# Greater Birmingham and Solihull LEP

## Low Carbon Environmental Goods and Services Market Snapshot

**Midlands Energy Hub**
2017/18 to 2019/20

**Final Report March 2021**
kMatrix Data Services Ltd

kMatrix

MIDLANDS ENERGY HUB

sustainability west midlands

# Disclaimer

## kMatrix

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## Midlands Energy Hub

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# Project Overview

The Low Carbon and Environmental Goods and Services sector study was commissioned by Nottingham City Council on behalf of the Midlands Energy Hub, sponsored by the Department of Business, Energy and Industrial Strategy (BEIS), and its stakeholders across the Midlands including the Local Enterprise Partnerships (LEPs) and Local Authorities.

The study was commissioned in November 2020 and awarded to kMatrix Data Services Ltd and Sustainability West Midlands, with the aim of understanding the current state of the sector, where support is needed to help grow the sector across the Midlands from a Local Authority level to a regional level and the role the sector can play to drive a low-carbon recovery from Covid-19.

The UK has a clear commitment to clean growth, where the economy continues to grow while reducing greenhouse gas emissions. The commitments are set out in the Industrial Strategy and the Clean Growth Strategy. The UK has a strong record of clean growth, cutting carbon emissions by 42% between 1990 and 2015, while experiencing a 67% increase in GDP during the same period, in contrast to the G7 emissions reduction of 3% and GDP increase of 61%[1]. This has been achieved through a variety of strategies including improved energy efficiency, increased recycling of waste products and improved automobile engine technology, with the largest contribution in reduction of emissions from the decarbonisation of power. The UK now has the largest installed offshore wind capacity in the world[2].

Although the UK is arguably a world leader in clean growth, there is an ongoing need for further development across multiple sectors to deliver on the low carbon economy commitments both local and central government are pursuing. LEPs in the Midlands are fully cognizant of the need to support and further develop the green economy, as set out in their Energy Strategies and Local Industrial Strategies.

The study is grounded in evidenced data provided by the kMatrix big data analytical tool, which has been used to inform the nature of the sector across the Midlands region, in a number of sub-sectors. The data has been used alongside desk research, documentation review, stakeholder engagement and collaboration with partners and the awarding authority to produce a series of reports constituting an evidence base of both quantitative and qualitative evidence. This evidence not only informs policy recommendations as an integral part of the study, but also acts as a baseline from which progress can be measured post Covid-19 and into the future.

The study involved the production of a quantitative evidence base led by kMatrix and a qualitative evidence-base led by Sustainability West Midlands with findings from each workstream enriching the evidence of the other. By full collaboration between partners, the project steering group and stakeholders, the evidence base produced by the project delivers a comprehensive overview of the LCEGS market, with detailed information at the LEP and Local Authority levels. The wider relevance to the green recovery and national commitment to net zero by 2050 have been considered throughout the work and are integral to the policy recommendations and growth forecasts made during the study.

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf

[2] https://gwec.net/global-figures/global-offshore/

# Report Introduction

This report is one of a series which quantify the LCEGS sector for the MEH as a region and from the perspective of the nine LEPs which comprise the MEH. The data in this report are produced using the kMatrix Big Data Analytical Tool, with full methodology paper delivered to the MEH.

The MEH Regional analysis of the LCEGS sector, at the Local Authority level is available in a separate report. The data in this report is specifically for the Greater Birmingham and Solihull Local Enterprise Partnership (LEP) and constituent Local Authorities. The reason for this delineation is the presence of some Local Authorities in more than one LEP, for example Hinckley and Bosworth is served by both Coventry and Warwick LEP and Leicester and Leicestershire LEP. Likewise, Bromsgrove, Redditch and Wyre Forest are all served by both Greater Birmingham and Solihull LEP and Worcestershire LEP. The purpose of the data at the LEP-level is to provide the individual LEPs with a snapshot of the LCEGS sector within the geographical area they serve, regardless of whether the Local Authorities within their boundaries are also served by other LEPs. To avoid the issue of double counting, the data at the Regional and LEP-level have been segregated, except for limited LEP-level data being available in the Regional report for growth rate comparison.

Alongside the data evidence-base is a qualitative evidence base including literature review and stakeholder engagement with 1-2-1 interviews and workshops. Both the data produced by kMatrix and the qualitative findings of Sustainability West Midlands have fed into the research and production of all reports.

The full list of reports available through this project include:

- Midlands Region Low Carbon Environmental Goods and Services Market Snapshot
- Black Country Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Coventry and Warwick Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- D2N2 Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Greater Birmingham and Solihull Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Greater Lincolnshire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Leicester and Leicestershire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Marches Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Stoke and Staffordshire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Worcestershire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Midlands Energy Hub Low Carbon Environmental Goods and Services Covid Impact Report
- Literature review & excel spreadsheet
- Stakeholder report
- Low Carbon Environmental Goods and Services Recommendations Report
- Midlands Energy Growth Forecast, Low Carbon Environmental Goods and Services Growth Forecast for Net Zero 2030 and 2050

# Local Authorities within the Greater Birmingham and Solihull LEP

This report includes local authority-level data, to allow deep disaggregation within the LEP area. For clarity of data visualization, the names of many local authorities have been shortened. The formal names and shortened labels of the local authorities within the Greater Birmingham and Solihull Local LEP are listed below:

| Formal name | Shortened label |
|---|---|
| Birmingham City C | Birmingham |
| East Staffordshire BC | East Staffordshire |
| Lichfield DC | Lichfield |
| Solihull BC | Solihull |
| Cannock Chase DC | Cannock Chase |
| Tamworth BC | Tamworth |
| Redditch BC | Redditch |
| Bromsgrove DC | Bromsgrove |
| Wyre Forest DC | Wyre Forest |

# Table of Contents

# Executive Summary

Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services (LCEGS) sector was worth £6.3bn to the Greater Birmingham and Solihull LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 2,800 businesses that employed 48,000 people in the sector in 2019/20.

### Sales and growth

The Low Carbon and Environmental Goods and Services sector in the Greater Birmingham and Solihull LEP grew year on year since 2017/18. In 2017/18 total sales in the sector were worth £5.5bn and have now reached £6.3bn in 2019/20.

The sector in the Greater Birmingham and Solihull LEP grew by 6.6% during the financial year 2017/18 to 2018/19 and 7.6% during 2018/19 to 2019/20. This rate of growth is stronger than the MEH average (5.2% and 5.9% respectively), but slower than the UK average for the same period (10.0% and 8.1% respectively), however, the fast rate of growth in London raises the UK average.

### Employment

Employment in Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was 48,322, up from 41,408 in 2017/18. Annual growth rate in employment was 11.0% between 2017/18 and 2018/19 and 5.2% between 2018/19 and 2019/20. This rate of growth is stronger than the MEH average (5.7% and 5.0% respectively) and compares with the UK average for the same period (9.4% and 7.3% respectively) however, the fast rate of growth in London raises the UK average.

### Companies

The number of companies in Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was 2,864, up from 2,455 in 2017/18. Annual growth rate in the number of companies was 3.6% between 2017/18 and 2018/19 and 12.7% between 2018/19 and 2019/20. This rate of growth is stronger than the MEH average (3.7% and 6.9% respectively) and compares with the UK average for the same period (9.3% and 10.3% respectively) however, the fast rate of growth in London raises the UK average.

### Greater Birmingham and Solihull LEP's sub-sectors

In 2019/20 Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services sector was made up by the following proportions: Low Carbon 40%, Renewable Energy 39% and Environmental 21%.

### Greater Birmingham and Solihull LEP's sub-sector strengths

The six largest sub-sectors in the Low Carbon and Environmental Goods and Services sector by sales account for 70% of the Greater Birmingham and Solihull LEP's total sales and are made up of:

- Wind (£1.0bn) – this includes control systems development and manufacture, drive train development, manufacture and systems integration, consulting houses and companies providing power firming systems and services, maintenance services and grid integration services
- Building Technologies (£947m) - this includes head office functions, building systems design and consultancy and building systems providers and installers
- Alternative Fuels (£856m) – this includes R&D functions, alternative fuel providers, designers and consultancy, process implementation, sales and accounting and application development specialists

- Photovoltaic (£655m) - this includes head office functions, systems developers, providers and installers.
- Water & Waste Water Treatment (£455m) - development and implementation by utilities along with supply, consultancy and implementation by independent consulting engineers
- Biomass (£452m) - this includes systems development, supply, implementation and R&D

The next six largest sub-sectors by sales account for a further 26% of Greater Birmingham and Solihull LEP's total sales and are made up of:

- Waste Management (£403m) - this includes process development and new process implementation and consulting, public and private operations management and supply and installation of operational equipment
- Alternative Fuel Vehicle (£341m) - include selling agencies, alternative fuel development companies and consulting and applications development for vehicle conversion specialists
- Recovery and Recycling (£325m) – this includes waste collection, glass stock processing and paper feedstock processing
- Geothermal (£271m) - this includes branch office functions, design, international consultancy, lateral geothermal systems providers and installers at the domestic and small commercial level and vertical control systems developers and suppliers
- Carbon Finance (£134m) - this includes Carbon finance consultancies
- Energy Management (£131m) – this includes registered gas engineers, measurement and control systems and fitting and maintenance

### Sub-sector growth

Greater Birmingham and Solihull LEP's six largest sub-sectors by sales have all enjoyed high levels of growth in sales, number of employees and number of companies between 2017/18 and 2019/20:

- Wind – sales have grown from £894m to £1.0bn (14.5%), number of employees by 16.6% and number of companies by 16.9%
- Building Technologies – sales have grown from £826m to £947m (14.7%), number of employees by 16.7% and number of companies by 17.0%
- Alternative Fuels – sales have grown from £747m to £856m (14.6% increase), number of employees by 16.9% and number of companies by 16.8%
- Photovoltaic – sales have grown from £572m to £655m (14.5% increase), number of employees by 16.8% and number of companies by 16.0%
- Water & Waste Water Treatment – sales have grown from £397m to £455m (14.7% increase), number of employees by 16.8% and number of companies also by 16.1%
- Biomass – sales have grown from £394m to £452m (14.7% increase), number of employees by 16.9% and number of companies by 17.0%

Sub-sectors which saw stronger growth than the UK average between 2017/18 and 2019/20 include:

- Energy Management with 14.8% (MEH 11.4%, UK 5.7%)
- Building Technologies with 14.7% (MEH 11.5%, UK 13.7%)
- Waste Management with 14.7% (MEH 11.2%, UK 12.6%)
- Air Pollution with 14.7% (MEH 11.4%, UK 5.8%)
- Water and Waste Water Treatment with 14.7% (MEH 11.3%, UK 12.7%)
- Contaminated Land Reclamation and Remediation with 14.7% (MEH 11.4%, UK 1.0%)
- Alternative Fuels with 14.6% (MEH 11.4%, UK 13.8%)
- Recovery and Recycling with 14.5% (MEH 11.3%, UK 13.7%)
- Alternative Fuel Vehicle with 14.5% (MEH 11.4%, UK 5.7%)
- Environmental Monitoring with 14.5% (MEH11.3%, UK 12.2%)
- Renewable Energy General Consultancy with 14.4% (MEH 11.3%, UK 10.8%)

- Hydro with 14.2% (MEH 11.0%, UK 1.8%)
- Marine Pollution Control with 13.8% (MEH 11.4%, UK12.7%)

Sub-sectors which saw weaker growth than the UK average between 2017/18 and 2019/20 include:

- Noise & Vibration Control with 14.7% (MEH 11.4%, UK 23.3%)
- Carbon Capture & Storage with 14.6% (MEH 11.3%, UK 19.0%)
- Biomass with 14.7% (MEH 11.3%, UK 28.2%)
- Geothermal with 14.5% (MEH 11.3%, UK 18.8%)
- Photovoltaic with 14.5% (MEH 11.3%, UK 24.3%)
- Wave & Tidal with 13.8% (MEH 11.2%, UK 24.9%)
- Wind with 14.5% (MEH 11.3%, UK 42.2%)

### Investment in R&D

Investment in R&D within Greater Birmingham and Solihull LEP grew in all three categories of investment between 2017/18 and 2019/20:

- Private Equity Investment in R&D grew 22.7% from £260m in 2017/18 to £319m in 2019/20
- Venture capital Investment in R&D grew 28.2% from £511m in 2017/18 to £655m in 2019/20
- Other Investment in R&D grew 25.7% from £763m in 2017/18 to £959m in 2019/20

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size
- Waste Management has stronger growth than the UK and significantly above average market size
- Water & Waste Water Treatment has slightly strong growth than the UK and significantly above average market size
- Building Technologies has similar growth to the UK and above average market size
- Photovoltaic has weaker growth than the UK, but significantly above average market size
- Biomass has weaker growth than the UK, but significantly above average market size
- Contaminated Land has a stronger growth than the UK average, but below average market size
- Hydro has a stronger growth than the UK average, but below average market size
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size
- Air Pollution has a stronger growth than the UK average, but below average market size

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size
- Wave & Tidal has weaker growth than the UK and below average market size

Additional Note

- Carbon Finance has weaker growth than the UK and below average market size, but is the only LEP to contain Carbon Finance within the MEH region. Carbon Finance is dominated by London and should not be considered a weakness.

### Scalability of sub-sectors

Scalability of the sub-sectors within the Greater Birmingham and Solihull LEP is variable and when combined with GVA, strengths include:

- Carbon Finance with reasonable GVA and extremely good Scalability (stronger position than the MEH average)

- Photovoltaic good Scalability and good GVA (stronger position than the MEH average)
- Water and waste Water Treatments with good GVA and medium Scalability
- Renewable Energy General Consultancy with good Scalability but small GVA
- Waste Management with medium Scalability and good GVA (stronger position than the MEH average)
- Energy Management with reasonable GVA and medium Scalability (stronger position than the MEH average)

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Greater Birmingham and Solihull LEP being 8.6% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 36.0% (MEH 35.7%)
- Power Distribution Engineers 29.2% (MEH 29.8%)
- Technicians 22.0% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.3% (MEH 6.3%)
- Specialist or Consultant 3.5% (MEH 3.3%)
- Administrative Workers 2.2% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Greater Birmingham and Solihull LEP at Level 1:

- Low Carbon 10.3% (MEH 10.5%)
- Renewable Energy 6.9% (MEH 7.0%)
- Environmental 10.5% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:

- Low Carbon 48.5% (MEH 47.3%)
- Renewable Energy 27.7% (MEH 27.9%)
- Environmental 35.4% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 33.9% (MEH 33.7%)
- Renewable Energy 25.3% (MEH 27.1%)
- Environmental 34.1% (MEH 32.6%)

Technicians:

- Low Carbon 27.5% (MEH 27.9%)
- Renewable Energy 16.9% (MEH 17.3%)
- Environmental 23.2% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Greater Birmingham and Solihull LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.4% (MEH 20.3%)
- Best-case scenario for the UK economy is 58.1% (MEH 57.9%)

Estimated growth in employees for the Greater Birmingham and Solihull LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 86.2% (MEH 86.0%)
- Best-case scenario for the UK economy is 343.3% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:

- Low Carbon 15.8% (MEH 17.0%)
- Renewable Energy 35.2% (MEH 34.5%)
- Environmental 26.7% (MEH 27.0%)

Power Distribution Engineers:

- Low Carbon 28.2% (MEH 28.1%)
- Renewable Energy 36.7% (MEH 35.1%)
- Environmental 28.2% (MEH 29.3%)

Technicians:

- Low Carbon 36.5% (MEH 34.2%)
- Renewable Energy 46.1% (MEH 45.9%)
- Environmental 39.6% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Greater Birmingham and Solihull LEP include:

- Building Technologies with good training capacity and upskilling potential
- Water & Waste Water Treatment with good training capacity and upskilling potential
- Recovery and Recycling with good training capacity and reasonable upskilling potential
- Alternative Fuel Vehicle with good training capacity and average upskilling potential
- Photovoltaic with good training capacity and strong potential for upskilling
- Waste Management with very high training capacity but low upskilling potential
- Alternative Fuels with good training potential but low upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Greater Birmingham and Solihull LEP include:

- Wave and Tidal has slightly below average upskilling potential but very low training capacity
- Environmental Monitoring has slightly below average upskilling potential but very low training capacity

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and high estimated potential impact
- Building Technologies with large market and good estimated potential impact
- Alternative Fuels with large market and high estimated potential impact
- Water & Waste Water Treatment with moderate market size and potential impact
- Photovoltaic with lower estimated potential impact and smaller market

Sub-sectors with a low estimated $CO_2$ reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market

### Greater Birmingham and Solihull LEP's Exports

The value of exports in Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was £638m, an increase from £566m in 2017/18. This accounted for 21% of the MEH's LCEGS exports in 2019/20 and is lower than Greater Birmingham and Solihull LEP's 24% share of the overall MEH LCEGS market.

Greater Birmingham and Solihull LEP's LCEGS exports grew by 4.6% and 7.8% over the last three years which compared with MEH growth of 4.5% and 6.2% and UK growth of approximately 8.7% and 9.5% respectively.

Greater Birmingham and Solihull LEP's top Export sub-sectors which saw large export market and strong growth include:

- Alternative Fuel Vehicle - £35m
- Waste Management - £43m
- Biomass - £44m
- Wind - £107m
- Building Technologies - £96m
- Alternative Fuels - £94m

### Greater Birmingham and Solihull LEP's Imports

The value of imports in Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was £638m, an increase from £543m in 2017/18. This accounted for 24% of the MEH's LCEGS imports in 2019/20 and is in line with the Greater Birmingham and Solihull LEP's 24% share of the overall MEH LCEGS market.

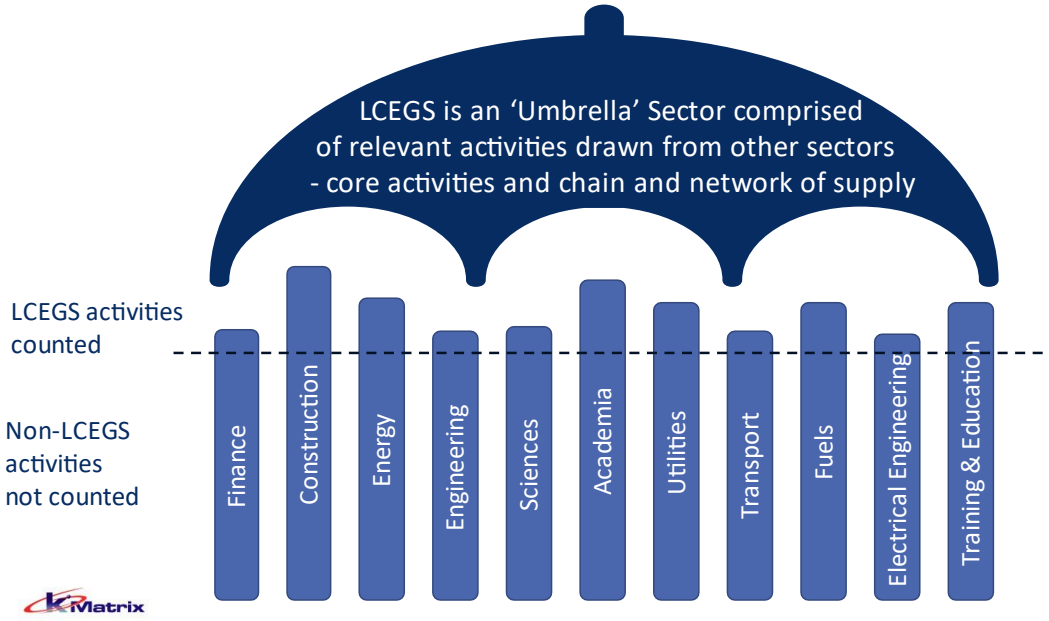
Greater Birmingham and Solihull LEP's LCEGS imports grew by 9.2% and 7.8% over the last three years which compared with MEH growth of 5.8% and 5.9% and UK growth of approximately 10.0% and 7.4% respectively.

# Introduction to the Low Carbon and Environmental Goods and Services Sector

This section includes a summary definition of the Low Carbon Environmental Goods Services sector, followed by a detailed description of the dataset that sits behind the data analysis and detail regarding the types of activities measured.

## Summary Sector Definition

The Low Carbon Environmental Goods and Services sector comprises products and services from across the economy, which actively enable a shift towards a green economy. The LCEGS sector is considered an 'umbrella' or horizontal sector, crossing many other traditional sectors, counting products and services from those sectors which can reduce carbon emissions and improve the environment:



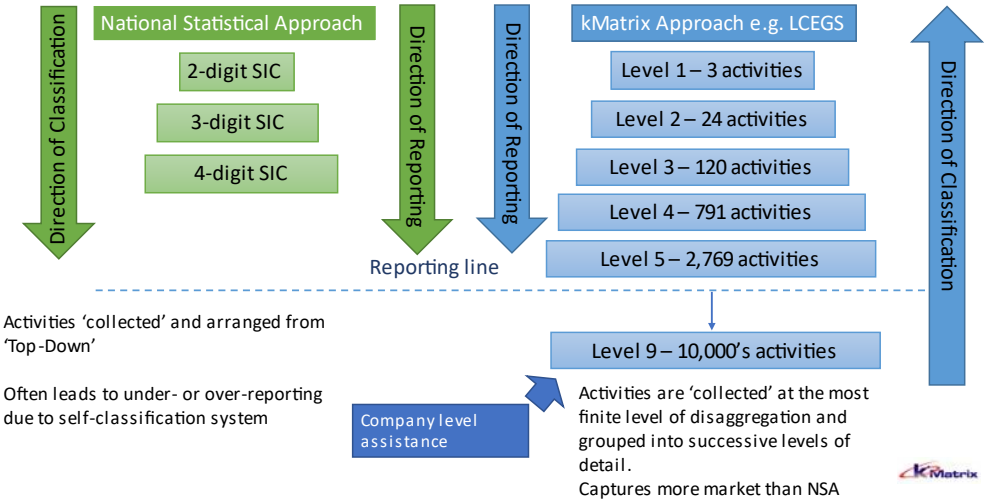

The sector is comprised of both core elements and those in the chain and network of supply, without whom the sector could not function.

## Brief Methodology

kMatrix uses a unique data triangulation methodology, developed with Professor R. Jaikumar of Harvard University over 35 years ago.

The process was originally developed to look at individual companies, providing evidenced data for development. As such, sectors are classified from the 'bottom up', collecting activities from the most finite level of granulation and grouping them into successive levels of detail.

## Example of bottom-up approach to classification – LCEGS Taxonomy




This is quite different to the National Statistical Approach, which classifies from the 'top down', with a company choosing their 2-digit code, then successive codes down through the classification system. The SIC system is very good as a national accounting system, but it struggles with hard to measure sectors such LCEGS. Here, the kMatrix system of data collection, which triangulates transactional data from many sources, up to 70,000 for this study, provides the flexibility of a definition tailored to the sector being studied. Although the sector is classified from the bottom up, the sector taxonomy is reported from the sector level down, through a series of levels of complexity.

This process has measured the LCEGS sector for the Greater London Authority and the UK for over a decade. kMatrix also collaborate with academic colleagues in several fields, co-authoring academic papers, which are peer-reviewed and published in academic journals including Nature, Climate Services and the Lancet.

Example sectors the process has been applied to, where evidence is available in the public domain via clients publishing reports or published peer-reviewed academic journals include:

- Cyber Security: https://www.eunity-project.eu/m/filer_public/4b/62/4b6262dc-3bca-4145-a84b-b514049156ce/1_lsec_japan_eunity_ecso_wg2_cima_seldeslachts_ulrich_20190124881.pdf
- Low carbon environmental goods and services sector: https://www.london.gov.uk/sites/default/files/london_low_carbon_market_snapshot_-_2019.pdf and https://www.enterprisem3.org.uk/sites/default/files/2020-02/Hampshire-LCEGS-Market-Report-2015-16-to-2017-18-2nd-Draft_0.pdf
- The green Economy: https://rgs-ibg.onlinelibrary.wiley.com/doi/pdf/10.1002/geo2.36 and https://www.nature.com/articles/s41599-019-0329-3
- Adaptation economy: https://www.nature.com/articles/nclimate2944
- Carbon Finance: https://www.nature.com/articles/nclimate1492?draft=marketing
- Weather and Climate: https://advances.sciencemag.org/content/3/5/e1602632.full
- Climate Services: https://www.sciencedirect.com/science/article/pii/S2405880719300494?via%3Dihub

# The LCEGS Dataset

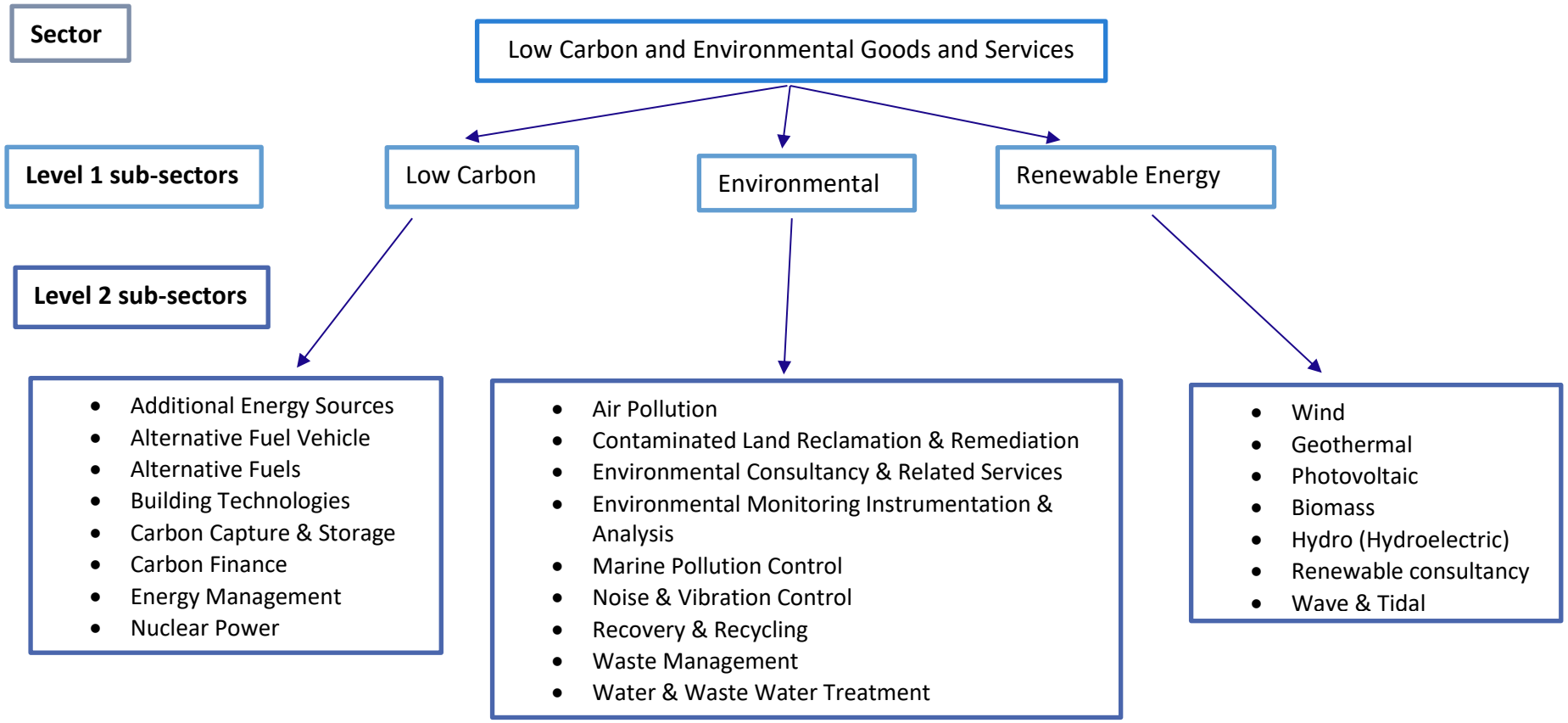
The data used in this report is based upon the work and methodology used by kMatrix to provide datasets on the UK's Low Carbon Environmental Goods and Services (LCEGS) sector for UK Government reported annually by the Department for Business, Innovation and Skills (BIS) from 2008/09 to 2011/12 and further reported every 3 years for the UK and London by the Greater London Authority to 2017/18, representing a continuous annual timeseries of the LCEGS sector for over a decade.

The LCEGS sector has been defined using 24 sub-sectors (or Level 2 markets) grouped into three broad categories (or Level 1 markets) - Environmental, Renewable Energy and Low Carbon. The addition of the Renewable Energy and Low Carbon groupings illustrates the evolution of the current LCEGS sector definition from its original Environmental roots and reflects developments in the market as sectors across the economy evolve to address the environmental challenges that they and the world is facing.

The dataset measures the core activities of the sector along with those in the supply chain, without whom the LCEGS sector could not operate. For example, the Wind sector includes those companies which develop the systems integration software enabling the power generated though turbines to be integrated into the National Grid, but it also includes those companies installing and maintaining the system integration software itself. Another example would be the collection of household waste, where the collection, processing and recycling of the waste is included, along with those companies who design, manufacture and supply the waste collection equipment itself.

The time series provides 11 years of sales, companies and employment data and 10 years of growth rates for the LCEGS sector as a whole. The data is then broken down into three Level 1 sub-sectors (Low Carbon, Environmental and Renewable Energy) and then those three sub-sectors are split into further Level 2 sub-sectors to provide greater resolution and insights for analysing the data.

The kMatrix methodology is based around the production of a taxonomy, similar to that used for biological taxonomic ranking, with similar products and services being grouped together. As an illustration (provided below), the LCEGS sector is broken down into three Level 1 sub-sectors, one of which is Renewable Energy, which is in turn broken down into seven Level 2 sub-sectors, one of which is Wind that is then broken down into a further three Level 3 sub-sectors and so on:




Although the taxonomy is reported and organised 'top down' as it goes from the sector to Level 1, to Level 2 etc., the data is gathered and organised from the 'bottom up'. The data is collected at the most finite disaggregation and then 'rolled up' to form the different levels. The current LCEGS sector definition, used in this report, includes 2,800 product and service activities at level 5 that are derived from sector supply chain activities (componentry & assemblies) and value chain activities (R&D, Supply & Training).

A glossary of economic activities included for each sub-sector of LCEGS is included as Appendix 1, a brief explanation of the LCEGS methodology as Appendix 2 and then a high-level comparison of data and methodologies between the Office of National Statistics (ONS) Environmental Goods and Services sector and LCEGS is presented in Appendix 3.

