Mapping the East Midlands Low Carbon Economy

A report prepared for *emda*

Ekosgen Consulting (UK) Ltd

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This document forms part of the *emda* Knowledge Bank

Mapping the East Midlands Low Carbon Economy

Final Report

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INVESTORS IN PEOPLE

TABLE OF CONTENTS

1 INTRODUCTION

1.1 This report presents the findings of a comprehensive mapping exercise of the Low Carbon Environmental Goods and Service sector (LCEGS) undertaken by ekosgen on behalf of the East Midlands Development Agency.

1.2 The aim of the research was to re-map this sector in detail in the light of new national and international research into market opportunities and regional research into sector strengths and build on the national research in two ways:

- Developing a detailed set of intelligence on the LCEGS sectors and their supply chains in the East Midlands; and
- Given existing sector specialisms in the East Midlands, nuclear and conventional power generation and their supply chains should be included.

1.3 The following outputs were required:

- Development of a **directory of LCEGS businesses in the East Midlands** and their supply chains, including power generation and nuclear power supply chains supporting Rolls Royce. The directory was to include company level information such as name, address, contact details, size and sub-sector. National research[1] suggested that there were approximately 3,400 companies in the sector.
- **Detailed Database** – For 1,000 of these companies, detailed information on business motivation and capacity was collected to provide a better understanding of the issues facing businesses in this sector.
- **Market Analysis** – To underpin the directory work and support the conclusions, a detailed market analysis of each of the LCEGS subsectors was undertaken. This involved a detailed, in–depth and well evidenced analysis of regional, national and international carbon sensitive market trends and opportunities.

[1] Low Carbon and Environmental Goods and Services: An Industry Analysis. BERR,2009.

2 Methodological Approach

Overview

2.1 The research involved the following main stages:

- ***Market Analysis*** – Desk research to identify sub-sectors with the greatest potential to deliver regional benefit. The desk research exercise involved producing a short but comprehensive report for each sub-sector identifying international and national trends, priorities and strengths and weaknesses. The report also clearly defined each sector showing the relevant business classification codes covering the sector. These reports are presented in Volume II.
- ***Development of a Primary Database*** – Using the business classification codes identified as part of the market analysis, business data was purchased from Experian. This was supported with investigative techniques to find company details where business classification systems were not adequate. This included working with trade associations, industry bodies and the Carbon Trust.
- Use of a ***telephone survey*** to make contact with all the businesses identified on the primary database, filtering out those that do not perceive themselves to be operating in the sector or supplying to it. Thus forming the ***basic business directory***.
- For those that were part of the sector, businesses were invited to take part in an ***in-depth interview***, with 1,000 full responses received. This explored their capabilities, capacity and attitudes to growth.

Defining the Sector

2.2 There are many definitions of the Low Carbon Environmental Goods and Services sector currently in use. For the purposes of this research, we have used the Innovas[2] definition as the starting framework, but adding in the conventional power generation sectors and nuclear power.

Table 1: Sub-sectors identified within the Innovas Approach

Environmental	Renewables	Emerging Low Carbon
Air Pollution	Hydro	Alternative Fuel Vehicles
Environmental Consultancy	Wave and Tidal	Alternative fuels
Environmental Monitoring	Biomass	Additional Energy Sources
Noise and Vibration Control	Wind	Carbon Capture and Storage
Contaminated Land	Geothermal	Carbon Finance
Waste Management	Photovoltaic	Energy Management
Water and Waste Water	Renewable Consulting	Building Technologies
Recovery and Recycling		

[2] Low Carbon and Environmental Goods and Services: An Industry Analysis. BERR, 2009.

2.3 The primary focus of the work was to build a comprehensive directory of businesses operating in the sector, with comparative analysis a secondary consideration. Therefore whilst some comparisons will be possible with other research, there are considerable differenced in approach and methodology and comparisons need to be undertaken with caution.

2.4 Each of these sub-sectors is at a different stage of development and maturity, with some being well established and clearly identifiable and others being very much emerging in nature. Aside from the addition of the nuclear and conventional power sectors, the following amendments were made to the definition:

- Renewable Consulting – The desk research found little evidence that this was a sector in its own right. With renewable consulting forming either an activity within the other renewable subsectors or environmental consultancy. Therefore Renewable Consulting was dropped as a separate sector for the market analysis.

- Alternative Fuels – This subsector was very fragmented covering a range of alternative fossil and non fossil fuels including nuclear power. Given the client requirement to cover nuclear power separately, the remaining elements of this sub-sector were too fragmented to form a clear market analysis and was therefore dropped as a separate sector;

- Additional Energy Sources – The Innovas definition included a very wide range of additional energy sources including fuel cells. In order to form a coherent market analysis, our research focused on fuel cells.

- Photovoltaic – We have amended the coverage of this sector to include solar thermal as well as Photovoltaic.

Table 2: Definition used in this research.

Environmental	Renewable Energy	Emerging Low Carbon	Power
Air Pollution	Hydro	Alternative Fuel Vehicles	Conventional Power
Environmental Consultancy	Wave and Tidal	Additional Energy Sources (Fuel Cells)	Nuclear Power
Environmental Monitoring	Biomass	Carbon Capture and Storage	
Noise and Vibration Control	Wind	Carbon Finance	
Contaminated Land	Geothermal	Energy Management	
Waste Management	Photovoltaic/Solar Thermal	Building Technologies	
Water and Waste Water			
Recovery and Recycling			

Conducting the Market Analysis

2.5 The purpose of this task was to identify LCEGS (and some non-LCEGS) sub-sectors and niches within the East Midlands economy which have the greatest potential to deliver regional benefit by exploiting a carbon sensitive market place.

2.6 There are three different types of green business:

- LCEGS business and supply chain - delivering core services to support the low carbon market;
- Non-LCEGS businesses but makers of 'green' products e.g. a software company may produce energy management software; and
- Businesses in the wider economy adopting 'green' solutions e.g. a retailer sourcing organic/recycled materials.

2.7 All three types of business will be impacted by a carbon sensitive market place and will be presented with both opportunities and threats. However, for the purposes of this research, we were principally interested in the first two. National research has shown that comparative advantage may be achieved more easily through developing “green” products and services in sectors where the UK currently has a comparative advantage e.g. software, electronic equipment, business services etc. (i.e. group 2), rather than through sectors traditionally considered “green”. For this reason, the analysis was conduced in two parts:

- Opportunities for LCEGS businesses and supply chain; and
- Opportunities for non LCEGS businesses to make 'green' products.

LCEGS Market Analysis

2.8 LCEGS Subsector - Information on each LCEGS sub-sector was reviewed and a summary report produced detailing:

- Global market situation;
- National market situation;
- Political Drivers;
- Supply chain/Niches;
- Investment Trends;
- East Midlands (Supply);
- East Midlands (Demand);
- Higher Education;
- Role of Energy Technology Institute;
- Skills and Capabilities;
- Trade Associations; and
- Business Classifications.

2.9 A very wide range of information was reviewed for each of the sub-sectors including general literature such as:

- Low Carbon and Environmental Goods and Services: An Industry Analysis, Innovas 2009;
- Towards a Low Carbon Economy, economic analysis and evidence for a low carbon industrial strategy, BIS, 2009;
- Market Opportunities in Environmental Goods and Services, Renewable Energy, Carbon Finance and CATS, UK Trade and Investment October 2008;
- Commission on Environmental Markets and Economic Performance, November 2007;
- Delivering the low-carbon economy – Business Opportunities for UK Manufacturers, EEF, January 2008; and
- Sector Skills Mapping in the Environmental Technology Sector, Energy and Utility Skills, March 2006.

2.10 As well as specific sub-sector information such as:

- Relevant Government Strategies, research and publications;
- Relevant legislation;
- Trade Association information and publications; and

- Carbon Trust information and publications.

2.11 This was supported by regional information such as:

- Regional Strategies;
- Regional Targets;
- Specific project information;
- Specific business information; and
- Higher Education Information

2.12 The 22 sub-sector reports are contained in Volume 2 of this research.

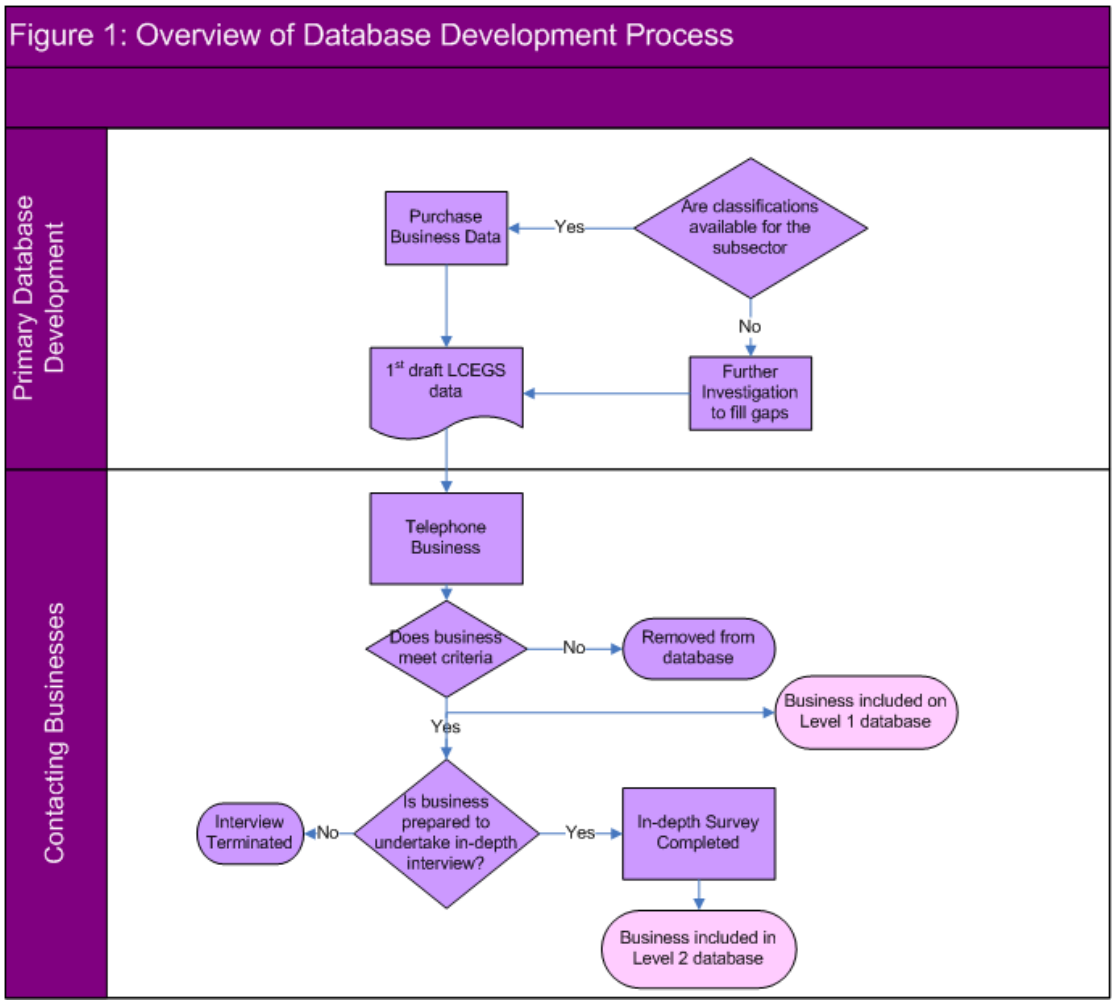
The Non-LCEGS Sector

2.13 Development of a paper exploring the regions strengths outside the LCEGS sector and the opportunities to develop low carbon products. This is also contained within Volume 2.

Developing the Databases

2.14 Figure 1 below shows an overview of the two phases of database development.

Figure 1: Database Development Process



2.15 The market analysis for each of the sub-sectors resulted in the production of a list of relevant business classification codes for each sub-sector. These utilised both SIC, Thompson and Yell classification systems to enable the closest matches to each sub-sector. Business data for the relevant codes was purchased from Experian Business directory and then manually checked for relevance to the sector. Where necessary, businesses with no clear link to the sector were manually removed from the primary database. Whilst for some sub-sectors this system produced an excellent match, for others, the classification systems were inadequate. In these instances, further investigative work was undertaken to fill the gaps. This included searches of trade associations, on-line directories and registers. In many instances, trade associations and other organisations offered to email their networks with an article about the research. A full list of sources for this stage can be found in Appendix A. Likewise, *emda* circulated information about the project through its newsletter. Once all current searches had been exhausted, emda released information from previous

mapping studies. These were de-duplicated against the master database. A total of 2,913 business were found through this process.

