9	17	3	4	10	8	13	8	4	8	7		

Table 13 shows regional employment levels compared by sub sector. The final row shows the regional percentage of the UK total and these show some differences to the regional sales figures. This means that some regions - East of England and the London- are slightly more labour- efficient (when employment and sales ratios are compared) than other regions. This is generally because of the mix of regional activities.

5.3 UK LCEGS Regional Growth 2009/10 to 2010/11

Table 14 shows regional sales growth rates by sub sector. Overall the East Midlands and the North West grew at a slightly faster rate than the rest of the UK. Most of the major variations in growth rates (negative or positive) relate to sub sectors that have a relatively small current UK economic value (Carbon Capture & Storage and Wave & Tidal) or a small regional value (Carbon Finance outside of London) and can be ignored.

Table 14: UK LCEGS Regional Sales Growth 2010/ 11 by Sub Sector

	Level 2	East Midlands	East of England	London	N Ireland	North East	North West	Scotland	South East	South West	Wales	West Midlands	Yorks & Humber
Environmental	Air Pollution	2.9	1.7	2.0	2.1	2.8	2.0	2.4	2.1	1.5	3.2	3.0	2.3
	Contaminated Land	2.9	2.9	3.6	0.5	2.4	2.5	2.6	2.0	2.6	4.5	4.4	2.9
	Environmental Consultancy	3.6	4.4	3.3	3.1	1.6	3.7	4.0	3.8	2.9	1.6	3.8	3.6
	Environmental Monitoring	8.5	4.4	5.7	7.0	5.6	3.9	7.4	2.5	1.0	9.2	1.0	1.7
	Marine Pollution Control	5.1	8.5	2.6	-3.3	4.2	1.6	4.7	3.7	1.3	-1.5	4.6	5.6
	Noise & Vibration Control	1.5	4.3	4.1	5.8	7.7	3.2	1.2	2.5	4.5	4.0	1.9	2.6
	Recovery and Recycling	3.3	3.6	3.4	3.7	3.4	3.8	3.2	3.5	3.2	3.6	3.1	3.5
	Waste Management	2.8	2.8	2.7	2.8	2.4	2.9	2.7	2.3	2.8	3.5	2.7	3.0
	Water Supply and Waste Water Treatment	2.0	1.8	1.7	1.8	1.6	1.9	1.7	1.6	1.7	1.8	1.7	1.6
Low Carbon	Additional Energy Sources	4.0	4.4	4.0	3.8	3.9	3.1	4.0	3.9	4.2	4.7	4.1	4.8
	Alternative Fuel Vehicle	4.6	4.0	4.2	4.0	4.0	3.9	4.1	3.4	3.7	4.3	4.5	3.8
	Alternative Fuels	5.0	4.9	5.0	5.5	5.2	6.3	5.6	5.0	5.1	5.8	6.6	5.7
	Nuclear Power	2.8	1.8	2.9	2.7	1.6	1.5	1.4	1.7	1.7	2.2	3.1	2.5
	Building Technologies	4.9	4.8	4.9	4.6	4.6	5.2	4.9	4.3	4.5	4.4	4.6	4.7
	Carbon Capture & Storage	4.4	3.5	3.4	0.4	2.0	3.0	3.1	-26.8	4.0	6.7	2.5	3.2
	Carbon Finance	5.5	7.4	6.6	1.7	8.9	7.6	5.9	5.2	4.6	11.1	10.4	12.1
Energy Management	3.4	3.5	3.6	3.1	3.2	3.5	3.7	3.2	3.3	3.4	3.5	3.3	
Renewables	Biomass	5.0	4.9	5.3	4.6	5.1	5.4	5.0	4.6	5.0	5.1	4.8	4.8
	Geothermal	5.3	4.4	5.1	4.9	5.4	5.6	5.4	4.5	5.0	5.1	5.3	4.9
	Hydro	3.3	1.8	2.7	0.9	6.1	3.0	1.8	3.1	1.7	0.3	2.9	3.2
	Photovoltaic	6.2	6.3	6.9	6.1	5.9	6.6	6.9	5.7	5.9	6.7	5.7	5.7
	Renewable Consulting	3.8	2.0	2.8	5.4	1.7	3.0	2.2	3.1	2.4	0.6	1.7	3.7
	Wave & Tidal	4.4	4.2	7.8	-15.3	7.7	0.4	4.3	6.1	9.9	-2.9	0.4	7.1
	Wind	7.2	7.4	6.6	7.4	7.2	7.9	8.3	7.1	7.0	6.5	6.8	7.7
Total	4.9	4.3	5.1	4.6	4.5	4.9	4.7	4.2	4.2	4.5	4.8	4.4	

Table 15: UK LCEGS Regional Employment Growth 2010/ 11 by Sub Sector

	Level 2	East Midlands	East of England	London	N Ireland	North East	North West	Scotland	South East	South West	Wales	West Midlands	Yorks & Humber
Environmental	Air Pollution	3.1	3.0	2.9	3.1	3.0	3.0	3.2	3.3	2.6	2.9	3.0	3.1
	Contaminated Land	3.2	3.7	3.2	3.3	3.0	3.4	2.9	3.5	3.3	2.9	3.6	3.2
	Environmental Consultancy	2.5	3.4	2.7	3.2	3.5	3.0	2.5	2.8	3.2	2.8	3.5	3.1
	Environmental Monitoring	3.1	2.8	3.1	2.4	3.2	2.2	3.4	2.8	3.7	3.0	2.6	2.8
	Marine Pollution Control	2.6	2.6	2.5	3.9	3.4	2.9	3.3	3.3	3.4	2.7	2.7	3.0
	Noise & Vibration Control	2.3	2.8	3.4	3.4	3.5	2.6	3.4	3.6	3.4	3.4	3.1	2.8
	Recovery and Recycling	2.9	3.1	3.1	3.0	3.3	3.0	3.6	2.7	2.9	3.0	3.2	3.1
	Waste Management	3.3	3.8	2.6	2.7	2.6	2.5	2.7	2.9	3.1	3.2	2.8	2.8
	Water Supply and Waste Water Treatment	2.9	2.6	2.7	2.7	2.4	3.1	3.6	3.2	2.8	2.6	3.2	3.1
Low Carbon	Additional Energy Sources	-0.1	0.0	-0.2	0.2	0.2	-0.4	-0.5	0.2	0.2	-0.1	0.1	0.1
	Alternative Fuel Vehicle	2.1	3.5	3.9	3.0	3.1	3.2	3.8	2.5	2.8	2.5	4.3	3.9
	Alternative Fuels	2.0	2.8	1.4	2.5	3.4	1.9	1.9	1.5	4.0	4.2	2.6	3.8
	Nuclear Power	-0.3	0.2	-0.5	0.3	-0.1	-0.5	0.3	0.1	0.3	-0.3	0.3	0.4
	Building Technologies	2.4	3.7	2.9	2.7	3.2	3.1	2.9	3.3	3.1	3.5	2.9	3.6
	Carbon Capture & Storage	-0.6	-0.1	0.1	0.0	0.5	-0.1	-0.1	0.2	-0.2	-0.2	-1.0	-0.3
	Carbon Finance	-1.4	-0.2	1.5	1.0	1.7	-0.2	1.2	-0.3	-0.1	-0.1	-0.1	1.7
	Energy Management	3.1	3.1	3.1	3.2	3.4	2.9	3.2	2.8	3.1	2.7	3.1	2.7
Renewables	Biomass	3.2	3.4	3.2	4.1	2.4	2.8	3.3	4.0	2.9	3.1	2.8	2.3
	Geothermal	2.8	3.7	3.3	3.1	3.1	2.5	3.1	3.0	2.6	3.3	3.3	2.3
	Hydro	2.2	3.2	3.2	2.6	3.9	2.8	3.7	2.7	3.3	2.0	3.1	2.7
	Photovoltaic	2.7	3.0	3.9	3.6	3.0	2.7	3.1	3.2	2.5	2.9	2.9	3.1
	Renewable Consulting	-1.0	0.2	-0.7	-0.7	-0.2	-0.5	0.2	0.2	-0.6	0.4	-0.1	0.7
	Wave & Tidal	3.2	3.2	3.2	5.6	3.7	3.4	3.6	3.4	4.0	2.9	2.1	2.2
	Wind	3.5	2.6	3.4	2.8	2.7	3.7	3.0	3.5	2.9	2.9	3.2	3.3
	Total	2.5	3.0	2.6	2.8	2.9	2.6	2.7	2.7	2.9	2.9	3.1	3.0

Table 15 shows regional employment growth rates by sub sector. Overall the West Midlands, Yorks & Humber and the East of England grew at a slightly faster rate than the rest of the UK, but overall the figures show a consistent level of employment growth (with some sub sector variances) across all of the regions.

In Figure 16 each LCEGS sub sector is shown as a 100% chart, but this time with each UK region representing a percentage of the UK value (due to comparative sizes not all sub sectors are visible).