# What is actually measured?

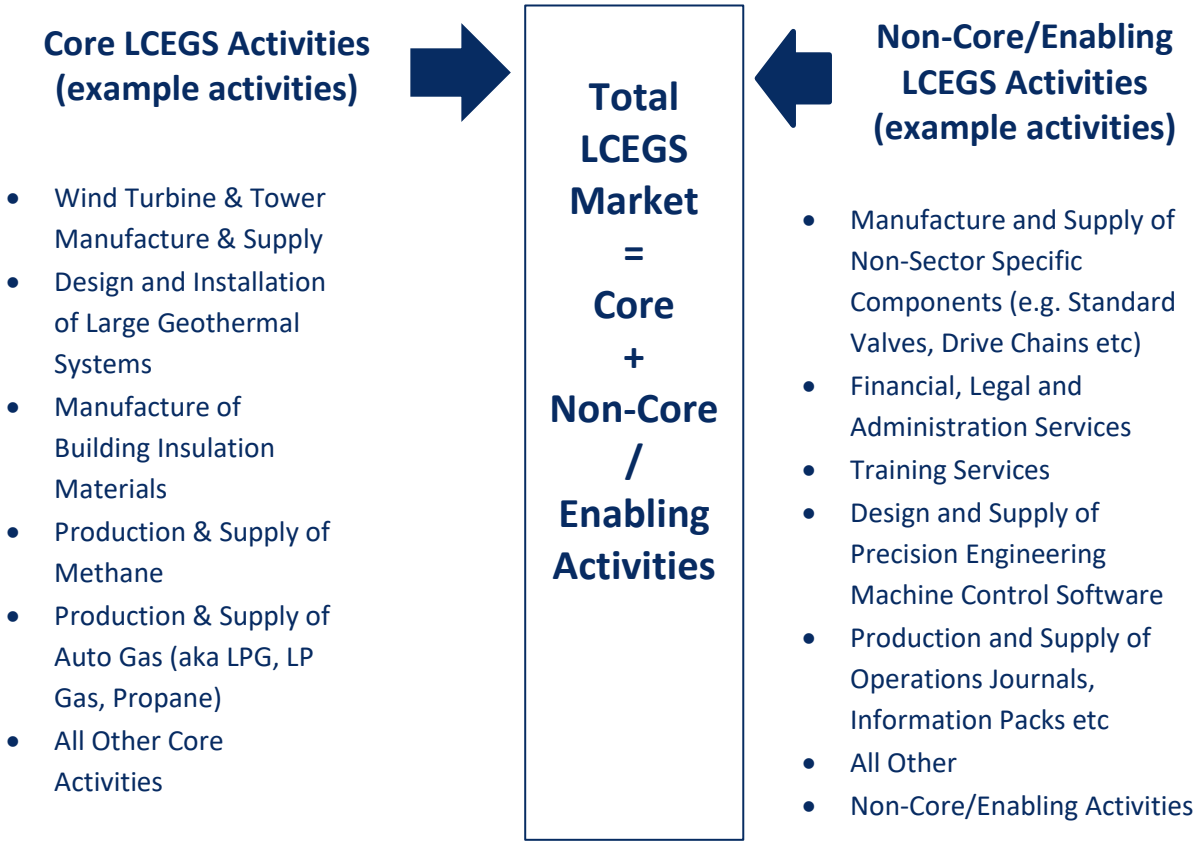
The dataset measures the core activities of the sector along with enabling activities in the supply chain, without whom the LCEGS sector could not operate. For example, the Wind sector includes those companies which develop the systems integration software enabling the power generated though turbines to be integrated into the National Grid, but it also includes those companies installing and maintaining the system integration software itself. Another example would be the collection of household waste, where the collection, processing and recycling of the waste is included, along with those companies who design, manufacture and supply the waste collection equipment itself.

The purpose of the LCEGS dataset in its original form, is to provide a standardized measure of the complete LCEGS sector. The whole dataset includes those 'core' activities, which would immediately come to mind such as the manufacture of a wind turbine blade, but also the less obvious 'non-core' activities, such as the manufacture of the bearings for the turbine. Non-Core activities can be considered "enablers" for the Core sector and are often companies who have diversified from existing strengths into new sector activities. Non-core activities also include mid-stream activities, R&D, finance, training and other activities which cross multiple other sectors, but without which the LCEGS sector could not function.


The definition of a sector is almost always open to debate, in terms of what is, or is not, considered to be part of the sector in question. The kMatrix methodology includes all aspects that can realistically be considered part of the LCEGS sector. The taxonomy is built and interrogated by assembling activities and services which are then grouped together under different headings. From the example taxonomy in figure 1, seven level 2 activities are grouped together to form the Renewable Energy Level 1 heading. There are five levels in total, comprising approximately 2,800 activities.

The following picture illustrates the two distinctive sides of the LCEGS market, the smaller Core market and the much larger Non-Core market, provided by enablers within the LCEGS sector. Examples give a simplistic overview of the types and differences between activities, with the Core side including activities such as manufacture of wind turbines and building insulation materials. The enablers providing Non-Core activities are offering components that are non-sector specific, such as valves, gaskets, drive chains etc., alongside financial, legal and administration activities.

In essence, Core activities are those products and services which are generally LCEGS specific, whereas the Non-Core activities, provided by enablers are products and services which are not LCEGS specific and can generally be found in other sectors. Core activities are considered vertical in nature, being sector specific, whereas Non-Core activities are horizontal, crossing other sectors. Both sides of the market are required for the sector to function.




The economic values provided are Sales values, which are transactions made within the sector, which have an economic footprint that can be measured. For companies which service multiple sectors, for example in finance, the sales value is the value of sales that company has in the LCEGS market, it does not include finance sales into other sectors.

## The complexity of determining the potential contribution to net zero

Understanding the potential contribution of each sub-sector to net zero targets (2030 & 2050) is important in identifying where priority markets lie for reaching those goals. Although the LCEGS sector entails low carbon and renewable energy technologies, they are not all equal in terms of their own carbon footprints or their ability to impact on net zero targets.

When assessing the potential for each Level 2 sub-sector to contribute to net-zero, there are a number of factors to consider, including:

- The embodied carbon of the product, is the carbon footprint to make the product, increasing throughout the supply chain and across geographies
- The carbon emissions during transportation, installation and commissioning of a product
- The emissions produced during operational lifetime of a product
- The emissions produced during decommissioning, dismantling and recovery of materials
- The localisation and format of the chain and network of supply

Academia varies with regards to estimating the carbon footprint of products, for example, photovoltaic systems produce almost zero carbon emissions when in operation, however carbon emissions are produced during the manufacturing process. Life cycle analysis of renewable energy systems, quantifying the carbon emissions of photovoltaic systems, report a wide range of carbon emissions factors. This is partly due to different methodologies and associated assumptions or design considerations[3].

There are also variations in carbon emissions within industries, for example, the life cycle carbon emissions from both on- and off-shore wind are very low at 15 and 12 $gCO_2eq/kWh$[4]. The carbon emissions reduction of wind power cannot be solely estimated as being the value of carbon emissions displaced from coal- or gas-fired generation. Wind power is not carbon-zero, because greenhouse gases are emitted during installation, maintenance and decommissioning and wind power will not replace all forms of conventional generation equally and will depend on the operation of the whole grid. Variations in cost and carbon emissions estimates are affected by assumptions made in the calculation itself and the differences in wind turbine designs, manufacturing and installations locations, maintenance and disposal.

When the embodied emissions for each material involved in manufacture, transport to site and installation are quantified, higher rated turbines had greater embodied carbon emissions, with a 3 MW turbine incorporating 1046 tCO2eq, compared with only 58 tCO2eq for an 80 kW turbine. However, the greater electricity output from the larger turbines offset these emissions more quickly, with a recovery of 6 days for a 3.4 MW turbine, compared with 354 days for a 100kW one.[5] Renewable energy generation is clean when compared with conventional energy generation methods, however the cost, payback time, size of power generation, construction time, resource capacity, characteristics of resource, external funding and other factors have affected how quickly different technologies have been adopted and the subsequent relative sizes of each market. The size of each market, corresponding to the carbon emissions displaced from conventional energy generation methods differs, as does the lifecycle carbon footprint of each renewable energy sub-sector.

Building Technologies are hugely important in terms of decarbonisation potential. An estimated 37% of UK emissions are attributable to heat[6], so building technologies such as roof and wall insulation, insulative glazing and other technologies designed to prevent the loss of heat can indirectly lead to reduction in energy usage and carbon emissions. As for the renewable energy sub-sector, the reductions in carbon emissions through a decrease in energy consumption, must offset

[3] Nian, V (2016) Impacts of changing design considerations on the life cycle carbon emissions of solar photovoltaic systems. J. Applied Energy 183 (2016) 1471-1487 https://doi.org/10.1016/j.apenergy.2016.08.176

[4] https://www.climatexchange.org.uk/media/1459/life_cycle_wind_-_executive_summary_.pdf

[5] Smoucha EA, Fitzpatrick K, Buckingham S, Knox OGG (2016) Life Cycle Analysis of the Embodied Carbon Emissions from 14 Wind Turbines with Rated Powers between 50 Kw and 3.4 Mw. J Fundam Renewable Energy Appl 6: 211. doi:10.4172/20904541.1000211

[6] Clean Growth – Transforming Heating, Overview of Current Evidence, Department for Business, Energy and Industrial Strategy, December 2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766109/decarbonising-heating.pdf

any embodied carbon and those emissions associated with transportation, installation, those produced during usage, maintenance and 'end-of-life' recovery of materials.

In terms of sub-sectors within the Environmental Level 1 sub-sector, the carbon footprint of Water and Waste Water Treatment may be decreased dramatically by the usage of forward osmosis membrane-technology during the next generation of waste water treatment[7].

Within Waste Management, the collection, re-use and recycling of the 2 Mt of waste electrical and electronic equipment (WEEE) produced in the UK each year has become a foremost environmental issue in the UK[8], where efforts are undergoing to increase the levels and efficiency of recycling. Each sub-sector within the LCEGS sector has the potential to play their part in the move towards net zero, but as indicated above, the relative impact they may have varies both between sub-sectors and between academics attempting to quantify current levels.

For this study, the level 2 sub-sectors have been allocated a relative impact score of "Low", "Medium" and "High", based upon estimates including the activities present in the area being studied, the localization of chains and networks and supply and the technologies both being used and produced.

[7] Environ. Sci.: Water Res. Technol., 2020, 6, 153

[8] Clarke C, Williams I, Turner D, (2019) Evaluating the carbon footprint of WEE management in the UK. J Resources, Conservation & Recycling 141 (2019) 465-473

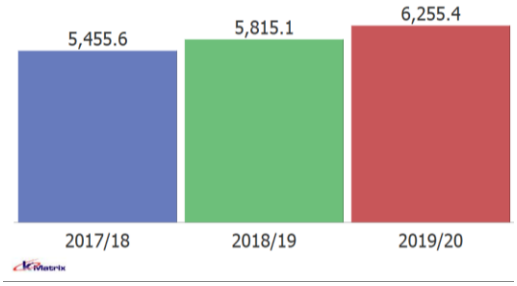
# 1. Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services (LCEGS) Analysis

This section of the report analyses the Greater Birmingham and Solihull LEP's LCEGS at Level 1 and Level 2. It also provides information at Level 3 to show the type of activities included in these sub-sectors.

## 1.1 LCEGS Compared by Year

In this section of the report, the Greater Birmingham and Solihull LEP's LCEGS performance is compared for the last three years for the three key measures of Sales, Employment and Growth.

**Figure 1: Sales 2017/18 to 2019/20 in £m**

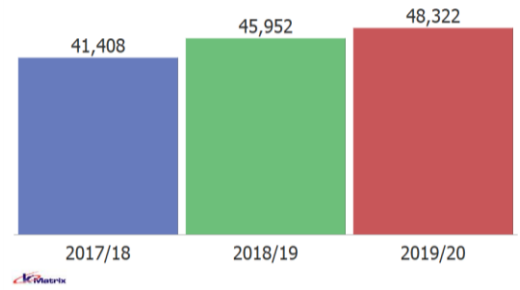



Greater Birmingham and Solihull LEP's sales in 2019/20 were £6.3bn, up from £5.5bn in 2017/18.

Annual sales growth in Greater Birmingham and Solihull LEP's LCEGS was 6.6% from 2017/18 to 2018/19 and 7.6% from 2018/19 to 2019/20.

In comparison MEH Regional sales growth in LCEGS was 5.2% and 5.9% respectively.

**Figure 2: Employment 2017/18 to 2019/20**

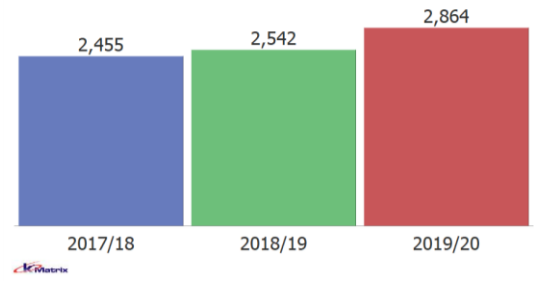



Greater Birmingham and Solihull LEP's LCEGS employment in 2019/20 was 48,322, up from 41,408 in 2017/18.

Annual employment growth in Greater Birmingham and Solihull LEP's LCEGS was 11.0% from 2017/18 to 2018/19 and 5.2% from 2018/19 to 2019/20.

In comparison MEH Regional employment growth in LCEGS was 5.7% and 5.0% respectively.

**Figure 3: Companies 2017/18 to 2019/20**




Greater Birmingham and Solihull LEP's LCEGS company count in 2019/20 was 2,864, up from 2,455 in 2017/18.

Annual company growth in Greater Birmingham and Solihull LEP's LCEGS was 3.6% from 2017/18 to 2018/19 and 12.7% from 2018/19 to 2019/20.

In comparison MEH Regional company growth in LCEGS was 3.7% and 6.9% respectively.

Growth in the Greater Birmingham and Solihull LEP has been higher across each of the three parameters between 2017/18 and 2019/20 when compared with the MEH Region as a whole.

## 1.2 Greater Birmingham and Solihull LEP's LCEGS at Level 1

The analysis in this section of the report focuses on the Level 1 and Level 2 split of LCEGS in the Greater Birmingham and Solihull LEP for each of the last three years.

**Figure 4: Sales 2017/18 to 2019/20 in £m (Level 1)**

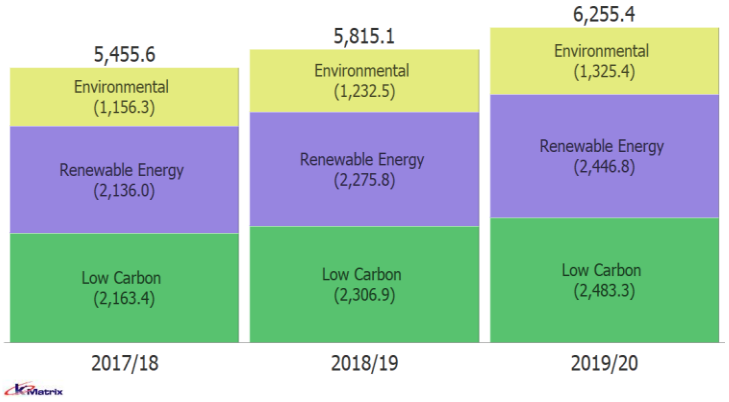



Figure 4 shows the three-year LCEGS sales split by Level 1.

In 2017/18 the split was 40% Low Carbon, 39% Renewable Energy and 21% Environmental. The split had not changed in 2019/20.

**Figure 5: Employment 2017/18 to 2019/20 (Level 1)**

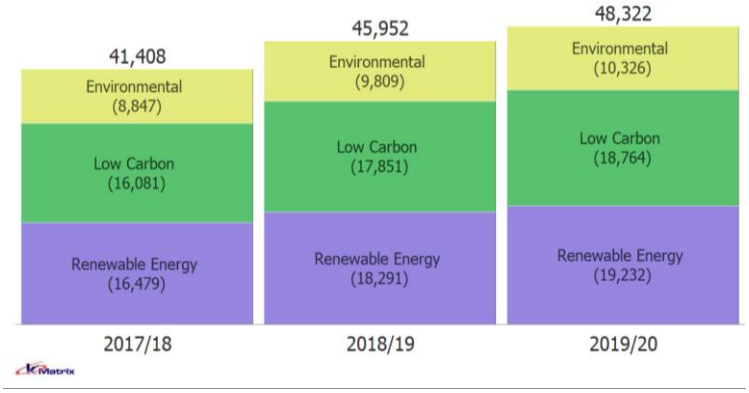



Figure 5 shows the three-year employment split by Level 1.

In 2017/18 the split was 40% Renewable Energy, 39% Low Carbon and 21% Environmental. The split had not changed in 2019/20.

**Figure 6: Companies 2017/18 to 2019/20 (Level 1)**

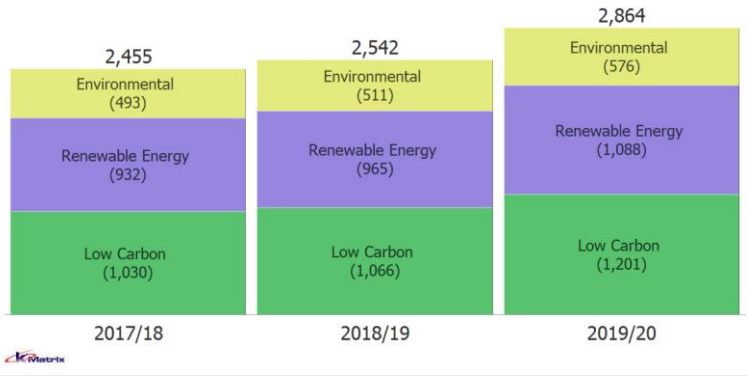



Figure 6 shows the three-year company split by Level 1.

In 2017/18 the split was 42% Renewable Energy, 38% Low Carbon and 20% Environmental. The split had not changed in 2019/20.

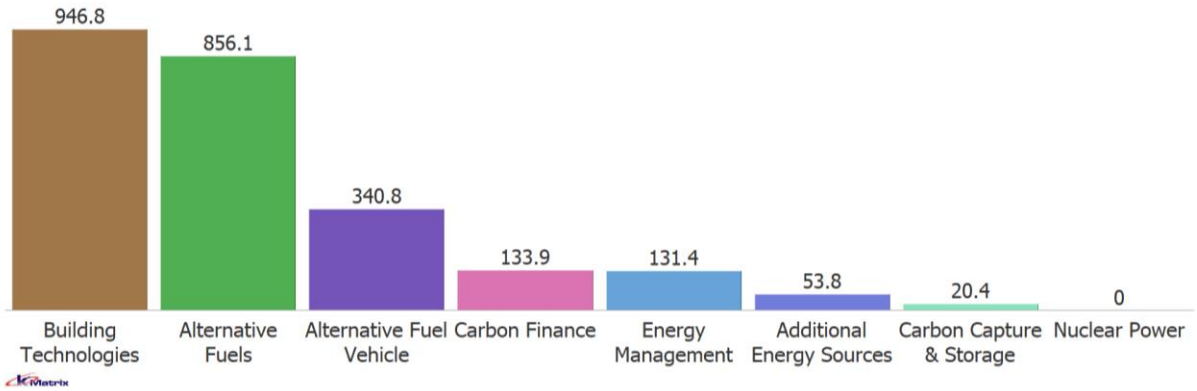
In 2019/20 MEH Regional LCEGS sales was split - Renewable Energy 39%, Low Carbon 39% and Environmental 22%.

## 1.3 Greater Birmingham and Solihull LEP's LCEGS Level 1 - Low Carbon Market

In this section we look at the Low Carbon market in greater detail. Initially we split the market into eight further sub-sectors (Level 2) and then look at the highest performing Level 2 sub-sectors in more detail by highlighting activity happening within them at Level 3.

### 1.3.1 Low Carbon Market (Level 2)

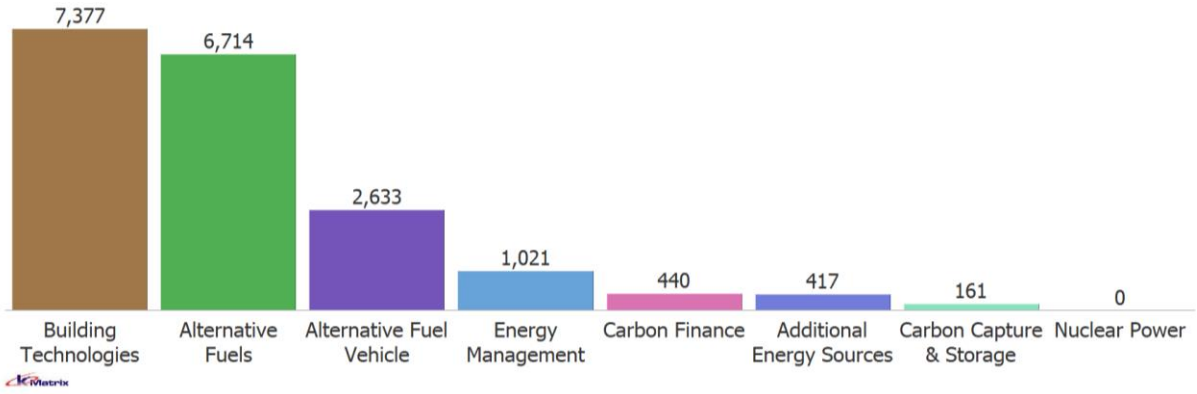
**Figure 7: Sales 2019/20 in £m (Level 2)**




Low Carbon is further sub-divided into eight sub-sectors, of which five account for 97% of sales (Figure 7). These four are made up of Building Technologies 38%, Alternative Fuels 34%, Alternative Fuel Vehicle 14%, Carbon Finance, 5% and Energy Management 5%.

Each of these five sub-sectors grew between 2017/18 and 2019/20: Building Technologies from £825.5m to £946.8m; Alternative Fuels from £747.1m to £856.1m; Alternative Fuel Vehicle from £297.7m to £340.8m, Carbon Finance from £113.7m to £133.9m and Energy Management from £114.5m to £131.4m.

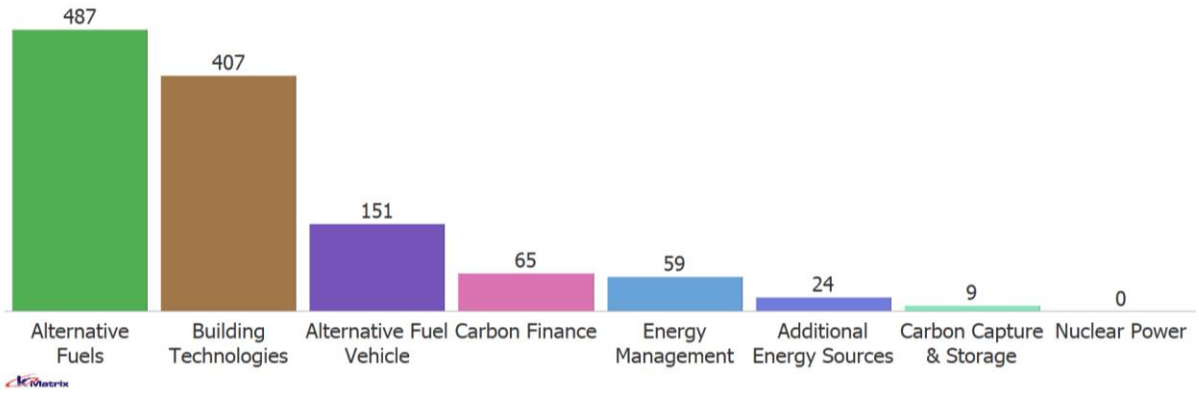
**Figure 8: Employment 2019/20 (Level 2)**




The same five sub-sectors account for 97% of employment (Figure 8). They are Building Technologies 39%, Alternative Fuels 36%, Alternative Fuel Vehicle 14%, Energy Management 5% and Carbon Finance 2%.

Each of these five sub-sectors grew between 2017/18 and 2019/20: Building Technologies from 6,321 to 7,377; Alternative Fuels from 5,742 to 6,714; Alternative Fuel Vehicle from 2,259 to 2,633, Energy Management from 874 to 1,021 and Carbon Finance from 389 to 440.

**Figure 9: Companies 2019/20 (Level 2)**

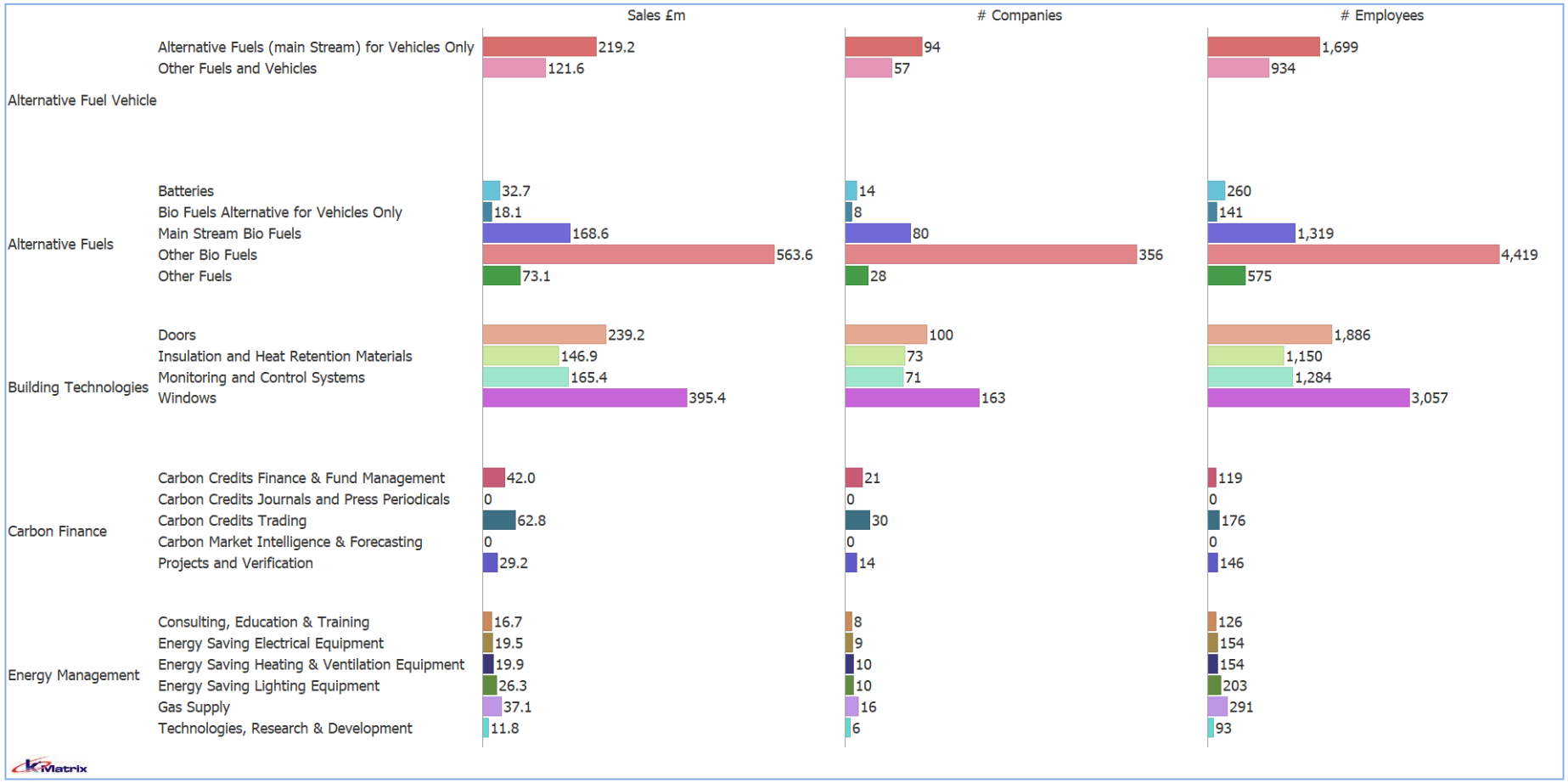



The same five sub-sectors again account for 97% of companies (Figure 9). They are Alternative Fuels 41%, Building Technologies 34%, Alternative Fuel Vehicle 13%, Carbon Finance 5% and Energy Management 5%.

Each of these five sub-sectors grew between 2017/18 and 2019/20: Alternative Fuels from 417 to 487; Building Technologies from 348 to 407; Alternative Fuel Vehicle from 129 to 151, Carbon Finance from 57 to 65 and Energy Management from 51 to 59.

### 1.3.2 Low Carbon Market at Level 3

**Figure 10: Summary of selected metrics for 2019/20 for selected Low Carbon Level 2 sub-sectors at Level 3**




The top five Level 2 sub-sectors for Low Carbon are Alternative Fuel Vehicle, Alternative Fuels, Building Technologies, Carbon Finance and Energy Management, making up 97% of the Low Carbon market in Greater Birmingham and Solihull LEP. Figure 10 shows a summary of the Sales, Companies and Employees for these Level 2 sub-sectors, broken out into their Level 3 sub-sectors.

Building Technologies is the largest Level 2 sub-sector and Windows is the largest of the four Level 3 sub-sectors, making up 42% of the market. Example companies in this sub-sector would include window manufacturers, agents and installers.

Alternative Fuels has five sub-sectors at level 3, of which, Other Biofuels accounts for 66% of Sales. Example companies of this sub-sector would include process designers and consultancy, process implementation and sales and application development specialists.

Alternative Fuel Vehicles has only two sub-sectors at level 3, with Alternative Fuels (main stream) for Vehicles Only holding 64% of the market share. Example companies in this sub-sector would include selling agencies, alternative fuel development companies and consulting and applications development for vehicle conversion specialists.

Carbon Finance has five sub-sectors at level, with Carbon Credits Trading holding 47% of the market. Example companies in this sub-sector include carbon credits trading houses.

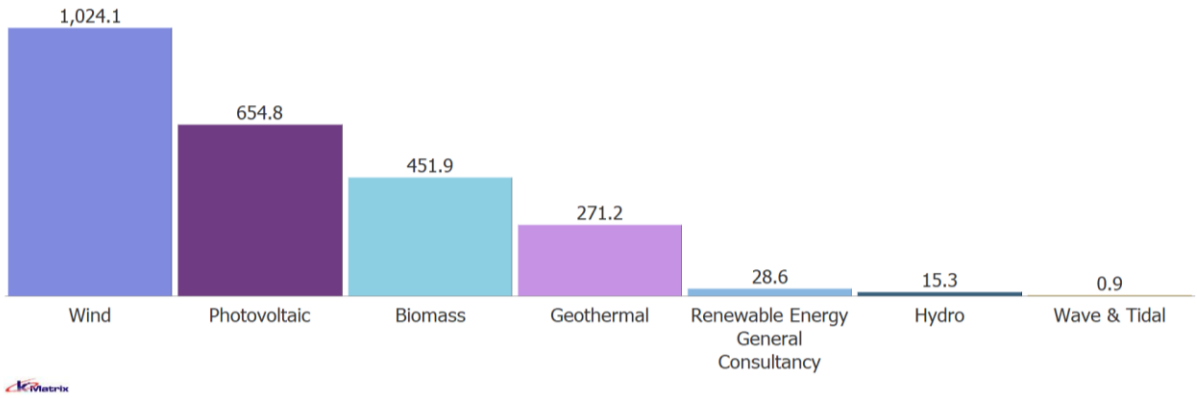
Energy Management has six sub-sectors at level 3, with Gas Supply holding 28% of the market share. Example companies in this sub-sector would include registered gas engineers, measurement and control systems and fitting and maintenance.

## 1.4 Greater Birmingham and Solihull LEP's LCEGS Level 1 - Renewable Energy Market

In this section we look at the Renewable Energy market in greater detail. Initially we split the market into eight further sub-sectors, Level 2, and then look at the highest performing Level 2 sub-sectors in more detail by highlighting activity happening within them at Level 3.