2.16 Each business on the database was then telephoned by our research partners, Research Resource, a fully accredited market research agency. Following a short introduction, businesses were asked a series of 3 filter questions which were:

- A1: Do you operate in any of the following sectors (select all that apply from list);
- A2: Which is your main business area (select one only from previous list); and
- A3: Do you supply at least 20% of your sales to any of the following LCEGS sectors (select all that apply).

2.17 If a business selected Yes at question A1 or A3, they were deemed to be part of the sector and invited to take part in the second stage interview process. Conversely, if a business did not operate in any of the sectors from the list or supply to the sectors, they were deemed to be not in the sector and the interview terminated.

2.18 The second stage interview process involved the completion of an in-depth interview about the following topics:

- Business Profile;
- Management Style and Approach;
- Growth Plans;
- Markets;
- Working with Others;
- Technology;
- Skills; and
- Supply Chain.

2.19 A copy of the full questionnaire can be found in Appendix B.

Analysis

2.20 An excel database was produced containing the raw data and a series of analysis files as follows:

- An analysis of the findings for each sub-sector;

- An analysis of each of the 3 main sectors i.e. the Environmental Goods and Services sector, the Renewable Energy sector and the Emerging Low Carbon Sector.

- For convenience, the spreadsheet also included tabbed files for the following groups of businesses:

  - All businesses;

  - Each sub-sector; and

  - The top and bottom 20% of businesses with respect to their capacity in terms of: Technology, Management, Growth, Collaboration and Skills. These groupings were put together by developing combined indicators from answers to specific questions in the survey. Scores were attributed to particular questions which were used to develop a combined indicator score for the metric in question. The scoring system can be seen in Appendix C. These were then converted into percentiles in order to identify the top and bottom 20%.

3 Fieldwork Findings

Sectoral Analysis

3.1 The fieldwork found a total of ***2,020 businesses operating within the LCEGS sector*** in the East Midlands. 1,529 of these reported that the LCEGS sector was their main business sector, with a further 491 reporting that they operated within the sector, but their business was principally in another sector e.g. manufacturing. Table 3 below shows the split between the various sub-sectors.

Table 3: Businesses operating within the LCEGS sector.

Sub-Sector	Operate Within	Main Sector
Air Pollution	79	39
Environmental Consultancy	250	163
Environmental Monitoring, Instrumentation and Analysis	102	59
Marine Pollution Control	11	1
Noise and Vibration Control	45	25
Contaminated Land	14	16
Waste Management	223	160
Water Supply and Waste Water Treatment	243	168
Recovery and Recycling	552	330
Total EGS Businesses		**964**
Hydro	11	3
Wave and Tidal	6	2
Biomass	45	17
Wind	35	13
Geothermal	26	11
Renewable Energy	57	16
Photovoltaic/Solar	60	37
Total Renewable Energy Businesses		**99**
Alternative Fuel Vehicles	21	10
Alternative Fuels	24	9
Additional Energy Sources	6	2
Carbon Capture and Storage	8	3
Carbon Finance	10	1
Energy Management	223	149
Building Technologies	304	203
Total Emerging Low Carbon Businesses		**377**
Civil Nuclear	116	52
Conventional Power	102	40
Other		**491**
Total	Not applicable	2,020

3.2 Further to this, the survey found another 80 companies who did not describe themselves as operating within the sector, but did describe themselves as supplying at least 20% of their sales to the sector.

Table 4: Sub-sectors supplied by 80 'supply chain companies'.

Sub-Sector	Sectors supplied to (Tick all that apply)
Air Pollution	1
Environmental Consultancy	0
Environmental Monitoring, Instrumentation and Analysis	4
Marine Pollution Control	1
Noise and Vibration Control	0
Contaminated Land	7
Waste Management	4
Water Supply and Waste Water Treatment	20
Recovery and Recycling	4
Hydro	0
Wave and Tidal	1
Biomass	2
Wind	3
Geothermal	1
Renewable Energy	4
Photovoltaic/Solar	0
Alternative Fuel Vehicles	6
Alternative Fuels	1
Additional Energy Sources	1
Carbon Capture and Storage	0
Carbon Finance	0
Energy Management	41
Building Technologies	15
Civil Nuclear	5
Conventional Power	15
Total	80

3.3 Whilst not directly comparable, this research has found results of a similar order of magnitude to that estimated by Innovas in their national research[3]. Table 5 below shows that the Innovas research estimated that there were approximately 3,400 businesses in the East Midlands and that a high proportion of these would be found in the Renewable Energy and Emerging Low Carbon sectors. This research has found a lower overall level, but a higher proportion within the more established Environmental Goods and Services sector. Overall, this research has found a lower than expected number of businesses operating in the Renewable Energy and Emerging Low Carbon sectors. There are two potential reasons for this:

[3] Low Carbon and Environmental Goods and Services: An Industry Analysis. BERR, 2009

- The Innovas methodology is over-optimistic or utilises definitions which extend further into the wider economy than those deployed for this research; or
- That this research, despite going to considerable lengths, was unsuccessful in finding all the relevant businesses in these emerging sub-sectors.

We suspect the reality is a combination of both.

Table 5: Comparison with expected results.

Sub-Sector	Innovas Estimate	Main Sector
EGS Sector	502	962
Renewables	1189	99
Emerging Low Carbon	1677	377
Civil Nuclear	Not covered	52
Conventional Power	Not covered	40
Other		491
Supply to	Not analysed separately	80
Total	**3368**	**2,020**

Sampling

3.4 The in-depth survey of 1,000 businesses confirmed in the sector was not designed to be representative. The commission required that we attempt to prioritise those businesses that had the greatest potential to add value to the low carbon economy in the East Midlands, therefore following the primary database development phase, a prioritisation exercise was undertaken to ensure that major players and perceived important sectors were included in the in-depth sample. However, in order to achieve the target of 1,000 completed in-depth interviews the research company needed to invite most businesses that were confirmed as part of the sector, to participate in the more detailed survey.

3.5 To get a feel for the representativeness of the sample, the SIC codes for those that participated in the full interview were compared with the SIC codes for those that were simply confirmed as part of the sector. This analysis can be found in Appendix D. Whilst this only covers those businesses whose details were purchased from Experian (1638 businesses) and therefore have SIC codes for, this shows a very good spread across the SIC codes between the two groups

3.6 Likewise, an analysis by Question A2 (which is your main business area) shows a good spread across the LCEGS sectors, suggesting that the sample is broadly representative by LCEGS subsector.

Table 6: Representativeness of sample by LCEGS sector

A2 Which is your main business area?	Database confirmation	Full interview	Grand Total
Air Pollution	21	18	39
Environmental Consultancy	59	104	163
Environmental monitoring, Instrumentation & Analysis	29	30	59
Marine Pollution Control		1	1
Noise and Vibration Control	10	15	25
Contaminated land	9	7	16
Waste management	101	59	160
Water supply and waste water treatment	88	80	168
Recovery and Recycling	213	117	330
Hydro		3	3
Wave and Tidal		2	2
Biomass	5	12	17
Wind	4	9	13
Geothermal	6	5	11
Renewable Energy	3	13	16
Photovoltaic	14	23	37
Other Renewable Energy	3	13	16
Alternative Fuel Vehicle	3	7	10
Alternative Fuels	4	5	9
Additional Energy Sources	2		2
Carbon Capture & Storage	1	2	3
Carbon Finance		1	1
Energy Management	59	90	149
Building Technologies	103	100	203
Civil Nuclear	31	21	52
Conventional Power	25	15	40
Other	229	222	491
Grand Total	1059	961	2020

3.7 Table 7 shows that the majority (61%) of businesses fall into the smallest sizeband. The Annual Business Inquiry shows that 84% of all East Midland businesses fall into this group, suggesting that either the survey is bias towards larger businesses or that this sector is on average larger than most. Whilst there was an element of targeting for the in-depth survey work, this was relatively small (i.e. a couple of dozen businesses at most) not the 230 businesses required to cause this difference. Therefore, we would conclude that businesses in this sector tend to be larger than average.

Table 7: Number of employees in East Midlands LCEGS businesses

Size band	LCEGS sample (%)
1 to 10	61.2
11 to 49	24.7
50 to 199	9.3.
Greater than 200	3.2

(Source ekosgen survey of LCEGS businesses, Base = 1000)

Profile of LCEGS businesses

3.8 Table 8, shows that the majority of LCEGS businesses (81%) in the sample were structured as limited companies; this is higher than the UK average of 58%[4].

Table 8: Legal Status

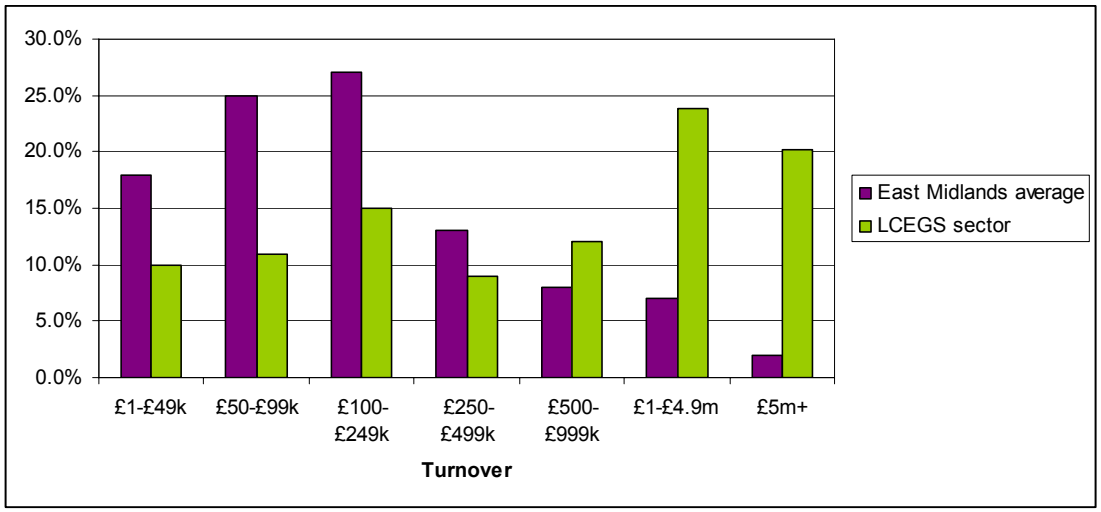
C6: What is the legal status of your business?	
Sole Trader	110
Legal Partnership	52
Limited Company	814
PLC	15
Not for Profit/Charitable	7

(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.9 Likewise, Figure 2 shows that there appears to be higher proportion of business in the larger turnover categories than typically found in the East Midlands[3]. Again this suggests that businesses in this sector tend to be larger than average.

[4] ONS, Inter-departmental business register, September 2009.

Figure 2: Turnover



* 237 respondents refused to answer this question.

Growth Plans

3.10 LCEGS businesses appear to be optimistic about their growth prospects, with 52% expecting turnover to increase of the next 12months and 39% expecting it to stay the same.

3.11 Over the next 3 years, 17% plan to grow substantially and 57% growing moderately. Only 3% plan to become smaller.

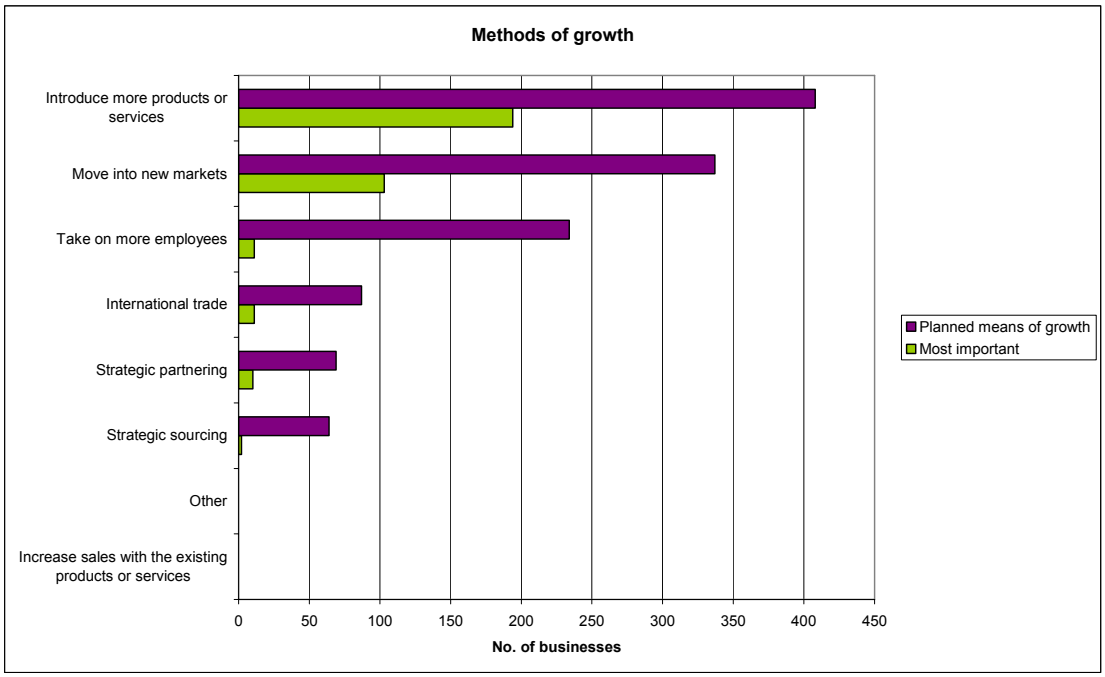
Table 9: Forecast turnover change

C8: Over the next 12 months do you anticipate that your turnover will:	
Decrease	8%
Stay the same	39%
Increase	52%
Base	999

Table 10: Expansion Plans

E1: Would you describe your expansion plans over the next 3 years to be:	
Become smaller	3%
Stay the same	23%
Grow moderately	57%
Grow substantially	17%
Base	1000

Figure 3: Methods of Growth



(Source ekosgen survey of LCEGS businesses, Base = 736)

3.12 Figure 3 shows that most businesses plan to introduce new products and services and move into new markets to grow their business.