Figure 16: UK LCEGS Sub Sector Sales Compared by Region 2010/ 11

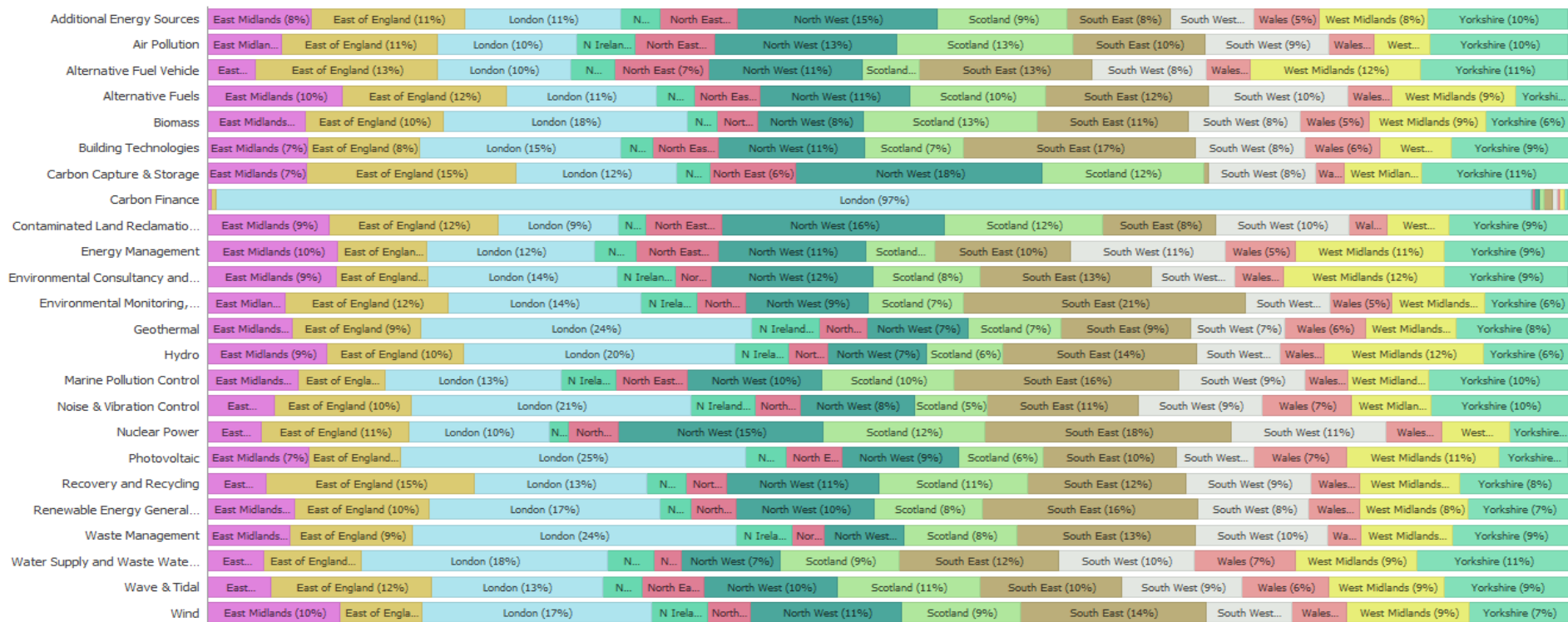


Figure 16 shows (in a more visual format) regional variations and specific regional strengths when compared with the rest of the UK i.e. London for Carbon Finance, South East for Environmental Monitoring, North West for Contaminated Land Reclamation and the East of England for Recovery & Recycling.

6. UK LCEGS Imports

6.1 Introduction

LCEGS imports are important because they are a measure of products and services that:

- cannot be purchased from the UK (a capability or capacity gap)
- are not purchased from the UK because of cheaper prices from overseas
- are purchased into the UK as part of final UK outputs (global supply chain links)
- represent a possible inward investment opportunity.

In the following sub section Imports are analysed for the last three years. This analysis focuses on Imports from all Top 53 countries to the UK. These countries account for approximately 90% of all UK imports. Data for this section is drawn from Appendix F.

6.2 UK LCEGS Imports by Year

The total for UK LCEGS imports in 2010/ 11 is **£6.8 billion**. This shows an annual increase from 2009/ 10 of **3.1%**, compared with increases from 2008/ 9 to 2009/ 10 of **4.7%**.

Table 16 shows the three year import values by sub sector. The highest imports are for Alternative Fuels, Building Technologies, Water/ Waste Water, Wind, Geothermal and Photovoltaic.

Table 16: UK LCEGS Imports Three Year Trend by Sub Sector (£m)

	Level 2 Imports in £m	2008/ 09	2009/ 10	2010/ 11	% Diff 2008/ 09 to 2009/ 10	% Diff 2009/ 10 to 2010/ 11
Environmental	Air Pollution	103.2	113.8	117.5	10.3	3.3
	Contaminated Land	48.7	55.8	57.6	14.6	3.3
	Environmental Consultancy	14.4	13.4	13.8	-7.3	3.2
	Environmental Monitoring	12.6	12.1	12.5	-4.0	3.2
	Marine Pollution Control	1.5	1.7	1.7	7.8	3.0
	Noise & Vibration Control	18.4	19.1	19.7	3.8	3.2
	Recovery and Recycling	262.3	263.1	271.6	0.3	3.2
	Waste Management	333.6	321.2	326.4	-3.7	1.6
	Water Supply and Waste Water Treatment	712.4	872.1	900.3	22.4	3.2
Low Carbon	Additional Energy Sources	96.4	103.1	110.2	7.0	6.9
	Alternative Fuel Vehicle	385.8	387.4	376.4	0.4	-2.8
	Alternative Fuels	621.8	674.1	719.5	8.4	6.7
	Nuclear Power	83.1	80.6	79.1	-2.9	-2.0
	Building Technologies	851.8	786.0	811.7	-7.7	3.3
	Carbon Capture & Storage	43.6	54.4	61.3	24.8	12.8
	Carbon Finance	103.9	95.3	98.6	-8.3	3.5
	Energy Management	204.3	192.9	199.1	-5.6	3.2
Renewables	Biomass	453.1	455.9	467.6	0.6	2.6
	Geothermal	614.0	678.5	700.4	10.5	3.2
	Hydro	34.3	38.5	39.8	12.2	3.2
	Photovoltaic	640.7	648.8	670.3	1.3	3.3
	Renew able Consulting	58.7	65.4	65.7	11.5	0.5
	Wave & Tidal	4.7	5.0	5.1	5.5	3.2
	Wind	634.1	696.6	716.6	9.9	2.9
Total	6337.2	6634.5	6842.7	4.7	3.1	

The growth in Imports from 2009/ 10 to 2010/ 11 is highest for Carbon Capture & Storage and Alternative Fuels. Import flows since 2007/ 08 have been varied and a consistent trend in import growth (by sub sector) has yet to emerge

Of the total £6.8bn, 66% is accounted for by: Water/ Waste Water (13%), Building Technologies (12%), Alternative Fuels (11%) and Wind, Photovoltaic and Geothermal (10% each).

6.3 UK and Regional Imports by Country

Figure 17 shows the values (£m) for imports from the Top 13 countries. China leads with £464m (7%), followed by Hong Kong⁸ £403m (6%) and Spain £308m (5%). The Top 13 countries account for £3.5bn of imports or 52% of the total.

Figure 17: UK LCEGS Imports (£m) by Top Source Countries 2010/ 11

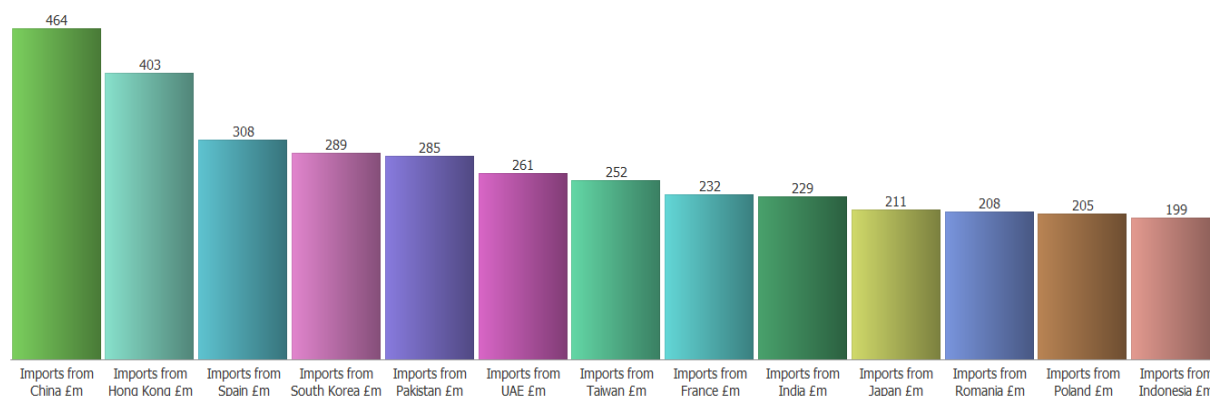
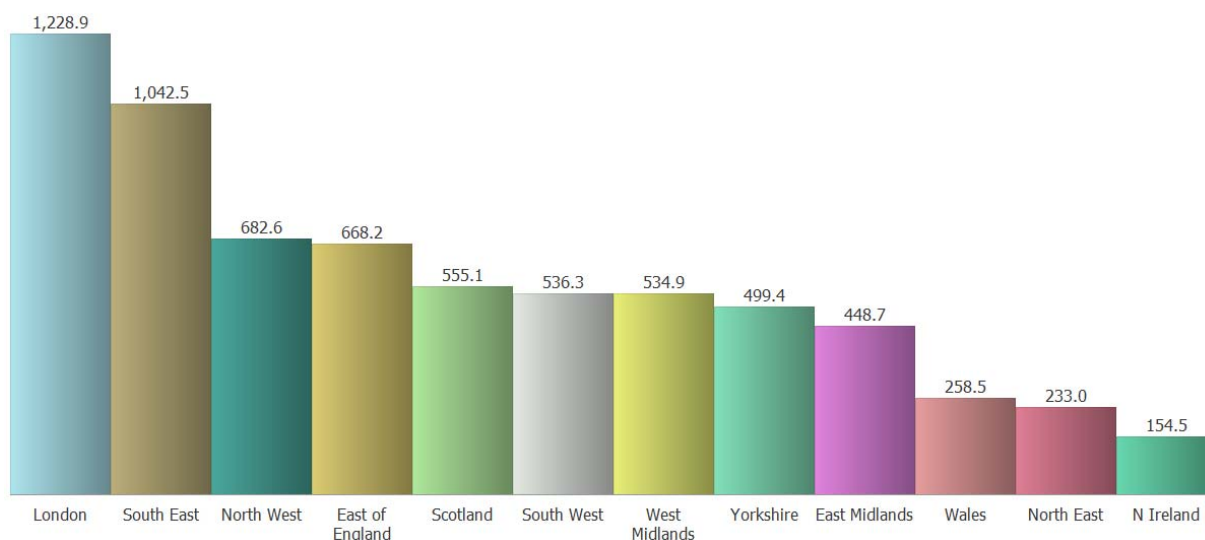