### 1.4.1 Renewable Energy Market at Level 2

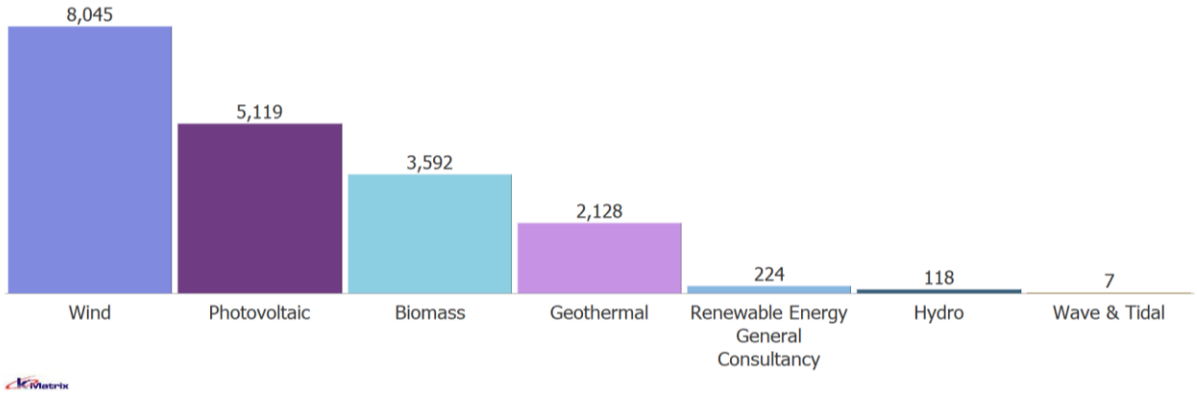
**Figure 11: Sales 2019/20 in £m (Level 2)**




Renewable Energy is then split into seven sub-sectors, of which four account for 98% of sales (Figure 11). These four are made up of Wind 42%, Photovoltaic 27%, Biomass 18% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from £894.1m to £1.0bn; Photovoltaic from £571.7m to £654.8m; Biomass from £394.1m to £451.9m and Geothermal from £236.8m to £271.2m.

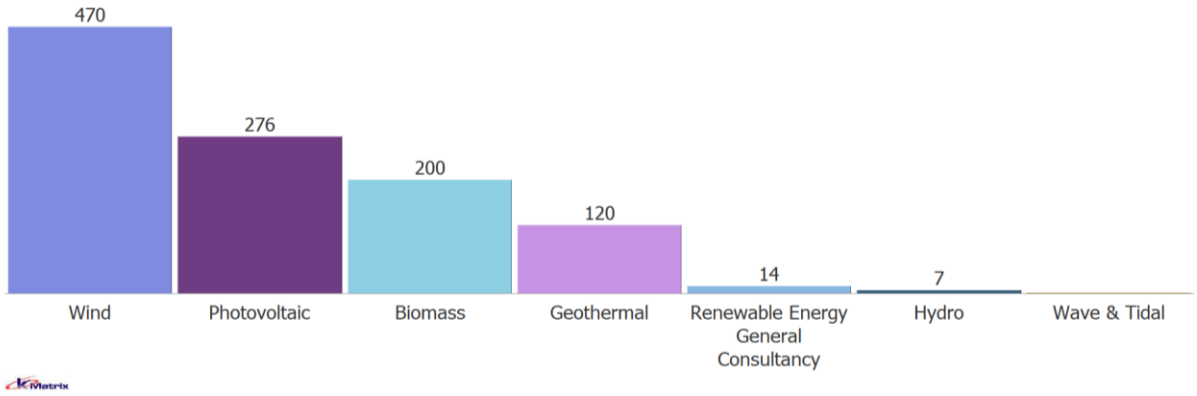
**Figure 12: Employment 2019/20 (Level 2)**




The same four sub-sectors account for 98% of employment (Figure 12). They are made up of Wind 42%, Photovoltaic 27%, Biomass 19% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from 6,898 to 8,045; Photovoltaic from 4,383 to 5,119; Biomass from 3,074 to 3,592 and Geothermal from 1,824 to 2,128.

**Figure 13: Companies 2019/20 (Level 2)**



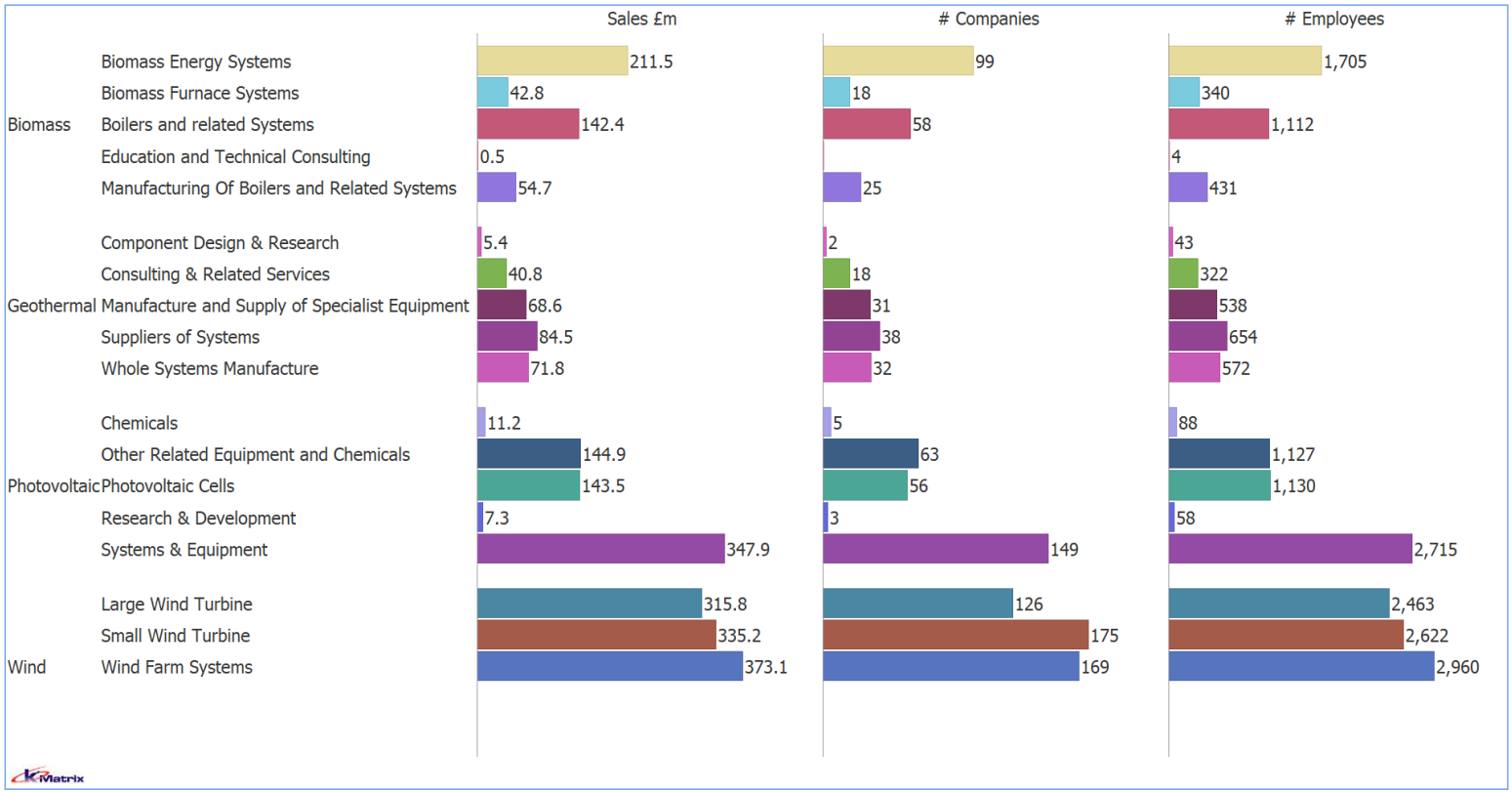

The same four sub-sectors also account for 98% of companies (Figure 13). They are made up of Wind 43%, Photovoltaic 25%, Biomass 18% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from 402 to 470; Photovoltaic from 238 to 276; Biomass from 171 to 200 and Geothermal from 103 to 120.

Note: there are 0 companies listed for Wave & Tidal, because these are engineering services to the wave and tidal sector from various companies, delivered by the equivalent of 7 employees from various organisations, however counting all of those organisations as companies would give a false impression of the sub-sector being larger than it is. The sales are opportunistic and not necessarily regular by their nature.

### 1.4.2 Renewable Energy Market at Level 3

**Figure 14: Summary of selected metrics for 2019/20 for selected Renewable Energy Level 2 sub-sectors at Level 3**




The top four Level 2 sub-sectors for Low Carbon are Wind, Photovoltaic, Biomass and Geothermal, making up 98% of the Renewable Energy market in the Greater Birmingham and Solihull LEP. Figure 14 shows a summary of the Sales, Companies and Employees for these Level 2 sub-sectors, broken out into their Level 3 sub-sectors.

Wind is the largest Level 2 sub-sector with 42% of sales and has three sub-sectors at Level 3, the largest being Wind Farm Systems which makes up 36% of sales in this market. Example companies include those providing power firming systems and services, maintenance services and grid integration services.

Photovoltaic has five sub-sectors at level 3, the largest being Systems & Equipment which makes up 53% of sales in this market. Example companies include systems developers, suppliers and installers.

Biomass has five sub-sectors at level 3, the largest being Biomass Energy Systems which makes up 47% of the sales in this market, example companies include developers, installers and consultancies.

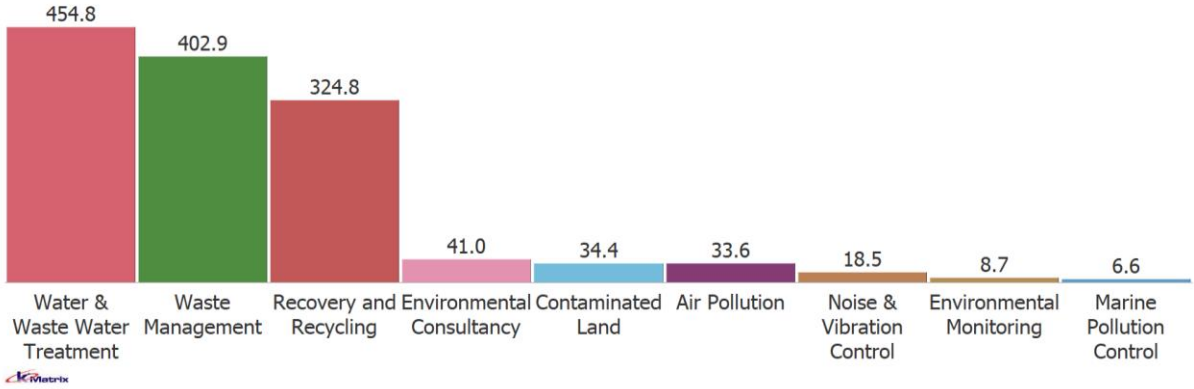
Geothermal has five sub-sectors at Level 3, the largest being Suppliers of Systems which makes up 31% of the sales in this market. Example companies include lateral geothermal systems providers and installers at the domestic and small commercial level and vertical control systems developers and suppliers.

## 1.5 Greater Birmingham and Solihull LEP's LCEGS Level 1 - Environmental Market

In this section we look at the Environmental market in greater detail. Initially we split the market into eight further sub-sectors, Level 2, and then look at the highest performing Level 2 sub-sectors in more detail by highlighting the activity happening within them at Level 3.

### 1.5.1 Environmental Market at Level 2

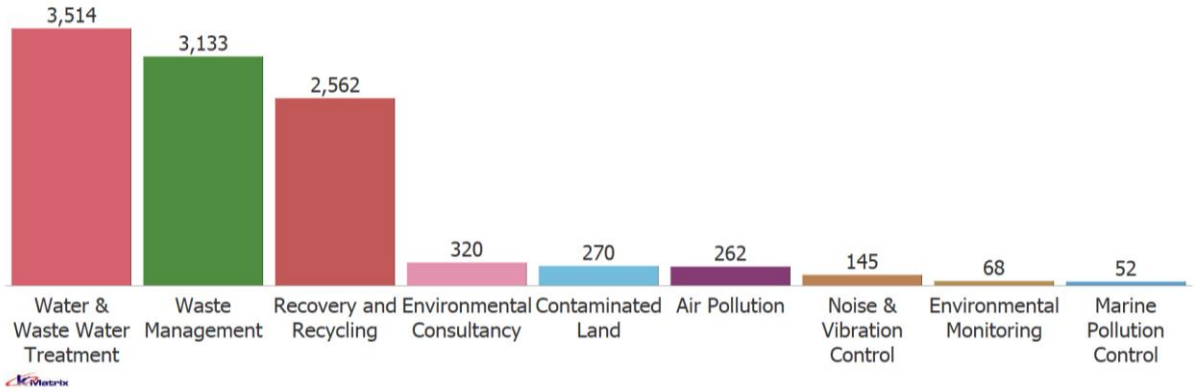
**Figure 15: Sales 2019/20 in £m (Level 2)**




Environmental is split into nine sub-sectors, of which three account for 89% of sales (Figure 15). These three are made up of Water Supply & Waste Water Treatment 34%, Waste Management 30% and Recovery & Recycling 25%.

Each of these three sub-sectors have grown between 2017/18 and 2019/20: Water Supply and Waste Water Treatment from £396.6m to £454.8m; Waste Management from £351.3m to £402.9m and Recovery and Recycling from £283.7m to £324.8m.

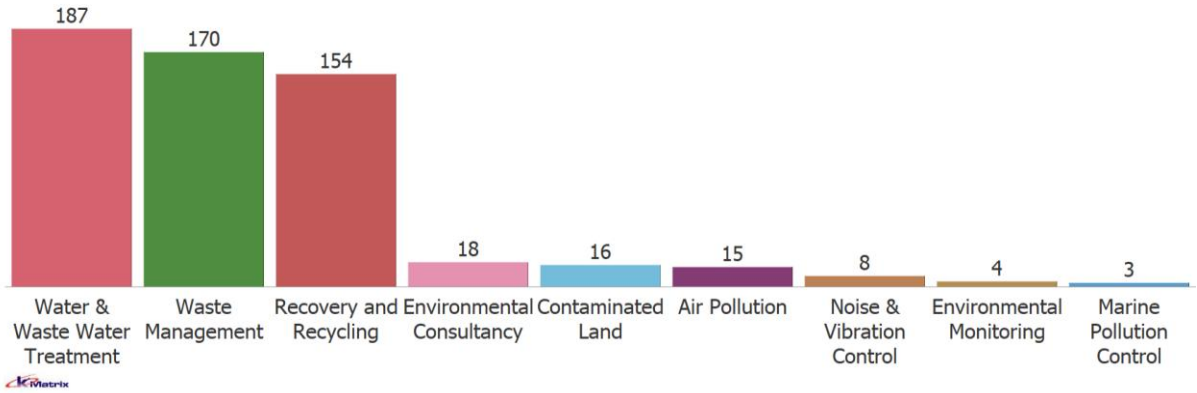
**Figure 16: Employment 2019/20 (Level 2)**




The same three sub-sectors account for 89% of employment (Figure 16). They are made up of Water Supply & Waste Water Treatment 34%, Waste Management 30% and Recovery & Recycling 25%.

Each of these three sub-sectors have grown between 2017/18 and 2019/20: Water & Waste Water Treatment from 3,009 to 3,514; Waste Management from 2,687 to 3,133 and Recovery and Recycling from 2,195 to 2,562.

**Figure 17: Companies 2019/20 (Level 2)**




The same three sub-sectors also account for 89% of companies (Figure 17). They are made up of Water Supply & Waste Water Treatment 32%, Waste Management 30% and Recovery & Recycling 27%.

Each of these three sub-sectors have grown between 2017/18 and 2019/20: Water & Waste Water Treatment from 161 to 187; Waste Management from 146 to 132 and Recovery and Recycling from 132 to 154.

### 1.5.2 Environmental Market at Level 3

**Figure 18: Summary of selected metrics for 2019/20 for Waste Management and Water & Waste Water Treatment sub-sectors at Level 3**


Figure 18 shows the Sales, Companies and Employees for the Waste Management and Water & Waste Water Treatment Level 2 sub-sectors broken down into their Level 3 sub-sectors.

Water & Waste Water Treatment is made up of four Level 3 sub-sectors, the largest being Water Treatment and Distribution which makes up 77% of sales. Example activities include development and implementation by utilities along with supply, consultancy and implementation by independent consulting engineers.

Waste Management is made up of four Level 3 sub-sectors with sales more evenly distributed across them than for the Water and Waste Water Treatment market. The largest Level 3 sub-sector is Equipment for Waste Treatment which makes up 36% of sales in the market. Example companies are those involved in development, manufacture and supply. The next largest sub-sector is Construction & Operation of Waste Treatment Facilities which makes up

33% of sales. Example companies are those involved in both public and private operations management and supply and installation of operational equipment.

**Figure 19: Summary of selected metrics for 2019/20 for Recovery and Recycling at Level 3**

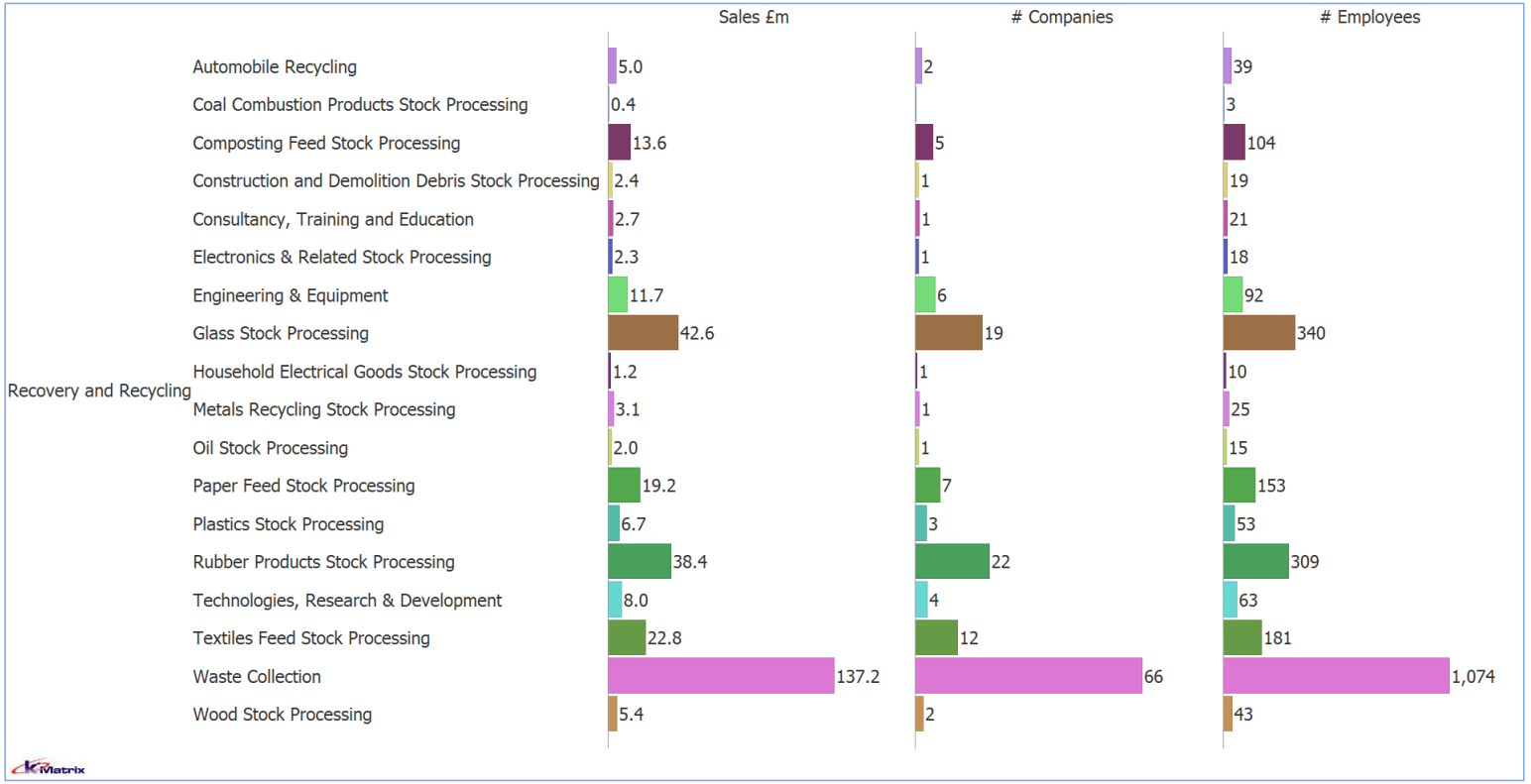



Figure 19 shows the Sales, Companies and Employees for the Level 2 Recovery & Recycling sub-sector broken down into its Level 3 sub-sectors. There are eighteen Level 3 sub-sectors and Waste Collection, including the collection of all waste, both municipal and commercial (landfill and recyclates), is clearly the largest sub-sector making up 42% of all sales in the Recovery and Recycling sub-sector. There are then a number of waste stream stock processing sub-sectors with the largest ones being Glass, Rubber Products, Textiles, Paper and Composting.

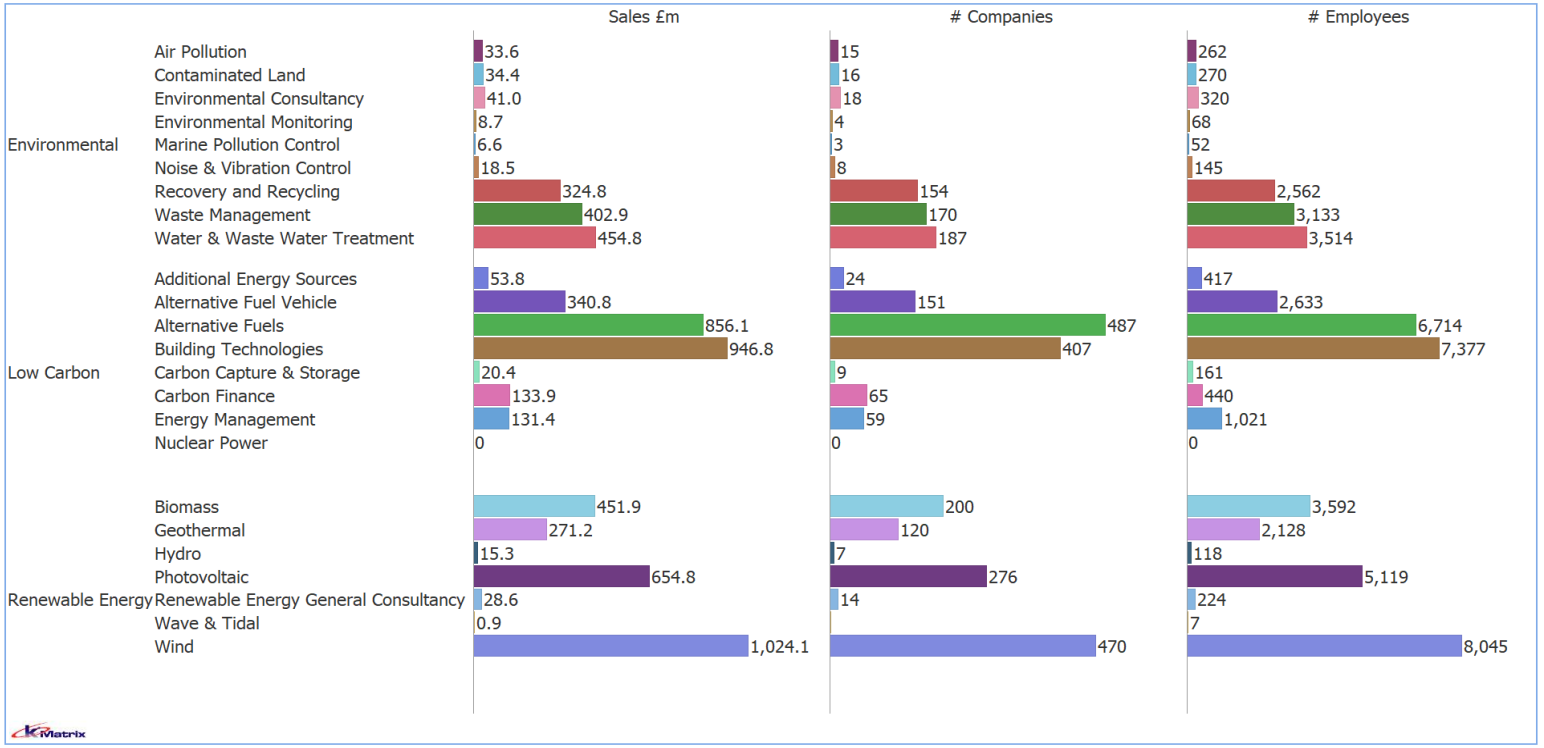
## 1.6 Greater Birmingham and Solihull LEP's LCEGS Level 2 Summary

Figure 20 compares all 24 sub-sectors of LCEGS and shows that the six leading sub-sectors: Wind (16%), Building Technologies (15%), Alternative Fuels (14%), Photovoltaic (10%), Water & Waste Water Treatment (7%) and Biomass (7%) have the largest share in terms of sales, company numbers and employment and accounted for 70% of Greater Birmingham and Solihull LEP's LCEGS sector activity in 2019/20.

There is then a second grouping of six sub-sectors that are: Waste Management 6%, Alternative Fuel Vehicle 5%, Recovery and Recycling 5%, Geothermal 4%, Carbon Finance 2% and Energy Management 2%, and that make up a further 26% of the LCEGS sector sales in 2019/20.

These 12 sub-sectors dominate the LCEGS sector sales and together made up 96% of its overall sales in 2019/20.

**Figure 20: LCEGS Summary 2019/20 for Sales, Number of Companies and Number of Employees**



## 1.7 Greater Birmingham and Solihull LEP and the MEH's LCEGS compared

The Greater Birmingham and Solihull LEP accounts for 24% of the Midlands Energy Hub Region's LCEGS sector.

**Figure 21: Greater Birmingham and Solihull LEP Measures 2019/20 by Level 1**

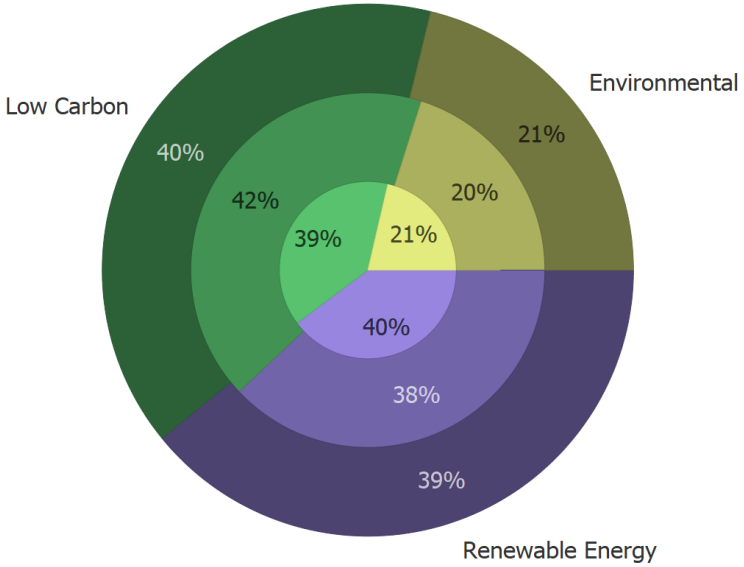
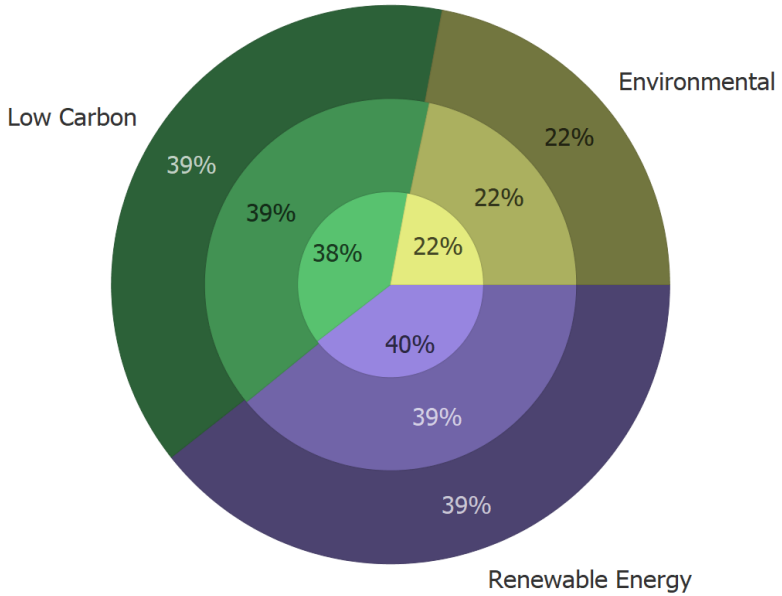



**Figure 22: MEH Measures 2019/20 by Level 1**




Figures 21 and 22 compare the profile of the Greater Birmingham and Solihull LEP and the MEH region's LCEGS activities at Level 1 for sales (outer circle), companies (middle circle) and employment (inner circle). Greater Birmingham and Solihull LEP is broadly in line with the MEH LCEGS sector, with slightly more market within the Low Carbon sub-sector than the regional average, with the company share being 3% higher than the regional average. The Environmental sub-sector is weaker than the national average, particularly in the number of companies.