3.13 265 businesses were not planning to grow. The most frequently selected reason for this was 'Happy with the size we are' followed by 'Something else'. Of these other responses, the main reasons given were due to the economic conditions, lack of growth in the market or the owner planning to retire soon.

Table 11: Reaons for not planning to grow business

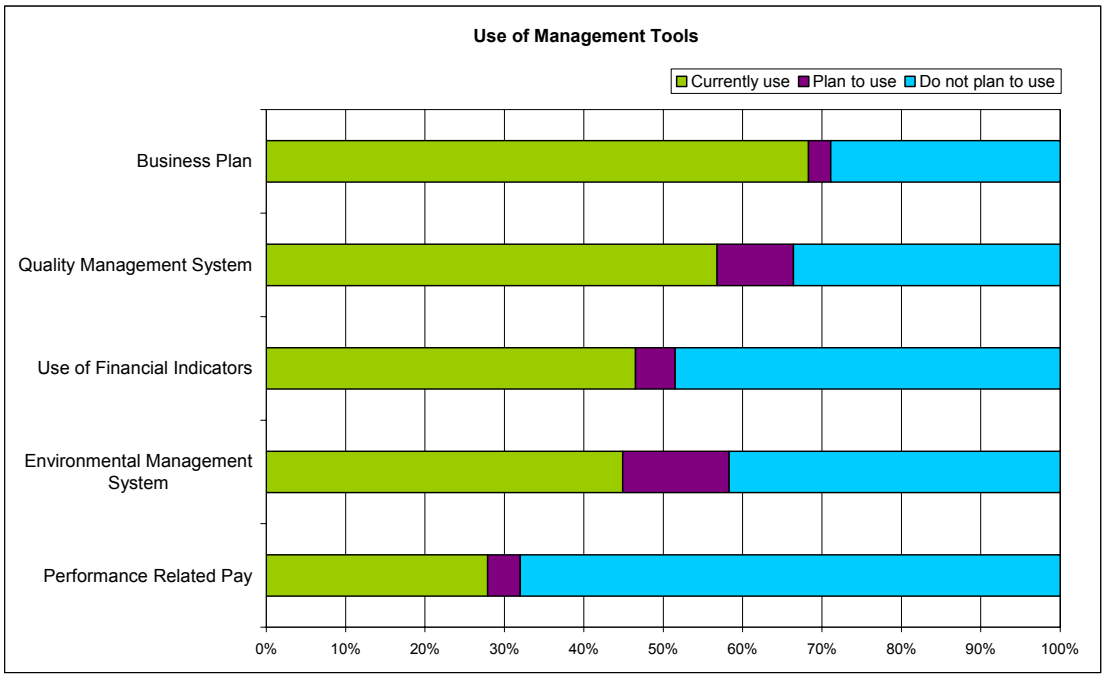
E4: And why are you not planning to grow the business? Is it....	
Happy with the size we are	119
Have been growing recently	12
Looking to reduce hours worked	8
Don't have to resources	0
Reluctant to take on more staff	9
Reluctant to take on more borrowing	0
Want to stay below VAT threshold	0
Something else	97

(Source ekosgen survey of LCEGS businesses, Base = 265)

Management Capacity

3.14 Figure 4 shows that approximately 70% of the regions LCEGS businesses use or plan to use a business plan as a management tool. There is a good use of both quality and environmental management systems with 57% of businesses currently using quality systems and 45% using Environmental Management Systems.

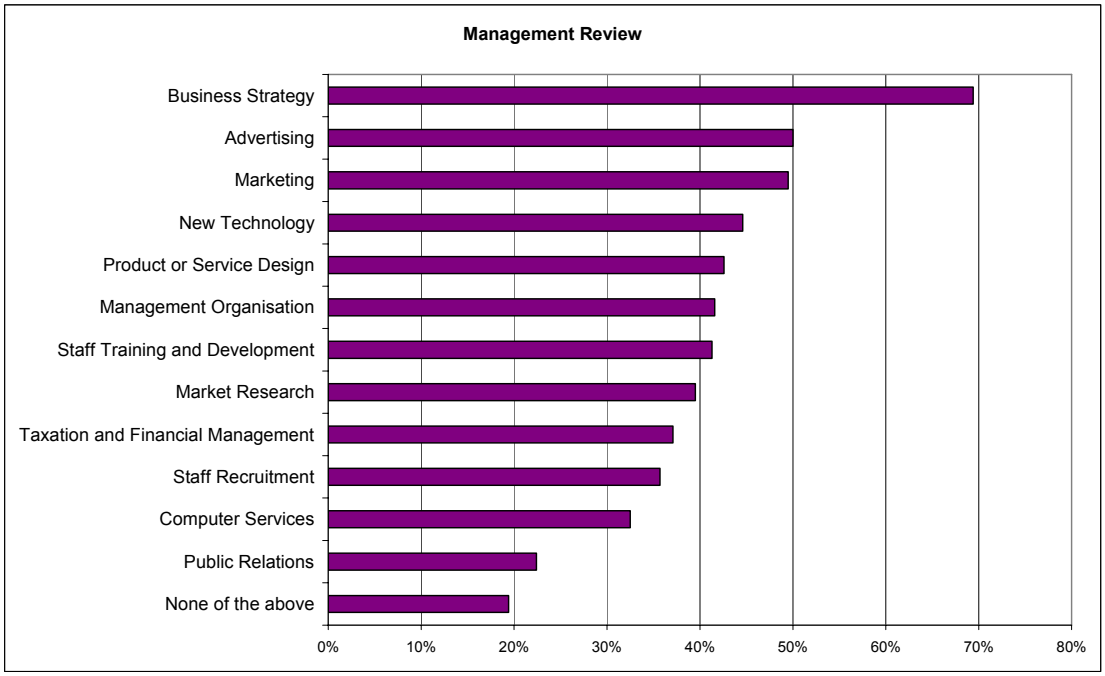
Figure 4: Use of Management Tools



(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.15 Figure 5 overleaf shows that unsurprisingly the majority of businesses (69%) have reviewed business strategy in the past 12 months. The next most common areas are advertising and marketing, with 50% of businesses reviewing these areas. 19% of businesses reported 'none of the above' to this question, suggesting that formal management review processes were less likely to be used in these organisations. A review of the businesses in this group found that they were more likely to be sole traders (32% compared with 11% in the main sample) or smaller businesses, where formal business planning practices are less likely to be used.

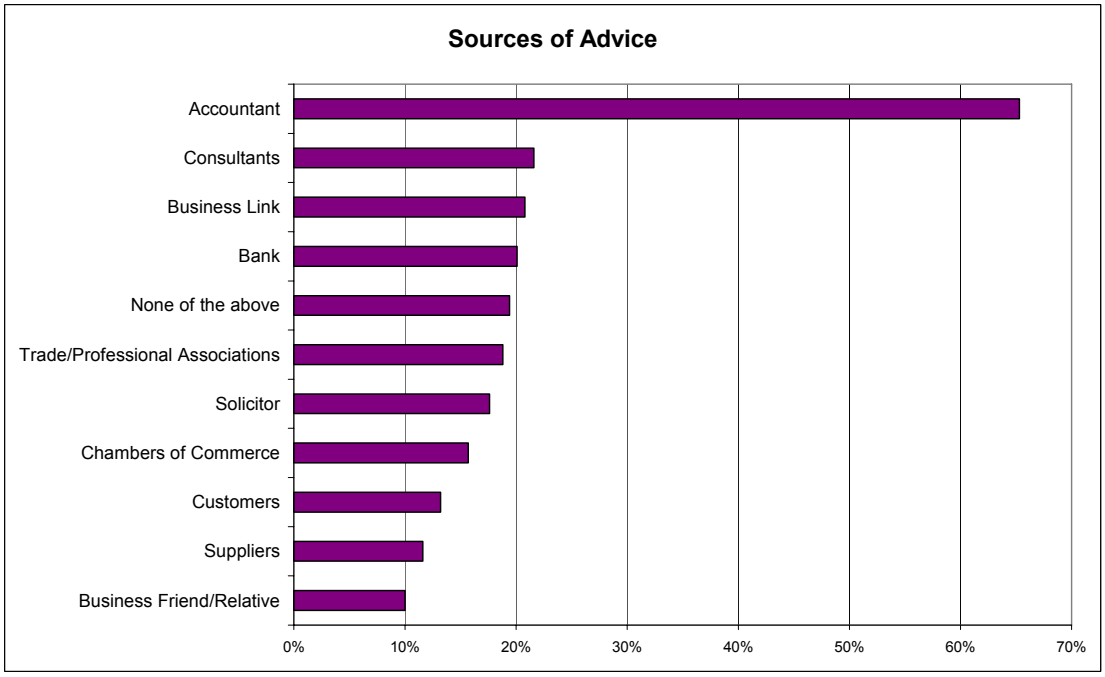
Figure 5: D2 In the last 12 months has the management team reviewed plans in relation to…



(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.16 Figure 6 below shows that 65% of businesses have obtained advice from their accountant, with consultants and Business Link coming a distant 2nd and 3rd with 22% and 21% respectively.

Figure 6: D3: From which of the following external sources have you obtained business advice

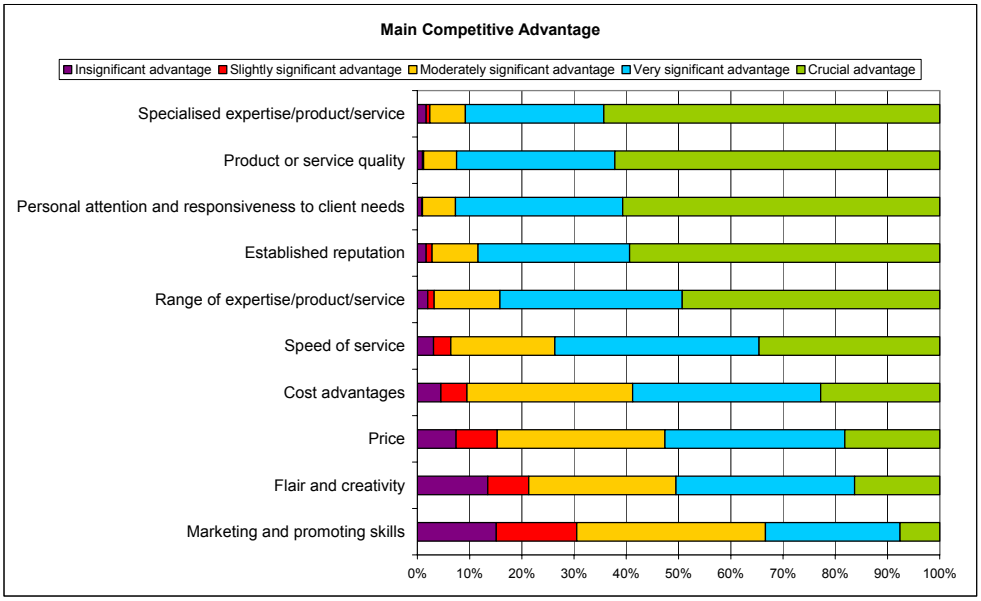


(Source ekosgen survey of LCEGS businesses, Base = 1000)

Markets

3.17 Figure 7 below shows that 91% LCEGS businesses feel that their specialist expertise is a crucial or very significant advantage. Of almost equal importance were issues such as quality, attention to client needs and reputation. Interestingly, price was only of crucial or very significant importance to 52% of companies, suggesting that the market is not overly competitive at this stage.