Figure 18 shows UK imports by region and Devolved Administration. London accounts for 18% of all imports, followed by South East (15%), North West (10%), East of England (10%) and the South West (8%).

Figure 18: UK LCEGS Imports (£m) by Region 2010/ 11



⁸ Much of which will have originated from China and Asia

Table 17 (below) is a heat map⁹ (colour coded red for low through to green for high value) and shows the highest value of UK imports at Level 3 for 23 of the Top 53 countries.

Table 17: UK LCEGS Imports Heat Map (£m) Top Level 3 Activities for 2010/ 11

Level 2	Level 3	Brazil	China	France	Germany	Hong Kong	India	Indonesia	Italy	Japan	Malaysia	Mexico	Pakistan	Poland	Portugal	Romania	Singapore	South Korea	Spain	Taiwan	Thailand	Turkey	UAE	US
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	3	12	4	7	21	7	28	9	10	5	5	16	7	7	5	14	12	6	4	8	6	4	9
Alternative Fuels	Main Stream Bio Fuels	2	4	2	3	7	3	1	3	2	2	1	8	2	1	1	4	1	21	6	1	4	4	1
Alternative Fuels	Other Bio Fuels	11	25	8	19	45	25	7	16	9	13	6	48	13	7	10	18	9	22	31	9	25	23	8
Alternative Fuels	Other Fuels	2	4	2	2	7	3	1	2	2	2	1	6	3	1	1	4	2	0	6	2	4	3	1
Biomass	Biomass Energy Systems	3	17	7	5	7	7	7	3	8	8	4	10	4	3	5	4	10	5	5	5	6	5	6
Biomass	Biomass Furnace Systems	1	4	2	1	3	3	2	1	2	2	1	3	2	1	1	1	3	1	2	1	2	1	2
Biomass	Boilers and related Systems	2	12	5	4	7	6	6	3	6	6	3	9	4	2	4	4	8	9	4	4	5	4	4
Biomass	Manufacturing Of Boilers and Related Systems	1	5	2	1	2	2	2	1	2	2	1	3	2	1	1	1	3	1	2	1	2	1	1
Building Technologies	Doors	4	13	6	5	15	5	4	7	8	6	12	12	6	3	6	11	5	6	11	6	5	12	6
Building Technologies	Insulation and Heat Retention Materials	3	15	5	4	16	5	4	7	8	7	14	11	8	2	9	11	6	7	9	6	8	14	7
Building Technologies	Monitoring and Control Systems	1	4	1	2	6	2	1	3	2	2	4	4	3	1	3	3	2	2	4	2	2	4	2
Building Technologies	Window s	4	14	5	6	17	5	5	9	9	7	15	13	8	2	8	13	6	23	12	8	8	12	7
Carbon Finance	Carbon Credits Trading	2	6	2	2	5	3	2	2	3	6	2	4	3	1	3	2	4	3	2	1	2	3	3
Geothermal	Consulting & Related Services	2	7	3	2	6	3	6	3	3	3	2	0	3	2	3	3	4	5	5	3	2	7	3
Geothermal	Manufacture and Supply of Specialist Equipment	2	8	3	3	6	4	7	4	3	4	2	0	3	3	3	3	4	3	5	3	3	7	4
Geothermal	Suppliers of Systems	3	9	3	3	8	4	8	4	3	4	3	0	3	3	4	3	5	2	6	4	3	9	4
Geothermal	Whole Systems Manufacture	6	23	8	6	17	10	15	8	8	10	6	1	8	7	10	7	10	23	13	9	6	19	9
Photovoltaic	Other Related Equipment and Chemicals	6	15	7	6	9	6	1	7	5	7	5	8	4	1	8	4	11	4	7	1	3	7	6
Photovoltaic	Photovoltaic Cells	4	16	6	5	8	5	1	6	4	7	4	7	3	1	7	4	10	3	5	0	3	6	6
Photovoltaic	Systems & Equipment	10	34	12	12	17	11	2	13	9	15	11	14	7	1	14	9	21	38	11	1	7	15	11
Recovery and Recycling	Waste Collection	2	8	4	3	5	4	1	3	5	3	2	4	4	1	3	4	3	5	1	2	4	4	5
Waste Management	Construction & Operation of Waste Treatment Facilities	2	7	29	3	8	4	2	2	1	3	2	5	3	3	3	2	6	7	2	3	2	1	3
Waste Management	Equipment For Waste Treatment	2	6	21	2	6	3	1	2	1	3	1	3	3	3	2	1	5	5	2	3	2	1	3
Water Supply and Waste Water T	Engineering	6	10	6	3	10	6	13	3	5	5	5	4	7	13	7	2	10	6	17	9	3	9	4
Water Supply and Waste Water T	Water Treatment and Distribution	17	34	22	8	36	19	39	9	15	16	15	14	24	42	24	6	34	17	12	26	7	31	13
Wind	Large Wind Turbine	5	22	3	8	14	10	3	9	12	10	6	9	10	3	9	5	12	8	10	6	10	5	6
Wind	Small Wind Turbine	4	16	2	7	12	7	2	8	11	7	4	7	8	2	7	4	10	5	7	6	7	4	5
Wind	Wind Farm Systems	7	25	4	12	19	11	3	12	16	11	7	10	11	3	9	7	15	17	10	9	10	6	8

⁹ All heat mapping in this report is derived from Microsoft Excel rules for conditional formatting where Red starts at 0, Green ends at the highest value in the data set and orange is set at the 50% Median. All values between are shown as graduated shades between green and red.

Table 17 shows a much more varied picture of imports, with high values for Other Bio Fuels (Hong Kong, Pakistan and Taiwan) Water Treatment and Distribution (many countries), and Photovoltaic Systems & Equipment (China and Spain).

7. Exports

7.1 Introduction

In this section of the report we look at the export performance of the UK LCEGS Sector for 2010/ 11. This section analyses the existing trading relationships for the UK both by market and by destination country. The focus is on where strong export relations exist today and whether these areas correspond to the most attractive future global markets. The analysis includes both Tangibles (products) and Intangibles (services). Data for this section is drawn from Appendix G.

7.2 UK LCEGS Exports by Year

The total for UK LCEGS exports in 2010/ 11 is **£11.8 billion**. This shows an annual increase from 2009/ 10 of **3.9%**, compared with increases from 2008/ 9 to 2009/ 10 of **3.9%**. This is a slight reduction from the 4.3% increase in exports from 2007/ 08 to 2008/ 09.

In Table 18 we compare UK export values for 2007/ 08 to 2009/ 10 by sub sector.

Table 18: UK LCEGS Exports Three Year Trend by Sub Sector (£m)

	Level 2 Exports in £m	2008/ 09	2009/ 10	2010/ 11	% Diff 2008/ 09 to 2009/ 10	% Diff 2009/ 10 to 2010/ 11
Environmental	Air Pollution	161	161	169	-0.1	4.5
	Contaminated Land	95	87	91	-7.5	4.5
	Environmental Consultancy	42	40	41	-4.5	4.4
	Environmental Monitoring	20	19	20	-4.0	4.5
	Marine Pollution Control	3	3	3	-10.7	4.2
	Noise & Vibration Control	35	32	34	-7.1	4.5
	Recovery and Recycling	538	558	583	3.7	4.5
	Waste Management	473	510	520	7.7	2.0
	Water Supply and Waste Water Treatment	1,173	1,165	1,218	-0.6	4.5
Low Carbon	Additional Energy Sources	158	178	173	12.3	-2.6
	Alternative Fuel Vehicle	606	648	638	6.9	-1.6
	Alternative Fuels	1,073	1,131	1,222	5.4	8.0
	Nuclear Power	158	177	187	12.2	5.7
	Building Technologies	1,459	1,369	1,430	-6.2	4.5
	Carbon Capture & Storage	67	65	68	-3.4	4.4
	Carbon Finance	163	152	163	-6.9	7.0
	Energy Management	322	328	343	2.0	4.5
Renewables	Biomass	730	699	724	-4.3	3.7
	Geothermal	885	962	1,005	8.7	4.5
	Hydro	58	65	68	13.6	4.6
	Photovoltaic	1,158	1,284	1,341	10.8	4.5
	Renew able Consulting	92	98	66	5.9	-32.7
	Wave & Tidal	8	8	8	-3.3	4.5
	Wind	1,426	1,587	1,655	11.3	4.3
Total	10904	11326	11770	3.9	3.9	

Table 18 shows that the highest value exports are consistently- Alternative Fuels, Building Technologies, Photovoltaic, Wind and Water/ Waste Water. They account for £6.9 bn in 2010/ 11 or 58% of all exports.