**Figure 23 Greater Birmingham and Solihull LEP's LCEGS sub-sectors for 2019/20 at Level 2**

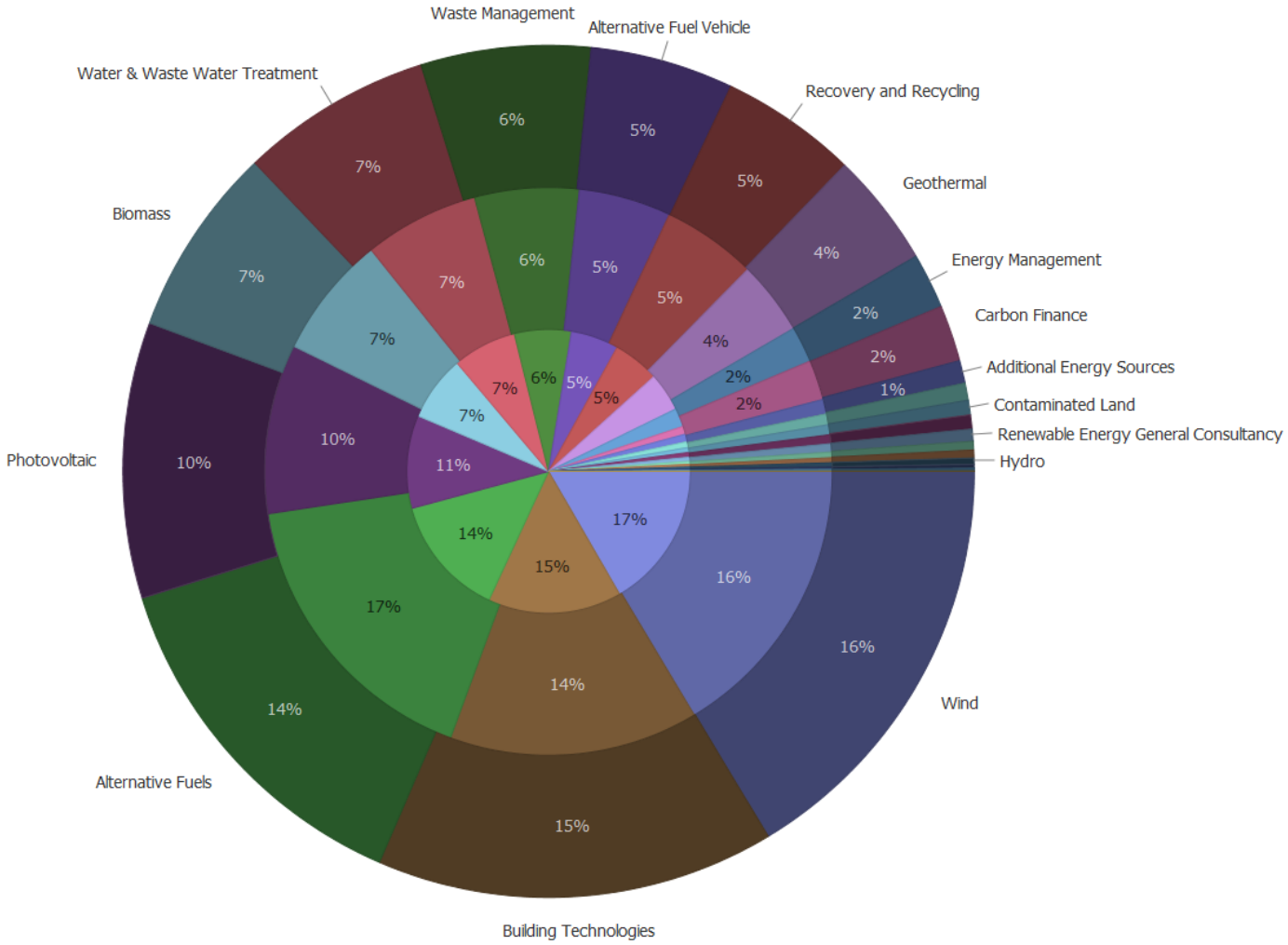
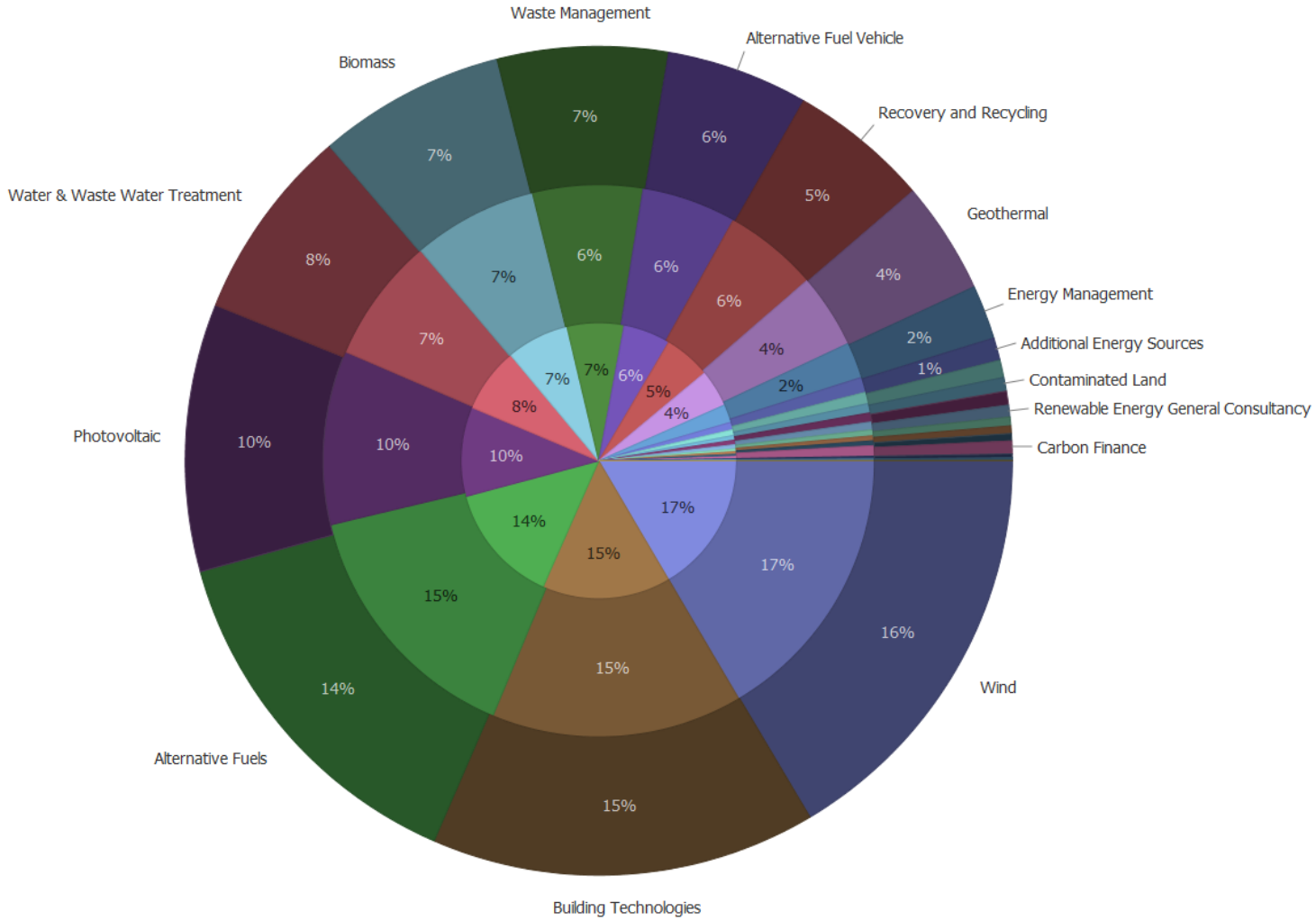


**Figure 24: MEH's LCEGS sub-sectors for 2019/20 at Level 2**




Figures 23 and 24 extends the analysis by comparing the profile of the Greater Birmingham and Solihull LEP and MEH's LCEGS activities at Level 2 for sales (outer circle), companies (middle circle) and employment (inner circle).

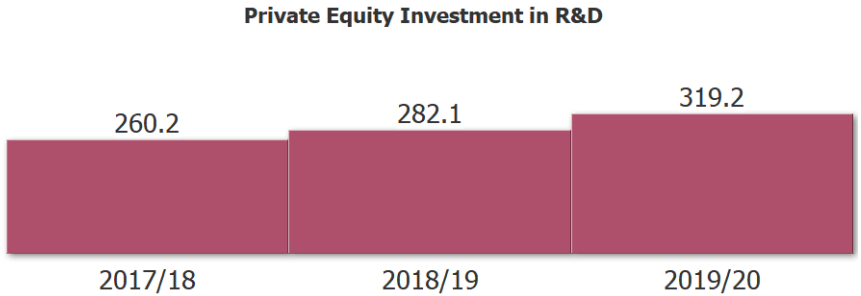
There are differences between the two, such as a higher percentage of companies in the Alternative Fuels sub-sector in than the national average, the presence of Carbon Finance (2%) and slightly stronger Water & Waste Water Treatment than Biomass by 1% in the Greater Birmingham and Solihull LEP than the regional average.

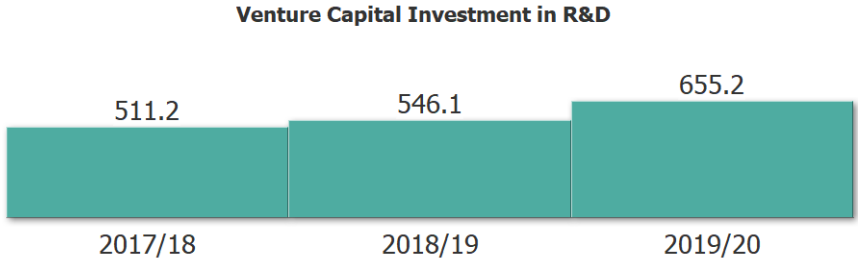
Other differences relate to percentage share of market for the different measures, although this is within 1% of the Regional average.

## 1.8 Greater Birmingham and Solihull LEP's LCEGS Investment in R&D

This section examines the investment profile of the Greater Birmingham and Solihull LEP at the sector level and Level 1 for 2017/18, 2018/19 and 2019/20 and for Level 2 and the top Level 3 subsectors.

**Figure 25: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D by Fiscal Year**



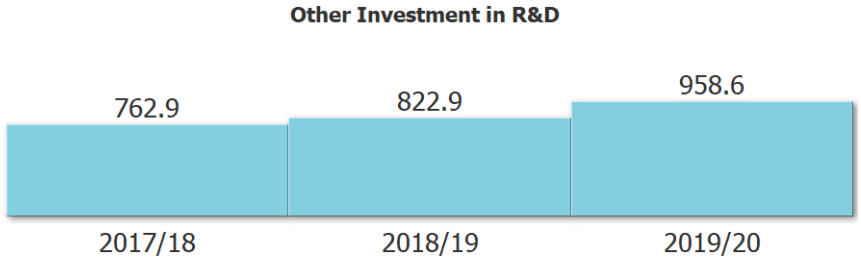




Figure 25 shows the investment for the three financial years of the sector study, made into the whole LCEGS sector.

Private Equity Investment has grown from £260m in 2017/18 to £319m in 2019/20, representing 8.4% growth between 2017/18 and 2018/19 and 13.2% growth between 2018/19 and 2019/20.

By comparison, the MEH region's growth rates were 5.8% and 6.1%.

Venture Capital Investment has grown from £511m in 2017/18 to £655m in 2019/20, representing 6.8% growth between 2017/18 and 2018/19 and 20.0% growth between 2018/19 and 2019/20.

By comparison, the MEH region's growth rates were 5.4% and 6.2%.

Other Investment has grown from £763m in 2017/18 to £959m in 2019/20, representing 7.9% growth between 2017/18 and 2018/19 and 16.5% growth between 2018/19 and 2019/20.

By comparison, the MEH region's growth rates were 6.2% and 5.6%.

**Figure 26: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D by Fiscal Year – Level 1**

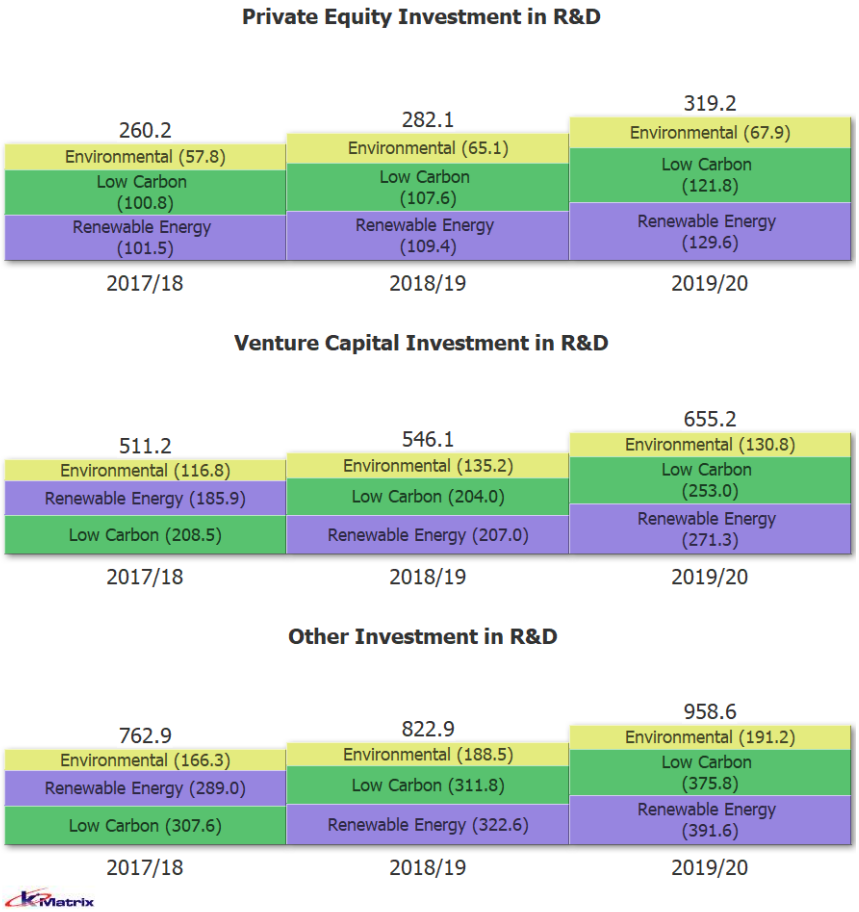



Figure 26 shows the investment for the three financial years of the sector study, made into the LCEGS sector, split into Level 1.

Private Equity Investment was split in 2019/20 Low Carbon 38%, Renewable Energy 41% and Environmental 21%. This is broadly in line with the sales split of 40%, 39% and 21%.

Venture Capital Investment was split in 2019/20 Low Carbon 39%, Renewable Energy 41% and Environmental 20%. This is broadly in line with the sales split of 40%, 39% and 21%.

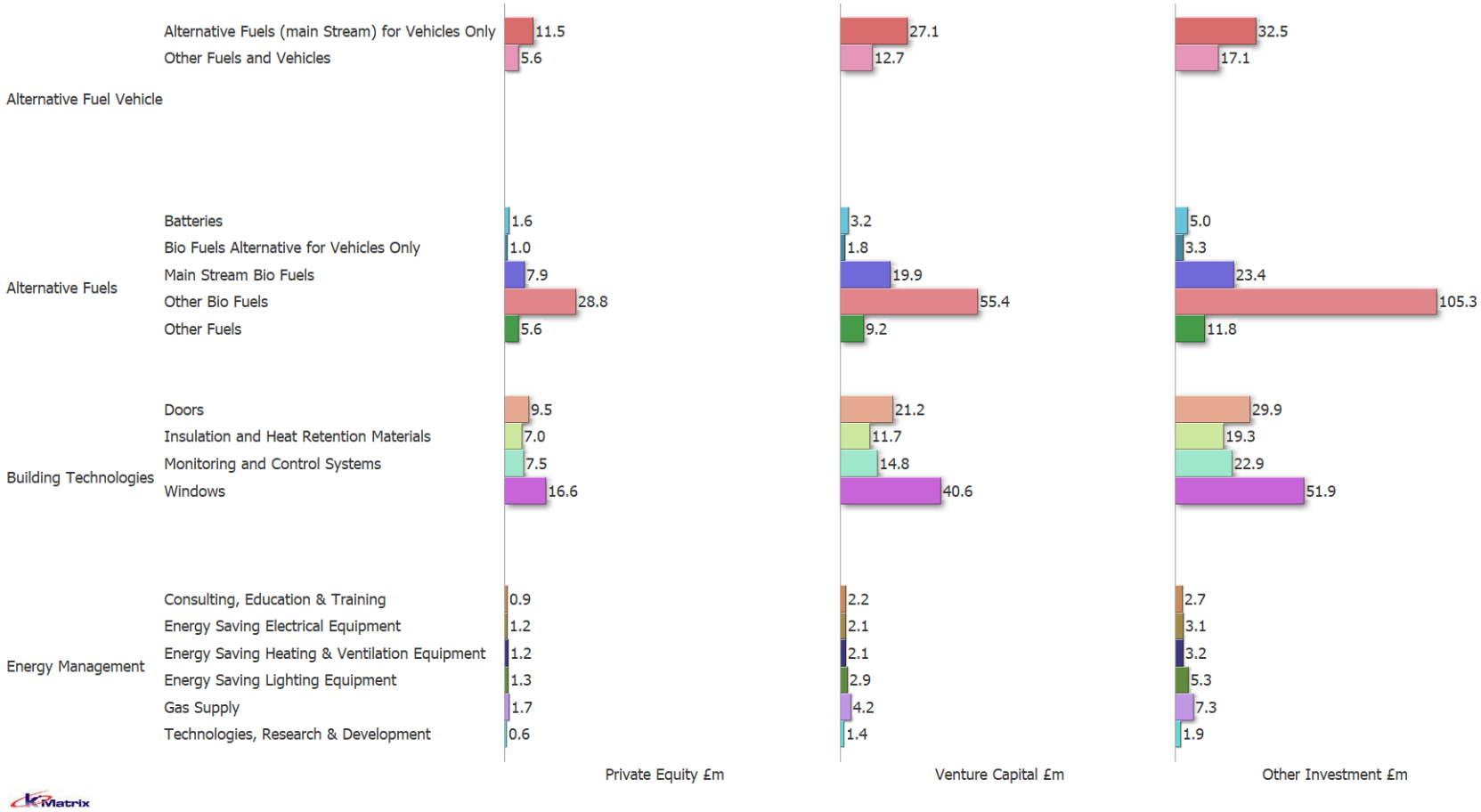
Other Investment was split in 2019/20 Low Carbon 39%, Renewable Energy 41% and Environmental 20%. This is broadly in line with the sales split of 40%, 39% and 21%.

**Figure 27: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D 2019/20 – Level 2 Low Carbon**


Investment for each of the top five Low Carbon sub-sectors grew between 2017/18 and 2019/20:

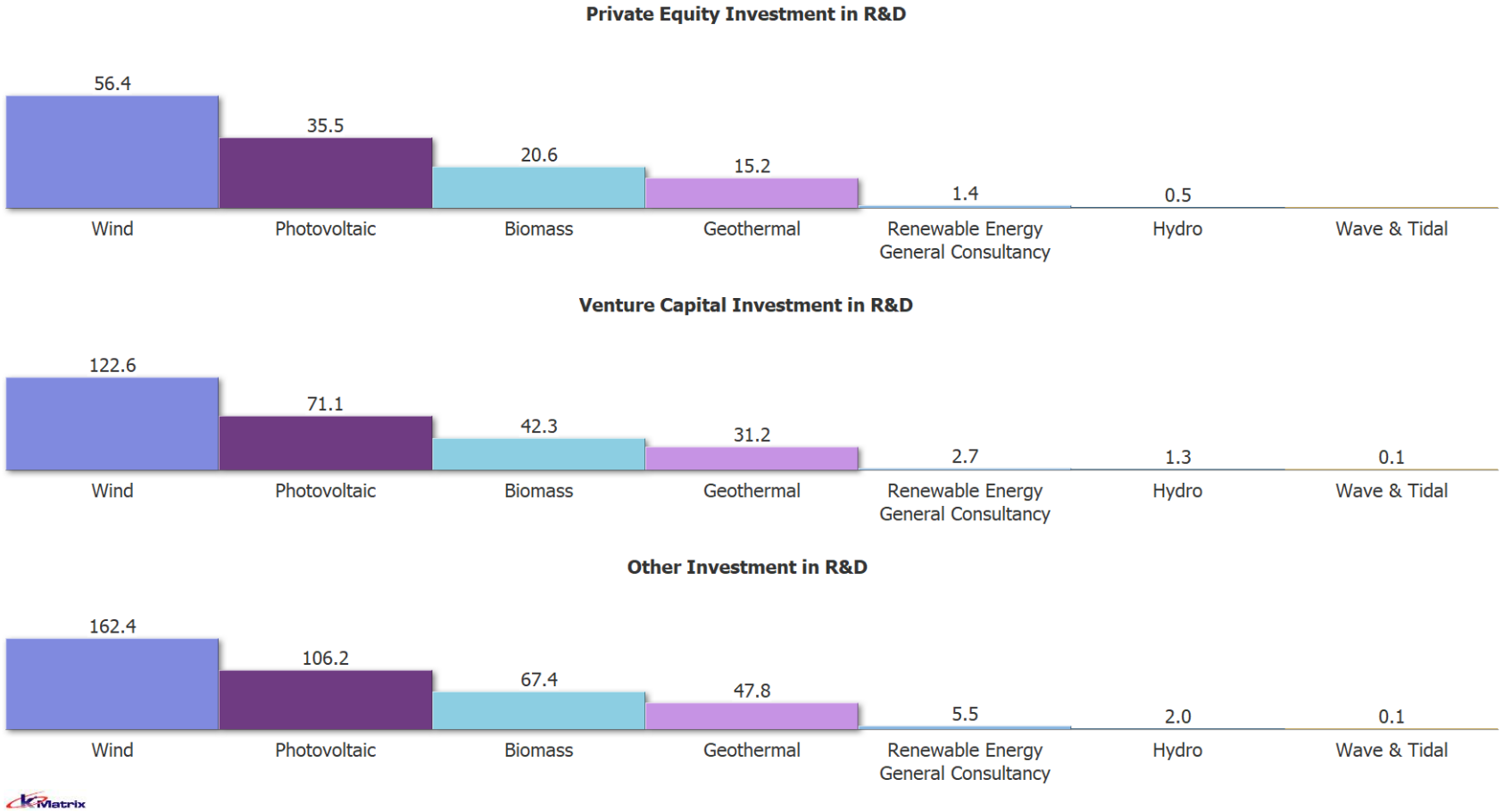
- Building Technologies from £37m to £41m for Private Equity, £76m to £88m for Venture Capital and £119m to £124m for Other Investment
- Alternative Fuels from £33m to £45m for Private Equity, £67m to £90m for Venture Capital and £95m to £149m for Other Investment
- Alternative Fuel Vehicle was steady at £17m for Private Equity, grew from £35m to £40m for Venture Capital and £45m to £50m for Other Investment
- Energy Management grew from £6m to £7m for Private Equity, £13m to £15m for Venture Capital and £19m to £23m for Other Investment
- Carbon Finance grew from £5m to £8m for Private Equity, £12m to £13m for Venture Capital and was steady at £19m for Other Investment

**Figure 28: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D 2019/20 – Low Carbon top Level 3 sub-sectors**




Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Low Carbon have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.3.

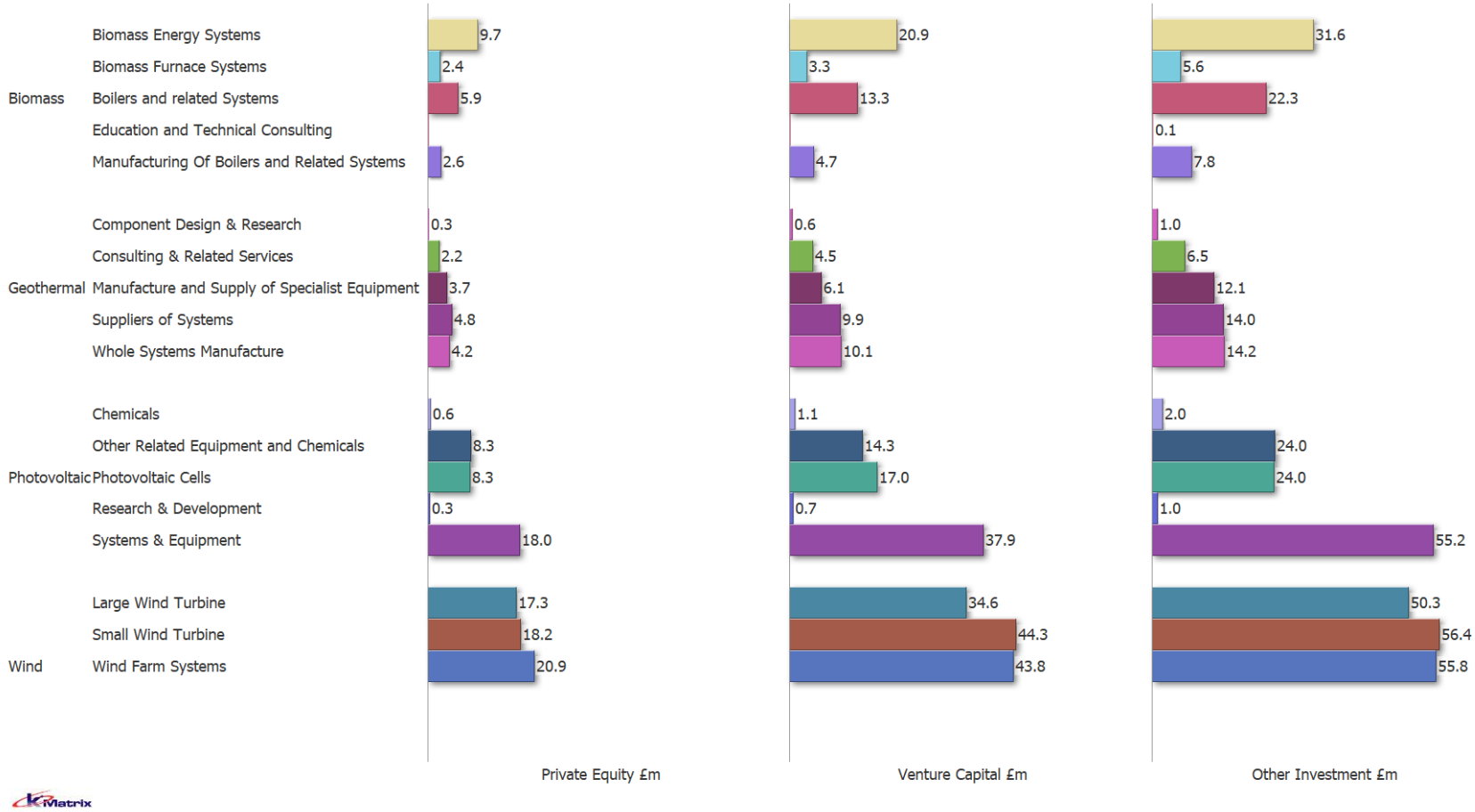
**Figure 29: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D 2019/20 – Level 2 Renewable Energy**




Investment for each of the top four Renewable Energy sub-sectors grew between 2017/18 and 2019/20:

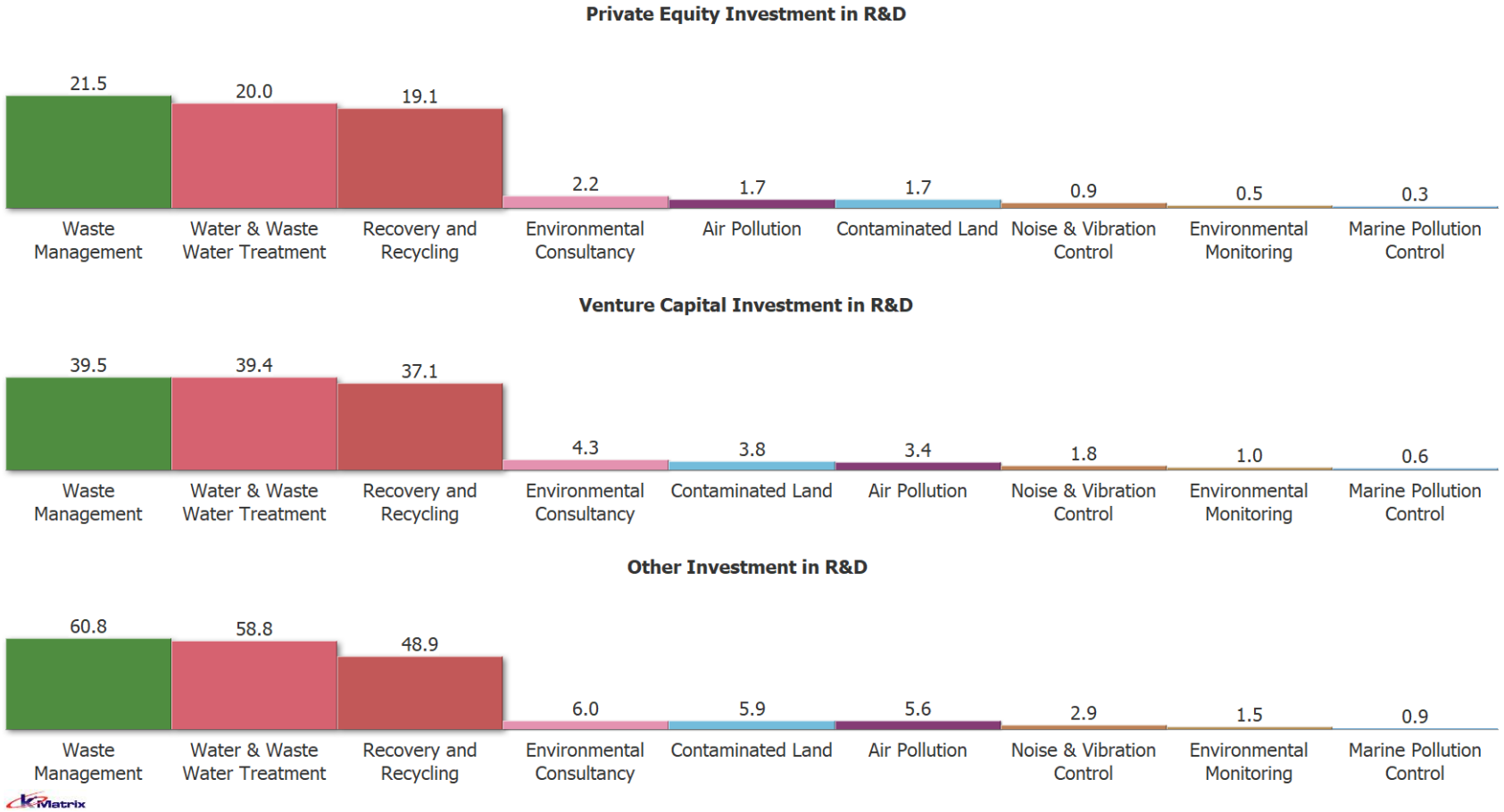
- Wind from £41m to £56m for Private Equity, £77m to £123m for Venture Capital and £117m to £162m for Other Investment
- Photovoltaic from £27m to £36m for Private Equity, £49m to £71m for Venture Capital and £81m to £106m for Other Investment
- Biomass was steady at £21m for Private Equity, grew from £37m to £42m for Venture Capital and £56m to £67m for Other Investment
- Geothermal grew from £11m to £15m for Private Equity, £20m to £31m for Venture Capital and £30m to £48m for Other Investment

**Figure 30: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D 2019/20 – Renewable Energy top Level 3 sub-sectors**




Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Renewable Energy have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.4, with the exception of increased investment in Small Wind Turbine in the Wind sub-sector than would be expected from the sales pattern.