Figure 7: In which areas do you feel your main competitive advantage lies?

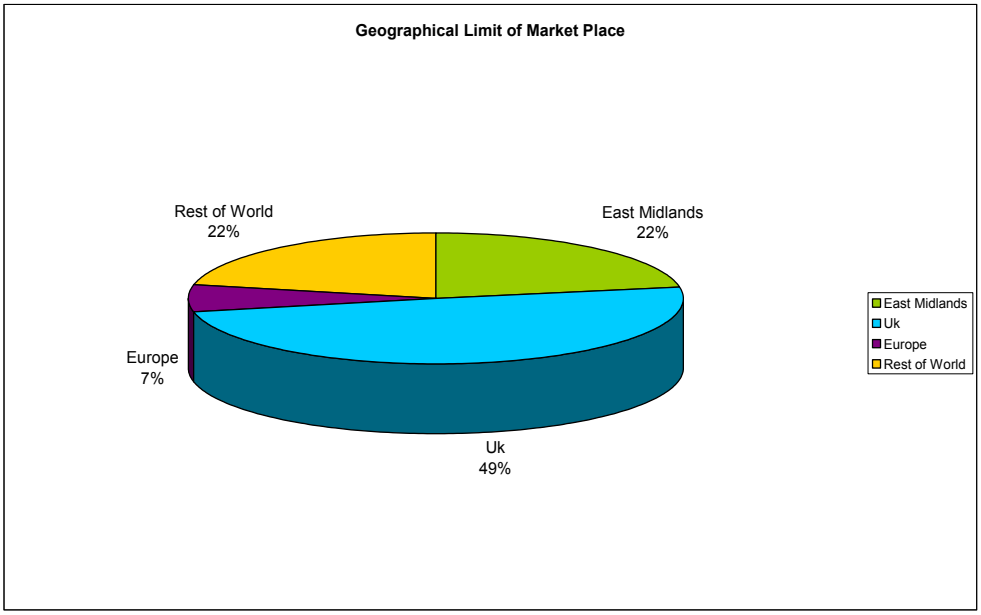


(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.18 Businesses had mixed views in terms of rating the prospects in their sector, with almost 20% rating them as poor and 51% moderate. The remaining 29% rated the prospects within their sector as strong.

3.19 Figure 8 shows that most LCEGS businesses perceive the limits of their markets to be beyond the region, with 49% perceiving their market boundaries to be UK, but with a significant proportion (29%) serving an international market. Of those companies that are serving an international market, on average they are exporting to 4.5 countries. ***This is an important finding in terms of supporting the sector, as it illustrates that the sector is able to benefit from both national and global opportunities and whilst regional market opportunities are important for sector growth, national and international opportunities are equally relevant.***

Figure 8: Geographical Limit of Market Place



(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.20 Table 12 shows that businesses identified new business opportunities through a wide range of means, with a large number of businesses selecting 'other' methods not listed in the questionnaire. These included word of mouth, recommendations, exhibitions, internet trading, repeat business and sales teams. Advertising, networking events and working with collaborators were the most important methods of finding new business opportunities.

Table 12: F4: In What ways do you identify new business opportunities

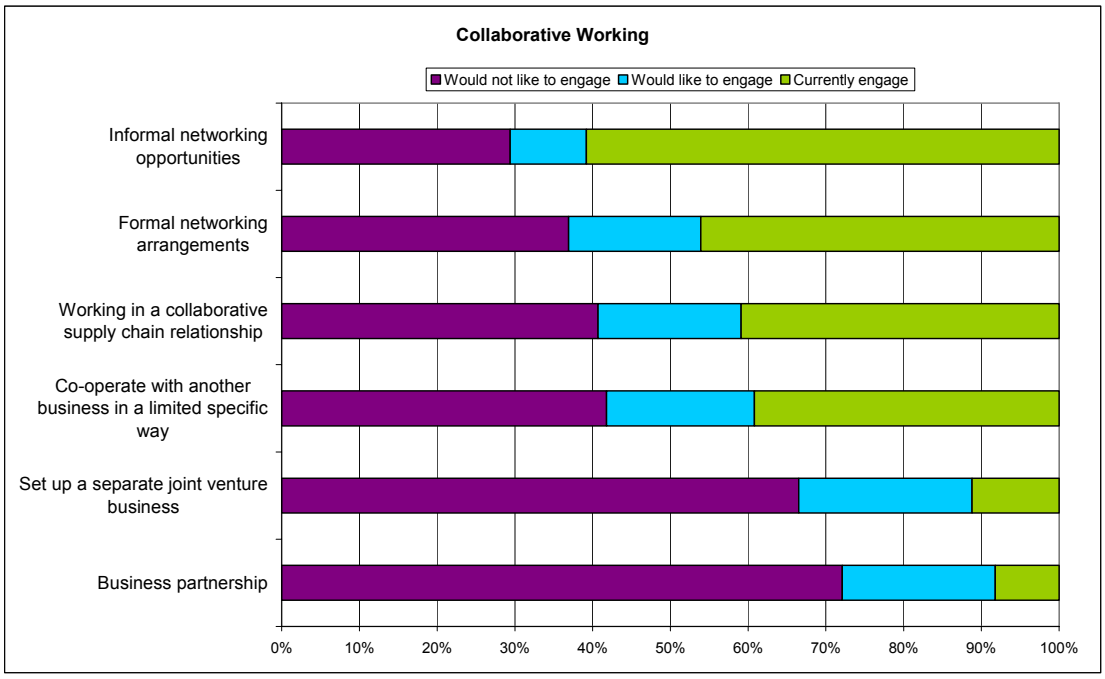
F4: In what ways do you identify new business opportunities	
Other (Specify)	639
Advertising	400
Networking events	269
Working with collaborators	205
Newsletters and marketing material	198
Customer account management	163
PR	112

(Source ekosgen survey of LCEGS businesses, Base = 1000)

Working with Others

3.21 Figure 9 shows that approximately 60% of businesses currently engage in informal network opportunities, with a further 10% who would like to become engaged. Moving down the graph, we can see as the forms of co-operation become more formal, businesses are less likely to be currently engaged. However, businesses appear to have a strong appetite for formal engagement, with 40% working in an existing supply chain relationship or co-operating with another business in a limited way. Whilst a small proportion (10%) currently engage in formal business partnerships and joint ventures, approximately 20% of businesses would like to engage in these more formal arrangements. ***This suggests that there may be a good appetite for interventions that help businesses to work more collaboratively.***

Figure 9: G1: Which of the following business to business opportunities do you engage with or are interested in engaging with?



(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.22 Table 13 shows that 455 businesses have entered into collaborative arrangements of some description and their reasons for doing so varied quite considerably. The main frequently cited was to expand the range of expertise or products offered to customers (160 businesses), which is linked to the 5th reason, 'assist in the development of specialist services/products required by customers. 150 businesses entered into collaborative arrangements for R&D purposes.

Table 13: G3: If you have entered into collaborative arrangements, were they designed to:

G3: If you have entered into collaborative arrangements, were they designed to:	
Expand the range of expertise or products offered to customers	160
Share research and development activity	150
Improve financial and market credibility	120
Assist in management and staff development	86
Assist in the development of specialist services/ products required by customers	79
Help to keep current customers	77
Provide access to new UK markets	72
Gain access to or spread costs of new equipment or information sources	70
Provide access to overseas markets	32
Not entered into collaborative arrangements	545

(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.23 Table 14, shows that businesses are engaged with a wide range of organisations, with a high number engaged with Business Link (290), relevant trade associations and Higher education institutions. Only 386 of the 1000 companies were not engaged with any of these organisations.

Table 14: G2: Which of the following other types of organisations are you engaged with?

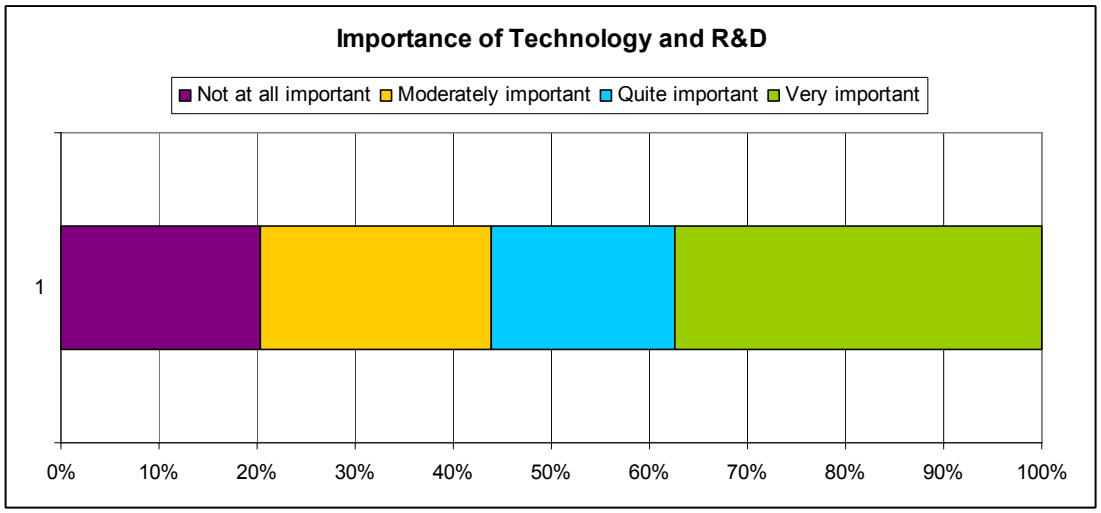
G2: Which of the following other types of organisations are you engaged with?	
Business Link	290
Trade Associations (please list)	243
Universities/ FE colleges	240
Carbon Trust	192
Train2Gain	119
UKTI	94
Knowledge Transfer Partnerships	78
Innovation Networks	63
None of the above	386

(Source ekosgen survey of LCEGS businesses, Base = 1000)

Technology

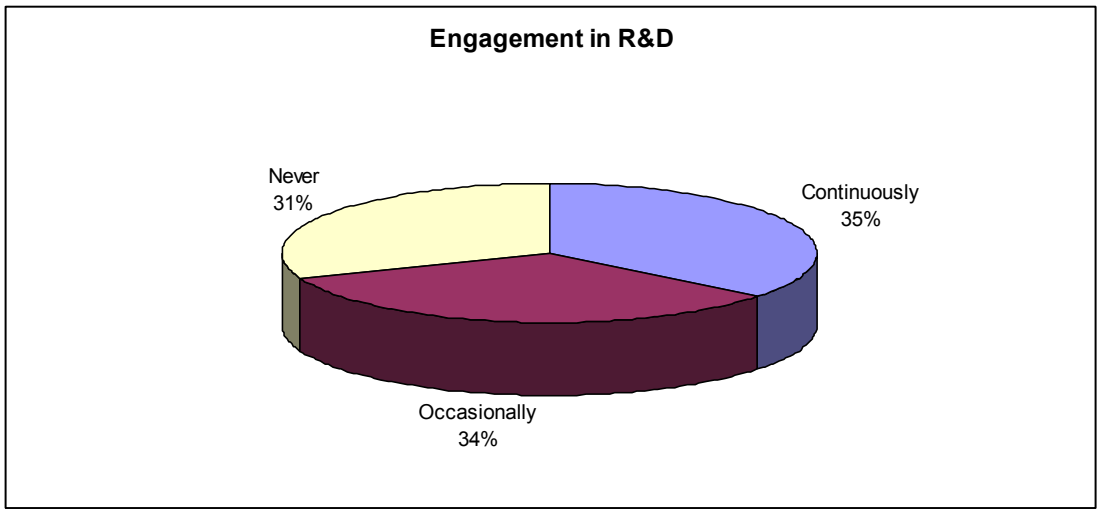
3.24 Figure 10 below shows that Technology and R&D are either quite or very important to over 55% of businesses in the sector, with Figure 10 showing that 35% of firms engage in R&D continuously, with a further 34% engaging occasionally. 20% of companies would say that they were developing pioneering technologies. 20% of companies surveyed stated that they held intellectual property rights of one form or another, the most common being patents and trade marks (Table 15).

Figure 10: H1: To what extent is technology and R&D important to your company



(Source ekosgen survey of LCEGS businesses, Base = 1000)

Figure 11: H2: Does your firm engage in R&D



(Source ekosgen survey of LCEGS businesses, Base = 1000)

Table 15: Intellectual Property Protection held.

H6: Which of the following forms of Intellectual Property Protection do you hold, or are applying for:	
Patents	116
Copyrights	109
Design Rights	80
Trade Marks	119
None of the above	793

(Source ekosgen survey of LCEGS businesses, Base = 1000)

Skills and Employment

3.25 Table 16 below shows employment across the whole sector broken down by occupational group and full/part time. We can see that employment in this sector is principally full time, with approximately 1% of employment in part time positions. The levels of recruitment difficulties being experienced are relatively low, with 4% of businesses finding it difficult to recruit technologists, scientists and higher professionals, as well as skills manual staff.