Columns 5 and 6 show the year-on-year increases in exports. What is of most interest in the growth in annual exports is that while the overall percentage for the past two years remains the same, the way in which those exports are achieved across the LCEGS sub sectors differs markedly

Table 19 shows exports as a percentage of total LCEGS sales for the last three years. Surprisingly, the percentage has remained at between 9.6 and 9.7% for all three years despite year-by-year fluctuations at the sub sector level. While this figure is consistent, LCEGS is not one of the UK's strongest exporting sectors (compared with more mature sectors like Aerospace and Marine).

Table 19 shows that some sub sector products and services are more successful at exporting than others. The highest ratios of exports to sales for 2010/ 11 are Photovoltaic (25%), Air Pollution Control (17%), Noise & Vibration Control (15%), Water/ Waste Water Treatment (14%) and Additional Energy Sources, Biomass, Carbon Capture & Storage and Renewable Consulting (13%).

Table 19: UK LCEGS Exports as a Percentage of Total Sales (£m)

		2008/ 09			2009/ 10			2010/ 11		
Level 2 Exports in £m		Sales	Exports	Exports as % of Sales	Sales	2009/ 10	Exports as % of Sales	Sales	2010/ 11	Exports as % of Sales
Environmental	Air Pollution	978	161	16.5	997	161	16.2	1,018	169	16.6
	Contaminated Land	939	95	10.1	963	87	9.1	990	91	9.2
	Environmental Consultancy	770	42	5.4	794	40	5.0	821	41	5.0
	Environmental Monitoring	155	20	12.9	160	19	12.0	166	20	12.1
	Marine Pollution Control	124	3	2.3	129	3	2.0	133	3	2.0
	Noise & Vibration Control	212	35	16.3	220	32	14.6	229	34	14.7
	Recovery and Recycling	6,724	538	8.0	6,936	558	8.0	7,174	583	8.1
	Waste Management	4,946	473	9.6	5,071	510	10.1	5,210	520	10.0
Water Supply and Waste Water Treatment	8,101	1,173	14.5	8,230	1,165	14.2	8,373	1,218	14.5	
Low Carbon	Additional Energy Sources	1,251	158	12.7	1,297	178	13.7	1,347	173	12.9
	Alternative Fuel Vehicle	13,113	606	4.6	12,915	648	5.0	13,430	638	4.7
	Alternative Fuels	15,678	1,073	6.8	17,176	1,131	6.6	18,107	1,222	6.7
	Nuclear Power	3,727	158	4.2	3,798	177	4.7	3,873	187	4.8
	Building Technologies	13,526	1,459	10.8	14,129	1,369	9.7	14,794	1,430	9.7
	Carbon Capture & Storage	483	67	14.0	497	65	13.1	515	68	13.2
	Carbon Finance	5,640	163	2.9	5,925	152	2.6	6,319	163	2.6
	Energy Management	2,634	322	12.2	2,718	328	12.1	2,812	343	12.2
Renewables	Biomass	5,216	730	14.0	5,454	699	12.8	5,728	724	12.6
	Geothermal	9,722	885	9.1	10,186	962	9.4	10,701	1,005	9.4
	Hydro	516	58	11.2	529	65	12.4	544	68	12.6
	Photovoltaic	4,721	1,158	24.5	4,997	1,284	25.7	5,315	1,341	25.2
	Renewable Consulting	492	92	18.8	505	98	19.3	520	66	12.7
	Wave & Tidal	78	8	10.6	82	8	9.7	86	8	9.7
	Wind	12,258	1,426	11.6	13,070	1,587	12.1	14,017	1,655	11.8
	Total	112,004	10,904	9.7	116,780	11,326	9.7	122,222	11,770	9.6

7.3 UK and Regional Exports by Country

The second “dimension” of export analysis is by country. In Figure 19 we show that the Top 13 Export destinations for the UK. The leading destinations are China (7%), Hong Kong (5%), Spain (4.3%), South Korea (4%) and Taiwan, India and

Pakistan(3.5%). This ranking of export markets has remained reasonably consistent for each of the last three years, with the exception of Romania who have now moved just outside of the Top 13.

Figure 19: UK LCEGS Exports (£m) by Top Export Destinations for 2010/ 11

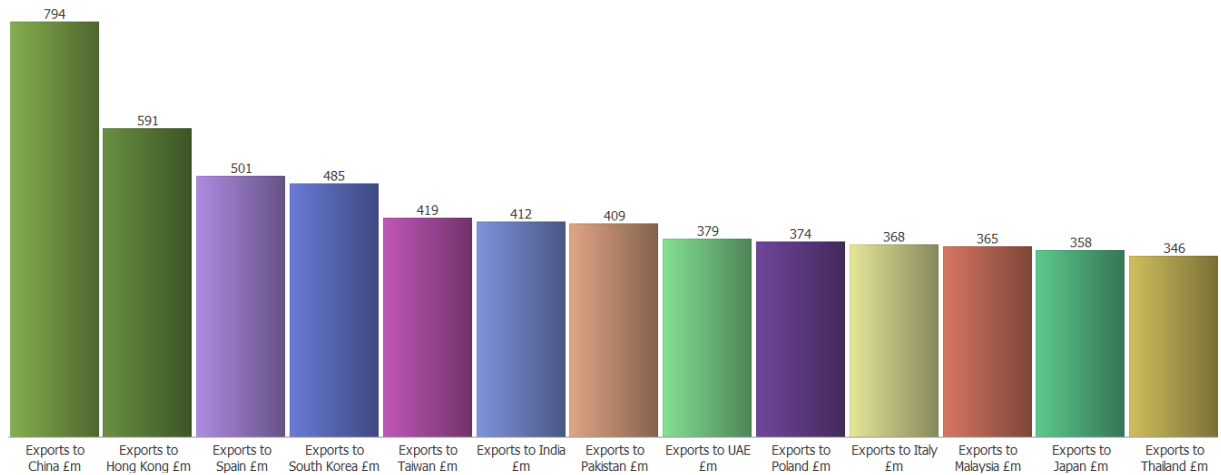


Figure 20 shows UK exports by region and Devolved Administration. London accounts for 18% of all exports, followed by South East (15%), North West (10%), East of England (10%) and the South West, Scotland and West Midlands (8%).

Figure 20: UK LCEGS Exports (£m) by Region 2010/ 11

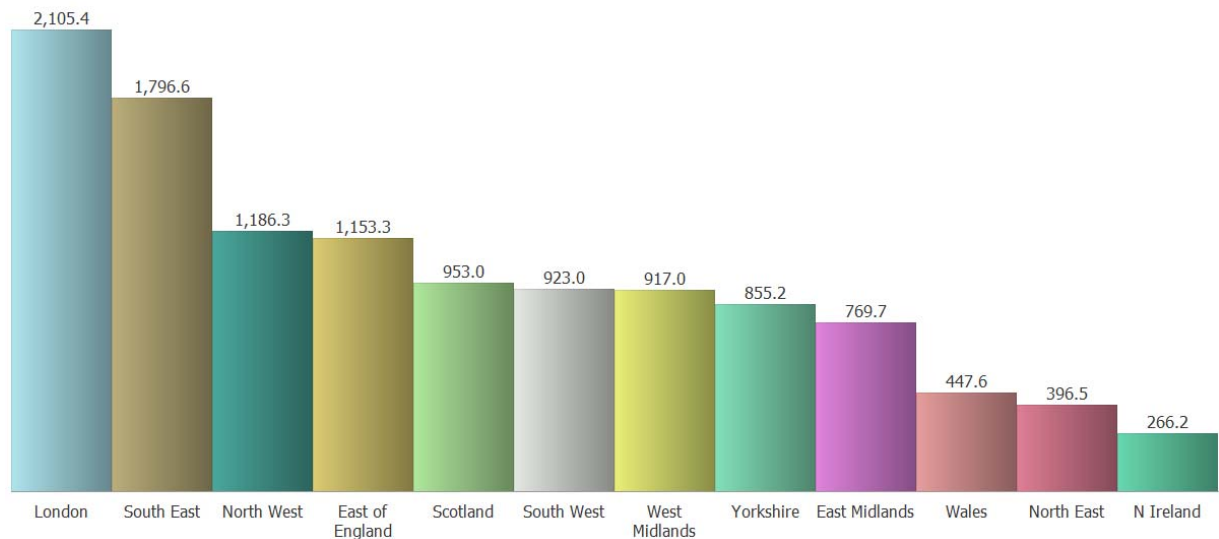


Table 20 is a heat map (colour coded red for low through to green for high value) and shows the highest value of UK exports at Level 3 for 33 market activities for 25 of the Top 53 countries.