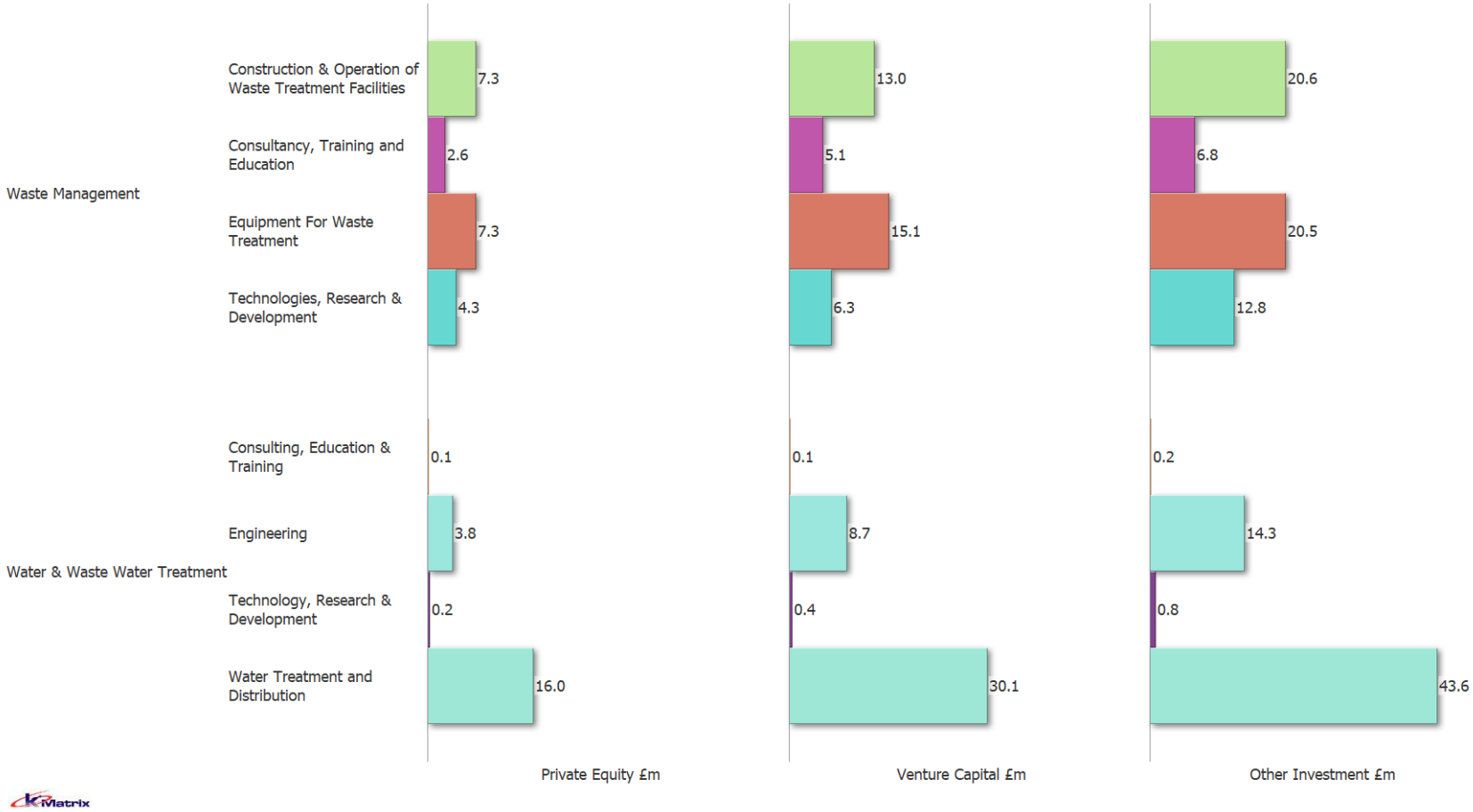
**Figure 31: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D 2019/20 – Level 2 Environmental**




Investment for each of the top three Environmental sub-sectors grew between 2017/18 and 2019/20:

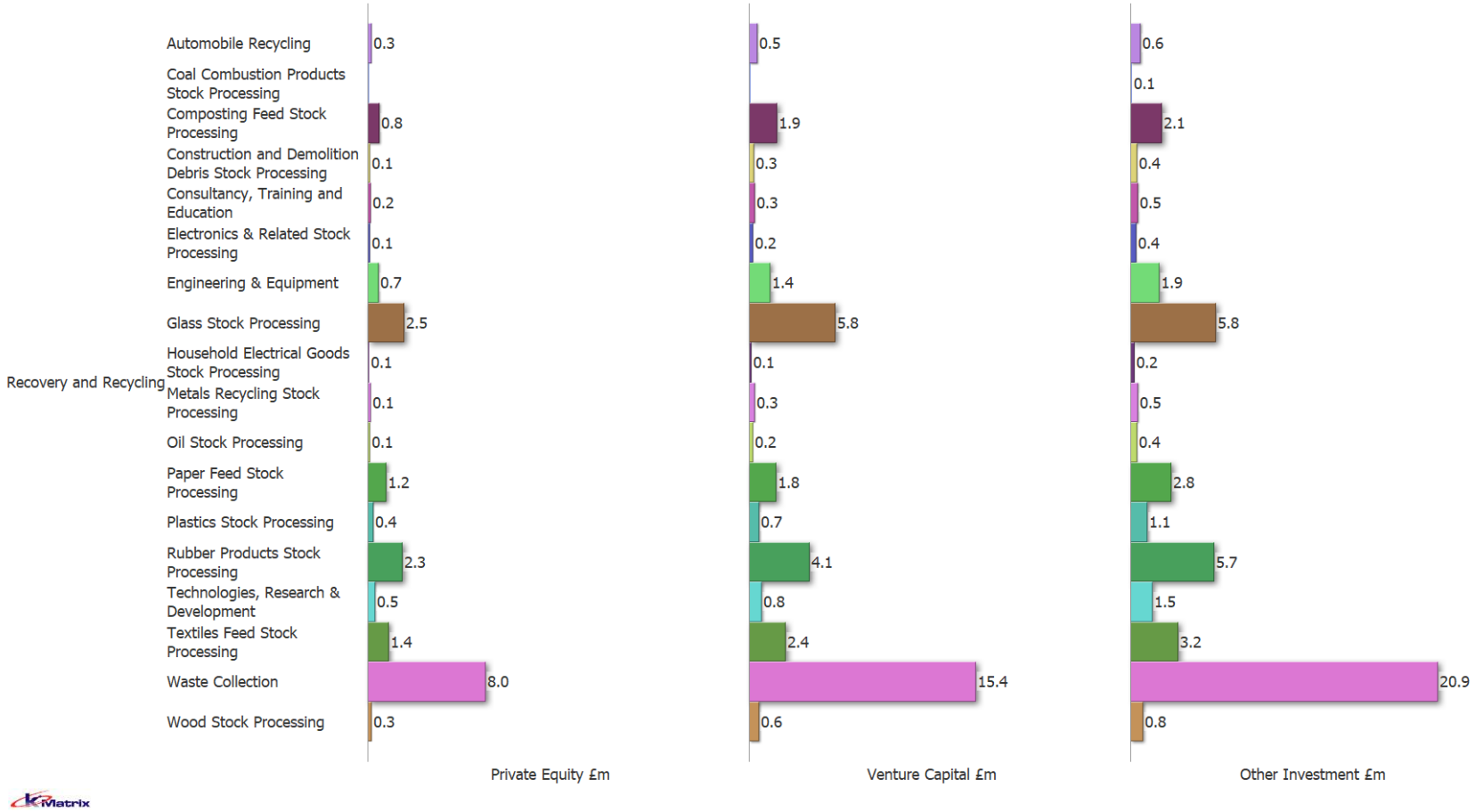
- Water & Waste Water Treatment fell from £21m to £20m for Private Equity, £40m to £39m for Venture Capital and grew from £55m to £59m for Other Investment .
- Waste Management grew from £16m to £22m for Private Equity, £35m to £39m for Venture Capital and £50m to £61m for Other Investment
- Recovery and Recycling grew from £15m to £19m for Private Equity, £29m to £37m for Venture Capital and £42m to £49m for Other Investment

**Figure 32: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D 2019/20 – Environmental top Level 3 sub-sectors, Waste Management and Water and Waste Water Treatment**




Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Environmental have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.5.

**Figure 33: Greater Birmingham and Solihull LEP's LCEGS Investment in R&D 2019/20 – Environmental top Level 3 sub-sectors, Recovery and Recycling**




Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Environmental have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.5.

## 1.9 Greater Birmingham and Solihull LEP's LCEGS Company Size

In this section we look at the number of companies within the Greater Birmingham and Solihull LEP, split by size of company, using the standard classification of company size. Growth between one year and the next is shown in red.

Company size classifications:

- Start-up = any company formed during the previous 12 months, for 2017/18 that would include companies formed during 2016/17 and so on
- Micro = companies with 2-9 employees
- SME = Small and Medium-sized companies, with 10-249 employees
- Large = companies with 250-1,500 employees
- Corporations = any company with 1,501 or more employees
- Total Companies = the total company count

Start-ups listed in 2017/18 will have been formed in 2016/17, those listed in 2018/19 will have been formed in 2017/18 and those in 2019/20 will have been formed in 2018/19. Start-up companies are a discrete category, not dependent on number of employees and are not double counted in the other categories.

Table 1 shows the company count for the LCEGS sector across the Greater Birmingham and Solihull LEP, split by Start-up, Micro, SME, Large and Corporations, with the Total Number of Companies for reference. The table is also split by Level 1, providing both a sector and Level 1 overview.

**Table 1: Greater Birmingham and Solihull LEP's LCEGS Number of Companies Split by Company Size, with Growth 2017/18 to 2019/20 – Level 1**

| | # Start-up | | | | | # Micro | | | | | # SMEs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Level 1 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 |
| Environmental | 25 | 3.7% | 26 | 12.4% | 29 | 148 | 3.7% | 154 | 12.4% | 173 | 247 | 3.7% | 256 | 12.6% | 288 |
| Low Carbon | 52 | 1.2% | 53 | 13.8% | 60 | 312 | 2.3% | 319 | 12.4% | 359 | 512 | 4.3% | 535 | 12.8% | 603 |
| Renewable Energy | 47 | 4.0% | 49 | 11.6% | 54 | 278 | 5.1% | 293 | 12.0% | 328 | 466 | 2.5% | 478 | 13.4% | 542 |
| **Total** | **123** | **2.8%** | **127** | **12.7%** | **143** | **739** | **3.6%** | **765** | **12.2%** | **859** | **1,225** | **3.5%** | **1,268** | **13.0%** | **1,433** |

| | # Large | | | | | # Corporations | | | | | Total # Companies | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Level 1 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 |
| Environmental | 49 | 3.5% | 51 | 12.8% | 58 | 25 | 3.9% | 26 | 13.1% | 29 | 493 | 3.7% | 511 | 12.6% | 576 |
| Low Carbon | 102 | 5.4% | 107 | 11.7% | 120 | 52 | 1.8% | 53 | 13.9% | 60 | 1,030 | 3.5% | 1,066 | 12.6% | 1,201 |
| Renewable Energy | 94 | 3.9% | 97 | 12.0% | 109 | 47 | 3.1% | 48 | 14.1% | 55 | 932 | 3.5% | 965 | 12.8% | 1,088 |
| **Total** | **245** | **4.5%** | **256** | **12.0%** | **286** | **123** | **2.7%** | **126** | **13.8%** | **143** | **2,455** | **3.6%** | **2,542** | **12.7%** | **2,864** |

Table 1 shows that the growth in the number of companies per size grouping is similar across the Level 1 sub-sectors, with growth between 2018/19 and 2019/20 being stronger in all size groupings than the previous year.

The strongest growth between 2018/19 and 2019/20 of 13.9% was seen in corporations for Low Carbon, with the weakest growth of 11.7% was seen in Large in the Low Carbon sub-sector.

Tables 2a and 2b show the company count for the LCEGS sector across the Greater Birmingham and Solihull LEP, split by Start-up, Micro, SME, Large and Corporations, with the Total Number of Companies again for reference. The table is also split by Level 2.

**Table 2a: Greater Birmingham and Solihull LEP's LCEGS Number of Companies Split by Company Size, with Growth 2017/18 to 2019/20 – Level 2**

| | | # Start-up | | | | | # Micro | | | | | # SMEs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Growth | | Growth | | | Growth | | Growth | | | Growth | | Growth | |
| Level 1 | Level 2 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| **Environmental** | Air Pollution | 1 | 0.0% | 1 | 0.0% | 1 | 4 | 0.0% | 4 | 0.0% | 4 | 6 | 0.0% | 6 | 16.7% | 7 |
| **Environmental** | Contaminated Land | 1 | 0.0% | 1 | 0.0% | 1 | 4 | 0.0% | 4 | 25.0% | 5 | 7 | 0.0% | 7 | 14.3% | 8 |
| **Environmental** | Environmental Consultancy | 1 | 0.0% | 1 | 0.0% | 1 | 5 | 0.0% | 5 | 0.0% | 5 | 8 | 0.0% | 8 | 12.5% | 9 |
| **Environmental** | Environmental Monitoring | 0 | 0.0% | 0 | 0.0% | 0 | 1 | 0.0% | 1 | 0.0% | 1 | 2 | 0.0% | 2 | 0.0% | 2 |
| **Environmental** | Marine Pollution Control | 0 | 0.0% | 0 | 0.0% | 0 | 1 | 0.0% | 1 | 0.0% | 1 | 1 | 0.0% | 1 | 0.0% | 1 |
| **Environmental** | Noise & Vibration Control | 0 | 0.0% | 0 | 0.0% | 0 | 2 | 0.0% | 2 | 0.0% | 2 | 3 | 33.3% | 4 | 0.0% | 4 |
| **Environmental** | Recovery and Recycling | 7 | 0.0% | 7 | 14.3% | 8 | 40 | 2.5% | 41 | 14.6% | 47 | 66 | 3.0% | 68 | 13.2% | 77 |
| **Environmental** | Waste Management | 7 | 14.3% | 8 | 12.5% | 9 | 44 | 2.3% | 45 | 13.3% | 51 | 73 | 4.1% | 76 | 11.8% | 85 |
| **Environmental** | Water & Waste Water Treatment | 8 | 0.0% | 8 | 12.5% | 9 | 48 | 4.2% | 50 | 12.0% | 56 | 81 | 2.5% | 83 | 13.3% | 94 |
| **Low Carbon** | Additional Energy Sources | 1 | 0.0% | 1 | 0.0% | 1 | 6 | 0.0% | 6 | 16.7% | 7 | 10 | 10.0% | 11 | 9.1% | 12 |
| **Low Carbon** | Alternative Fuel Vehicle | 6 | 16.7% | 7 | 0.0% | 7 | 38 | 5.3% | 40 | 12.5% | 45 | 64 | 4.7% | 67 | 11.9% | 75 |
| **Low Carbon** | Alternative Fuels | 21 | 0.0% | 21 | 14.3% | 24 | 128 | 0.0% | 128 | 11.7% | 143 | 206 | 4.9% | 216 | 14.4% | 247 |
| **Low Carbon** | Building Technologies | 17 | 5.9% | 18 | 11.1% | 20 | 104 | 3.8% | 108 | 13.9% | 123 | 174 | 3.4% | 180 | 12.8% | 203 |
| **Low Carbon** | Carbon Capture & Storage | 0 | 0.0% | 0 | 0.0% | 0 | 2 | 0.0% | 2 | 50.0% | 3 | 4 | 0.0% | 4 | 25.0% | 5 |
| **Low Carbon** | Carbon Finance | 3 | 0.0% | 3 | 0.0% | 3 | 17 | 5.9% | 18 | 11.1% | 20 | 28 | 7.1% | 30 | 6.7% | 32 |
| **Low Carbon** | Energy Management | 3 | 0.0% | 3 | 0.0% | 3 | 15 | 6.7% | 16 | 12.5% | 18 | 25 | 4.0% | 26 | 15.4% | 30 |
| **Low Carbon** | Nuclear Power | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Renewable Energy** | Biomass | 9 | 0.0% | 9 | 11.1% | 10 | 51 | 5.9% | 54 | 13.0% | 61 | 86 | 1.2% | 87 | 13.8% | 99 |
| **Renewable Energy** | Geothermal | 5 | 0.0% | 5 | 20.0% | 6 | 31 | 3.2% | 32 | 12.5% | 36 | 52 | 1.9% | 53 | 13.2% | 60 |
| **Renewable Energy** | Hydro | 0 | 0.0% | 0 | 0.0% | 0 | 2 | 0.0% | 2 | 0.0% | 2 | 3 | 0.0% | 3 | 0.0% | 3 |
| **Renewable Energy** | Photovoltaic | 12 | 0.0% | 12 | 16.7% | 14 | 71 | 4.2% | 74 | 13.5% | 84 | 119 | 2.5% | 122 | 13.1% | 138 |
| **Renewable Energy** | Renewable Consultancy | 1 | 0.0% | 1 | 0.0% | 1 | 4 | 0.0% | 4 | 0.0% | 4 | 6 | 0.0% | 6 | 16.7% | 7 |
| **Renewable Energy** | Wave & Tidal | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 |
| **Renewable Energy** | Wind | 20 | 5.0% | 21 | 9.5% | 23 | 120 | 5.8% | 127 | 11.0% | 141 | 201 | 2.5% | 206 | 14.1% | 235 |
| **Total** | | **123** | **3.3%** | **127** | **11.0%** | **141** | **738** | **3.5%** | **764** | **12.4%** | **859** | **1,225** | **3.3%** | **1,266** | **13.2%** | **1,433** |

**Table 2b: Greater Birmingham and Solihull LEP's LCEGS Number of Companies Split by Company Size, with Growth 2017/18 to 2019/20 – Level 2**

| | | # Large | | | | | # Corporations | | | | | Total # Companies | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Growth | | Growth | | | Growth | | Growth | | | Growth | | Growth | |
| Level 1 | Level 2 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| **Environmental** | Air Pollution | 1 | 0.0% | 1 | 0.0% | 1 | 1 | 0.0% | 1 | 0.0% | 1 | 12 | 8.3% | 13 | 15.4% | 15 |
| **Environmental** | Contaminated Land | 1 | 0.0% | 1 | 100.0% | 2 | 1 | 0.0% | 1 | 0.0% | 1 | 14 | 0.0% | 14 | 14.3% | 16 |
| **Environmental** | Environmental Consultancy | 2 | 0.0% | 2 | 0.0% | 2 | 1 | 0.0% | 1 | 0.0% | 1 | 15 | 6.7% | 16 | 12.5% | 18 |
| **Environmental** | Environmental Monitoring | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 4 | 0.0% | 4 | 0.0% | 4 |
| **Environmental** | Marine Pollution Control | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 3 | 0.0% | 3 | 0.0% | 3 |
| **Environmental** | Noise & Vibration Control | 1 | 0.0% | 1 | 0.0% | 1 | 0 | 0.0% | 0 | 0.0% | 0 | 7 | 0.0% | 7 | 14.3% | 8 |
| **Environmental** | Recovery and Recycling | 13 | 7.7% | 14 | 14.3% | 16 | 7 | 0.0% | 7 | 14.3% | 8 | 132 | 3.8% | 137 | 12.4% | 154 |
| **Environmental** | Waste Management | 15 | 0.0% | 15 | 13.3% | 17 | 7 | 14.3% | 8 | 12.5% | 9 | 146 | 3.4% | 151 | 12.6% | 170 |
| **Environmental** | Water & Waste Water Treatment | 16 | 6.3% | 17 | 11.8% | 19 | 8 | 0.0% | 8 | 12.5% | 9 | 161 | 3.7% | 167 | 12.0% | 187 |
| **Low Carbon** | Additional Energy Sources | 2 | 0.0% | 2 | 0.0% | 2 | 1 | 0.0% | 1 | 0.0% | 1 | 20 | 5.0% | 21 | 14.3% | 24 |
| **Low Carbon** | Alternative Fuel Vehicle | 13 | 0.0% | 13 | 15.4% | 15 | 6 | 16.7% | 7 | 14.3% | 8 | 129 | 3.9% | 134 | 12.7% | 151 |
| **Low Carbon** | Alternative Fuels | 40 | 7.5% | 43 | 11.6% | 48 | 21 | 0.0% | 21 | 14.3% | 24 | 417 | 2.9% | 429 | 13.5% | 487 |
| **Low Carbon** | Building Technologies | 35 | 2.9% | 36 | 13.9% | 41 | 18 | 0.0% | 18 | 11.1% | 20 | 348 | 3.7% | 361 | 12.7% | 407 |
| **Low Carbon** | Carbon Capture & Storage | 1 | 0.0% | 1 | 0.0% | 1 | 0 | 0.0% | 0 | 0.0% | 0 | 8 | 0.0% | 8 | 12.5% | 9 |
| **Low Carbon** | Carbon Finance | 6 | 0.0% | 6 | 0.0% | 6 | 3 | 0.0% | 3 | 0.0% | 3 | 57 | 7.0% | 61 | 6.6% | 65 |
| **Low Carbon** | Energy Management | 5 | 0.0% | 5 | 20.0% | 6 | 3 | 0.0% | 3 | 0.0% | 3 | 51 | 2.0% | 52 | 13.5% | 59 |
| **Low Carbon** | Nuclear Power | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Renewable Energy** | Biomass | 17 | 5.9% | 18 | 11.1% | 20 | 9 | 0.0% | 9 | 11.1% | 10 | 171 | 3.5% | 177 | 13.0% | 200 |
| **Renewable Energy** | Geothermal | 10 | 10.0% | 11 | 9.1% | 12 | 5 | 0.0% | 5 | 20.0% | 6 | 103 | 3.9% | 107 | 12.1% | 120 |
| **Renewable Energy** | Hydro | 1 | 0.0% | 1 | 0.0% | 1 | 0 | 0.0% | 0 | 0.0% | 0 | 6 | 0.0% | 6 | 16.7% | 7 |
| **Renewable Energy** | Photovoltaic | 24 | 4.2% | 25 | 12.0% | 28 | 12 | 0.0% | 12 | 16.7% | 14 | 238 | 3.4% | 246 | 12.2% | 276 |
| **Renewable Energy** | Renewable Consultancy | 1 | 0.0% | 1 | 0.0% | 1 | 1 | 0.0% | 1 | 0.0% | 1 | 12 | 0.0% | 12 | 16.7% | 14 |
| **Renewable Energy** | Wave & Tidal | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 |
| **Renewable Energy** | Wind | 41 | 2.4% | 42 | 11.9% | 47 | 20 | 0.0% | 20 | 20.0% | 24 | 402 | 3.7% | 417 | 12.7% | 470 |
| **Total** | | **245** | **4.1%** | **255** | **12.2%** | **286** | **124** | **1.6%** | **126** | **13.5%** | **143** | **2,456** | **3.5%** | **2,543** | **12.6%** | **2,864** |

Table 2 shows that the growth in the number of companies per size grouping is more variable at this level of detail, as would be expected with a smaller number of companies having a greater impact on growth rates. For example, a 100% increase in Contaminated Land is seen in the Large category when 1 company grew to 2.

## 1.10 Greater Birmingham and Solihull LEP's LCEGS by Skills

In this section we look at the skills within the Greater Birmingham and Solihull LEP, through the number of employees listed in accordance with Standard Occupational Classification 2020 Index. This data will be overlaid with demand mapping during the Policy development and Growth forecasting phase of the study. Table 3 shows the number of employees within each standard Occupational Class for the LCEGS sector as a whole, per year.

**Table 3: Greater Birmingham and Solihull LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – LCEGS Sector**

| | LCEGS Sector Totals | | | | |
|---|---|---|---|---|---|
| Skill | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 |
| Technicians | 1,005 | 18.4% | 1,190 | -5.6% | 1,124 |
| Snr Management SME | 2,354 | 3.4% | 2,433 | 3.1% | 2,508 |
| Supervisory | 2,404 | -2.3% | 2,350 | 24.1% | 2,917 |
| Middle / Junior Management | 2,394 | 2.7% | 2,457 | 15.1% | 2,828 |
| Designer / Developer | 339 | 4.2% | 353 | 10.9% | 391 |
| Clerical | 1,233 | 12.6% | 1,389 | 5.9% | 1,471 |
| Self Employed | 319 | -3.2% | 308 | 32.3% | 408 |
| Advisor or Agent | 244 | 6.5% | 260 | 10.4% | 287 |
| Educator | 8 | 1.8% | 8 | 11.6% | 9 |
| Specialist or Consultant | 1,473 | 16.1% | 1,710 | 4.0% | 1,778 |
| Editor | 38 | 9.8% | 41 | 2.7% | 42 |
| Industrial Researchers | 395 | 10.9% | 438 | -9.0% | 398 |
| Scientist | 168 | 2.9% | 173 | 3.6% | 180 |
| Maintenance Engineer | 2,632 | 12.6% | 2,964 | 2.6% | 3,041 |
| Civil Engineer | 193 | 20.6% | 232 | -14.9% | 198 |
| Production Engineer | 500 | -0.7% | 496 | 12.3% | 557 |
| Power distribution Engineer | 1,231 | 14.0% | 1,403 | -3.4% | 1,356 |
| Construction Engineer | 270 | 8.7% | 294 | 11.4% | 327 |
| Sales Exec | 1,281 | 13.3% | 1,452 | -4.3% | 1,390 |
| Marketing Personnel | 1,245 | 5.8% | 1,317 | 12.0% | 1,475 |
| General Semi Skilled Worker | 2,594 | 6.5% | 2,764 | 7.9% | 2,983 |
| General Labour | 3,139 | 6.8% | 3,353 | 3.1% | 3,458 |
| Other Employees | 3,523 | -6.1% | 3,307 | 21.2% | 4,006 |
| Administrative workers | 1,422 | 19.2% | 1,694 | -0.9% | 1,679 |
| **Total Number of Employees** | **41,408** | **11.0%** | **45,952** | **5.2%** | **48,322** |

At the sector-level we can see that the number of employees per occupational classification varies considerably between each year. For example, the Technicians classification saw growth of 18.4% between 2017/18 and -5.6% between 2018/19.

Due to the varied nature of the LCEGS sector, which draws from many more traditional sectors such as Engineering, Construction and many others, the decrease in employee numbers from year to year can be a result of employees working within the same company, but within a different sector. An example would be a company engineering components within both the Wind sub-sector and Automotive sector, where one year the company services more Wind than Automotive contracts, the employee numbers would count more Wind employees; the following year the company services more Automotive contracts than Wind contracts, resulting in an apparent reduction in the number of employees for the Wind sector, which is true with regards to those working *within the LCEGS Sector* but it does not necessarily follow that they are job losses within companies themselves.

The Total Number of Employees increases year on year, which is more reliable indication of employment growth due to the larger numbers being less impacted by the natural fluctuations mentioned above.

Table 4 shows the number of employees within each standard Occupational Class for the Level 1 sub-sectors.

**Table 4: Greater Birmingham and Solihull LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Level 1**

| | Low Carbon | | | | | Renewable Energy | | | | | Environmental | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Growth | | Growth | | | Growth | | Growth | | | Growth | | Growth | |
| Skill | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| Technicians | 321 | 18.5% | 381 | -5.7% | 359 | 413 | 18.4% | 489 | -5.7% | 461 | 271 | 18.3% | 320 | -5.3% | 303 |
| Snr Management SME | 576 | 2.9% | 593 | 3.1% | 612 | 1,363 | 3.4% | 1,410 | 3.1% | 1,453 | 414 | 3.9% | 430 | 3.1% | 443 |
| Supervisory | 642 | -3.1% | 622 | 26.1% | 784 | 1,324 | -2.1% | 1,296 | 23.6% | 1,602 | 439 | -1.5% | 432 | 22.5% | 530 |
| Middle / Junior Management | 623 | 2.3% | 637 | 15.3% | 735 | 1,336 | 2.7% | 1,371 | 15.1% | 1,579 | 435 | 3.1% | 449 | 14.7% | 515 |
| Designer / Developer | 86 | 4.1% | 89 | 11.1% | 99 | 104 | 4.2% | 108 | 11.1% | 120 | 149 | 4.3% | 156 | 10.6% | 172 |
| Clerical | 344 | 12.6% | 387 | 6.4% | 412 | 666 | 12.6% | 750 | 5.8% | 794 | 223 | 12.6% | 251 | 5.6% | 265 |
| Self Employed | 114 | -3.4% | 110 | 32.8% | 146 | 87 | -3.3% | 84 | 32.6% | 111 | 118 | -2.9% | 115 | 31.7% | 151 |
| Advisor or Agent | 128 | 6.1% | 136 | 10.6% | 150 | 30 | 6.7% | 32 | 10.3% | 35 | 86 | 6.9% | 92 | 10.3% | 102 |
| Educator | 0 | 1.4% | 0 | 11.7% | 0 | 0 | 1.9% | 0 | 11.7% | 0 | 7 | 1.8% | 7 | 11.6% | 8 |
| Specialist or Consultant | 525 | 17.0% | 615 | 5.5% | 648 | 661 | 15.5% | 763 | 3.1% | 787 | 287 | 15.7% | 333 | 3.2% | 343 |
| Editor | 8 | 9.8% | 9 | 2.7% | 9 | 9 | 9.7% | 10 | 2.6% | 10 | 20 | 9.8% | 22 | 2.8% | 23 |
| Industrial Researchers | 222 | 10.8% | 246 | -9.0% | 224 | 47 | 10.9% | 53 | -9.2% | 48 | 125 | 11.0% | 139 | -9.0% | 126 |
| Scientist | 111 | 2.8% | 114 | 3.6% | 119 | 16 | 3.1% | 17 | 3.6% | 17 | 41 | 3.1% | 42 | 3.6% | 44 |
| Maintenance Engineer | 650 | 12.6% | 732 | 2.7% | 751 | 1,422 | 12.6% | 1,601 | 2.5% | 1,642 | 561 | 12.6% | 631 | 2.6% | 648 |
| Civil Engineer | 45 | 20.8% | 54 | -15.1% | 46 | 46 | 20.6% | 55 | -15.2% | 47 | 102 | 20.6% | 123 | -14.6% | 105 |
| Production Engineer | 151 | -1.0% | 150 | 12.6% | 168 | 215 | -0.7% | 214 | 12.2% | 240 | 133 | -0.3% | 133 | 12.0% | 149 |
| Power distribution Engineer | 263 | 14.1% | 301 | -3.2% | 291 | 688 | 14.0% | 784 | -3.4% | 758 | 280 | 13.9% | 318 | -3.5% | 307 |
| Construction Engineer | 57 | 9.3% | 63 | 11.1% | 69 | 93 | 8.6% | 101 | 11.4% | 112 | 120 | 8.5% | 130 | 11.6% | 146 |
| Sales Exec | 384 | 13.2% | 435 | -4.3% | 416 | 651 | 13.3% | 737 | -4.4% | 705 | 247 | 13.3% | 280 | -3.8% | 269 |
| Marketing Personnel | 374 | 5.8% | 396 | 12.0% | 443 | 650 | 5.7% | 687 | 12.0% | 769 | 221 | 6.2% | 234 | 12.0% | 262 |
| General Semi Skilled Worker | 653 | 6.3% | 694 | 8.1% | 751 | 1,386 | 6.5% | 1,476 | 8.0% | 1,594 | 555 | 6.8% | 593 | 7.6% | 638 |
| General Labour | 1,060 | 6.8% | 1,132 | 2.9% | 1,165 | 1,678 | 6.9% | 1,793 | 3.1% | 1,849 | 401 | 6.8% | 428 | 3.8% | 444 |
| Other Employees | 851 | -9.2% | 772 | 23.9% | 957 | 2,019 | -3.2% | 1,954 | 18.0% | 2,307 | 653 | -11.2% | 580 | 28.0% | 742 |
| Administrative workers | 420 | 20.0% | 503 | -1.1% | 498 | 716 | 19.0% | 851 | -0.8% | 845 | 286 | 18.6% | 340 | -0.9% | 337 |
| **Total Number of Employees** | **16,081** | **11.0%** | **17,851** | **5.1%** | **18,764** | **16,479** | **11.0%** | **18,291** | **5.1%** | **19,232** | **8,847** | **10.9%** | **9,809** | **5.3%** | **10,326** |

A similar pattern is seen the Level 1 figures, with natural fluctuations in employee numbers. The number do give an indication of the relative scale of employment between sub-sectors in the different occupational classes.

The top 11 sub-sectors account for 95% of employment in the LCEGS sector in the Greater Birmingham and Solihull LEP. Tables 5a-5d shows the numbers of employees within each standard Occupational Class for the top 11 Level 2 sub-sectors of the LCEGS sector.