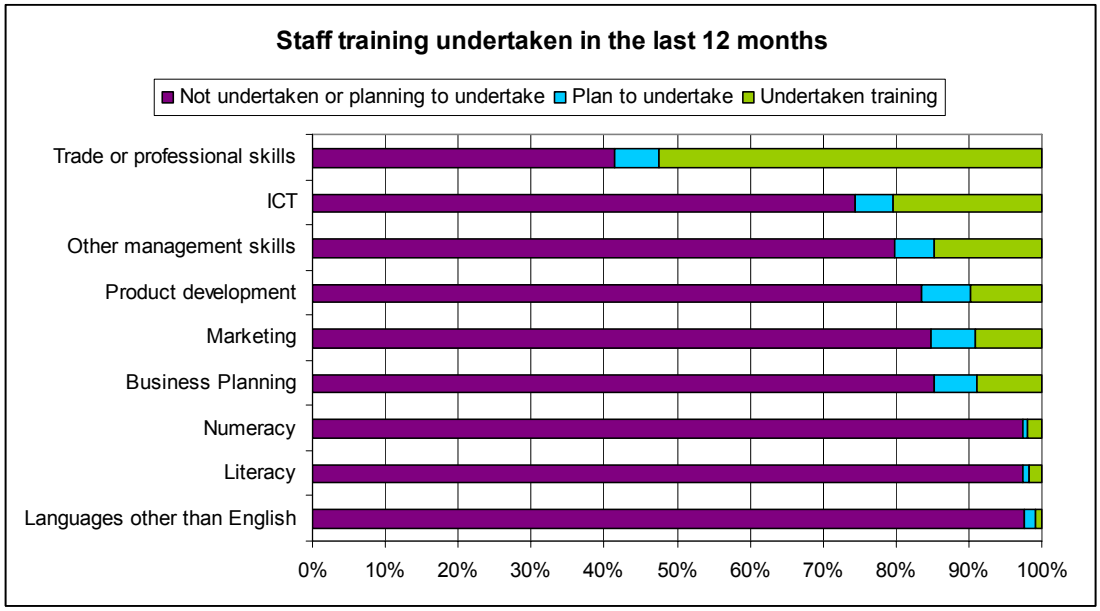
Table 16: Numbers employed and difficulties recruiting

	Full Times	Part Time	Businesses experiencing recruitment difficulties?
Skilled manual	9,652	162	4.2%
Clerical and administrative	4,223	50	1.7%
Technicians and lower professionals	4,223	50	3.0%
Technologists, scientists and higher professionals	3,898	31	4.0%
Managerial	3,906	30	2.0%
Total	**25,901**	**323**	

(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.26 Figure 12 shows that businesses were most likely to undertake training for trade and professional skills than other areas, with over 50% of businesses having undertaken staff training in this area during the last 12 months.

Figure 12: I4: Staff training undertaken in the last 12 months or plan to in the next 12 months



(Source ekosgen survey of LCEGS businesses, Base = 1000)

3.27 Companies had mixed approaches to identifying training needs, with 36% stating that they had no specific method and 25% stating that this was done informally. The remainder used a mixture of company training needs analysis and formal appraisals. 7.5% are signed up to the skills pledge – a government led initiative to whereby companies commit to improving the skills of their workforce and 16% have used train to gain advisors and funding to identify appropriate training.

3.28 Table 17 shows that businesses were much more likely to use private training agencies and consultancies than any other organisation.

Table 17: I5: In providing training for your staff, which of the following organisations have you used?

I5: In providing training for your staff, which of the following organisations have you used?	
Private Training Agencies/ Consultancies	43%
Colleges of Further Education/ Technical Colleges	18%
University/ Institute of Higher Education	10%
Professional Associations	10%
Trade Associations	10%
Equipment Suppliers	8.5%
Chambers of Commerce	6%
Voluntary Organisations	1%

(Source ekosgen survey of LCEGS businesses, Base = 1000)

4 Size and Value of the LCEGS sector in the East Midlands

4.1 In this section, we provide a brief discussion regarding the size and value of the sector in the East Midlands.

4.2 The research process found 2,100 businesses that operated in the LCEGS sector in the East Midlands. As these are genuine businesses that have all been contacted as part of the research, we are confident that this represents a lower limit to the size of the sector.

4.3 The research process was rigorous and efforts were made to track down and include businesses in the sector, but it is important to recognise that we will have inevitably missed some businesses. These are likely to be those businesses who principally operate in other large sectors, such as construction, manufacturing and engineering, but who also operate or are diversifying into the LCEGS sector. The size of these sectors meant that it was not possible to search them for businesses which might be operating in the LCEGS sector also.

4.4 The in-depth survey of 1,000 of the 2,100 businesses, was not designed to be representative. However, our analysis suggests that the survey appears to be broadly representative of the sub-sectors and the SIC codes in the main population. Therefore we think that the sample is broadly representative, although there is some evidence of bias towards larger companies.

4.5 The survey of 1,000 businesses found a total of 37,637 people employed within the sample, grossed up simply to reflect the whole population, we would estimate that there are apprxoximately 79,000 people employed in the sector. This is a similar order of magnitude to that identified by Innovas for the region (62,000). The questionnaire did not distinguish between total employees and those working in the sector. Many companies operate in the LCEGS sector as well as others such as engineering or manufacturing, therefore this estimate is likely to be an upper limit of employment in the sector.

4.6 These businesses operated across 1,498 sites and had a combined turnover of £1,117m[5].

[5] Derived from an analysis of mid-points from the survey data, not actual reported figures.

5 Sectoral Analysis

5.1 This section brings together the findings from the desk research exercise which looked at the potential for sector development within each sub-sector with the findings from the survey of LCEGS businesses. This is brought together in the form of a sectoral assessment for each sub-sector. This is summarised in the tables below which illustrate on a traffic light basis where opportunities are high (green), medium (orange) and low (red).

Environmental Goods and Services

5.2 ***Air Pollution***

A1: No of Businesses which operate in	79	A2: No of Businesses for which this is their main sector	39	A3: of businesses which supply to	38
C3: Total number of sites (sample)	67	C4: Total number in employment (sample)	938		

(Source: ekosgen survey of LCEGS businesses)

5.3 The air pollution sub-sector is a relatively small sub-sector with moderate growth potential internationally, but relatively low growth potential in the UK. Politically, there are a number of pieces of air quality legislation in the UK, largely driven by European directives; however the sub-sector is not high on the political agenda. Whilst the East Midlands universities have some strength in this area, there is little evidence of any commercial comparative advantage.

5.4 ***Environmental Consultancy***

A1: No of Businesses which operate in	250	A2: No of Businesses for which this is their main sector	163	A3: of businesses which supply to	155
C3: Total number of sites (sample)	197	C4: Total number in employment (sample)	5229		

(Source: ekosgen survey of LCEGS businesses)

5.5 Whilst it is a relatively small sector both nationally and internationally it has good growth prospects and is identified as important with respect to exporting. The increasing profile of low carbon and environmental issues will impact on this sector as it serves all elements of the LCEGS market.

5.6 *Environmental Monitoring*

A1: No of Businesses which operate in	102	A2: No of Businesses for which this is their main sector	59	A3: of businesses which supply to	67
C3: Total number of sites (sample)	69	C4: Total number in employment (sample)	2633		

(Source: ekosgen survey of LCEGS businesses)

5.7 Whilst this is a small sector nationally and internationally, it is perhaps of growing importance in servicing the other sectors, especially given increasing legislation such as the Environmental Liability Directive requiring those responsible to meet the cost of preventative and remedial measures. At the regional level, performance in this sub-sector is considered to be average, with potentially higher levels of demand around contaminated land.

5.8 *Marine Pollution Control*

A1: No of Businesses which operate in	11	A2: No of Businesses for which this is their main sector	1	A3: of businesses which supply to	5
C3: Total number of sites (sample)	9	C4: Total number in employment (sample)	243		

(Source: ekosgen survey of LCEGS businesses)

5.9 This sector is small internationally and nationally. Its focus is principally around the prevention of pollution from offshore oil activity and therefore there will be limited demand for these services in the East Midlands.

5.10 *Noise and Vibration Control*

A1: No of Businesses which operate in	45	A2: No of Businesses for which this is their main sector	25	A3: of businesses which supply to	25
C3: Total number of sites (sample)	41	C4: Total number in employment (sample)	1035		

(Source: ekosgen survey of LCEGS businesses)

5.11 This is a small sector both internationally and nationally, with the UKTI report rating the UK's overall strength in this sector as poor. Despite this the sector is expected to grow significantly to 2014 reflecting the introduction of regulations controlling vibration at work. This research confirmed the Innovas findings that the sector is relatively small, with only 45 businesses operating in the sector.

5.12 *Contaminated Land*

A1: No of Businesses which operate in	49	A2: No of Businesses for which this is their main sector	16	A3: of businesses which supply to	38
C3: Total number of sites (sample)	52	C4: Total number in employment (sample)	556		

(Source: ekosgen survey of LCEGS businesses)

5.13 This is a moderately sized EGS sector at national and international level. Opportunities are believed to be significant in former Eastern European countries in the next 10 years as support becomes available to deal with contaminated sites. At the regional level, there is significant demand to remediate derelict and brownfield land associated with coalfields and heavy industrial sites, although the sector remains a relatively modest 49 companies, with only 16 identifying this as their main sector.

5.14 ***Waste Management***

A1: No of Businesses which operate in	223	A2: No of Businesses for which this is their main sector	160	A3: of businesses which supply to	168
C3: Total number of sites (sample)	185	C4: Total number in employment (sample)	2074		

(Source: ekosgen survey of LCEGS businesses)

5.15 This is firmly established sub-sector with growth being driven by legislation and the need to find innovative ways to manage, and ultimately reduce the negative impacts of waste. The sector is one of the largest, both nationally and regionally, however, growth is relatively small and there is no evidence of regional comparative advantage. The presence of the University of Northampton's Centre for Research into Sustainable Wastes Management specialising in healthcare waste may present a niche for local businesses to capitalise on.

5.16 ***Water and Waste Water***

A1: No of Businesses which operate in	243	A2: No of Businesses for which this is their main sector	167	A3: of businesses which supply to	226
C3: Total number of sites (sample)	365	C4: Total number in employment (sample)	3337		

(Source: ekosgen survey of LCEGS businesses)

5.17 This is a large sector both nationally and internationally, but with relatively low levels of growth. Politically the most significant interest is with respect to water efficiency. Regionally, the sector contains 243 businesses operating within it, although there is no evidence of comparative advantage, the University of Nottingham's Green Chemical and Water technologies research theme may provide opportunities for regional businesses to capitalise on.

5.18 *Recovery and Recycling*

A1: No of Businesses which operate in	552	A2: No of Businesses for which this is their main sector	330	A3: of businesses which supply to	325
C3: Total number of sites (sample)	270	C4: Total number in employment (sample)	5971		

(Source: ekosgen survey of LCEGS businesses)

5.19 This is a large and established sector both internationally and nationally. There are high levels of political interest in this area reflecting the need to increase recycling levels across the board. Regionally, this is a large sector, but currently there is no evidence to suggest any sort of comparative advantage.

5.20 Table 18 provides a summary of the relative elements of these sub-sectors highlighting in green those elements where there is high potential, orange – medium potential and red – poor/low potential.

Table 18: EGS Sector Priorities.

Sub-Sector	International Potential	National potential	Political drive (UK)	East Midlands Supply	EM HE Capacity	Overall Importance for East Midlands
Air Pollution						
Environmental Consultancy						
Environmental Monitoring						
Marine Pollution Control						
Noise and Vibration Control						
Contaminated Land						
Waste Management						
Water Supply and Waste Water Treatment						
Recovery and Recycling						

Renewable Energy

5.21 **Hydro**

A1: No of Businesses which operate in	11	A2: No of Businesses for which this is their main sector	3	A3: of businesses which supply to	7
C3: Total number of sites (sample)	15	C4: Total number in employment (sample)	216		

(Source: ekosgen survey of LCEGS businesses)

5.22 Hydro is a relatively mature renewable energy sub-sector, predicted to experience a relatively slow growth rate. However, the UK renewable Energy Strategy highlights a small role in meeting the UK's renewable energy targets, particularly for micro and small scale developments. Only 11 businesses were identified as operating in this sector in the East

Midlands, with just 3 claiming that this was their main sector. For this reason this sector is of low importance to the region.