A vertical analysis of the table confirms the importance of the Top 13 countries and a horizontal analysis highlights at least ten significant export activities that are important to most of the 25 countries. These are:

- Mainstream Alternative Vehicle Fuels
- Other Bio Fuels
- Biomass Energy Systems
- Insulation & Heat Retention Materials
- Geothermal Systems Manufacture
- Photovoltaic Systems & Equipment
- Water Treatment & Distribution
- Large Wind Turbines
- Small Wind Turbines
- Wind Farm Systems.

When vertical and horizontal analysis is applied some niche markets (outside of the Top 13 countries) appear- Water Treatment & Distribution in Indonesia, Saudi Arabia and UAE and Photovoltaic Systems & Equipment to Russia.

Table 20: UK LCEGS Exports Heat Map (£m), Top Level 3 Activities for 2010/ 11

Level 2	Level 3	Australia	Brazil	Canada	China	France	Germany	Hong Kong	India	Indonesia	Italy	Japan	Malaysia	Mexico	Pakistan	Poland	Romania	Russia	Saudi Arabia	South Africa	South Korea	Spain	Taiwan	Thailand	UAE	US
Air Pollution	Indoor Air Quality	1	1	1	6	2	1	3	3	0	2	3	3	1	4	2	3	3	1	2	5	2	1	1	3	2
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	13	6	7	27	5	14	38	17	6	10	16	13	8	34	15	17	6	22	12	23	9	9	24	10	14
Alternative Fuel Vehicle	Other Fuels and Vehicles	2	1	1	5	1	2	7	3	1	2	3	2	1	5	2	3	1	4	2	4	2	2	4	1	2
Alternative Fuels	Main Stream Bio Fuels	2	3	4	9	3	3	6	8	2	3	2	4	2	7	3	3	2	5	1	2	37	6	4	4	2
Alternative Fuels	Other Bio Fuels	15	20	28	73	14	22	48	62	13	21	12	32	13	48	24	21	13	33	11	18	43	42	37	33	20
Alternative Fuels	Other Fuels	2	4	4	11	2	3	8	9	2	3	3	5	1	7	5	3	2	6	2	3	0	9	8	5	2
Biomass	Biomass Energy Systems	11	5	10	22	13	8	13	16	4	7	10	10	7	19	9	8	15	8	10	17	7	11	14	10	12
Biomass	Biomass Furnace Systems	4	1	3	6	4	2	5	7	1	2	3	3	2	5	3	2	5	2	3	5	2	3	3	3	3
Biomass	Boilers and related Systems	7	3	6	15	8	5	10	11	3	5	7	7	5	13	8	5	11	5	7	11	11	7	8	7	7
Biomass	Manufacturing Of Boilers and Related Systems	3	1	2	4	2	2	3	5	1	2	3	2	1	4	2	2	3	1	2	4	2	3	3	2	2
Building Technologies	Doors	7	8	5	20	9	9	18	8	9	20	16	9	12	13	11	10	5	5	4	12	12	19	9	18	10
Building Technologies	Insulation and Heat Retention Materials	13	10	9	28	11	11	29	10	12	27	22	13	17	16	20	18	10	9	7	19	16	21	11	26	15
Building Technologies	Monitoring and Control Systems	5	3	3	9	3	4	10	3	4	11	7	4	5	6	6	6	3	3	2	6	6	9	4	8	5
Building Technologies	Window s	11	8	7	20	8	10	23	7	11	26	18	9	14	15	15	12	7	7	5	14	45	19	11	17	11
Carbon Finance	Carbon Credits Trading	1	2	9	2	1	6	6	1	4	5	3	1	2	1	4	3	4	3	9	3	2	4	1	1	1
Energy Management	Energy Saving Lighting Equipment	2	2	2	7	3	2	4	3	2	2	2	3	1	2	2	2	4	3	1	5	4	3	1	3	4
Energy Management	Gas Supply	3	2	2	7	3	3	5	4	2	3	3	3	2	2	3	2	4	3	1	5	6	2	1	4	5
Geothermal	Consulting & Related Services	2	3	2	13	4	4	7	5	2	4	3	6	3	1	4	5	3	4	3	7	6	6	3	9	5
Geothermal	Manufacture and Supply of Specialist Equipment	3	4	2	17	5	5	8	7	3	6	4	8	4	1	5	6	5	5	4	8	5	8	5	11	6
Geothermal	Suppliers of Systems	2	4	2	17	5	5	9	7	3	6	3	8	5	1	5	7	5	5	4	9	4	8	4	10	6
Geothermal	Whole Systems Manufacture	6	10	6	50	13	12	22	19	7	14	10	21	10	2	13	17	11	14	10	18	35	21	12	28	17
Photovoltaic	Other Related Equipment and Chemicals	8	7	4	27	12	9	14	10	1	12	13	13	8	15	12	12	9	2	7	15	5	10	1	9	10
Photovoltaic	Photovoltaic Cells	7	7	5	29	13	8	15	10	1	13	13	15	9	18	11	14	10	2	8	15	5	10	1	9	12
Photovoltaic	Systems & Equipment	13	14	10	64	22	19	31	22	3	25	30	31	18	31	24	25	22	5	13	29	52	21	1	20	20
Recovery and Recycling	Waste Collection	6	5	5	16	9	6	10	7	9	8	9	7	5	10	10	7	7	7	5	7	11	3	10	8	11
Waste Management	Construction & Operation of Waste Treatment Facilities	3	5	4	15	5	5	17	8	10	4	3	7	5	9	6	6	10	14	4	13	14	6	3	3	8
Waste Management	Equipment For Waste Treatment	2	3	2	11	3	3	10	6	6	3	2	4	3	5	5	4	8	9	3	8	9	3	2	2	6
Waste Management	Technologies, Research & Development	1	2	1	5	2	2	8	3	4	1	1	3	2	3	2	3	4	6	1	4	5	2	1	1	3
Water Supply and Waste Water	Engineering	3	7	6	12	11	4	15	10	21	7	7	6	6	5	9	8	5	12	7	13	11	29	16	12	8
Water Supply and Waste Water	Water Treatment and Distribution	12	19	13	38	33	11	52	31	56	19	22	18	20	18	32	25	12	43	18	41	31	15	46	38	25
Wind	Large Wind Turbine	3	12	10	47	6	14	24	17	20	16	20	21	10	16	17	15	16	10	9	30	13	17	23	11	11
Wind	Small Wind Turbine	2	8	6	27	3	10	15	11	11	10	13	12	6	11	12	9	10	7	6	21	6	10	17	7	7
Wind	Wind Farm Systems	3	14	12	53	7	19	29	20	20	19	25	23	12	20	21	17	20	13	11	39	27	19	32	12	16