**Table 5a: Greater Birmingham and Solihull LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Alternative Fuel Vehicle, Alternative Fuels and Biomass**

| | Alternative Fuel Vehicle | | | | | Alternative Fuels | | | | | Biomass | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Growth | | Growth | | | Growth | | Growth | | | Growth | | Growth | |
| Skill | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| Technicians | 17 | 18.1% | 20 | -5.0% | 19 | 125 | 18.4% | 148 | -5.5% | 140 | 73 | 18.4% | 86 | -5.6% | 81 |
| Snr Management SME | 30 | 3.1% | 31 | 3.6% | 32 | 103 | 3.6% | 107 | 3.3% | 110 | 305 | 3.4% | 315 | 3.3% | 326 |
| Supervisory | 37 | -1.5% | 36 | 22.8% | 44 | 129 | -1.9% | 126 | 23.6% | 156 | 301 | -2.2% | 295 | 24.4% | 367 |
| Middle / Junior Management | 38 | 2.5% | 38 | 15.3% | 44 | 127 | 2.8% | 130 | 15.1% | 150 | 298 | 2.8% | 306 | 15.1% | 352 |
| Designer / Developer | 4 | 4.1% | 4 | 11.0% | 5 | 22 | 4.0% | 23 | 11.2% | 26 | 34 | 4.1% | 35 | 11.2% | 39 |
| Clerical | 23 | 12.4% | 25 | 5.8% | 27 | 64 | 12.6% | 72 | 5.8% | 76 | 149 | 12.6% | 168 | 5.9% | 177 |
| Self Employed | 22 | -3.3% | 22 | 32.1% | 29 | 34 | -3.1% | 33 | 32.2% | 44 | 15 | -3.5% | 14 | 33.0% | 19 |
| Advisor or Agent | 40 | 6.3% | 43 | 10.6% | 47 | 3 | 6.8% | 3 | 10.2% | 3 | 5 | 6.7% | 5 | 10.5% | 6 |
| Educator | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 1.9% | 0 | 11.7% | 0 |
| Specialist or Consultant | 21 | 18.6% | 25 | 8.6% | 27 | 110 | 16.0% | 127 | 4.0% | 132 | 163 | 15.4% | 189 | 3.0% | 194 |
| Editor | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 4 | 9.5% | 5 | 2.7% | 5 |
| Industrial Researchers | 65 | 10.8% | 72 | -8.9% | 66 | 47 | 10.9% | 52 | -8.9% | 47 | 6 | 10.8% | 7 | -9.1% | 6 |
| Scientist | 7 | 2.8% | 7 | 3.6% | 7 | 84 | 2.9% | 87 | 3.6% | 90 | 9 | 3.2% | 9 | 3.5% | 9 |
| Maintenance Engineer | 53 | 12.5% | 60 | 3.0% | 62 | 160 | 12.5% | 180 | 2.8% | 185 | 299 | 12.6% | 337 | 2.9% | 347 |
| Civil Engineer | 8 | 20.6% | 10 | -14.6% | 8 | 1 | 20.2% | 1 | -14.5% | 1 | 5 | 20.7% | 6 | -14.9% | 5 |
| Production Engineer | 0 | 0.0% | 0 | 0.0% | 0 | 90 | -1.0% | 89 | 12.6% | 100 | 47 | -0.8% | 47 | 12.6% | 53 |
| Power distribution Engineer | 8 | 13.8% | 9 | -3.1% | 9 | 29 | 13.8% | 33 | -3.2% | 32 | 147 | 14.2% | 168 | -3.3% | 163 |
| Construction Engineer | 8 | 8.9% | 9 | 11.2% | 10 | 1 | 8.4% | 1 | 11.7% | 1 | 4 | 8.9% | 5 | 11.4% | 5 |
| Sales Exec | 44 | 12.8% | 50 | -4.2% | 47 | 133 | 13.3% | 151 | -4.3% | 144 | 147 | 13.2% | 167 | -4.2% | 160 |
| Marketing Personnel | 43 | 5.8% | 46 | 11.9% | 51 | 129 | 5.9% | 136 | 11.9% | 153 | 149 | 5.8% | 157 | 12.2% | 177 |
| General Semi Skilled Worker | 38 | 6.2% | 40 | 8.3% | 44 | 172 | 6.3% | 183 | 8.0% | 198 | 299 | 6.5% | 319 | 8.2% | 345 |
| General Labour | 59 | 6.6% | 63 | 3.5% | 65 | 232 | 6.8% | 248 | 3.2% | 256 | 302 | 6.7% | 322 | 3.5% | 333 |
| Other Employees | 45 | -19.0% | 37 | 49.6% | 55 | 157 | -12.3% | 138 | 36.7% | 188 | 445 | -1.6% | 438 | 14.7% | 503 |
| Administrative workers | 31 | 18.9% | 36 | -1.0% | 36 | 84 | 18.8% | 100 | -0.9% | 99 | 151 | 19.0% | 180 | -0.8% | 179 |
| **Total Number of Employees** | **2,259** | **10.9%** | **2,506** | **5.1%** | **2,633** | **5,742** | **11.2%** | **6,383** | **5.2%** | **6,714** | **3,074** | **11.2%** | **3,417** | **5.1%** | **3,592** |

**Table 5b: Greater Birmingham and Solihull LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Building Technologies, Energy Management and Geothermal**

| | Building Technologies | | | | | Energy Management | | | | | Geothermal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Growth | | Growth | | | Growth | | Growth | | | Growth | | Growth | |
| Skill | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| Technicians | 143 | 18.6% | 169 | -5.8% | 159 | 23 | 18.6% | 27 | -5.9% | 25 | 36 | 18.5% | 43 | -5.6% | 41 |
| Snr Management SME | 350 | 3.2% | 361 | 3.1% | 372 | 43 | 3.4% | 44 | 3.0% | 46 | 143 | 3.4% | 148 | 3.1% | 153 |
| Supervisory | 341 | -2.3% | 333 | 24.6% | 415 | 44 | -2.2% | 43 | 24.3% | 54 | 138 | -2.1% | 135 | 23.8% | 167 |
| Middle / Junior Management | 338 | 2.6% | 347 | 15.3% | 400 | 44 | 2.7% | 45 | 15.2% | 52 | 139 | 2.6% | 143 | 15.1% | 164 |
| Designer / Developer | 40 | 4.2% | 42 | 11.2% | 46 | 12 | 4.2% | 12 | 10.9% | 13 | 16 | 4.1% | 17 | 11.1% | 18 |
| Clerical | 178 | 12.7% | 201 | 6.0% | 213 | 23 | 12.7% | 25 | 5.8% | 27 | 70 | 12.5% | 79 | 5.8% | 84 |
| Self Employed | 39 | -3.9% | 37 | 33.8% | 50 | 11 | -3.7% | 11 | 33.6% | 14 | 8 | -3.3% | 8 | 32.7% | 10 |
| Advisor or Agent | 47 | 6.5% | 50 | 10.5% | 55 | 10 | 6.7% | 10 | 10.4% | 12 | 8 | 6.6% | 8 | 10.5% | 9 |
| Educator | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 1.3% | 0 | 11.7% | 0 | 0 | 0.0% | 0 | 0.0% | 0 |
| Specialist or Consultant | 266 | 17.0% | 312 | 5.7% | 329 | 28 | 15.9% | 33 | 4.0% | 34 | 73 | 15.4% | 84 | 3.1% | 87 |
| Editor | 1 | 9.6% | 2 | 2.7% | 2 | 4 | 9.7% | 5 | 2.5% | 5 | 4 | 9.7% | 4 | 2.5% | 4 |
| Industrial Researchers | 87 | 10.8% | 97 | -9.0% | 88 | 9 | 10.8% | 10 | -9.4% | 9 | 6 | 11.0% | 6 | -9.2% | 6 |
| Scientist | 12 | 2.6% | 12 | 3.6% | 13 | 5 | 2.5% | 5 | 3.9% | 5 | 4 | 2.9% | 4 | 3.6% | 4 |
| Maintenance Engineer | 349 | 12.6% | 393 | 2.7% | 403 | 54 | 12.6% | 61 | 2.8% | 62 | 146 | 12.5% | 164 | 2.8% | 168 |
| Civil Engineer | 21 | 20.9% | 26 | -15.2% | 22 | 9 | 20.8% | 11 | -15.4% | 9 | 7 | 20.7% | 9 | -15.0% | 7 |
| Production Engineer | 45 | -1.0% | 44 | 12.6% | 50 | 10 | -1.0% | 10 | 12.6% | 11 | 25 | -0.7% | 25 | 12.5% | 28 |
| Power distribution Engineer | 183 | 14.1% | 208 | -3.1% | 202 | 26 | 14.3% | 30 | -3.4% | 29 | 71 | 13.9% | 81 | -3.2% | 78 |
| Construction Engineer | 33 | 9.7% | 37 | 10.9% | 41 | 9 | 9.1% | 10 | 11.2% | 11 | 6 | 8.7% | 6 | 11.4% | 7 |
| Sales Exec | 163 | 13.3% | 184 | -4.4% | 176 | 28 | 13.3% | 31 | -4.6% | 30 | 74 | 13.2% | 84 | -4.3% | 81 |
| Marketing Personnel | 161 | 5.6% | 171 | 12.0% | 191 | 25 | 5.7% | 27 | 12.0% | 30 | 73 | 5.7% | 77 | 12.2% | 87 |
| General Semi Skilled Worker | 360 | 6.3% | 383 | 8.3% | 415 | 51 | 6.5% | 54 | 8.1% | 58 | 145 | 6.4% | 155 | 8.0% | 167 |
| General Labour | 670 | 6.8% | 715 | 2.7% | 735 | 77 | 6.9% | 82 | 3.2% | 85 | 214 | 6.8% | 229 | 3.3% | 237 |
| Other Employees | 492 | -7.4% | 456 | 24.5% | 567 | 67 | -8.3% | 62 | 26.2% | 78 | 208 | -2.9% | 202 | 18.6% | 240 |
| Administrative workers | 196 | 19.4% | 234 | -0.8% | 232 | 27 | 19.1% | 32 | -0.8% | 32 | 73 | 18.9% | 87 | -0.9% | 86 |
| **Total Number of Employees** | **6,321** | **11.2%** | **7,028** | **5.0%** | **7,377** | **874** | **11.1%** | **972** | **5.1%** | **1,021** | **1,824** | **11.0%** | **2,024** | **5.1%** | **2,128** |

**Table 5c: Greater Birmingham and Solihull LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Photovoltaic, Recovery & Recycling and Waste Management**

| | Photovoltaic | | | | | Recovery and Recycling | | | | | Waste Management | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Growth | | Growth | | | Growth | | Growth | | | Growth | | Growth | |
| Skill | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| Technicians | 121 | 18.5% | 143 | -5.6% | 135 | 81 | 18.2% | 96 | -5.2% | 91 | 68 | 18.3% | 81 | -5.4% | 76 |
| Snr Management SME | 360 | 3.0% | 371 | 3.5% | 384 | 91 | 3.6% | 94 | 3.5% | 98 | 121 | 4.2% | 126 | 2.6% | 129 |
| Supervisory | 345 | -2.4% | 337 | 24.7% | 420 | 96 | -1.5% | 94 | 22.3% | 115 | 132 | -1.2% | 130 | 21.8% | 158 |
| Middle / Junior Management | 349 | 2.3% | 357 | 15.3% | 411 | 95 | 2.9% | 98 | 14.8% | 113 | 134 | 3.3% | 138 | 14.6% | 158 |
| Designer / Developer | 26 | 4.0% | 27 | 11.5% | 30 | 69 | 4.2% | 72 | 10.6% | 79 | 28 | 4.5% | 29 | 10.4% | 32 |
| Clerical | 173 | 12.5% | 195 | 5.9% | 206 | 48 | 12.5% | 54 | 5.6% | 57 | 69 | 12.7% | 78 | 5.3% | 82 |
| Self Employed | 19 | -3.7% | 18 | 33.6% | 24 | 23 | -2.9% | 23 | 31.8% | 30 | 35 | -2.5% | 35 | 30.9% | 45 |
| Advisor or Agent | 2 | 6.8% | 3 | 10.4% | 3 | 9 | 6.5% | 9 | 10.6% | 10 | 49 | 7.2% | 52 | 10.2% | 58 |
| Educator | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 1.5% | 0 | 11.7% | 0 | 3 | 2.2% | 3 | 11.5% | 3 |
| Specialist or Consultant | 166 | 15.7% | 192 | 3.4% | 199 | 80 | 15.4% | 92 | 2.7% | 95 | 83 | 16.0% | 96 | 3.8% | 100 |
| Editor | 0 | 0.0% | 0 | 0.0% | 0 | 4 | 9.8% | 4 | 2.9% | 4 | 7 | 9.9% | 8 | 2.9% | 8 |
| Industrial Researchers | 13 | 11.0% | 15 | -9.6% | 13 | 21 | 11.0% | 24 | -9.0% | 22 | 68 | 11.0% | 75 | -8.9% | 69 |
| Scientist | 0 | 2.9% | 0 | 4.1% | 0 | 19 | 3.0% | 19 | 3.6% | 20 | 12 | 3.4% | 13 | 3.8% | 13 |
| Maintenance Engineer | 352 | 12.5% | 395 | 2.7% | 406 | 121 | 12.5% | 136 | 2.6% | 140 | 163 | 12.7% | 183 | 2.6% | 188 |
| Civil Engineer | 10 | 20.9% | 12 | -15.6% | 10 | 37 | 20.6% | 44 | -14.8% | 38 | 26 | 20.5% | 31 | -14.5% | 27 |
| Production Engineer | 48 | -0.7% | 47 | 12.2% | 53 | 43 | -0.4% | 43 | 12.0% | 48 | 30 | -0.1% | 30 | 11.7% | 33 |
| Power distribution Engineer | 179 | 13.8% | 204 | -2.9% | 198 | 65 | 13.8% | 74 | -3.3% | 72 | 81 | 13.9% | 92 | -3.9% | 88 |
| Construction Engineer | 19 | 9.5% | 21 | 10.9% | 23 | 37 | 8.6% | 40 | 11.4% | 44 | 33 | 8.0% | 36 | 12.0% | 40 |
| Sales Exec | 170 | 13.2% | 193 | -4.7% | 184 | 81 | 13.3% | 92 | -4.0% | 88 | 67 | 13.3% | 76 | -3.2% | 73 |
| Marketing Personnel | 175 | 5.5% | 184 | 12.0% | 206 | 65 | 6.1% | 69 | 11.8% | 77 | 62 | 6.3% | 66 | 12.0% | 74 |
| General Semi Skilled Worker | 369 | 6.0% | 392 | 8.4% | 425 | 160 | 6.7% | 170 | 7.6% | 183 | 152 | 7.0% | 162 | 7.5% | 175 |
| General Labour | 480 | 6.8% | 513 | 2.7% | 527 | 161 | 6.9% | 172 | 3.5% | 178 | 94 | 6.7% | 100 | 4.4% | 105 |
| Other Employees | 498 | -2.8% | 484 | 17.9% | 571 | 129 | -18.0% | 105 | 44.5% | 152 | 204 | -11.2% | 181 | 28.0% | 232 |
| Administrative workers | 187 | 19.5% | 224 | -0.9% | 222 | 66 | 18.5% | 78 | -0.9% | 77 | 89 | 18.4% | 106 | -0.8% | 105 |
| **Total Number of Employees** | **4,383** | **11.2%** | **4,874** | **5.0%** | **5,119** | **2,195** | **10.9%** | **2,435** | **5.2%** | **2,562** | **2,687** | **10.7%** | **2,975** | **5.3%** | **3,133** |

**Table 5d: Greater Birmingham and Solihull LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Water & Waste Water Treatment**

| | Water & Waste Water Treatment | | | | | Wind | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Growth | | Growth | | | Growth | | Growth | |
| Skill | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| Technicians | 101 | 18.3% | 119 | -5.3% | 113 | 178 | 18.4% | 211 | -5.7% | 199 |
| Snr Management SME | 164 | 3.7% | 170 | 3.2% | 175 | 547 | 3.7% | 567 | 2.7% | 582 |
| Supervisory | 169 | -1.6% | 166 | 23.2% | 205 | 530 | -1.9% | 520 | 22.6% | 638 |
| Middle / Junior Management | 164 | 3.0% | 169 | 14.7% | 194 | 540 | 2.9% | 556 | 15.0% | 640 |
| Designer / Developer | 40 | 4.3% | 42 | 10.7% | 46 | 26 | 4.3% | 27 | 10.9% | 30 |
| Clerical | 83 | 12.6% | 93 | 5.7% | 98 | 268 | 12.7% | 303 | 5.6% | 320 |
| Self Employed | 45 | -3.1% | 44 | 31.9% | 58 | 41 | -3.1% | 40 | 32.2% | 53 |
| Advisor or Agent | 6 | 6.6% | 7 | 10.5% | 7 | 5 | 7.0% | 5 | 10.2% | 6 |
| Educator | 0 | 1.8% | 0 | 11.7% | 0 | 0 | 0.0% | 0 | 0.0% | 0 |
| Specialist or Consultant | 97 | 15.5% | 113 | 3.0% | 116 | 248 | 15.4% | 286 | 2.9% | 294 |
| Editor | 3 | 9.9% | 3 | 2.9% | 3 | 1 | 10.1% | 1 | 3.0% | 1 |
| Industrial Researchers | 8 | 10.8% | 8 | -8.8% | 8 | 7 | 11.2% | 8 | -9.6% | 7 |
| Scientist | 3 | 3.2% | 3 | 3.5% | 3 | 1 | 3.2% | 1 | 4.3% | 1 |
| Maintenance Engineer | 225 | 12.5% | 253 | 2.8% | 260 | 614 | 12.7% | 693 | 2.3% | 708 |
| Civil Engineer | 29 | 20.5% | 34 | -14.4% | 29 | 21 | 20.5% | 26 | -15.2% | 22 |
| Production Engineer | 51 | -0.3% | 51 | 12.1% | 57 | 94 | -0.6% | 94 | 12.0% | 105 |
| Power distribution Engineer | 108 | 13.8% | 123 | -3.4% | 119 | 284 | 14.0% | 324 | -3.8% | 312 |
| Construction Engineer | 40 | 8.6% | 43 | 11.6% | 48 | 61 | 8.4% | 66 | 11.5% | 73 |
| Sales Exec | 74 | 13.3% | 84 | -3.8% | 81 | 254 | 13.5% | 289 | -4.5% | 276 |
| Marketing Personnel | 72 | 6.1% | 76 | 12.1% | 85 | 249 | 5.8% | 264 | 11.8% | 295 |
| General Semi Skilled Worker | 196 | 6.8% | 209 | 7.6% | 225 | 561 | 6.8% | 600 | 7.7% | 646 |
| General Labour | 101 | 6.7% | 108 | 3.9% | 112 | 669 | 7.0% | 716 | 3.1% | 738 |
| Other Employees | 255 | -7.8% | 235 | 20.1% | 282 | 852 | -4.0% | 818 | 19.2% | 975 |
| Administrative workers | 101 | 18.7% | 120 | -1.1% | 119 | 295 | 18.7% | 351 | -0.6% | 348 |
| **Total Number of Employees** | **3,009** | **10.9%** | **3,338** | **5.3%** | **3,514** | **6,898** | **10.8%** | **7,645** | **5.2%** | **8,045** |

Again, a similar pattern is seen the Level 2 figures as those in Level 1, with natural fluctuations in employee numbers. As for Level 1, the numbers do give an indication of the relative scale of employment between sub-sectors in the different occupational classes.

## 1.11 Greater Birmingham and Solihull LEP's LCEGS Growth

In Section 1.1 annual growth in Greater Birmingham and Solihull LEP's LCEGS sales, companies and employment was compared with growth in the MEH's LCEGS sector as a whole for 2017/18 to 2019/20. Table 6 shows the Greater Birmingham and Solihull LEP's annual growth in more detail by breaking it down into sub-sectors for each of the three years. Growth between one year and the next is shown in red.

The Greater Birmingham and Solihull LEP covers 22% of the MEH's total LCEGS sector in terms of sales. The growth rates for the Greater Birmingham and Solihull LEP are stronger than the MEH regional average, but exhibit a similar pattern, being relatively uniform across sub-sectors compared with the UK. The UK growth rates are affected by the activity in London, which are more volatile than in other areas of the country, such as the MEH region. As such, the MEH growth rates are more indicative of the growth rates you would expect in regions not affected by activities in London. The growth rates for the Greater Birmingham and Solihull LEP are in line with this trend, with the exception of Wave & Tidal.

While annual growth in the LCEGS sector as a whole has varied between 2.8 and 13.5% for each of the three parameters, Table 6 shows that the sector has grown evenly in terms of sales across the Level 2 sub-sectors. The advantage of even growth is less volatility and more stability and certainty in the market. It is illustrative of the whole LCEGS sector growing together due to better coordination across networks and chains of supply than the national average. There is more variation in growth between sub-sectors in terms of the number of employees and companies, as they respond to different pressures within different sub-sectors.

The Greater Birmingham and Solihull LEP has grown stronger than the MEH average, and is also above the UK average for some Level 2 sub-sectors, which are a reflection of the opportunities that are being created by drivers of growth including policy, regulation and consumer choices ,these include:

- Air Pollution, where the Greater Birmingham and Solihull LEP growth rates were 6.5% between 2017/18 and 2018/19 and 7.7% between 2018/19 and 2019/20 and the UK growth rates were 1.7% between 2017/18 and 2018/19 and -4.3% between 2018/19 and 2019/20
- Alternative Fuel Vehicle, where the Greater Birmingham and Solihull LEP growth rates were 6.7% between 2017/18 and 2018/19 and 7.5% between 2018/19 and 2019/20 and the UK growth rates were 7.4% between 2017/18 and 2018/19 and -1.6% between 2018/19 and 2019/20
- Alternative Fuels, where the Greater Birmingham and Solihull LEP growth rates were 6.5% between 2017/18 and 2018/19 and 7.6% between 2018/19 and 2019/20 and the UK growth rates were 10.2% between 2017/18 and 2018/19 and 3.3% between 2018/19 and 2019/20
- Contaminated Land, where the Greater Birmingham and Solihull LEP growth rates were 6.7% between 2017/18 and 2018/19 and 7.5% between 2018/19 and 2019/20 and the UK growth rates were 5.5% between 2017/18 and 2018/19 and -4.3% between 2018/19 and 2019/20
- Energy Management, where the Greater Birmingham and Solihull LEP growth rates were 6.6% between 2017/18 and 2018/19 and 7.6% between 2018/19 and 2019/20 and the UK growth rates were 6.7% between 2017/18 and 2018/19 and -1.0% between 2018/19 and 2019/20
- Hydro, where the Greater Birmingham and Solihull LEP growth rates were 6.0% between 2017/18 and 2018/19 and 7.7% between 2018/19 and 2019/20 and the UK growth rates were 5.6% between 2017/18 and 2018/19 and -3.6% between 2018/19 and 2019/20

**Table 6: Greater Birmingham and Solihull LEP's LCEGS Sales (£m), Company and Employment Growth 2017/18 to 2019/20**

| | | Sales £m | | | | | # Companies | | | | | # Employees | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Growth | | Growth | | | Growth | | Growth | | | Growth | | Growth | |
| Level 1 | Level 2 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 | 2017/18 | % | 2018/19 | % | 2019/20 |
| **Environmental** | Air Pollution | 29.3 | 6.5% | 31.2 | 7.7% | 33.6 | 12 | 8.3% | 13 | 15.4% | 15 | 225 | 10.7% | 249 | 5.2% | 262 |
| **Environmental** | Contaminated Land | 30.0 | 6.7% | 32.0 | 7.5% | 34.4 | 14 | 0.0% | 14 | 14.3% | 16 | 231 | 10.8% | 256 | 5.5% | 270 |
| **Environmental** | Environmental Consultancy | 35.8 | 6.7% | 38.2 | 7.3% | 41.0 | 15 | 6.7% | 16 | 12.5% | 18 | 274 | 10.9% | 304 | 5.3% | 320 |
| **Environmental** | Environmental Monitoring | 7.6 | 6.6% | 8.1 | 7.4% | 8.7 | 4 | 0.0% | 4 | 0.0% | 4 | 58 | 12.1% | 65 | 4.6% | 68 |
| **Environmental** | Marine Pollution Control | 5.8 | 6.9% | 6.2 | 6.5% | 6.6 | 3 | 0.0% | 3 | 0.0% | 3 | 45 | 11.1% | 50 | 4.0% | 52 |
| **Environmental** | Noise & Vibration Control | 16.1 | 6.8% | 17.2 | 7.6% | 18.5 | 7 | 0.0% | 7 | 14.3% | 8 | 124 | 11.3% | 138 | 5.1% | 145 |
| **Environmental** | Recovery and Recycling | 283.7 | 6.5% | 302.2 | 7.5% | 324.8 | 132 | 3.8% | 137 | 12.4% | 154 | 2,195 | 10.9% | 2,435 | 5.2% | 2,562 |
| **Environmental** | Waste Management | 351.3 | 6.6% | 374.6 | 7.6% | 402.9 | 146 | 3.4% | 151 | 12.6% | 170 | 2,687 | 47.9% | 3,975 | -21.2% | 3,133 |
| **Environmental** | Water & Waste Water Treatment | 396.6 | 6.6% | 422.8 | 7.6% | 454.8 | 161 | 3.7% | 167 | 12.0% | 187 | 3,009 | 12.4% | 3,383 | 3.9% | 3,514 |
| **Low Carbon** | Additional Energy Sources | 47.0 | 6.6% | 50.1 | 7.4% | 53.8 | 20 | 5.0% | 21 | 14.3% | 24 | 358 | 10.6% | 396 | 5.3% | 417 |
| **Low Carbon** | Alternative Fuel Vehicle | 297.7 | 6.5% | 317.1 | 7.5% | 340.8 | 129 | 3.9% | 134 | 12.7% | 151 | 2,259 | 10.9% | 2,506 | 5.1% | 2,633 |
| **Low Carbon** | Alternative Fuels | 747.1 | 6.5% | 795.9 | 7.6% | 856.1 | 417 | 2.9% | 429 | 13.5% | 487 | 5,742 | 11.2% | 6,383 | 5.2% | 6,714 |
| **Low Carbon** | Building Technologies | 825.5 | 6.6% | 880.0 | 7.6% | 946.8 | 348 | 3.7% | 361 | 12.7% | 407 | 6,321 | 11.2% | 7,028 | 5.0% | 7,377 |
| **Low Carbon** | Carbon Capture & Storage | 17.8 | 6.7% | 19.0 | 7.4% | 20.4 | 8 | 0.0% | 8 | 12.5% | 9 | 138 | 10.9% | 153 | 5.2% | 161 |
| **Low Carbon** | Carbon Finance | 113.7 | 8.0% | 122.8 | 9.0% | 133.9 | 57 | 7.0% | 61 | 6.6% | 65 | 389 | 6.4% | 414 | 6.3% | 440 |
| **Low Carbon** | Energy Management | 114.5 | 6.6% | 122.1 | 7.6% | 131.4 | 51 | 2.0% | 52 | 13.5% | 59 | 874 | 11.2% | 972 | 5.0% | 1,021 |
| **Low Carbon** | Nuclear Power | 0.0 | 0.0% | 0.0 | 0.0% | 0.0 | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 |
| **Renewable Energy** | Biomass | 394.1 | 6.6% | 420.0 | 7.6% | 451.9 | 171 | 3.5% | 177 | 13.0% | 200 | 3,074 | 11.2% | 3,417 | 5.1% | 3,592 |
| **Renewable Energy** | Geothermal | 236.8 | 6.5% | 252.3 | 7.5% | 271.2 | 103 | 3.9% | 107 | 12.1% | 120 | 1,824 | 11.0% | 2,024 | 5.1% | 2,128 |
| **Renewable Energy** | Hydro | 13.4 | 6.0% | 14.2 | 7.7% | 15.3 | 6 | 0.0% | 6 | 16.7% | 7 | 102 | 9.8% | 112 | 5.4% | 118 |
| **Renewable Energy** | Photovoltaic | 571.7 | 6.5% | 609.1 | 7.5% | 654.8 | 238 | 3.4% | 246 | 12.2% | 276 | 4,383 | 11.2% | 4,874 | 5.0% | 5,119 |
| **Renewable Energy** | Renewable Consultancy | 25.0 | 6.8% | 26.7 | 7.1% | 28.6 | 12 | 0.0% | 12 | 16.7% | 14 | 192 | 10.9% | 213 | 5.2% | 224 |
| **Renewable Energy** | Wave & Tidal | 0.8 | 0.0% | 0.8 | 12.5% | 0.9 | 0 | 0.0% | 0 | 0.0% | 0 | 6 | 0.0% | 6 | 16.7% | 7 |
| **Renewable Energy** | Wind | 894.1 | 6.6% | 952.7 | 7.5% | 1,024.1 | 402 | 3.7% | 417 | 12.7% | 470 | 6,898 | 10.8% | 7,645 | 5.2% | 8,045 |
| **Total** | | **5,455.4** | **6.6%** | **5,815.3** | **7.6%** | **6,255.3** | **2,456** | **3.5%** | **2,543** | **12.6%** | **2,864** | **41,408** | **13.5%** | **46,998** | **2.8%** | **48,322** |

Some sub-sectors have shown stronger growth across the 3-year study period 2017/18 to 2019/20 than the UK average and should be considered strengths of the region and include:

- Energy Management with 14.8% (MEH 11.4%, UK 5.7%)
- Building Technologies with 14.7% (MEH 11.5%, UK 13.7%)
- Waste Management with 14.7% (MEH 11.2%, UK 12.6%)
- Air Pollution with 14.7% (MEH 11.4%, UK 5.8%)
- Water and Waste Water Treatment with 14.7% (MEH 11.3%, UK 12.7%)

- Contaminated Land Reclamation and Remediation with 14.7% (MEH 11.4%, UK 1.0%)
- Alternative Fuels with 14.6% (MEH 11.4%, UK 13.8%)
- Recovery and Recycling with 14.5% (MEH 11.3%, UK 13.7%)
- Alternative Fuel Vehicle with 14.5% (MEH 11.4%, UK 5.7%)
- Environmental Monitoring with 14.5% (MEH11.3%, UK 12.2%)
- Renewable Energy General Consultancy with 14.4% (MEH 11.3%, UK 10.8%)
- Hydro with 14.2% (MEH 11.0%, UK 1.8%)
- Marine Pollution Control with 13.8% (MEH 11.4%, UK12.7%)

Some sub-sectors have shown weaker growth across the 3-year study period 2017/18 to 2019/20 than the UK average and include:

- Noise & Vibration Control with 14.7% (MEH 11.4%, UK 23.3%)
- Carbon Capture & Storage with 14.6% (MEH 11.3%, UK 19.0%)
- Biomass with 14.7% (MEH 11.3%, UK 28.2%)
- Geothermal with 14.5% (MEH 11.3%, UK 18.8%)
- Photovoltaic with 14.5% (MEH 11.3%, UK 24.3%)
- Wave & Tidal with 13.8% (MEH 11.2%, UK 24.9%)
- Wind with 14.5% (MEH 11.3%, UK 42.2%)

By overlaying the sales for each sub-sector as a proportion of the UK market, the impact of stronger or weaker sales growth can be examined more closely. Table 7 shows how the Greater Birmingham and Solihull LEP compares with the UK as a whole for the 24 Level 2 sub-sectors. The LEP as a % of UK Sales and MEH Sales has been converted to a Proportionality Factor, where 1.0 equals the sector value (2.8% and 23.6% respectively), below 1.0 represents a smaller market than the sector total proportion and above 1.0 represents a market which is larger than the sector total proportion. Likewise the LEP/UK and LEP/MEH Growth Factor indicates where growth is stronger than the UK (above 1.0) or weaker than the UK (below 1.0).