5.23 ***Wave and Tidal***

A1: No of Businesses which operate in	6	A2: No of Businesses for which this is their main sector	2	A3: of businesses which supply to	8
C3: Total number of sites (sample)	5	C4: Total number in employment (sample)	20		

(Source: ekosgen survey of LCEGS businesses)

5.24 This is a relatively small low value sector at present, but is forecast to offer longer-term opportunities as commercialisation takes place. The UK is forecast to be a dominant player in the wave power over the next five years as a result of a number of advances in wave technologies, combined with the UK's tidal resource and engineering capabilities. The East Midlands however, has a relatively small presence in this sector and therefore overall the sector is of med-low importance to the region.

5.25 ***Biomass***

A1: No of Businesses which operate in	45	A2: No of Businesses for which this is their main sector	17	A3: of businesses which supply to	30
C3: Total number of sites (sample)	50	C4: Total number in employment (sample)	2724		

(Source: ekosgen survey of LCEGS businesses)

5.26 The biomass sector is important both internationally and nationally, with its global value standing at approximately £140bn. It is a relatively diverse sector, covering several different types of technology and fuel, as well as a diverse supply chain covering agriculture as well as food and drink. This research found 45 companies operating in this sector in the East Midlands employing 2,724 people. The presence of the CREST centre at Loughborough, with its research into biomass CHP and the Energy Technology Research Institute at Nottingham University which focuses on the optimisation of crops to be used in energy production may present an important opportunities for the region's businesses. Therefore this sub-sector has been rated of high importance of the region.

5.27 **Wind**

A1: No of Businesses which operate in	35	A2: No of Businesses for which this is their main sector	13	A3: of businesses which supply to	36
C3: Total number of sites (sample)	27	C4: Total number in employment (sample)	5392		

(Source: ekosgen survey of LCEGS businesses)

5.28 Both on and offshore wind represent growing sectors worldwide. The onshore wind sector is relatively mature with established highly consolidated supply chains. The UK has an existing presence in this supply chain and the East Midlands shows existing comparative advantage here, with specialists in the manufacture of small wind turbines and a total of 35 businesses operating in the sector, employing 5,392. The offshore sector is still in the development phase and there are considerable opportunities in developing this sector. The East Midlands has a growing local market for both offshore and onshore wind and this could be an opportunity for local businesses. The knowledge base is strong in the East Midlands with the presence of both the Energy Technology Institute and Loughborough University's CREST centre, both undertaking research into the wind sector.

5.29 ***Geothermal/Heatpumps***

A1: No of Businesses which operate in	26	A2: No of Businesses for which this is their main sector	11	A3: of businesses which supply to	18
C3: Total number of sites (sample)	22	C4: Total number in employment (sample)	444		

(Source: ekosgen survey of LCEGS businesses)

5.30 The Geothermal sector is estimated to have a global value of approximately £9.22bn, but is predicted to grow strongly. In the UK, ground source heat is given a substantial role in meeting the UK Renewable Energy Strategy target of 12% heat from renewables by 2020. Political drivers include £6m for the exploration of deep geothermal power in the UK and the inclusion of ground source heat pumpt technology in the Code for sustainable homes. The industry has a large supply chain which contributes to the value of the sector. This research has found 26 businesses operating in this sector in the East Midlands.

5.31 ***Solar/Photovoltaic***

A1: No of Businesses which operate in	60	A2: No of Businesses for which this is their main sector	37	A3: of businesses which supply to	48
C3: Total number of sites (sample)	68	C4: Total number in employment (sample)	640		

(Source: ekosgen survey of LCEGS businesses)

5.32 This sector is one of the fastest growing globally, with a 70% increase in capacity in 2008 and an international market value of £141bn. The UK has a 3.12% share of this market and PV exports represent ¼ of all LCEGS exports from the UK. There is political drive for further installations in the UK, principally through the domestic sector through both solar thermal and photo-voltaic. This research found 60 businesses operating in the sector in the East Midlands, with a total of 640 people in employment. Both the CREST research centre at

Loughborough University and the Energy Technology Research Institute at Nottingham University have research groups examining thin film PV, PV materials and devices, low cost manufacturing processes and passive solar technologies. This body of research is an important opportunity for sector development in the region.

5.33 Table 19 shows the relative potential of the Renewable Energy sectors.

Table 19: Renewable Energy Sector Priorities

Sub-Sector	International Potential	National potential	Political drive (UK)	East Midlands Supply	EM HE Capacity	Overall Importance for East Midlands
Hydro						
Wave & Tidal						
Biomass						
Wind						
Geothermal						
Solar/PV						

Emerging Low Carbon

5.34 *Alternative Fuel Vehicles*

A1: No of Businesses which operate in	21	A2: No of Businesses for which this is their main sector	10	A3: of businesses which supply to	16
C3: Total number of sites (sample)	17	C4: Total number in employment (sample)	1560		

(Source: ekosgen survey of LCEGS businesses)

5.35 This sector includes both alternative fuels and alternative vehicles such as hybrid and electric vehicles, making it a globally important sector. Nationally it is proposed that the UK is poorly placed to make any significant contribution to the challenges of a technology shift towards low carbon power trains – largely because the relevant R&D is being conducted in the OEM home markets i.e outside the UK. However, it is considered that it will be possible to attract R&D to the UK through a long term large scale demand side intervention. Politically, there is considerable support for growth of this sector, with a package of measures to strengthen the sector introduced in 2009. Within the region, this research identified 21 companies employing 1,560 people. The region does however have a strong presence within transport equipment and therefore this might present an important niche opportunity. The presence of CENEX, the UK's first Centre of Excellence of low carbon and fuel cell technologies at the University of Loughborough and the Energy Technology Institute's Plug in

Vehicle Economics and Infrastructure project may provide important opportunities for the sector. Therefore, this is small but strategically important sub-sector for the region.

5.36 ***Additional Energy Sources***

A1: No of Businesses which operate in	6	A2: No of Businesses for which this is their main sector	2	A3: of businesses which supply to	4
C3: Total number of sites (sample)	4	C4: Total number in employment (sample)	205		

(Source: ekosgen survey of LCEGS businesses)

5.37 Fuel cells commercialisation is developing rapidly across the world, with a recent DTI/Carbon Trust report estimating that the global market potential will reach £14bn by 2011. The sector currently small in the UK, but expertise spans the length of the value chain from R&D to systems integration, financing and maintenance. The region has significant HEI capabilities in this area, including the home of Cenex, the UK's first national centre for low carbon and fuel cell technologies at Loughborough University, represents significant capacity for the region. This research found 6 businesses operating in the sector, including 2 for which this is their main sector. This sector is therefore small but strategically important sub-sector to the region.

5.38 ***Carbon Capture and Storage***

A1: No of Businesses which operate in	8	A2: No of Businesses for which this is their main sector	3	A3: of businesses which supply to	5
C3: Total number of sites (sample)	7	C4: Total number in employment (sample)	210		

(Source: ekosgen survey of LCEGS businesses)

5.39 This is a new and potentially globally important sector. The International Energy Agency estimates that CCS will need to be installed on the equivalent of 630 coal-fired power plants by 2030 in order to meet global carbon dioxide reduction targets. If the technology is proven, the sector has significant growth potential in the UK. Significant opportunities exist for UK suppliers of capital goods to the power generation industry. The UK has a strong manufacturing and R&D base in the sector and the capability to supply a number of the major systems, subsystems and components of an advanced coal fired plant. The East Midlands is home to 30% of the UK's coal fired power station output and may be the home of one of the first demonstration projects (Killingholme). The region has significant HEI capacity in this area being the home to the Centre for Innovation in Carbon Capture and Storage at the University of Nottingham. This research found 8 companies operating in this sector. This sector has been rated important to the region.

5.40 ***Energy Management***

A1: No of Businesses which operate in	304	A2: No of Businesses for which this is their main sector	149	A3: of businesses which supply to	251
C3: Total number of sites (sample)	219	C4: Total number in employment (sample)	9782		

(Source: ekosgen survey of LCEGS businesses)

5.41 This sector includes energy saving, lighting, heating, ventilation and electrical equipment. It is therefore a relatively mature sector and encompasses the likes of the household appliance industry. Demand for improvements in these technologies has been increasing and is largely driven by regulation such as building regulations, the Carbon Emission Reduction Target and Energy labelling. This research found 304 businesses operating in this sub-sector, making it an important sub-sector for the region.

5.42 ***Carbon Finance***

A1: No of Businesses which operate in	10	A2: No of Businesses for which this is their main sector	1	A3: of businesses which supply to	3
C3: Total number of sites (sample)	11	C4: Total number in employment (sample)	596		

(Source: ekosgen survey of LCEGS businesses)

5.43 Carbon finance is an emerging sector supporting the trade in carbon emissions. The London-based emissions trading exchange leads the world and is more than twice as active as its nearest competitor. Innovas estimate that the international market value of this sub-sector stands at £31bn and is forecast to grow rapidly. Within the UK however, London dominates the market, accounting for 96.6% of sectoral GVA. This research found 10 companies operating in this sector, but only one describing it as their main sector. This sector has been rated of medium- low importance for the region.

5.44 ***Building Technologies***

A1: No of Businesses which operate in	293	A2: No of Businesses for which this is their main sector	203	A3: of businesses which supply to	280
C3: Total number of sites (sample)	196	C4: Total number in employment (sample)	3829		

(Source: ekosgen survey of LCEGS businesses)

5.45 This is a large and important sector, accounting for 1/5 of the total global LCEGS market. The Carbon Trust estimates that buildings alone account for around 40% of the UK's carbon emissions. The Government has indicated that change is needed and will be driven by climate change regulations. The region is home to the Institute of Sustainable Energy

Technology at Nottingham University which undertakes research into renewable and sustainable technologies in buildings. This research has found 293 businesses operating in this sector, with 203 stating that this was their main sector. The RDA is already working with this sub-sector through the iNET for Sustainable Construction which facilitates delivery of training in low carbon construction skills and innovation to industry. This sector has been rated highly important to the region.

5.46 ***Electricity Generation***

A1: No of Businesses which operate in	102	A2: No of Businesses for which this is their main sector	40	A3: of businesses which supply to	83
C3: Total number of sites (sample)	65	C4: Total number in employment (sample)	4064		

(Source: ekosgen survey of LCEGS businesses)

5.47 This is an established sector which is forecast to grow significantly in the next 20 years as demand for electricity generating capacity increases. At the national level, the industry faces substantial challenges in ensuring delivery of new generating capacity that will be needed if Britain is to maintain security of supply at current levels. There will be substantial demand for both replacement plant and renewables, as well as appropriate back-up facilities to deal with intermittency and an upgraded transmission network. The region has a number of centres of expertise in this area such as the University of Leicester and the University of Loughborough. This research found 102 businesses currently operating in the sector and as such it has been rated highly important to the region.

5.48 ***Civil Nuclear***

A1: No of Businesses which operate in	116	A2: No of Businesses for which this is their main sector	52	A3: of businesses which supply to	114
C3: Total number of sites (sample)	57	C4: Total number in employment (sample)	8217		

(Source: ekosgen survey of LCEGS businesses)

5.49 This is a globally and nationally important sector, with important opportunities in the next 20 years. The white paper on Nuclear power set out a clear role for nuclear power to play a key role in the country's future energy mix. The presence of Rolls Royce in the region with its supply chain, makes this an important sector for the region, although the choice of the NW and Yorkshire as the nuclear low carbon economic area may have an impact on the future opportunities available to the sector in the region.

5.50 Table 20 highlights the strengths and weaknesses within the Emerging Low Carbon sector.

Table 20: ELC Sector Priorities

Sub-Sector	International Potential	National potential	Political drive (UK)	East Midlands Supply	EM HE Capacity	Overall Importance for East Midlands
Alternative Fuels - Vehicles						
Fuel Cells						
CCS						
Carbon Finance						
Energy Management						
Building Technologies						
Electricity Generation						
Civil Nuclear						

6 Conclusions and Recommendations

6.1 This research found 2,100 businesses operating or supplying into the LCEGS sector in the East Midlands. This represents a minimum size of the sector. We are confident that we have identified a large proportion of those businesses for which this sector is their main business area. We also found 481 (of the 2,100) businesses which operate in this area, but do not consider it to be their main business area. These tended to be in manufacturing, engineering or construction. We expect that this figure is an under-estimate of the number of businesses that fall into this group, as these businesses are much harder to find.

6.2 The research found a lower proportion of businesses in the Renewable Energy and Emerging Low Carbon sectors than expected. There are two potential reasons for this difference:

- That the Innovas model went much further down the supply chains for these sectors than was possible through a bottom up approach. However, if this were the case, we would have expected the Innovas research to have found a higher number of businesses in all sub-sectors. This research found a higher number of Environmental Goods and Services businesses than was estimated by Innovas, but a lower number of Renewable Energy and Emerging Low Carbon businesses.
- That despite a multi-stranded search methodology, the research failed to capture 100% of these businesses. It is likely that renewable energy and emerging low carbon businesses are 'hiding' in other sectors such as engineering, manufacturing or construction.