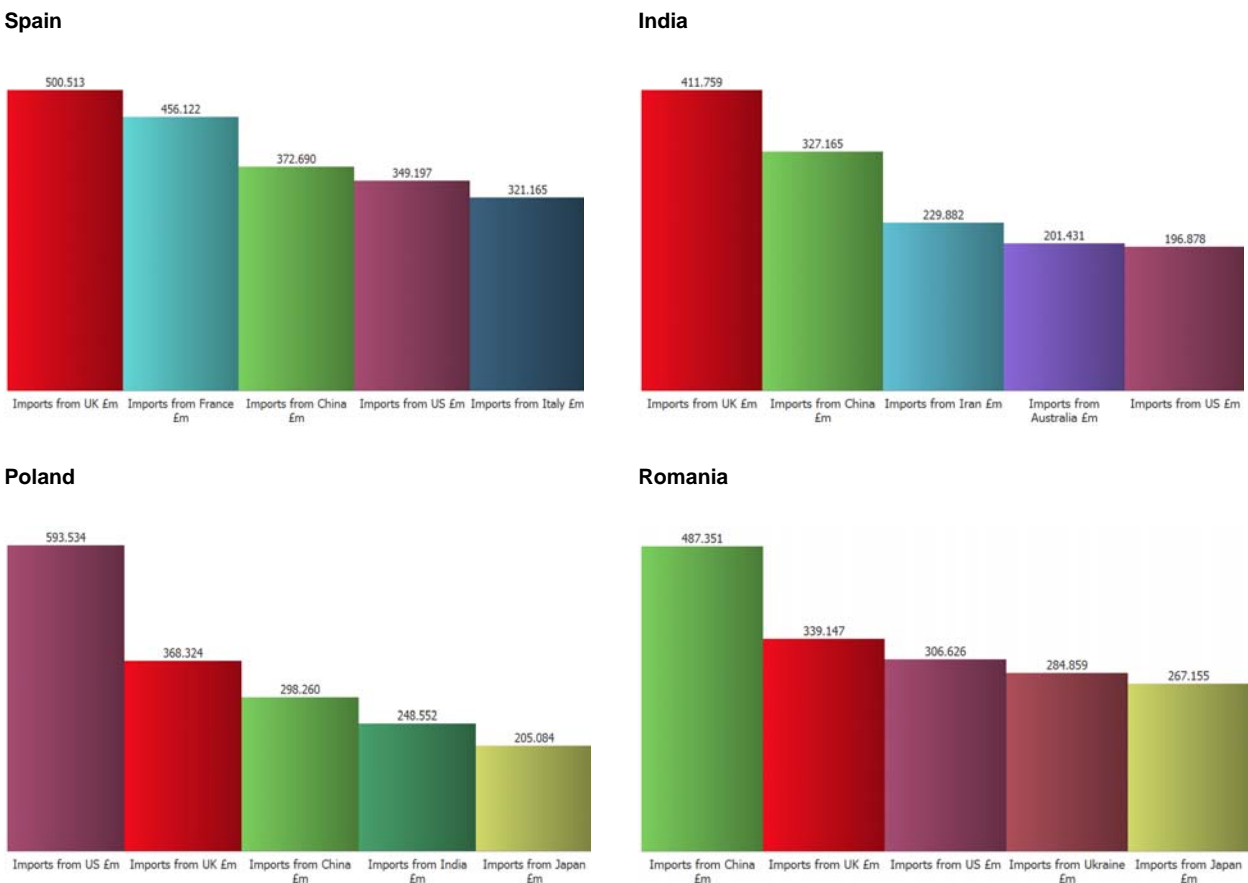
Key:  Low  Medium  High

7.4 UK LCEGS Exports by Country and by Market

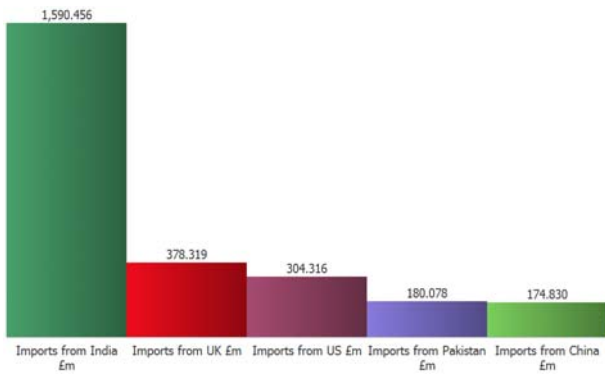
In the previous sub section, the focus was on the VALUE of exports into destination countries. In this sub section the focus is on the UK ranking in relation to a country's TOTAL imports. For this analysis total import and export data is compiled for all Top 53 countries (UK included) and UK exports are compared with all other Top 52 countries into a single country. This means that UK export performance can be ranked in relation to competing exporters for any of the major economies. This analysis adds a competitive dimension to the value of current export performance and is an indicator of the quality of trading relationship that exists. This data is drawn from Appendix H files on International Markets.

In Figure 21 we show where UK exports are ranked for the Top 13 countries: Spain and India (1st); UAE, Poland and Romania (2nd); South Korea, Pakistan, Malaysia and Taiwan (3rd); Hong Kong (4th), China (5th) and Japan/ Italy (7th). Each graphic shows the comparative value of imports and ranking of the UK against its international competitors. In most cases the UK is the leading European exporter to these countries.

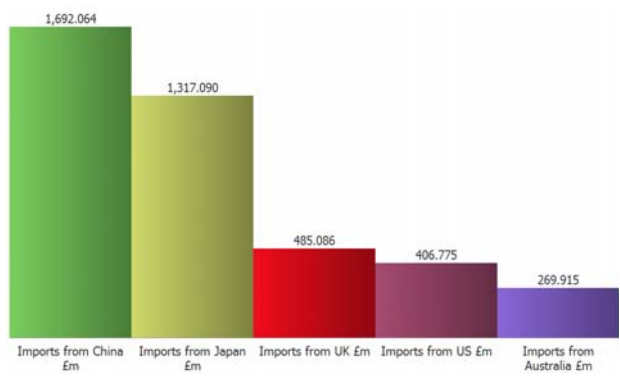
Figure 21: Examples of Import Ranking Exercise for LCEGS £m



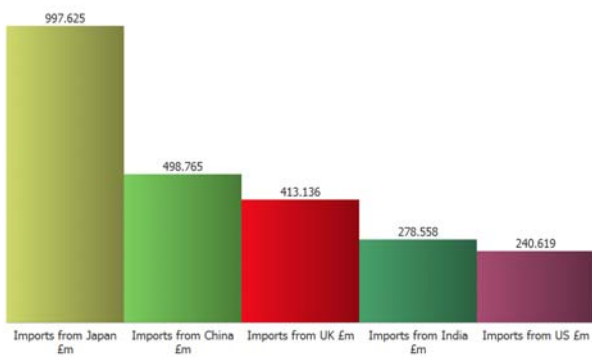
UAE



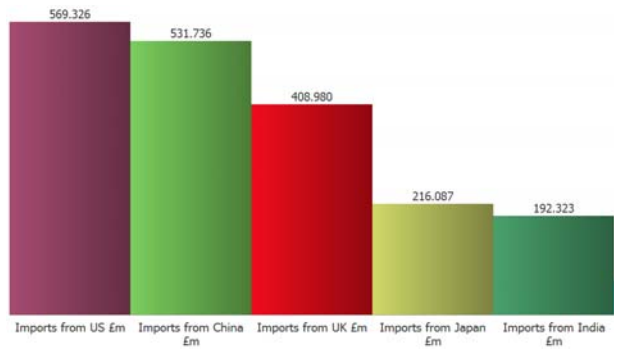
South Korea



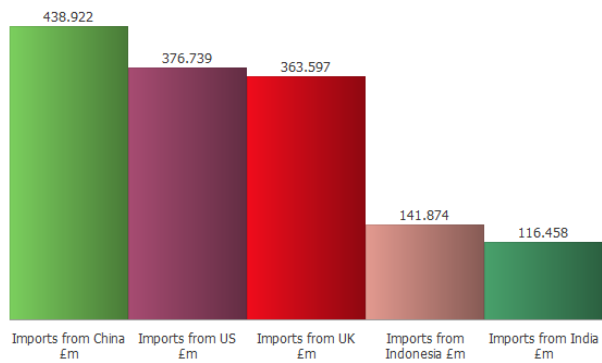
Taiwan



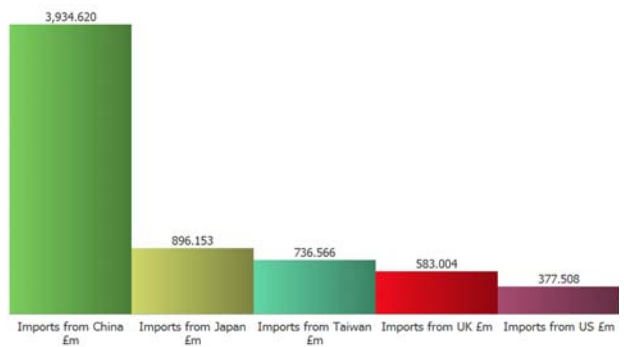
Pakistan



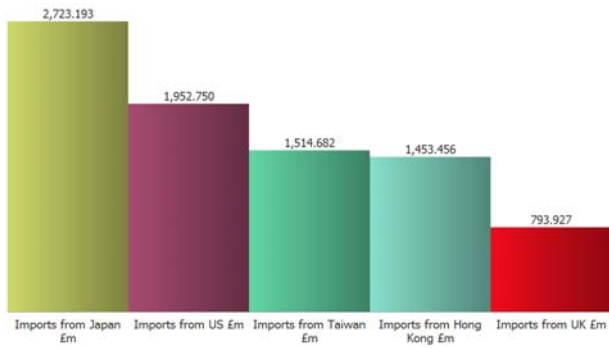
Malaysia



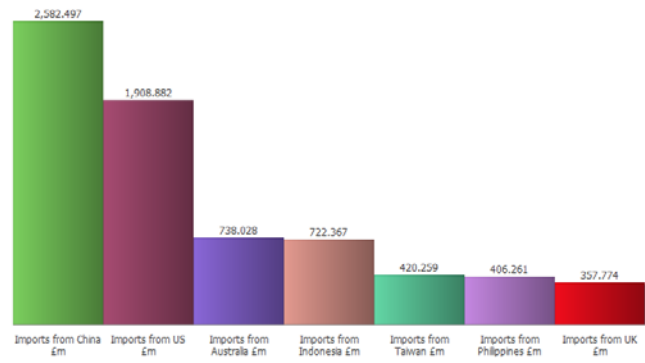
Hong Kong



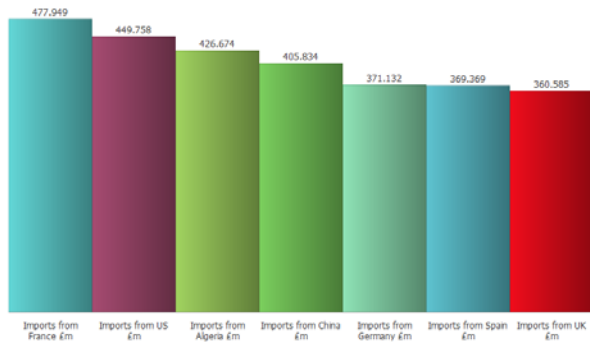
China



Japan



Italy



Appendix

A. Glossary of LCEGS Activities

The **Low Carbon and Environmental Goods and Services** (LCEGS) sector is divided into three main activity blocks- Environmental, Renewable Energy and Low Carbon (Level 1). These are in turn divided into 24 subsectors (Level 2):

- The Environmental activity block includes Air Pollution Control, Contaminated Land Reclamation & Remediation, Environmental Consultancy, Environmental Monitoring, Marine Pollution Control, Noise & Vibration Control, Recovery & Recycling, Waste Management and Water Supply/ Waste Water Treatment.
- The Renewable Energy activity block includes Biomass, Geothermal, Hydro, Photovoltaic, Renewable Energy Consultancy, Wave & Tidal and Wind.
- The Low Carbon activity block includes Additional Energy Sources, Alternative Fuels & Vehicles, Alternative Fuels, Building Technologies, Carbon Capture & Storage, Carbon Finance, Energy Management and Nuclear Power.