**Table 7: UK, MEH and Greater Birmingham and Solihull LEP's LCEGS Sales (£m) and 3-Year Growth Comparison**

| | | UK | | MEH | | | LEP | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Level 1 | Level 2 | UK Sales £m 2019/20 | UK 3-Year Growth % | MEH Sales £m 2019/20 | MEH 3-year Growth % | MEH as % of UK | LEP Sales £m 2019/20 | LEP 3-year growth % | LEP as % of UK | LEP/UK Sales Prop. | LEP/UK Growth Factor | LEP as % of MEH | LEP/MEH Growth Factor | LEP/MEH Sales Prop |
| Environmental | Air Pollution | 1,283.9 | 5.8% | 143.2 | 11.4% | 11.2% | 33.6 | 14.6% | 2.6% | 2.5 | 2.5 | 23.4% | 1.3 | 1.0 |
| Environmental | Contaminated Land Reclamation & Remediation | 1,269.2 | 1.0% | 143.3 | 11.4% | 11.3% | 34.4 | 14.6% | 2.7% | 2.5 | 15.2 | 24.0% | 1.3 | 1.0 |
| Environmental | Environmental Consultancy and Related Services | 1,268.4 | 16.8% | 179.9 | 11.3% | 14.2% | 41.0 | 14.6% | 3.2% | 3.0 | 0.9 | 22.8% | 1.3 | 1.0 |
| Environmental | Environmental Monitoring, Instrumentation and Analysis | 247.6 | 12.2% | 38.0 | 11.3% | 15.4% | 8.7 | 14.5% | 3.5% | 3.3 | 1.2 | 22.9% | 1.3 | 1.0 |
| Environmental | Marine Pollution Control | 206.3 | 12.7% | 27.7 | 11.4% | 13.4% | 6.6 | 14.7% | 3.2% | 3.0 | 1.2 | 24.0% | 1.3 | 1.0 |
| Environmental | Noise & Vibration Control | 394.7 | 23.3% | 79.5 | 11.4% | 20.1% | 18.5 | 14.7% | 4.7% | 4.4 | 0.6 | 23.3% | 1.3 | 1.0 |
| Environmental | Recovery and Recycling | 11,071.7 | 13.7% | 1,452.5 | 11.3% | 13.1% | 324.8 | 14.5% | 2.9% | 2.8 | 1.1 | 22.4% | 1.3 | 0.9 |
| Environmental | Waste Management | 7,384.8 | 12.6% | 1,769.7 | 11.2% | 24.0% | 402.9 | 14.7% | 5.5% | 5.1 | 1.2 | 22.8% | 1.3 | 1.0 |
| Environmental | Water Supply and Waste Water Treatment | 10,943.9 | 12.7% | 2,014.9 | 11.3% | 18.4% | 454.8 | 14.7% | 4.2% | 3.9 | 1.2 | 22.6% | 1.3 | 1.0 |
| Low Carbon | Additional Energy Sources | 2,129.7 | 15.9% | 234.7 | 11.3% | 11.0% | 53.8 | 14.5% | 2.5% | 2.4 | 0.9 | 22.9% | 1.3 | 1.0 |
| Low Carbon | Alternative Fuel Vehicle | 19,578.8 | 5.7% | 1,472.3 | 11.4% | 7.5% | 340.8 | 14.5% | 1.7% | 1.6 | 2.5 | 23.1% | 1.3 | 1.0 |
| Low Carbon | Alternative Fuels | 32,416.4 | 13.8% | 3,761.4 | 11.4% | 11.6% | 856.1 | 14.6% | 2.6% | 2.5 | 1.1 | 22.8% | 1.3 | 1.0 |
| Low Carbon | Building Technologies | 24,963.7 | 13.7% | 3,995.6 | 11.5% | 16.0% | 946.8 | 14.7% | 3.8% | 3.6 | 1.1 | 23.7% | 1.3 | 1.0 |
| Low Carbon | Carbon Capture & Storage | 816.0 | 19.0% | 90.3 | 11.3% | 11.1% | 20.4 | 14.6% | 2.5% | 2.3 | 0.8 | 22.6% | 1.3 | 1.0 |
| Low Carbon | Carbon Finance | 16,336.5 | 27.6% | 133.9 | 17.7% | 0.8% | 133.9 | 17.7% | 0.8% | 0.8 | 0.6 | 100.0% | 1.0 | 4.2 |
| Low Carbon | Energy Management | 3,950.9 | 5.7% | 559.7 | 11.4% | 14.2% | 131.4 | 14.7% | 3.3% | 3.1 | 2.6 | 23.5% | 1.3 | 1.0 |
| Low Carbon | Nuclear Power | 4,946.3 | 2.9% | 5.4 | 29.0% | 0.1% | 0.0 | 0.0% | 0.0% | 0.0 | 0.0 | 0.0% | 0.0 | 0.0 |
| Renewable Energy | Biomass | 11,234.4 | 28.2% | 1,943.2 | 11.3% | 17.3% | 451.9 | 14.7% | 4.0% | 3.8 | 0.5 | 23.3% | 1.3 | 1.0 |
| Renewable Energy | Geothermal | 19,687.0 | 18.8% | 1,163.0 | 11.3% | 5.9% | 271.2 | 14.5% | 1.4% | 1.3 | 0.8 | 23.3% | 1.3 | 1.0 |
| Renewable Energy | Hydro | 703.5 | 1.8% | 74.4 | 11.0% | 10.6% | 15.3 | 13.8% | 2.2% | 2.0 | 7.6 | 20.5% | 1.3 | 0.9 |
| Renewable Energy | Photovoltaic | 11,132.4 | 24.3% | 2,773.4 | 11.3% | 24.9% | 654.8 | 14.5% | 5.9% | 5.5 | 0.6 | 23.6% | 1.3 | 1.0 |
| Renewable Energy | Renewable Energy General Consultancy | 722.1 | 10.8% | 122.8 | 11.3% | 17.0% | 28.6 | 14.4% | 4.0% | 3.7 | 1.3 | 23.3% | 1.3 | 1.0 |
| Renewable Energy | Wave & Tidal | 171.5 | 24.9% | 4.1 | 11.2% | 2.4% | 0.9 | 13.8% | 0.5% | 0.5 | 0.6 | 21.4% | 1.2 | 0.9 |
| Renewable Energy | Wind | 36,664.3 | 42.2% | 4,373.1 | 11.3% | 11.9% | 1,024.1 | 14.5% | 2.8% | 2.6 | 0.3 | 23.4% | 1.3 | 1.0 |
| | | **219,523.9** | **18.9%** | **26,556.2** | **11.4%** | **12.1%** | **6,255.4** | **14.7%** | **2.8%** | | | **23.6%** | | |

Figure 34 shows how the Greater Birmingham and Solihull LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 1.1 %. This proportionality factor demonstrates where the Greater Birmingham and Solihull LEP holds a larger or smaller share of the UK market than would be expected, where:

- 1 = 1.1% of the UK market
- >1 = larger than 1.1% share
- <1 = smaller than 1.1% share

The y-axis represents the growth rate of the Greater Birmingham and Solihull LEP Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where:

- 1 = the UK growth rate
- >1 = stronger than the UK average growth
- <1 = weaker than UK growth

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 34 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric should be considered strengths, because although they are both below the expected size of market (2.7 for Contaminated Land and 2.2 for Hydro), they are growing significantly stronger than the UK average (14.6% LEP vs. 1.0% UK for Contaminated Land and 13.8% vs. 1.8% UK for Hydro)

**Figure 34: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

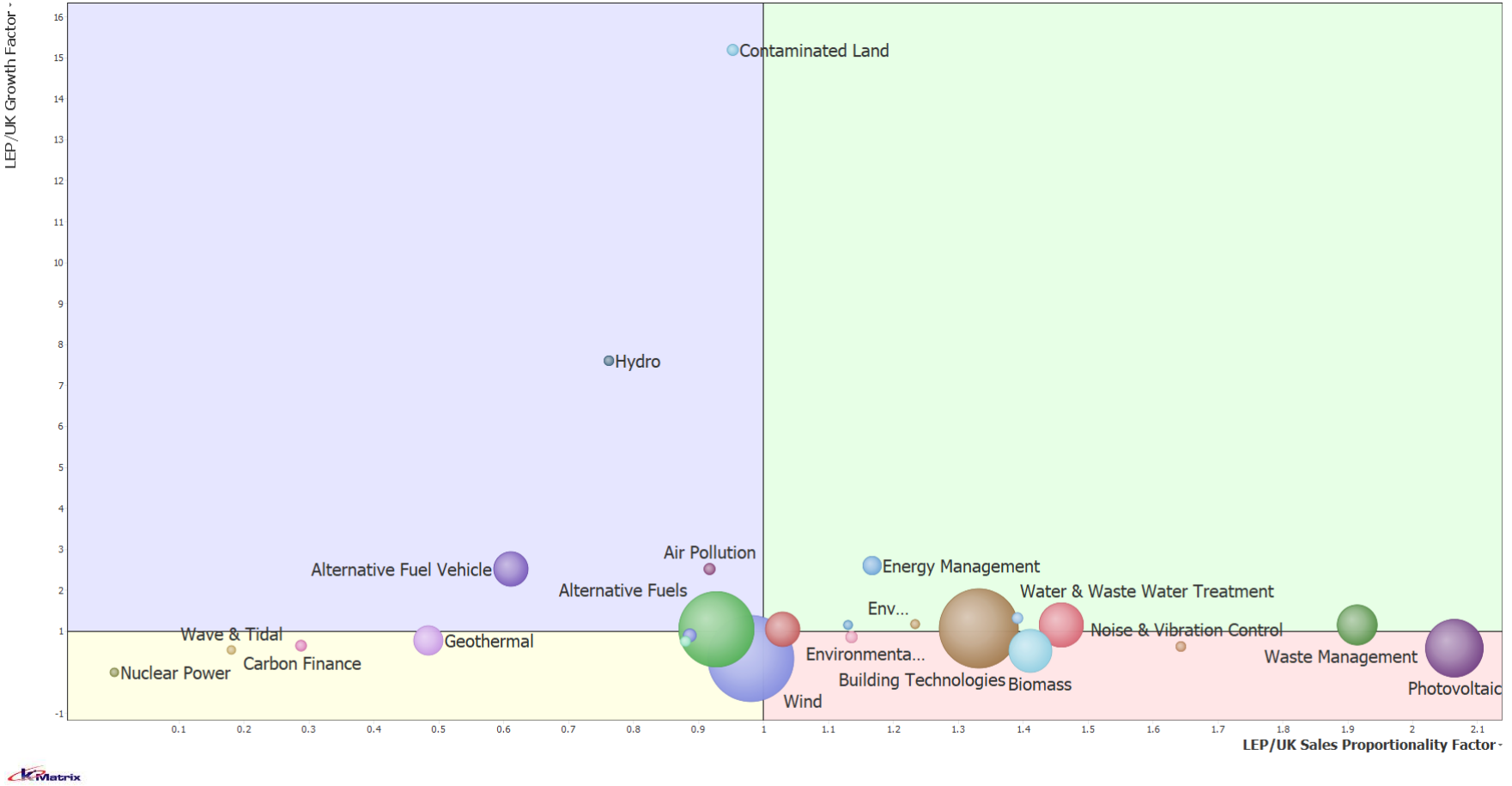
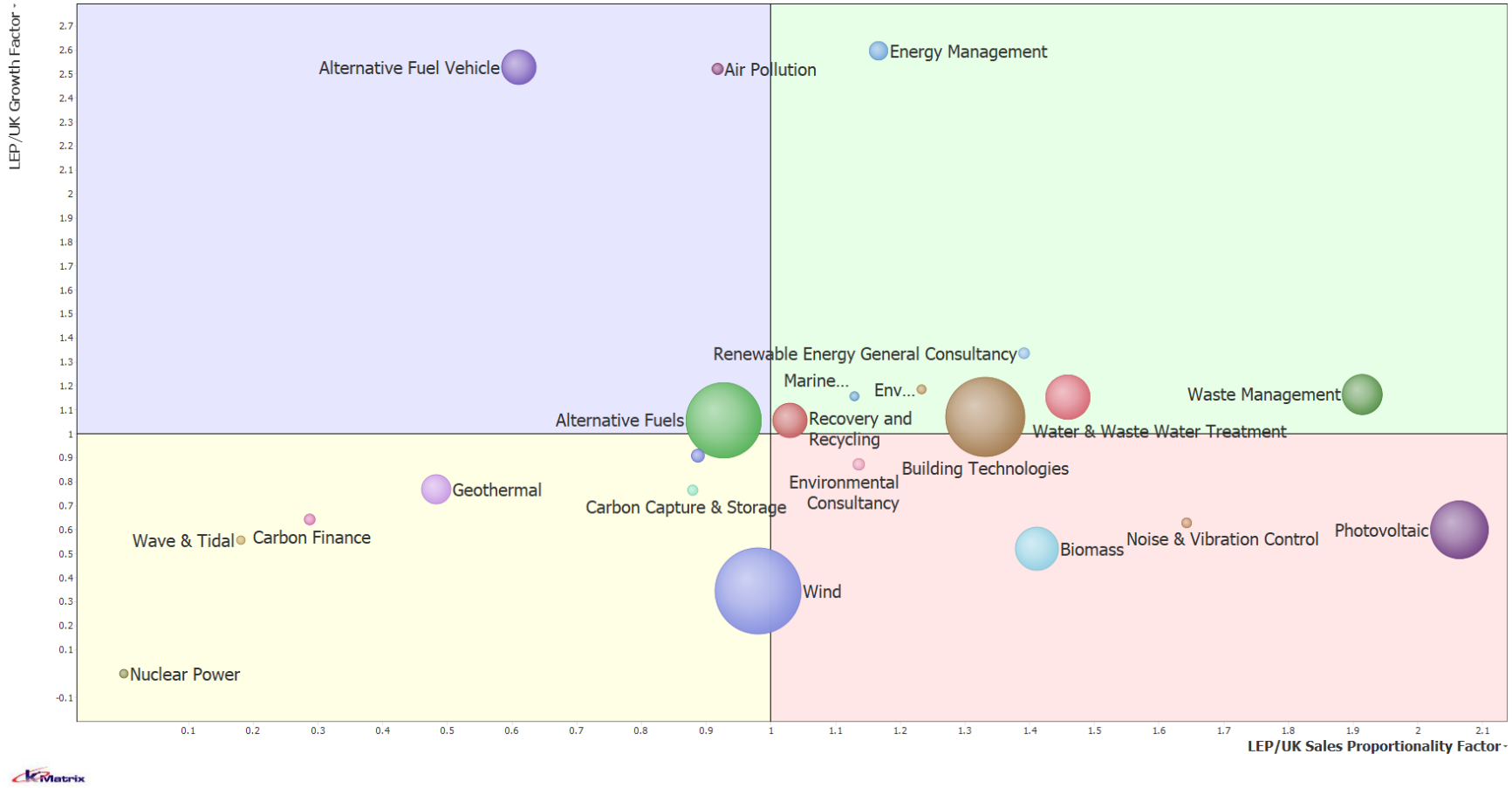


Figure 35 provides the same information as figure 34, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management Waste Management have the ideal characteristics of above UK average growth and above LEP average size. Those on the boundary of and within, the bottom right quadrant (red) also hold a larger UK share than the LEP's average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Biomass and to a lesser extent Wind, set these sub-sector apart as being strengths, despite lower growth. Alternative Fuel Vehicle can be considered a strength, because although it has a smaller size than would be expected, it has significantly stronger growth than the UK average. Those in the lower left (yellow) quadrant i.e. Wave & tidal and Carbon Finance can be considered relative weaknesses.

**Figure 35: LEP/UK Sales proportionality factor vs LEP/UK Growth factor of Level 2 Sub-sectors, Bubbles Sized by Sales £m, Excluding Contaminated Land and Hydro**



## 1.12 Greater Birmingham and Solihull LEP's LCEGS Sector Scalability

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 36 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Greater Birmingham and Solihull LEP's, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right hand corner of the graph, with high GVA and high Scalability. We can see that the Photovoltaic sub-sector has a reasonable combination of size and scalability, while Carbon Finance may be smaller in terms of market, but is highly scalable. Biomass is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4.

**Figure 36: Greater Birmingham and Solihull LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

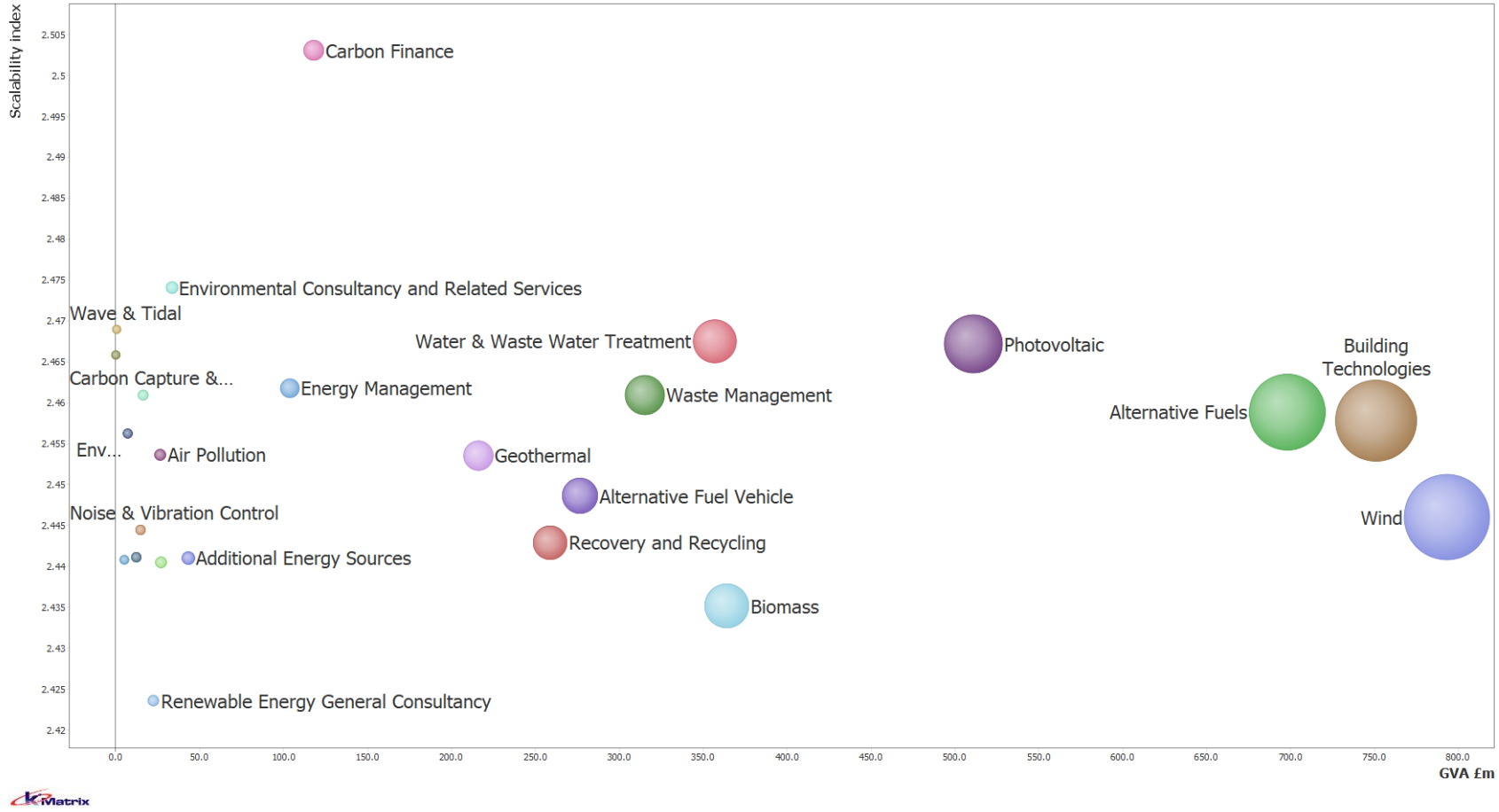
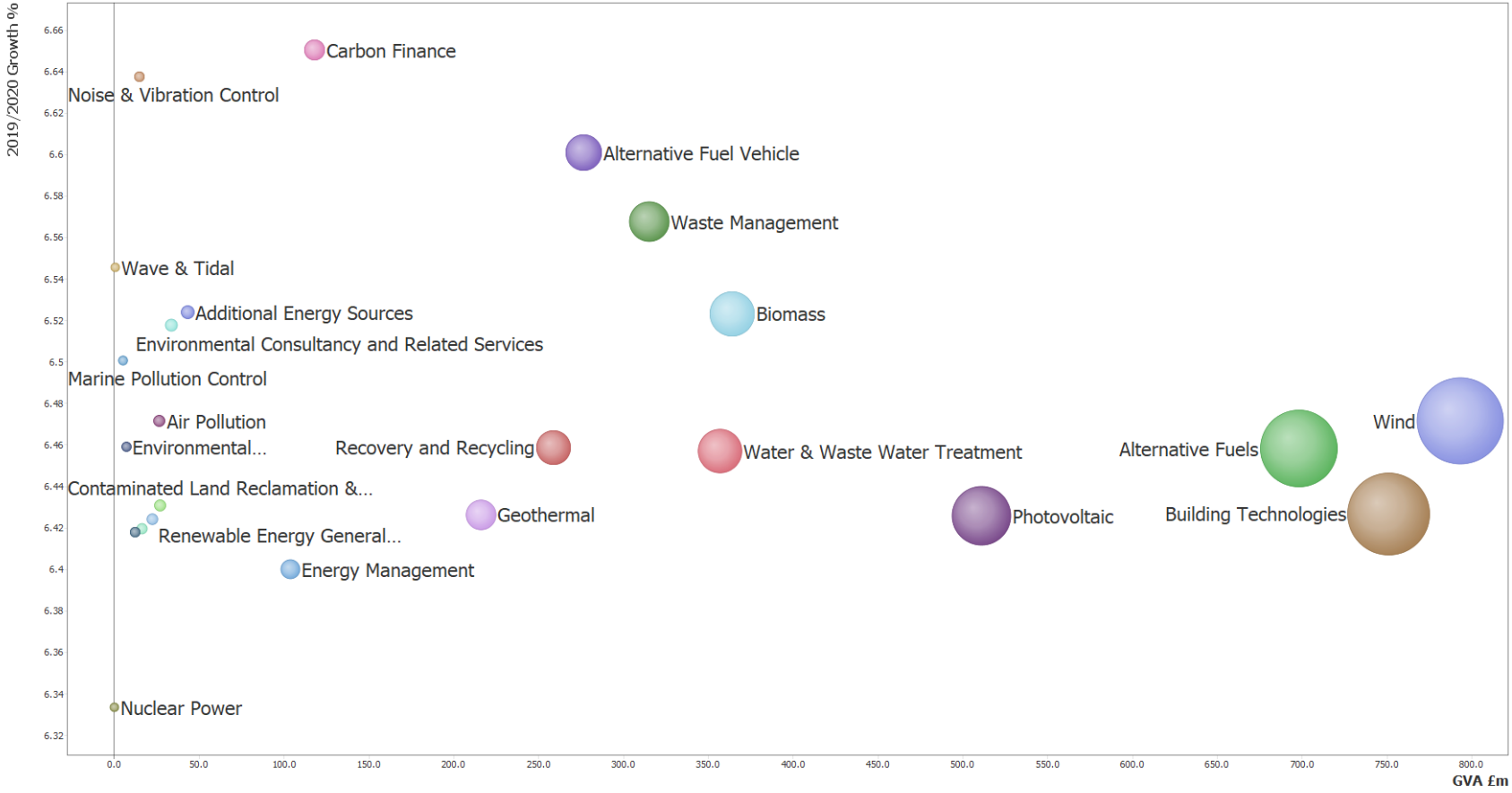


Figure 37 shows the same principle as Figure 36, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies a more favourable position of large size and high growth compared with the other two large subsectors. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 37: Greater Birmingham and Solihull LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**



## 1.13 Greater Birmingham and Solihull LEP's LCEGS Demand Analysis

This section provides data and analysis regarding the demand analysis which feeds into the Growth 2030/2050 sister report, produced as part of this project. There are three sub-sections:

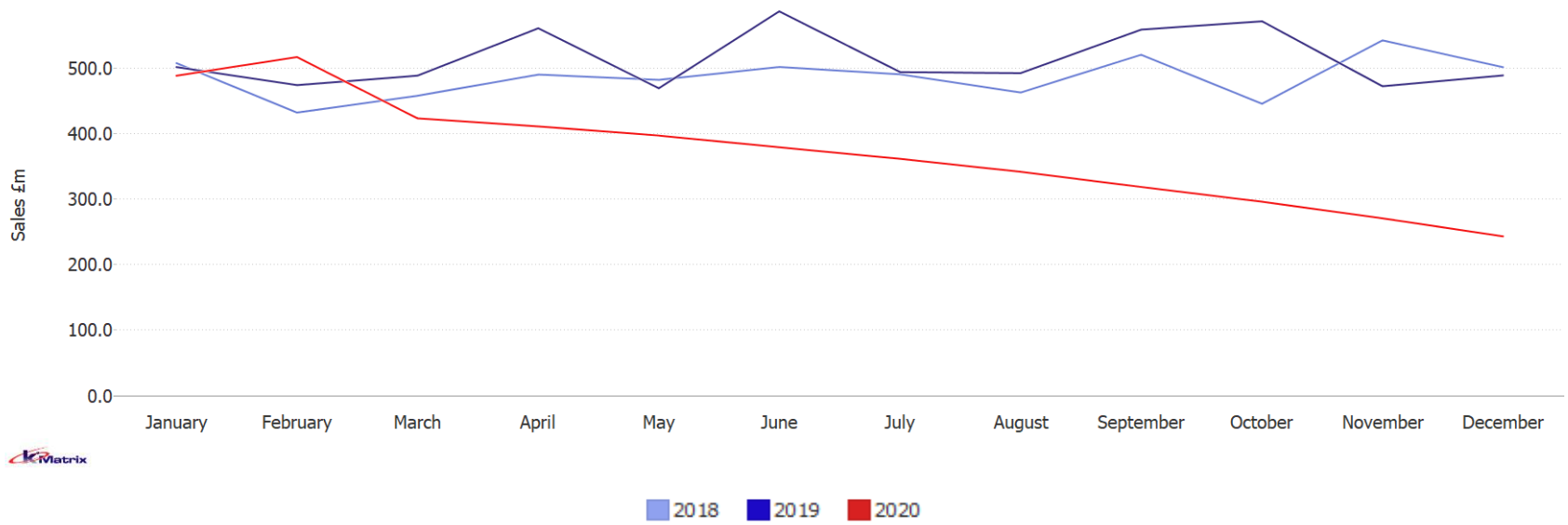
- 1.12.1 Current employment and growth required for 2030 and 2050 net zero targets
- 1.12.2 Current training provision and potential for upskilling of the current workforce within each Level 2 sub-sector
- 1.12.3 Potential of Level 2 sub-sectors to impact on CO2 reduction

### 1.13.1 Current employment, skills gaps and forecasts for 2030 and 2050 net zero targets

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 38, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Greater Birmingham an Solihull LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

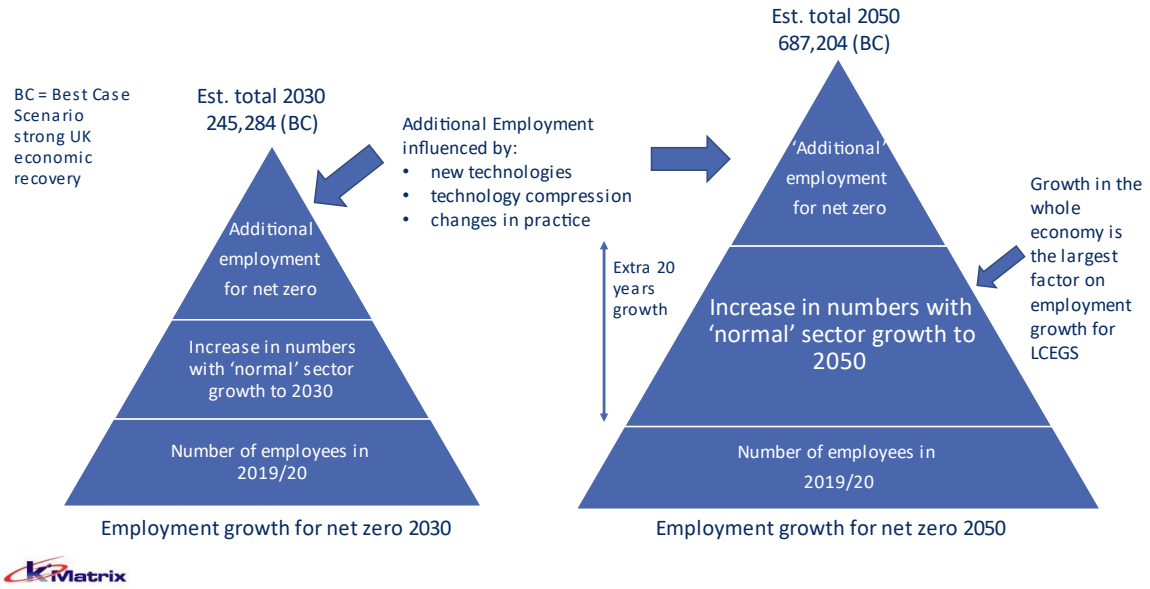
**Figure 38: Greater Birmingham and Solihull LEP LCEGS Sales, by month 2018, 2019 and 2020**




Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| *Timeline for Net Zero* | Implications of Covid-19 and Brexit |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.




The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.

On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.
In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 8 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Greater Birmingham and Solihull LEP.