6.3 Whilst the in-depth survey was not a random sample, the messages coming from this survey provide some useful insights into the sector and its current capacity for growth. These are:

- 74% of businesses were planning to grow either moderately or substantially over the next 3 years a really positive finding given the current economic climate.
- The sector has a wide geographical scope, 49% of companies working nationally and 29% serving international markets. This is an important finding as it illustrates that the sector is able to benefit from both national and global opportunities and whilst regional market opportunities are important, national and international opportunities are equally relevant.
- Businesses exhibit good levels of collaborative working both through informal channels and more formal arrangements, with a good understanding of the potential business benefits. There was a stronger demand for deeper levels of collaboration

such as formal business partnerships and joint ventures, suggesting there might be a good appetite for interventions that help businesses to work more collaboratively.

- Likewise, technology and R&D were also important to the sample, with 35% engaging in R&D continuously;
- In terms of skills and employment, recruitment difficulties appear to be low, with only 4% of businesses reporting recruitment difficulties for particular occupations. Businesses were most likely to train staff in trade and professional skills and were most likely to use private training agencies or consultancies than other types of provider.

6.4 These results show quite clearly that this sector is professional in its management and organisation and has clear capacity to delivery regional economic benefit resulting from the growth of the low carbon economy.

6.5 The research also included a sub-sectoral market analysis for each of the 23 sub-sectors covered in the research. This desk research reviewed both international, national and regional opportunities, as well as political drivers and higher education capacity in the region. The research was designed to help emda identify particular sub-sectors where there is regional strength, as well as provide emda with a thorough market analysis for each sub-sector. The research found that whilst the environmental goods and services sector is large in the region, it is serving a relatively mature market, with little evidence of enhanced regional capacity, either within the business base or higher education. Within renewables and emerging low carbon, the research found that whilst these sub-sectors were often small in size, they are expected to grow strongly and are supported by significant higher education or other research capacity in the region. This makes sectors such as biomass, wind and solar/PV, Carbon Capture and Storage, Energy Management, Building Technologies, Electricity Generation and Civil Nuclear strategically important to the region.

6.6 This provides an guide to the sectors where there are likely to be the greatest/most significant opportunities, however, it is also important to recognise that at the individual business level, there are likely to be businesses outside of these sectors which provide major opportunities for growth of the sector. The database of businesses and their individual survey responses provides a unique opportunity to identify high growth potential businesses in the sector.

6.7 ***Recommendation 1:*** Emda may wish to consider using its existing channels into these linked sectors (i.e. manufacturing, engineering and construction) to identify and support businesses diversifying into the LCEGS sector and where appropriate add new businesses into the database.

6.8 ***Recommendation 2:*** emda may wish to conduct further analysis and work with businesses to explore the following intervention themes: Collaborative working and Exploiting national and international opportunities.

6.9 ***Recommendation 3:*** emda should recognises the different needs of the LCEGS sub-sectors and ensures its policies and interventions support the strategically important sub-sectors identified in this report.

6.10 ***Recommendation 4:*** Whilst sub sectors are important, high growth potential and pioneering businesses are likely to be found across the whole sector. emda should ensure that it maximises the opportunity resulting from this research by conducted a detailed business by business analysis of the database. This analysis should review each individual businesses response in terms of a number of variables and open ended questions set against the context of the opportunities and higher education capacity in the region to form a qualitative assessment of each business and its high growth potential. This should also seek out potential niche clusters, supply chains or potential collaborative partnerships which provide specific opportunities for the region to capitalise on.

6.11 ***Recommendation 5:*** The database provides a significant and valuable resource to emda in order to target interventions and benefit businesses. Emda may wish to consider options for maintaining this database in the future.

- Option 1 – The database remains in its current format, as and when new businesses are identified or come forward, a member of staff updates the database. On a periodic basis, emda emails/writes to businesses on the database to update information.

- Option 2 – The database is migrated onto an on-line searchable format where businesses are able to 'log-on' an update their own information as and when changes occur. Businesses could be provided with an option to 'show' their details in a public facing directory, providing an opportunity for businesses to market themselves through the website.

A. Sources used to supplement primary database

EGS Organisations
Environmental Industries Commission
Noise An Vibration Control Group
Association of Noise Consultants -
Association for Organics Recycling
Association of Marine Scientific Industries -
Society of Maritime Industries -
Society of British Water and Wastewater Industries
Gambica Association Ltd -
Domestic Water treatment Association
Renewable Organisations
British Wind Energy Association (BWEA)
British Hydropower Association
Renewable Energy Centre
Ground Source Heat Pump Association
Solar Trade Association
Micro-power council
Gemserv (clear Skies)
Renewable Energy Association
Better Generation.com
Association for the Conservation of Energy
Emerging Low Carbon
Real Assurance
Low Carbon Vehicle Partnership
CCS
Fuel Cells UK
UK Hyrdogen Association
UK Sustainable Development Association
Association for Environment Conscious Building
The Combined Heat and Power Association
National Insulation Association
Heat Pump Association
Nuclear Industry Association
Carbon Trust - published supplier list
Carbon Trust - Applied Research

B. Topic Guide

Introduction

Good morning/afternoon, my name is xxx, I am calling you today, on behalf of *emda* (the East Midlands Development Agency). *emda* would like to provide support and assistance to businesses in the low carbon environmental goods and services sector in order to support the sector to grow and develop. Your business has been identified as operating within the environmental goods and services sector or its supply chain. The purpose of this call is to check that this is the case. Are you able to talk to me about your companies products and services?

Section A: Filter Questions

A1. Do you operate in any of the following sectors? [select all that apply].

Environmental Goods and Services		**Renewable Energy**		**Emerging Low Carbon**		**Civil nuclear/ conventional power**	
Air Pollution	1	Hydro	10	Alternative Fuel Vehicle	17	Civil Nuclear	24
Environmental Consultancy	2	Wave and Tidal	11	Alternative Fuels	18	Conventional Power	25
Environmental monitoring, Instrumentation & Analysis	3	Biomass	12	Additional Energy Sources	19		
Marine Pollution Control	4	Wind	13	Carbon Capture & Storage	20		
Noise and Vibration Control	5	Geothermal	14	Carbon Finance	21		
Contaminated land	6	Renewable Energy	15	Energy Management	22		
Waste management	7	Photovoltaic	16	Building Technologies	23		
Water supply and waste water treatment	8						
Recovery and Recycling	9					***NONE (Go To A3)***	***26***

A2. Which is your main business area? [select one only]

Environmental Goods and Services		**Renewable Energy**		**Emerging Low Carbon**		**Civil nuclear/ conventional**	
Air Pollution	1	Hydro	10	Alternative Fuel Vehicle	17	Civil Nuclear	24
Environmental Consultancy	2	Wave and Tidal	11	Alternative Fuels	18	Conventional Power	25
Environmental monitoring, Instrumentation & Analysis	3	Biomass	12	Additional Energy Sources	19		
Marine Pollution Control	4	Wind	13	Carbon Capture & Storage	20		
Noise and Vibration Control	5	Geothermal	14	Carbon Finance	21		
Contaminated land	6	Renewable Energy	15	Energy Management	22		
Waste management	7	Photovoltaic	16	Building Technologies	23		
Water supply and waste water treatment	8						
Recovery and Recycling	9						

A3. Do supply at least 20% of your sales to any of these sectors? [select all that apply]

Environmental Goods and Services		**Renewable Energy**		**Emerging Low Carbon**		**Civil nuclear/ conventional**	
Air Pollution	1	Hydro	10	Alternative Fuel Vehicle	17	Civil Nuclear	24
Environmental Consultancy	2	Wave and Tidal	11	Alternative Fuels	18	Conventional Power	25
Environmental monitoring, Instrumentation & Analysis	3	Biomass	12	Additional Energy Sources	19		
Marine Pollution Control	4	Wind	13	Carbon Capture & Storage	20		
Noise and Vibration Control	5	Geothermal	14	Carbon Finance	21		
Contaminated land	6	Renewable Energy	15	Energy Management	22		
Waste management	7	Photovoltaic	16	Building Technologies	23		
Water supply and waste water treatment	8						
Recovery and Recycling	9					***NONE***	***26***

If Yes at A1, Go To Section B

If No at A1 and A3, Close and Thank.

Section B

As part of this research we would like to speak to a small selection of businesses in more depth to better understand your working practices and future plans.

This information will help *emda* gain a better understanding of the environmental businesses in the region, how you operate and can be supported to grow and develop. The information you provide will help emda to develop a strategy for the sector and devise projects and programmes of support for the industry. Therefore we would be really grateful for your participation and support.

We anticipate that this part of the survey will take approximately 20 minutes. Are you the best person to speak to me about this? Ideally I would like to speak to someone on the management team?

Are you happy to proceed with this now, or would you like me to call back at another time?

If change of interviewee – introduce project again…

Good morning/afternoon, my name is xxx, I am calling you today, on behalf of *emda* (the East Midlands Development Agency).

emda would like to provide support and assistance to businesses in the low carbon environmental goods and services sector in order to support the sector to grow and develop. Your business has been identified as operating within the environmental goods and services sector or its supply chain.

As part of this research we would like to speak to a small selection of businesses in more depth to better understand your working practices and future plans.

This information will help *emda* gain a better understanding of the environmental businesses in the region, how you operate and can be supported to grow and develop. The information you provide will help emda to develop a strategy for the sector and devise projects and programmes of support for the industry. Therefore we would be really grateful for your participation and support.

Freedom of Information Act

I just need to read you a brief statement about the Freedom of Information Act.

The East Midlands Development Agency (emda) as the ultimate owner of the data you provide to us is subject to the provisions of the Freedom of Information Act (the 'Act'). That means that if a third party asks emda for the data you provide, emda will disclose it, unless one of the exemptions from disclosure applies. The 2 exemptions likely to be most applicable to the data are those found in sections 41 and 43 of the Act. Section 41 allows emda to refuse to disclose information that was provided in confidence. Section 43 allows emda to refuse to disclose information that is deemed commercially sensitive, but only if it isn't in the public interest to disclose it nonetheless.

If you are providing data in confidence, please say so. In those circumstances, emda will not disclose such information unless required to do so by the Act or following a requestor's successful appeal to the Information Commissioner. If you feel that information is commercially sensitive, but not confidential, again please say so and emda will take your views into account before making any decision on disclosure.

B1. Do you understand this? Yes 1 No 2

Section C: About your business

The following questions relate to your business operations. We are principally interested in your operations in the East Midlands, this includes the counties of Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire and Rutland. Throughout the survey, could you please respond with respect to your operations in the East Midlands.

Deleted C1 and C2 – As they duplicated A1 and A2.

C3. How many sites do you have in the East Midlands?

C4. How many staff do you employ at your sites in the East Midlands? (Full Time Equivalent) (including yourself)

C5. In what year did your firm begin trading in the East Midlands?

C6. What is the legal status of your business?

Sole trader	1
Legal Partnership	2
Limited Company	3
Plc	4
Not for profit/charitable	5

C7. Which of the following bands does your turnover fall into?

£1-£49k	1
£50-99k	2
£100-249k	3
£250-499k	4
£500-999k	5

£1-£4.9m	6
£5m+	7

C8. Over the next 12months, do you anticipate that your turnover will:

Decrease	1
Stay the same	2
Increase	3

Section D. Management

In this section we are looking to explore your style and approach to management.

D1. Which of the following management tools and systems do you use or are planning to use:

Tool/system	**Currently Use**	**Plan to use**	**Do not plan to use**
Business Plan	1	2	3
Quality Management System	1	2	3
Environmental Management System	1	2	3
Performance related Pay	1	2	3
Use of financial indicators e.g. profit and loss, gearing etc.	1	2	3

D2. In the last 12 months has the management team reviewed plans in relation to [select all that apply]

Business Strategy	1
Management Organisation	2
Marketing	3
Market Research	4
Advertising	5
Public Relations	6
Product or Service Design	7
New Technology	8

Computer Services	9
Staff Recruitment	10
Staff Training and Development	11
Taxation and Financial Management	12
None of the above	13

D3. From which of the following external sources have you obtained business advice: [select all that apply]

Accountant	1
Solicitor	2
Bank	3
Business Friend/Relative	4
Customers	5
Suppliers	6
Consultants	7
Chambers of Commerce	8
Trade/Professional Associations	9
Business Link	10
None of the above	11

Section E. Growth plans

In this section we are looking at your plans for growth.