Environmental activities include 9 sub sectors (Level 2), divided into 47 Level 3 activity groupings:

- Air Pollution includes indoor and industrial air quality and emissions control.
- Contaminated Land Reclamation/ Remediation includes Decommissioning of Nuclear Sites.
- Environmental Consulting includes consulting, training & other services.
- Environmental Monitoring includes analysis, monitoring and instrumentation.
- Marine Pollution and Noise & Vibration Control both include abatement, consulting and R&D.
- Recovery & Recycling includes Waste Collection and various recycling processes
- Waste Management includes Waste Treatment Facilities & Equipment, consulting and R&D
- Water Supply and Waste Water Treatment includes treatment, distribution, consulting and R&D.

Low Carbon includes 8 sub sectors (Level 2), divided into 49 Level 3 activity groupings:

- Carbon Finance includes Credits Finance, Fund Management, Trading and Research
- Carbon Capture & Storage includes Capture, Pipeline, Storage and Engineering.
- Energy Management includes Lighting, Heating & Ventilation and Engineering.
- Nuclear Power includes Construction, Commissioning, Operations, Engineering and Testing Services.
- Additional Energy Sources include Energy Storage Research, Fuel Cells & Hydrogen.
- Alternative Fuels & Vehicles includes main stream and other vehicle fuels.
- 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.

Renewable Energy includes 7 sub sectors (Level 2), sub divided into 30 Level 3 activity groupings:

- Wind includes Large Turbines, Small Turbines and Wind Farm Systems.
- Wave & Tidal includes Ebb & Flood, Pumps & Equipment, Turbine & Generation etc.
- Photovoltaic includes Systems & Equipment, Cells and Chemicals.
- Hydro includes Turbines, Pumps, Electricity Supply and Dams.
- Geothermal includes Whole Systems, Specialist Equipment, Consulting and R&D.
- Biomass includes Energy, Furnace, Boilers and Related Systems.
- Renewable Energy consulting includes specialist consulting and legal advice.

The **Additional Energy Sources** sub sector groups together R&D, Design and Prototyping activities relating to a range of new Low Carbon energy sources.

These energy sources include: Fuel Cells, Hydraulic Accumulators, Hydrogen, Molten Salt, Thermal Mass, Compressed Air, Superconducting Magnets and more general energy storage research.

This is a small sub sector (in value and impact) because only energy sources that have a current economic footprint (i.e. trading) are included. This excludes a number of promising energy sources that are still in development and for which economic evidence is not yet available.

The **Air Pollution Control** sub sector includes a wide range of manufacturing, operations, consulting and engineering functions that relate to improving and maintaining air quality. This includes:

- Emission Control sensing and monitoring systems and technologies.
- Indoor Air Quality Control (domestic and industrial) through ventilation, cooling and purification systems.
- Dust & Particulate control through installed technologies like filters, towers, scrubbers, cyclones and eliminators.
- Process Engineering for odour control and other cleaner technologies.
- Industrial Emission Control technologies and equipment (manufacture, installation, operations and maintenance).
- Emission Control through manufacture, installation and operation of sampling, control and evaluation systems.

The **Alternative Fuel and Vehicles** sub sector includes Low Carbon Fuel and technology activities that relate to (predominantly) automotive transport. It is divided into Alternative Fuels (main stream) and Other Fuels and Vehicles. This sub sector does not include bio diesel (see Alternative Fuels). It does include:

- Alternative Fuels includes the production, supply and distribution of Natural Gas (Compressed or Liquefied), Synthetic Fuel and Auto Gas (LPG, LP Gas or Propane).
- Other Fuels and Vehicles includes vehicle technologies and fuel sources that are still at an early stage.
- Research, Design, Development and Prototyping activities are included for: Hydrogen fuel cells and hydrogen internal combustion, Electric, Hybrid Electric, Steam powered, Organic waste fuel, Wood gas, Solar powered and Air, Spring and Wind powered vehicles.

The **Alternative Fuels** sub sector includes a wide range of Low(er) carbon fuel sources that are not included under Renewable Energy. It includes the manufacture, production, supply and distribution of:

- Batteries- chemicals, chargers, controllers, cables, connectors, containers, suppliers and testing equipment.
- Bio fuels for Vehicles- bio diesel, butanol, ethanol and vegetable oils.
- Mainstream Bio fuel applications (non transport)- bio diesel, butanol and ethanol.
- Other Bio fuels- biomass, methane, peanut oil, vegetable oil, wood and woodgas.
- Other fuels- Hydrogen.

The **Biomass Energy** sub sector includes all activities that convert biomass into energy but excludes biomass materials (see Alternative Fuels). It includes:

- Biomass furnace systems- manufacture, supply, consulting, design, installation, engineering and other services for domestic, industrial and community applications.
- Biomass energy systems- manufacture, supply, consulting, design, installation, engineering and other services for domestic, industrial and community applications.
- Manufacture of biomass boilers and systems including boilers, cogeneration, heat exchange and packaged power systems for domestic, industrial and community applications.
- Biomass boilers and related systems including supply, consulting, design, engineering, installation and other services for boilers, cogeneration, heat exchange and packaged power systems for domestic, industrial and community applications.
- Technical and operational consulting.

The **Building Technologies** sub sector includes main stream building materials and systems that contribute to reduced energy use and to lowering the carbon footprint of buildings. It includes:

- Windows- the manufacture, supply, distribution, installation and development of double glazed, electro chromatic, insulated alloy, honeycomb and triple glazed units.
- Doors- the manufacture, supply, distribution, installation and development of insulated alloy and plastic doors.

- Insulation and heat retention materials- the manufacture, supply, distribution, installation and development of insulation materials, heat retention surfaces & ceramics, electronic control systems and controlled venting and ducting systems.
- Monitoring and control systems- the manufacture, supply, distribution, installation and development of energy and distributed energy control, monitoring, management and analysis systems.

The **Carbon Capture & Storage** sub sector includes activities that store carbon emissions- from locations like power plants and prevent them entering the atmosphere. It includes manufacturing, supply, distribution, installation, maintenance, development and design of:

- Pre combustion capture systems
- Post combustion capture systems
- OxyFuel combustion systems
- Pipeline systems and services
- Ship storage and discharge systems
- Ocean storage equipment and services
- Mineral storage equipment and services
- Geological storage equipment and services
- Engineering, project management and consulting services.

The **Carbon Finance** sub sector includes investment activities and financial instruments for emission reduction projects and carbon trading. This includes:

- Carbon credits finance and fund management - land, project or general trading services from finance houses and investment funds.
- Carbon credits trading- development and supply of trading systems, land/ project/ general trading houses and transactions.
- Carbon market intelligence- carbon markets analysis & reporting and carbon trading by forecasting and reporting from journals, online, data providers or other publishing sources.
- Projects and verification- data collection, verification, legal, project development, capacity development and carbon declaration services.

- Press and journalism- financial press and periodicals, other journals, data providers and online services.

The **Contaminated Land Reclamation and Remediation** sub sector includes all activities that bring land back into agricultural, industrial, community or commercial use. This includes longer term activities like the decommissioning of nuclear sites.

Remediation and land reclamation includes land forming, bunds, geotextiles, storage & containment, oil interceptors, drainage systems, monitoring systems, proprietary treatment processes, sampling & analysis, site investigation, specialist cleaning services, cleaner technology R&D, surface & ground water services, organic waste composting and other services.

Decommissioning includes equipment, consulting, project management, safety critical assessment, pollution control, enviro risk analysis & impact assessment, recycling & compaction, waste collection & containment, waste water treatment, site assessment, excavation, sampling & analysis and monitoring.

The **Energy Management** sub sector includes energy saving and power management activities for industrial and domestic use. It includes:

- R&D into high efficiency lighting, heating & ventilation, power, lighting, equipment & pumps and advance management systems.
- Gas Supply- monitoring, meterage, leak detection & maintenance, gas supply control and manufacture of high efficiency consumer equipment and devices.
- Lighting- manufacture, supply, distribution and installation of energy saving light bulbs & tubes, lighting and control systems.
- Heating & Ventilation- manufacture, supply, distribution and installation of energy saving equipment and systems.
- Electrical- manufacture, supply and installation of energy saving power control, building control, power consumption control & monitoring systems.
- Consulting and other services - advice & consultancy, publication, training and design of management systems.