E1. Would you describe your expansion plans over the next 3 years to be:

Become smaller	1	Go to E4
Stay the same	2	Go to E4
Grow moderately	3	Ask E2
Grow Substantially	4	Ask E2

E2. And in what ways are you planning to grow the business? Are you planning to [select all that apply]

Move into new markets	1
Introduce more products or services	2
Increases sales with the existing	3

products or services	
Take on more employees	4
Strategic Sourcing	5
International trade	6
Strategic Partnering	7
Other (specify)	8

E3. Which of these is the most important to your growth plans? [select **one** only]

Move into new markets	1
Introduce more products or services	2
Increases sales with the existing products or services	3
Take on more employees	4
Strategic Sourcing	5
International trade	6
Strategic Partnering	7
Other (specify)	8

NOW GO TO F1

ASK ALL NOT PLANNING TO GROW (CODE 1-2) AT E4

E4. And why are you not planning to grow the business? Is it...

Happy with the size we are	1
Have been growing recently	2
Looking to reduce hours worked	3
Don't have the resources	4
Reluctant to take on more staff	5
Reluctant to take on more borrowing	6
Want to stay below VAT threshold	7
Something else (specify)	8

Section F – Markets

This section covers the key characteristics of your business in terms of its suppliers, customers and competitive situation.

F1: In which areas do you feel your main competitive advantage lies?

	Insignificant advantage	Slightly significant advantage	Moderately significant advantage	Very significant advantage	Crucial Advantage
Price	1	2	3	4	5
Marketing and Promoting Skills	1	2	3	4	5
Speed of service	1	2	3	4	5
Established reputation	1	2	3	4	5
Cost advantages	1	2	3	4	5
Product or service quality	1	2	3	4	5
Specialised expertise/product/service	1	2	3	4	5
Range of expertise/product/service	1	2	3	4	5
Flair and creativity	1	2	3	4	5
Personal attention and responsiveness to client needs?	1	2	3	4	5

F2. Within the main sector you operate in (main sector identified in Section A) How do you rate the opportunities for growth?

Poor	1
Moderate	2
Strong	3

F3. Within the main sector you operate in (main sector identified in q 1) what are the key market opportunities for growth?

F4. In what ways do you identify new business opportunities? [tick all that apply]

Advertising	1
Working with collaborators	2
Customer Account Management	3
Networking Events	4
Newsletters and marketing material	5
PR	6
Other (specify)	7

F5. What is the limit of geographical area that your market extends to?

East Midlands	1	Go to G1
UK	2	Go to G1
Europe	3	Ask F6
Rest of world	4	Ask F6

F6, how many countries are you exporting to?

Section G: Working with Others

G1. Which of the following business to business opportunities do you engage with or are interested in engaging with?:

	Currently engage	**Would like to engage**	**Would not like to engage**
Informal networking opportunities.	1	2	3
Formal networking arrangements e.g. trade associations, chambers of commerce etc.	1	2	3
Working in a collaborative supply chain relationship	1	2	3

Co-operate with another business in a limited specific way	1	2	3
Set-up a separate joint venture business (new company)	1	2	3
Business partnership (limited liability partnership)	1	2	3

G2. Which of the following other types of organisations are you engaged with?

Knowledge Transfer Partnerships	1
Universities/FE colleges	2
Innovation Networks	3
Carbon Trust	4
UKTI	5
Business Link	6
Trade Associations (please list)	7
Train2Gain	8
None of the above	9

G3. If you have entered into collaborative arrangements, were there designed to:

Share Research and Development Activity	1
Expand the range of expertise or products offered to customers	2
Assist in management and staff development	3
Improve financial and market credibility	4
Assist in the development of spcialist services/products required by customers	5
Gain access to or spread costs of new equipment or information sources	6
Help to keep current customers	7
Provide access to new UK markets	8
Provide access to overseas markets	9
Not entered into collaborative arrangements	10

Section H – Technology

H1. To what extent is technology and R&D important to your company?

Not at all important	1
Moderately important	2
Quite Important	3
Very Important	4

H2. Does your firm engage in R&D

Continuously	1
Occasionally	2
Never?	3

H3. What proportion of your turnover is spent on R&D?

H4. Are there technological areas where you would say you were developing pioneering technologies?

Yes	1	Ask H5
No	2	Go to H6

H5 If yes, what are these..

H6. Which of the following forms of Intellectual Property Protection do you hold, or are applying for:

Patents	1
Copyrights	2
Design Rights	3
Trade marks	4
None of the above	5

Section I. Skills

I1. A) What numbers of your workforce are currently employed in the occupation groups listed below?

B) Could you please also indicate if you are currently finding it difficult to recruit suitable employees in a particular occupation group?

	a) Write in no of workforce		***b) Difficulty recruiting?***
	Full Time	***Part Time***	***(Yes/No)***
Skilled manual			
Clerical & administrative			
Technicians & lower professionals			
Technologists, scientists & higher professionals			
Managerial			

I2. Are you facing specific skills shortages currently?

Yes	1	Ask I3
No	2	Go to I4

I3 In relation to trade and professional skills – what are the main skills gaps?

I4 In what areas have you undertaking staff training in the last 12months or plan to in the next 12 months? [Tick all that apply]

	Undertaken training	*Plan to undertake*	*Not undertaken or planning to undertake*
ICT	1	2	3
Trade or professional skills	1	2	3
Marketing	1	2	3
Business Planning	1	2	3
Other management skills	1	2	3
Product Development	1	2	3
Numeracy	1	2	3
Literacy	1	2	3
Languages other than English	1	2	3

I5. In providing training for your staff, which of the following organisations have you used? [Tick all that apply]

University/Institute of Higher Education	1
Colleges of Further education/Technical Colleges	2
Private Training Agencies/Consultancies	3
Chambers of Commerce	4
Voluntary Organisations	5
Professional Associations	6
Trade Associations	7
Equipment Suppliers	8

I6 Do you have a system for identifying training needs:

Company Training Needs Analysis	1
Formal Appraisals	2
Informally	3
No specific Method.	4

I7 Are you signed up to the skills pledge?

(Note to interviewers, the Skills Pledge is a formal commitment to train staff)

Yes	1
No	2

I8 Have you used Train to Gain advisors and funding?

Yes	1
No	2

Section J: Supply Chain

J1. Can you identify the names of 3 other regional businesses that form part of your supply chain and what they supply you with? For interviewer reference: We may use this information to survey these businesses

	Name	What they supply
Business 1		
Business 2		
Business 3		

Section J - Closure

J1, Your name

J2. Job Title

J3. What is your email address (or company address)

J4. Does your company have a website and if so, can I have the web address?
Record – web address

J5. May we contact you again with regards to this survey if any queries should arise?

Yes	1
No	2

On behalf of theEast Midlands Development Agency, I would like to thank-you for your participation in this research. As previously discussed, the information will be held by *emda* on an internal database. With respect to the Freedom of Information Act, can I just confirm,

J6. Have any of your answers been given to me been given in confidence? If so, which questions?

Yes (specify)	1
No	2

J7. Do you consider any of the information you have provided to be commercially sensitive? If so, which questions?

Yes (specify)	1
No	2

Thank-you and Close

C. Scoring System

Table 21: Scoring process to produce combined indicators.

Business Area	Questions Used in combined indicator	Scoring process
Technology	H1: To what extent is technology and R&D important to your company?	Not at all important = 0 points, Moderately Important = 1 point, Quite Important = 2 points, Very Important = 3 Points.
	H2: Does your firm engage in R&D?	Never = 0, Occasionally = 1, Continuously = 3.
	H4: Are there technological areas where you would say you were developing pioneering technologies?	Yes = 1, No = 0
	H6: Which of the following forms of Intellectual Property do you hold, or are applying for?	1 point for each form. *The scores from H1, H2, H4 and H6 were then summed to produced a combined indicator which was then converted into a percentile.*
Management	D1. Which of the following management tools and systems do you use or are planning to use…	Tool or system currently used = 1 point. Plan to use = 0.5points and Do not plan to use = 0 points.
	D2. In the last 12 months has the management team reviewed plans in relation to…	Each issue reviewed scored 1 point. *The points from both questions were summed to produce to produced a combined indicator which was then converted into a percentile.*
Growth	E1. Would you describe your expansion plans over the next 3 years to be..	Become smaller = 0, Stay the same = 1, Grow moderately = 2, Grow Substantially = 3
	F2. Within the main sector you operate in, how do you rate the opportunities for growth?	Poor = 1, Moderate = 2, Strong = 3 *The scores from questions E1 and F2 were then multiplied together to produce a combined indicator, which was then converted into percentiles.*
Collaboration	G1: Which of the following business to business opportunities do you engage with or are interested in engaging with?	All opportunities 'currently engaged' with were scored 1, ' would like to engage' scored 0.5 and 'would not like to engage' scoring 0.
	G2: Which of the following other types of organisations are you engaged with?	Each type of organisation selected was scored 1. *The results from each question were summed to produce a combined indicator, which was then converted into a percentile.*

Business Area	Questions Used in combined indicator	Scoring process
Skills	I4. In what areas have you undertaken staff training in the last 12 months or plan to in the next 12 months.	Each area where training has been undertaken was scored 1, where it is planned was scored 0.5 and not planning scored 0.
	I6: Do you have a system for identifying training needs?	Company Training Needs Analysis = 3, Formal Appraisals = 2, Informally = 1 and No specific method = 0.
	I7: Are you signed up to the Skills Pledge	Yes = 2, No = 0
	I8: Have you used Train to Gain advisors and funding	Yes = 2, No = 0. The results of the scoring for questions I4, I6, I7 and I8 were summed to produce a combined score, which was converted into a percentile.

D. Breakdown of Sample by SIC code

Count of SIC 1992 Description			
SIC 1992 Description	Database confirmation	Full interview	Grand Total
Agents involved in the sale of fuels, ores, metals and industrial chemicals	1		1
Architectural and engineering activities and related technical consultancy	173	199	372
Collection, purification and distribution of water	20	31	51
Construction of water projects	2	2	4
Demolition and wrecking of buildings; earth moving	18	2	20
Electricity transmission, distribution and supply	11	9	20
General construction of buildings and civil engineering works	11	3	14
General mechanical engineering	2		2
Installation of electrical wiring and fittings	10	4	14
Insulation work activities	19	19	38
Manufacture of accumulators, primary cells and primary batteries	5	4	9
Manufacture of basic iron and steel and of ferro-alloys (ECSC)		1	1
Manufacture of builders' carpentry and joinery	4	1	5
Manufacture of builders' carpentry and joinery of metal	12	3	15
Manufacture of central heating radiators and boilers	6	7	13
Manufacture of compressors	1	2	3
Manufacture of electric motors, generators and transformers	5	11	16
Manufacture of electrical equipment for engines and vehicles not elsewhere classified	8	12	20
Manufacture of electronic instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	11	4	15
Manufacture of flat glass	3	4	7
Manufacture of gas; distribution of gaseous fuels through mains	5	4	9
Manufacture of lifting and handling equipment	2	2	4
Manufacture of light metal packaging		1	1
Manufacture of lighting equipment and electric lamps	1		1
Manufacture of machine tools	1	2	3
Manufacture of motor vehicles	4	2	6
Manufacture of non-domestic cooling and ventilation equipment	11	11	22
Manufacture of office machinery	5	4	9
Manufacture of other chemical products not elsewhere classified	12	13	25
Manufacture of other general purpose machinery not elsewhere classified	3		3
Manufacture of other plastic products	47	25	72
Manufacture of other rubber products	8	9	17
Manufacture of plastic packing goods	66	59	125
Manufacture of plastics in primary forms		3	3
Manufacture of pumps	18	15	33
Manufacture of radio and electronic capital goods	5	3	8
Manufacture of taps and valves	5	10	15
Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1	1	2
Mineral oil refining	2		2
Other business activities not elsewhere classified	5	3	8
Other computer related activities	6	3	9

Other construction work involving special trades		2	2
Other retail sale in specialised stores not elsewhere classified		1	1
Other supporting water transport activities	1		1
Painting and glazing	14	9	23
Plumbing	4	7	11
Recycling of metal waste and scrap	7	3	10
Recycling of non-metal waste and scrap	2	4	6
Research and experimental development on natural sciences and engineering	15	28	43
Service activities incidental to oil and gas extraction excluding surveying	6	9	15
Sewage and refuse disposal, sanitation and similar activities	61	42	103
Shaping and processing of flat glass	4		4
Technical testing and analysis	2	1	3
Wholesale of electrical household appliances and radio and television goods	1	5	6
Wholesale of hardware, plumbing and heating equipment and supplies	14	28	42
Wholesale of other intermediate products	1	1	2
Wholesale of waste and scrap	221	120	341
Wholesale of wood, construction materials and sanitary equipment	2	6	8
(blank)			
Grand Total	884	754	1638