The **Environmental Consulting and Services** sub sector includes consulting, training and management services that are specific to the environmental sector. This includes:

- Specialist consulting- habitat assessment, regulations, compliance and management systems, audits and impact assessment, eco design, eco-investment, climate change modelling, insurance and bio- diversity advice & assessment.

- Manpower and executive recruitment, temporary and permanent recruitment, contracted and interim management services.
- Management services- general consulting, financial, IT, software and marketing services.
- Training and education- publications, online publications, teaching aids, newsletters and courses for waste management, waste water treatment etc.

The **Environmental Monitoring, Instrumentation and Analysis** sub sector includes activities that measure water, soil and air quality and that support wider pollution control activities in other land, water, marine or air- based environmental sub sectors. It includes:

- Environmental monitoring- development of cleaner monitoring processes and technologies, vehicle testing, oil spill detection, food testing, nitrate levels, meteorological, water/soil/air quality testing and monitoring.
- Instrumentation equipment & control manufacture, supply, maintenance and development of instrumentation, laboratory equipment and software for environmental/ air/ water/ land/ marine analysis.
- Environmental analysis- laboratory testing, data logging & recording, quality reporting, collection & collation of samples, auto sampling systems, in-field measurement and reporting and R&D in water, soil and emissions analysis.

The **Geothermal Energy** sub sector includes all activities relating to the extraction and use of heat generated from the earth. It includes:

- Manufacture and supply of specialist thermally enhanced equipment- grout, heat pumps, pipes, flow control valves, drilling equipment, installation rigs and ancillary equipment.
- Whole systems manufacture and supply for industrial, residential and community geothermal energy applications.
- Component design and research- design services, component research and component recycling.
- Consulting & related services- architectural, construction, systems design, consulting, engineering, installation and project development services.

The **Hydroelectric Energy** sub sector includes activities that help to extract energy from river and other water sources held in dams (as opposed to wave or tidal energy) that is used to drive turbines and generators. Large scale civil engineering/construction activities associated with dam building have not been included in this analysis. Included are:

- Turbines- manufacture, supply, installation and maintenance of turbine generators, control systems, spares and structural supports and fittings.
- Dams & structures- manufacture, supply, installation and maintenance of dam operational systems, control systems, maintenance services and sluice gates and actuators.
- Pumping & lubrication- manufacture, supply, installation and maintenance of pumps, spares, storage and lubrication systems and spares.
- Electricity supply- manufacture, supply, installation and maintenance of power factor, power distribution and grid connections and supporting structures.

The **Marine Pollution Control** sub sector includes responses to pollution hazards at sea and also discharged from land- based sources. It includes the following products and services for deep sea, coastal waters and inland waterways:

- Marine pollution abatement- manufacture, supply and maintenance of booms, chemical discharge treatment equipment, solid & liquid waste/ radioactive containment and treatment equipment and monitoring services, spillage clean- up services, shoreline & shallow water remediation and maintenance services and collection & containment services.
- R&D- cleaner processes and technologies, monitoring systems, oil absorbents, boom and containment systems, water containment and treatment technologies.
- Specialist consulting and training- chemical discharge prevention, education, policy & planning, training, publications, sewerage discharge management, radioactive waste management and solid and liquid waste management.

The **Noise & Vibration Control** sub sector includes all activities that prevent or control noise and vibration pollution. It includes

- Noise abatement- manufacture, supply, installation and maintenance of barriers, acoustic management equipment, noise insulation, noise & vibration control and monitoring equipment, acoustic management equipment, noise insulation materials, monitoring services, large plant services and surface modifications.
- R&D- noise attenuation, noise sensing, vibration sensing, vibration control and noise & vibration abatement equipment and cleaner technologies and process by development.
- Consulting and training- consulting, publications, training and noise monitoring services.

The **Nuclear Power** sub sector includes all activities that relate to the generation of nuclear power, excluding decommissioning of nuclear sites. It includes:

- Nuclear safety engineering services, regulatory compliance, reactor management, fail-to-safety engineering.
- Nuclear power plant operations management, engineering and PR.
- Nuclear cooling equipment- manufacture, installation and maintenance.
- Construction of plant and equipment- site development, reactor and buildings and power plant/ equipment construction.
- Commissioning engineering services- cooling & thermal control, engineering maintenance, instrumentation, power distribution, reactor & plant commissioning.
- Sampling & testing services- thermal control testing, remote monitoring, back-up plant monitoring and effluent discharge testing.
- Nuclear scientific services- research, laboratory testing and fuel management.

The **Photovoltaic Energy** sub sector includes all activities that help to convert solar radiation into useable energy. It includes:

- Chemicals- production and supply of solar chemicals and solar pond salt.
- Systems & equipment- manufacture, supply, installation and maintenance of active and batch systems, clerestory windows, light shelves and tubes, solar box cookers, solar combi systems and solar lighting design.
- R&D- solar power and solar car research.
- Photovoltaic cells- manufacture, supply, installation and maintenance of photovoltaic modules, mounting systems, ancillary components, cells and cell materials.
- Other equipment & chemicals- manufacture, supply, installation and maintenance of glass houses, convection towers, heliostats, parabolic collectors, turbines, trough collectors, towers and solar trackers.

The **Recovery & Recycling** sub sector includes all activities relating to the collection and processing of domestic and industrial waste products. This includes:

- Waste collection- manufacture, supply, installation and operation of equipment and services for collection of household, industrial and hazardous waste, treatment of waste prior to landfill and supply of pre-treated recyclates.
- Engineering & equipment- engineering services and process control for the complete range of recycling stock Consulting & training- collection and processing consultancy and training, publishing, legal & insurance advice.

- R&D- metals recovery, pyrolysis, bio-based systems, new recyclable materials, new collection & processing technologies.
- Recycling stock- recovery, recycling, processing, sorting, supply and packaging of rubber, plastics, paper, oil, electrical, electronics, glass, composting, construction & demolition, automotive, wood and textiles stocks.

The **Renewable Energy Consulting** sub sector includes consulting and legal services specific to Renewables i.e. not included in general or specific environmental consulting. It includes:

- Legal services- wind farm location and other renewable energies.
- Consulting- turbines, solar and photovoltaic applications, public sector and corporate Renewables policies, nuclear energy, insulation technologies and alternative fuel technologies.

The **Waste Management** sub sector includes the treatment/ management of domestic and industrial waste that cannot otherwise be recycled. It includes:

- Construction & operation of waste treatment facilities for anaerobic digestion, composting, incineration, landfill, waste to energy conversion and the supporting engineering services.
- Equipment for Waste treatment, manufacture, supply, installation and maintenance of bio filters, bio reactors, collection equipment, grease traps, oil interceptors, materials processing equipment, monitoring & control equipment and nightsoil & landfill leachate treatment.
- R&D- incineration technologies, energy from waste systems, cleaner processing & treatment technologies, disposal of hazardous waste and other materials processing technologies.
- Consultancy and training- books, periodicals & publications, specialist consulting and training for asbestos, hazardous materials and other waste management systems.

The **Water Supply and Waste Water Treatment** sub sector includes activities relating to the treatment of pollutants in the water supply. It includes:

- Water treatment and distribution, manufacture, supply, installation and maintenance of systems for activated sludge, aerobic & anaerobic treatment, biological odour & corrosion control, demand management & leakage reduction, effluent treatment, filters, macrobial treatment, screens, sequencing batch reactors, water disinfection and storm/ grey water treatment.

- Engineering- field engineering, pipe & valve maintenance, fitting & construction, fabrication & welding and engineering design.
- R&D - water purification, water management, black/ grey water treatment, biocides, bio reactors and aerobic/ anaerobic treatment technologies.
- Consulting and training- engineering and water management training, publishing and specialist consulting for water systems treatment, management and engineering.

The **Wave & Tidal Energy** sub sector includes all activities that help to convert the energy from waves and tides into usable power (also known as marine renewable energy). It includes:

- Turbines & generators- the manufacture, supply, installation and maintenance of tidal turbines, structural supports and fittings, spares and turbine control systems.
- Pumps & equipment- the manufacture, supply, installation and maintenance of pumps and pump spares.
- Two basin schemes- provision of structural engineering and field maintenance services.
- Ebb & flow systems- manufacture, supply, installation and maintenance of ebb and flood generation systems.
- Assessment & Measurement- waves, water levels, turbidity, tidal energy, sediment, salinity pollutants, fish stocks monitoring and local/ global environmental impact assessment.
- Other general services- financial planning, operational and maintenance services.

The **Wind Energy** sub sector includes all activities that convert wind power into usable energy. This includes wind farm systems, large and small wind turbines. The sub sector is divided by size of turbine rather than location (onshore and offshore) because it is easier to differentiate and map supply chain activities in this way. It includes:

- Wind farm systems- manufacture, supply, installation, operation and maintenance of integration, power plant, power control, grid entry equipment and systems and electrical and mechanical componentry.
- Small wind turbines- manufacture, supply, installation, operation and maintenance of small turbine systems (blades, towers, fixing structures, cowlings, enclosures, gear boxes and drive trains), componentry and research.

- Large Wind Turbines- manufacture, supply, installation, operation and maintenance of large turbine systems (blades, towers, fixing structures, cowlings, enclosures, gear boxes and drive trains), componentry and research.

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