Shortage of employees refers to the employees that are 'imported' from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not 'fit'. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as "Other Employees" because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to 'heads equivalent', so although for example, there are 9 Educators listed, with a shortage of 3, making a total of 11 in the region, this will equate to over 110 people providing 'pockets' of time, to equate to 11 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 8: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 1,124 | 247 | 22.0% | 1,371 | 1,463 | 6.7% | 1,935 | 41.1% | 2,288 | 66.9% | 5,424 | 295.7% |
| Snr Management SME | 2,508 | 255 | 10.1% | 2,762 | 3,278 | 18.7% | 4,332 | 56.8% | 5,089 | 84.2% | 11,979 | 333.7% |
| Supervisory | 2,917 | 300 | 10.3% | 3,216 | 3,783 | 17.6% | 4,987 | 55.1% | 5,913 | 83.8% | 14,106 | 338.6% |
| Middle / Junior Management | 2,828 | 292 | 10.3% | 3,120 | 3,695 | 18.4% | 4,839 | 55.1% | 5,680 | 82.1% | 13,609 | 336.2% |
| Designer / Developer | 391 | 103 | 26.3% | 494 | 511 | 3.4% | 671 | 35.9% | 787 | 59.3% | 1,881 | 280.7% |
| Clerical | 1,471 | 3 | 0.2% | 1,474 | 1,937 | 31.4% | 2,531 | 71.7% | 2,973 | 101.7% | 7,045 | 377.9% |
| Self Employed | 408 | 53 | 13.0% | 461 | 532 | 15.5% | 699 | 51.7% | 820 | 77.9% | 1,958 | 324.6% |
| Advisor or Agent | 287 | 49 | 17.1% | 336 | 379 | 12.7% | 493 | 46.8% | 578 | 72.1% | 1,380 | 310.6% |
| Educator | 9 | 3 | 32.5% | 11 | 11 | -1.3% | 15 | 28.8% | 17 | 53.5% | 41 | 260.2% |
| Specialist or Consultant | 1,778 | 62 | 3.5% | 1,841 | 2,338 | 27.0% | 3,048 | 65.6% | 3,572 | 94.1% | 8,505 | 362.0% |
| Editor | 42 | 2 | 3.9% | 44 | 56 | 25.9% | 73 | 65.0% | 86 | 95.9% | 203 | 360.7% |
| Industrial Researchers | 398 | 31 | 7.9% | 430 | 518 | 20.7% | 684 | 59.3% | 805 | 87.5% | 1,917 | 346.3% |
| Scientist | 180 | 59 | 33.0% | 239 | 234 | -2.2% | 307 | 28.3% | 369 | 54.5% | 867 | 262.9% |
| Maintenance Engineer | 3,041 | 193 | 6.3% | 3,234 | 3,965 | 22.6% | 5,226 | 61.6% | 6,179 | 91.0% | 14,648 | 352.9% |
| Civil Engineer | 198 | 53 | 26.9% | 251 | 258 | 2.7% | 338 | 34.9% | 402 | 60.3% | 953 | 279.8% |
| Production Engineer | 557 | 201 | 36.0% | 758 | 724 | -4.5% | 959 | 26.6% | 1,124 | 48.4% | 2,686 | 254.4% |
| Power distribution Engineer | 1,356 | 395 | 29.2% | 1,751 | 1,777 | 1.5% | 2,326 | 32.8% | 2,743 | 56.6% | 6,539 | 273.4% |
| Construction Engineer | 327 | 56 | 17.0% | 383 | 430 | 12.2% | 563 | 46.8% | 664 | 73.3% | 1,579 | 312.3% |
| Sales Exec | 1,390 | 159 | 11.4% | 1,548 | 1,819 | 17.5% | 2,388 | 54.2% | 2,811 | 81.6% | 6,665 | 330.5% |
| Marketing Personnel | 1,475 | 163 | 11.1% | 1,638 | 1,919 | 17.1% | 2,547 | 55.5% | 2,984 | 82.1% | 7,098 | 333.3% |
| General Semi Skilled Worker | 2,983 | 62 | 2.1% | 3,045 | 3,895 | 27.9% | 5,136 | 68.7% | 6,034 | 98.2% | 14,429 | 373.9% |
| General Labour | 3,458 | 0 | 0.0% | 3,458 | 4,544 | 31.4% | 5,956 | 72.2% | 6,981 | 101.9% | 16,628 | 380.9% |
| Other Employees | 4,006 | 208 | 5.2% | 4,214 | 5,238 | 24.3% | 6,856 | 62.7% | 8,104 | 92.3% | 19,334 | 358.8% |
| Administrative workers | 1,679 | 37 | 2.2% | 1,716 | 2,193 | 27.8% | 2,864 | 66.9% | 3,377 | 96.8% | 8,089 | 371.4% |
| **Total** | **34,811** | **2,984** | **8.6%** | **37,796** | **45,496** | **20.4%** | **59,774** | **58.1%** | **70,382** | **86.2%** | **167,562** | **343.3%** |

Table 8 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 36.0% (MEH 35.7%), Power Distribution Engineer 29.2% (MEH 29.8%) and Technicians 22.0% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.3% (MEH 6.3%), Specialist or Consultant 3.5% (MEH 3.3%) and Administrative Workers 2.2% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.4% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 58.1% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 86.2% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 343.3% (MEH 342.4%)

Tables 9, 10 and 11 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.3% (MEH 10.5%)
Renewable Energy – 6.9% (MEH 7.0%)
Environmental – 10.5% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 48.5% (MEH 47.3%); Renewable Energy 27.7% (MEH 27.9%) and Environmental 35.4% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 33.9% (MEH 33.7%); Renewable Energy 25.3% (MEH 27.1%) and Environmental 34.1% (MEH 32.6%)
Technicians: Low Carbon 27.5% (MEH 27.9%); Renewable Energy 16.9% (MEH 17.3%) and Environmental 23.2% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 64.4% (MEH 68.8%), but only 13.9% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 5 of the Greater Birmingham an Solihull LEP Market Snapshot report.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 15.8% (MEH 17.0%); Renewable Energy 35.2% (MEH 34.5%) and Environmental 26.7% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 28.2% (MEH 28.1%); Renewable Energy 36.7% (MEH 35.1%) and Environmental 28.2% (MEH 29.3%)
Technicians of: Low Carbon 36.5% (MEH 34.2%); Renewable Energy 46.1% (MEH 45.9%) and Environmental 39.6% (MEH 39.6%)

**Table 9: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 359 | 99 | 27.5% | 458 | 463 | 1.0% | 625 | 36.5% | 735 | 60.4% | 1,741 | 280.2% |
| Snr Management SME | 612 | 72 | 11.8% | 684 | 795 | 16.2% | 1,061 | 55.1% | 1,231 | 80.0% | 2,946 | 330.7% |
| Supervisory | 784 | 100 | 12.8% | 885 | 1,029 | 16.3% | 1,355 | 53.2% | 1,584 | 79.0% | 3,759 | 324.9% |
| Middle / Junior Management | 735 | 94 | 12.9% | 829 | 963 | 16.1% | 1,263 | 52.3% | 1,469 | 77.1% | 3,573 | 331.0% |
| Designer / Developer | 99 | 28 | 28.4% | 127 | 128 | 0.9% | 169 | 33.4% | 199 | 56.6% | 478 | 276.5% |
| Clerical | 412 | 1 | 0.3% | 413 | 543 | 31.4% | 706 | 70.9% | 833 | 101.5% | 1,975 | 378.0% |
| Self Employed | 146 | 24 | 16.3% | 170 | 192 | 13.2% | 249 | 46.9% | 292 | 72.4% | 697 | 311.3% |
| Advisor or Agent | 150 | 26 | 17.0% | 176 | 198 | 12.9% | 257 | 46.5% | 304 | 73.0% | 721 | 310.7% |
| Educator | 0 | 0 | 22.4% | 1 | 1 | 4.7% | 1 | 42.5% | 1 | 57.9% | 2 | 289.8% |
| Specialist or Consultant | 648 | 27 | 4.2% | 675 | 852 | 26.2% | 1,122 | 66.2% | 1,298 | 92.2% | 3,090 | 357.6% |
| Editor | 9 | 0 | 3.9% | 10 | 12 | 27.2% | 16 | 65.3% | 19 | 96.1% | 43 | 355.2% |
| Industrial Researchers | 224 | 18 | 8.0% | 242 | 292 | 20.6% | 385 | 58.9% | 455 | 88.1% | 1,089 | 350.1% |
| Scientist | 119 | 39 | 32.6% | 157 | 154 | -2.2% | 201 | 28.0% | 245 | 55.8% | 574 | 264.7% |
| Maintenance Engineer | 751 | 60 | 8.0% | 812 | 980 | 20.7% | 1,294 | 59.4% | 1,532 | 88.7% | 3,614 | 345.3% |
| Civil Engineer | 46 | 14 | 30.8% | 60 | 60 | -0.2% | 78 | 30.3% | 94 | 56.3% | 220 | 267.2% |
| Production Engineer | 168 | 82 | 48.5% | 250 | 214 | -14.5% | 289 | 15.8% | 336 | 34.5% | 810 | 224.3% |
| Power distribution Engineer | 291 | 99 | 33.9% | 390 | 381 | -2.3% | 500 | 28.2% | 589 | 51.1% | 1,401 | 259.5% |
| Construction Engineer | 69 | 14 | 20.3% | 84 | 91 | 9.2% | 120 | 43.7% | 139 | 66.2% | 334 | 299.7% |
| Sales Exec | 416 | 60 | 14.5% | 476 | 548 | 15.0% | 717 | 50.6% | 842 | 76.8% | 1,973 | 314.3% |
| Marketing Personnel | 443 | 60 | 13.6% | 503 | 582 | 15.7% | 768 | 52.6% | 907 | 80.1% | 2,147 | 326.7% |
| General Semi Skilled Worker | 751 | 19 | 2.5% | 770 | 976 | 26.8% | 1,294 | 68.1% | 1,523 | 98.0% | 3,586 | 365.9% |
| General Labour | 1,165 | 0 | 0.0% | 1,165 | 1,531 | 31.4% | 2,007 | 72.2% | 2,352 | 101.9% | 5,573 | 378.3% |
| Other Employees | 957 | 63 | 6.5% | 1,020 | 1,253 | 22.9% | 1,653 | 62.1% | 1,925 | 88.7% | 4,603 | 351.4% |
| Administrative workers | 498 | 14 | 2.8% | 512 | 654 | 27.7% | 855 | 67.0% | 998 | 95.1% | 2,409 | 370.9% |
| **Total** | **9,853** | **1,013** | **10.3%** | **10,866** | **12,889** | **18.6%** | **16,985** | **56.3%** | **19,900** | **83.1%** | **47,360** | **335.9%** |

**Table 10: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 461 | 78 | 16.9% | 539 | 605 | 12.2% | 788 | 46.1% | 939 | 74.1% | 2,225 | 312.5% |
| **Snr Management SME** | 1,453 | 135 | 9.3% | 1,588 | 1,902 | 19.8% | 2,504 | 57.7% | 2,963 | 86.5% | 6,910 | 335.1% |
| **Supervisory** | 1,602 | 142 | 8.9% | 1,745 | 2,070 | 18.6% | 2,720 | 55.9% | 3,258 | 86.7% | 7,795 | 346.9% |
| **Middle / Junior Management** | 1,579 | 142 | 9.0% | 1,721 | 2,063 | 19.9% | 2,690 | 56.3% | 3,171 | 84.3% | 7,568 | 339.8% |
| **Designer / Developer** | 120 | 26 | 21.7% | 146 | 158 | 7.7% | 207 | 41.4% | 244 | 66.3% | 579 | 295.3% |
| **Clerical** | 794 | 1 | 0.2% | 795 | 1,050 | 32.0% | 1,366 | 71.8% | 1,604 | 101.7% | 3,811 | 379.2% |
| **Self Employed** | 111 | 10 | 9.2% | 121 | 145 | 19.6% | 191 | 57.7% | 222 | 83.4% | 532 | 338.8% |
| **Advisor or Agent** | 35 | 6 | 16.5% | 41 | 46 | 12.2% | 61 | 49.1% | 70 | 73.0% | 169 | 313.8% |
| **Educator** | 0 | 0 | 12.0% | 0 | 0 | 19.0% | 0 | 48.6% | 0 | 94.9% | 0 | 335.4% |
| **Specialist or Consultant** | 787 | 23 | 2.9% | 810 | 1,036 | 28.0% | 1,342 | 65.7% | 1,581 | 95.2% | 3,761 | 364.4% |
| **Editor** | 10 | 0 | 3.4% | 11 | 14 | 26.3% | 18 | 67.3% | 21 | 97.6% | 50 | 360.6% |
| **Industrial Researchers** | 48 | 3 | 6.8% | 51 | 62 | 21.8% | 82 | 61.5% | 96 | 88.6% | 228 | 347.1% |
| **Scientist** | 17 | 5 | 29.9% | 23 | 23 | 1.1% | 30 | 33.5% | 36 | 57.7% | 83 | 266.5% |
| **Maintenance Engineer** | 1,642 | 91 | 5.5% | 1,733 | 2,141 | 23.5% | 2,816 | 62.5% | 3,337 | 92.6% | 7,923 | 357.2% |
| **Civil Engineer** | 47 | 10 | 21.0% | 57 | 61 | 8.1% | 80 | 40.5% | 96 | 68.2% | 227 | 300.1% |
| **Production Engineer** | 240 | 66 | 27.7% | 306 | 315 | 2.9% | 414 | 35.2% | 487 | 59.1% | 1,154 | 276.9% |
| **Power distribution Engineer** | 758 | 192 | 25.3% | 950 | 992 | 4.4% | 1,298 | 36.7% | 1,532 | 61.3% | 3,668 | 286.3% |
| **Construction Engineer** | 112 | 14 | 12.3% | 126 | 148 | 17.6% | 191 | 51.7% | 230 | 82.5% | 546 | 332.9% |
| **Sales Exec** | 705 | 65 | 9.2% | 770 | 916 | 19.1% | 1,205 | 56.6% | 1,428 | 85.5% | 3,387 | 340.1% |
| **Marketing Personnel** | 769 | 71 | 9.3% | 841 | 991 | 17.9% | 1,327 | 57.9% | 1,545 | 83.7% | 3,695 | 339.4% |
| **General Semi Skilled Worker** | 1,594 | 28 | 1.8% | 1,622 | 2,080 | 28.2% | 2,736 | 68.7% | 3,215 | 98.1% | 7,755 | 378.0% |
| **General Labour** | 1,849 | 0 | 0.0% | 1,849 | 2,432 | 31.6% | 3,187 | 72.4% | 3,732 | 101.9% | 8,923 | 382.7% |
| **Other Employees** | 2,307 | 105 | 4.5% | 2,412 | 3,021 | 25.3% | 3,940 | 63.4% | 4,673 | 93.8% | 11,153 | 362.5% |
| **Administrative workers** | 845 | 15 | 1.8% | 860 | 1,103 | 28.3% | 1,437 | 67.1% | 1,701 | 97.9% | 4,064 | 372.6% |
| **Total** | **17,886** | **1,230** | **6.9%** | **19,116** | **23,375** | **22.3%** | **30,633** | **60.3%** | **36,180** | **89.3%** | **86,206** | **351.0%** |

**Table 11: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 303 | 70 | 23.2% | 373 | 395 | 5.9% | 521 | 39.6% | 614 | 64.5% | 1,458 | 290.5% |
| Snr Management SME | 443 | 47 | 10.6% | 490 | 581 | 18.5% | 767 | 56.5% | 895 | 82.6% | 2,124 | 333.1% |
| Supervisory | 530 | 57 | 10.8% | 587 | 685 | 16.6% | 913 | 55.4% | 1,071 | 82.4% | 2,551 | 334.5% |
| Middle / Junior Management | 515 | 55 | 10.8% | 570 | 669 | 17.4% | 886 | 55.4% | 1,040 | 82.5% | 2,467 | 332.9% |
| Designer / Developer | 172 | 49 | 28.2% | 221 | 225 | 2.1% | 295 | 33.7% | 345 | 56.3% | 824 | 273.3% |
| Clerical | 265 | 1 | 0.2% | 266 | 344 | 29.7% | 459 | 72.7% | 536 | 101.8% | 1,258 | 373.9% |
| Self Employed | 151 | 19 | 12.6% | 170 | 196 | 14.9% | 259 | 52.2% | 306 | 79.4% | 729 | 327.7% |
| Advisor or Agent | 102 | 18 | 17.3% | 120 | 135 | 12.5% | 175 | 46.5% | 204 | 70.5% | 490 | 309.4% |
| Educator | 8 | 3 | 33.1% | 11 | 11 | -1.6% | 14 | 28.1% | 17 | 53.3% | 39 | 258.6% |
| Specialist or Consultant | 343 | 12 | 3.6% | 356 | 449 | 26.3% | 584 | 64.2% | 694 | 95.0% | 1,654 | 365.1% |
| Editor | 23 | 1 | 4.1% | 24 | 30 | 25.1% | 39 | 63.7% | 46 | 95.1% | 110 | 363.1% |
| Industrial Researchers | 126 | 10 | 8.0% | 137 | 164 | 20.4% | 217 | 59.0% | 254 | 85.9% | 600 | 339.3% |
| Scientist | 44 | 15 | 35.4% | 59 | 57 | -3.4% | 75 | 27.1% | 88 | 49.7% | 210 | 256.6% |
| Maintenance Engineer | 648 | 42 | 6.5% | 690 | 844 | 22.3% | 1,116 | 61.8% | 1,310 | 89.9% | 3,111 | 350.9% |
| Civil Engineer | 105 | 29 | 27.8% | 134 | 136 | 1.6% | 180 | 34.5% | 213 | 58.8% | 505 | 276.8% |
| Production Engineer | 149 | 53 | 35.4% | 202 | 195 | -3.5% | 255 | 26.7% | 301 | 49.4% | 721 | 257.6% |
| Power distribution Engineer | 307 | 105 | 34.1% | 412 | 404 | -1.8% | 528 | 28.2% | 622 | 51.0% | 1,470 | 256.9% |
| Construction Engineer | 146 | 28 | 19.1% | 173 | 190 | 9.7% | 251 | 44.9% | 295 | 70.0% | 699 | 303.3% |
| Sales Exec | 269 | 33 | 12.4% | 302 | 355 | 17.3% | 465 | 53.7% | 542 | 79.1% | 1,305 | 331.5% |
| Marketing Personnel | 262 | 32 | 12.2% | 294 | 345 | 17.5% | 452 | 53.6% | 532 | 80.9% | 1,257 | 327.2% |
| General Semi Skilled Worker | 638 | 15 | 2.3% | 653 | 839 | 28.5% | 1,106 | 69.4% | 1,296 | 98.5% | 3,088 | 373.0% |
| General Labour | 444 | 0 | 0.0% | 444 | 581 | 30.9% | 762 | 71.6% | 897 | 102.0% | 2,132 | 380.2% |
| Other Employees | 742 | 40 | 5.5% | 783 | 964 | 23.1% | 1,263 | 61.4% | 1,507 | 92.4% | 3,578 | 357.0% |
| Administrative workers | 337 | 8 | 2.3% | 344 | 437 | 26.9% | 573 | 66.3% | 678 | 96.8% | 1,616 | 369.1% |
| **Total** | **7,072** | **742** | **10.5%** | **7,814** | **9,232** | **18.1%** | **12,156** | **55.6%** | **14,302** | **83.0%** | **33,996** | **335.0%** |

### 1.13.2 Current Training Provision and Potential for Upskilling of the Current Workforce within each Level 2 sub-sector

In this section we explore both the current training capacity within the Greater Birmingham an Solihull LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 39 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Greater Birmingham an Solihull LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Greater Birmingham and Solihull LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 39: Greater Birmingham and Solihull LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

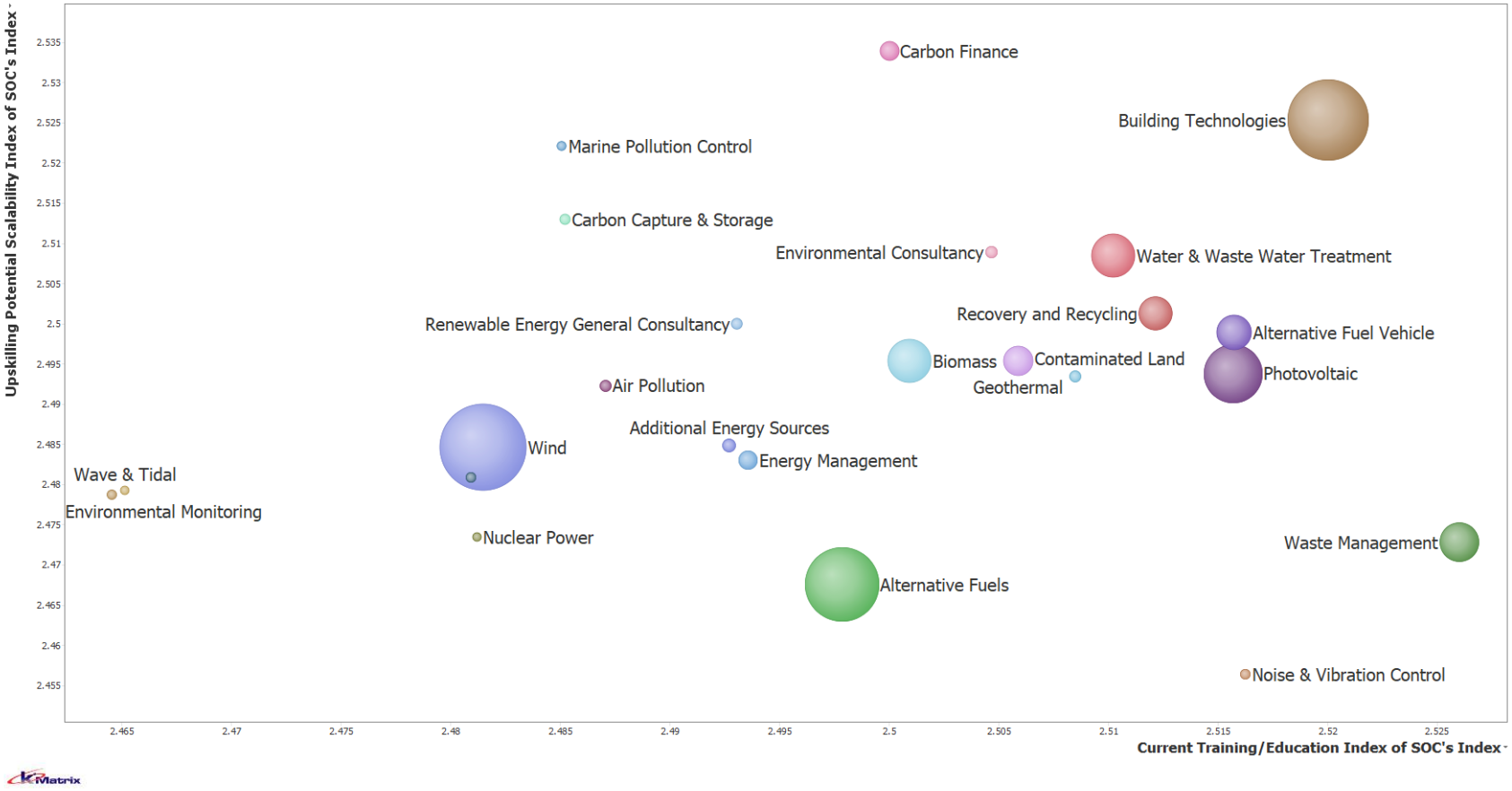



Figure 39 shows that Building Technologies holds the most desirable position, with good current training capacity combined with a strong potential for upskilling. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction. Alternative Fuel Vehicle, Photovoltaic and Water and Waste Water Treatment are also strong.

### 1.13.3 Potential of Level 2 sub-sectors to impact on CO2 reduction

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Greater Birmingham an Solihull LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

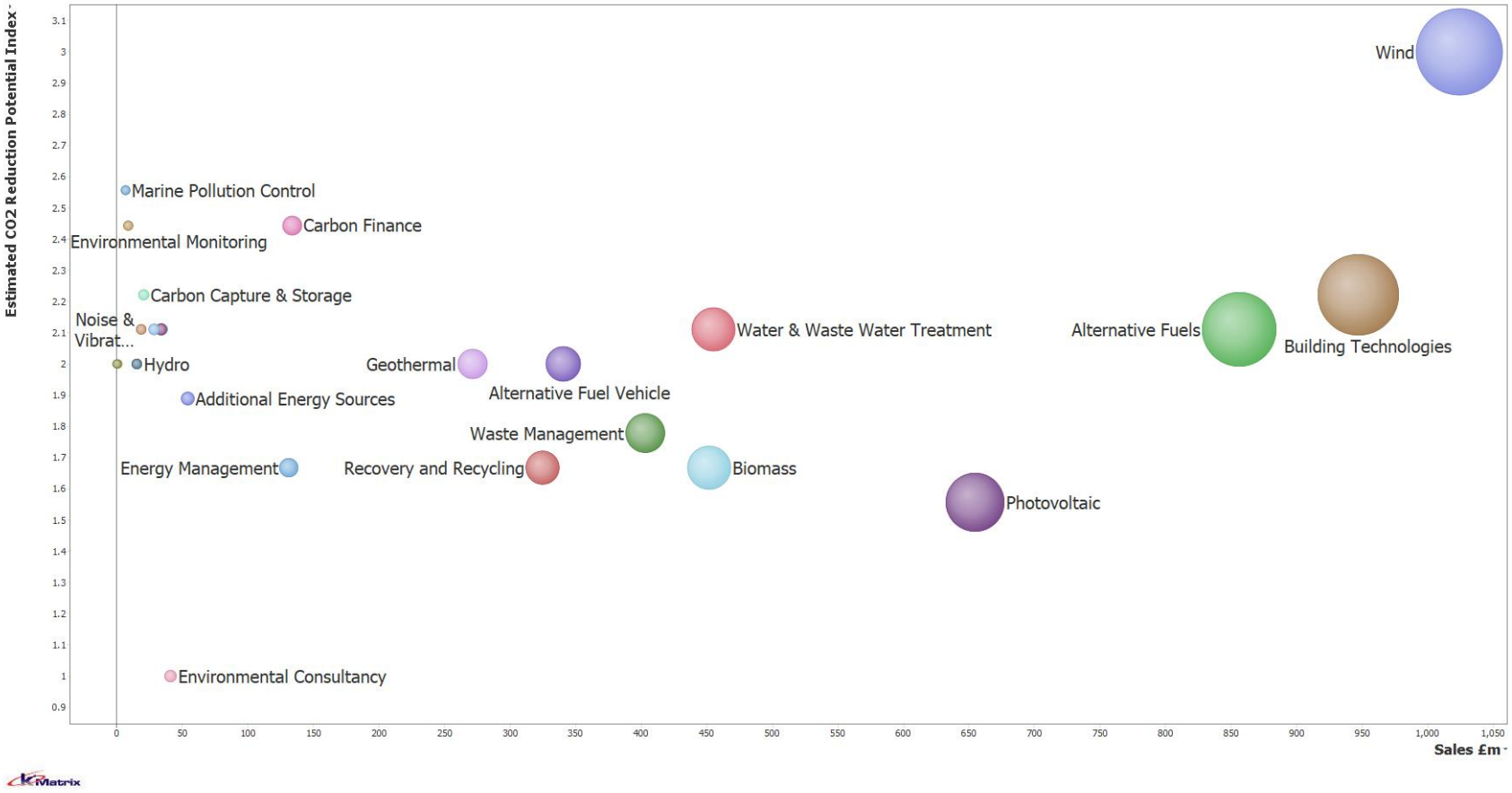
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 40 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Building Technologies having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 40: Greater Birmingham and Solihull LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



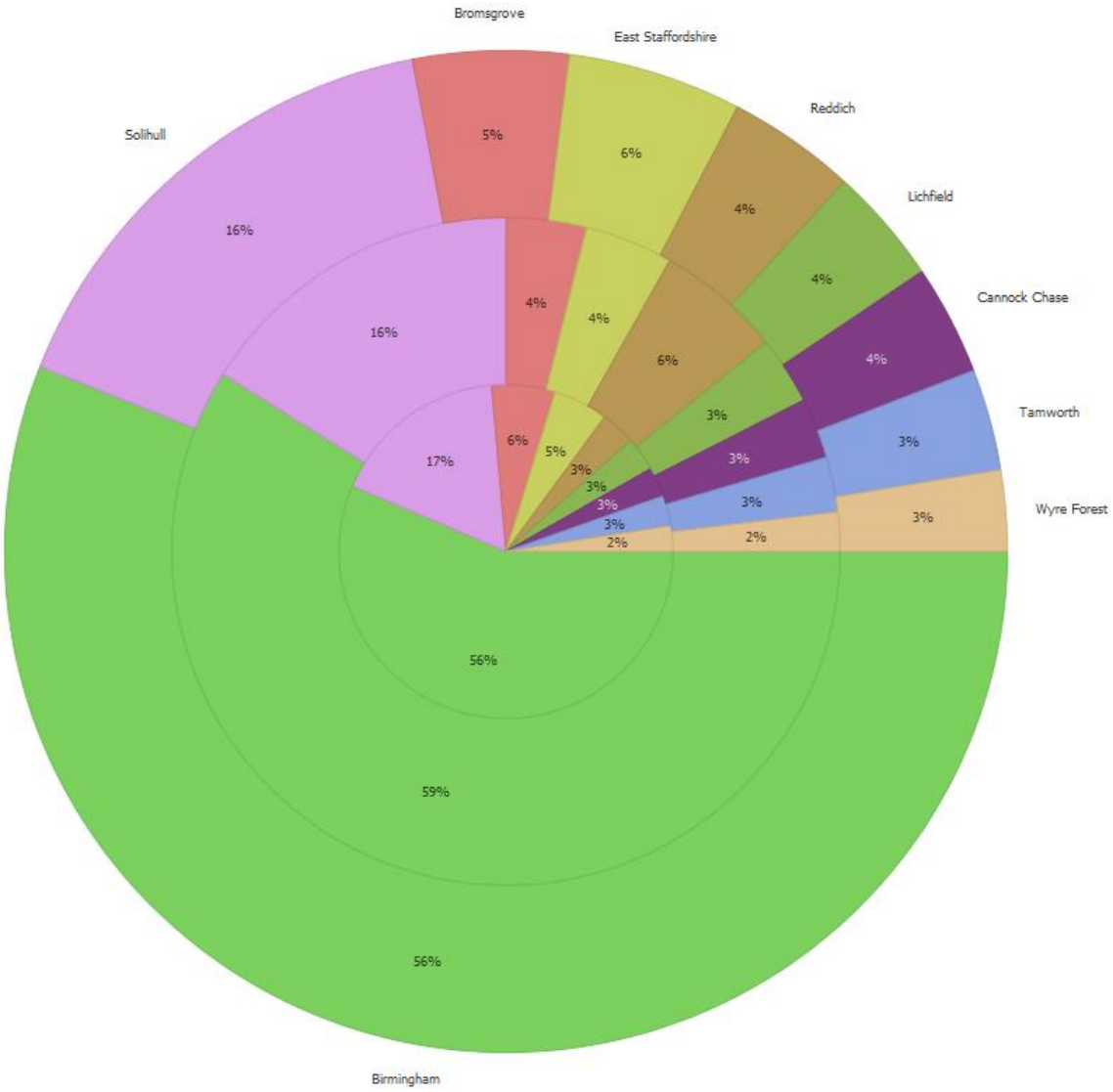
# 2. Greater Birmingham LEP's LCEGS by Local Authority

## 2.1 LCEGS by Local Authority

This section of the report the analyses the Greater Birmingham and Solihull LEP's 9 Local Authorities.

Figure 41 shows LCEGS for 2019/20 split by Local Authority for sales (outer circle), companies (middle circle) and employment (inner circle). Birmingham accounts for 56% of Greater Birmingham and Solihull LEP's LCEGS sales, 59% of companies and 56% of employment. The top 3 Local Authorities are Birmingham, Solihull and Bromsgrove. The smallest Local Authority is Wyre Forest with 3% of the market.

**Figure 41: Greater Birmingham and Solihull LEP's LCEGS 2019/20 by Local Authority for Sales, Companies and Employment**




Local Authorities are analysed in more detail, by year, by economic measure and by LCEGS activity in the following section.

## 2.2 Local Authority Analysis by Year and Sector

Table 12 shows the key metrics of Sales, Available Sales, GVA, Number of Companies and Number of Employees for each Local Authority at the Sector Level for three years with growth rates.

Sales represent the value of sales transactions (£m) and represent the turnover of companies. Available Sales (£m) provides a value for the portion of the market that is not 'locked' by long term contracts and is realistically available for market penetration by new market entrants, without the need for aggressive marketing or pricing strategies. GVA means the Gross Value Added and is the value of the transactions minus raw materials etc and represents the profit made.

Available sales fluctuate in all Local Authorities as contracts end and new ones begin

GVA tracks sales, with differences in growth rates between the two being within 0.1%.

The fluctuation between company and employees' numbers are not entirely independent, but they don't necessarily track each other. The fluctuation of employees can represent employees who are redeployed into other sectors within the same company and do not necessarily represent unemployment. Redeployment to other sectors (often with the same product e.g. financial analytics) is often due to the fluctuations in contracts affecting Available Sales.

Company number fluctuations might be a result of trading in other sectors, not that the company itself has ceased to trade.

Growth varies between years for the Local Authorities, with the highest increase in growth of 1.2% for Birmingham during 2018/19-2019/20 than the previous year.

There is significant difference in the growth rates between Local Authorities, with the strongest growth between 2018/19 and 2019/20 seen in:

- Tamworth – 14.8%
- Redditch – 14.6%
- Birmingham – 8.6%

**Table 12: Local Authorities Sales, Available Sales, GVA, Number of Employees and Number of Companies 2017/18 to 2019/20**

| | Sales £m | | | | |
|---|---|---|---|---|---|
| | | Growth | | Growth | |
| Local Authority | 2017/18 | % | 2018/19 | % | 2019/20 |
| Birmingham | 3,003.1 | 7.4% | 3,225.4 | 8.6% | 3,503.7 |
| Bromsgrove | 288.8 | 4.0% | 300.4 | 4.6% | 314.2 |
| Cannock Chase | 217.5 | 1.0% | 219.7 | 1.1% | 222.2 |
| East Staffordshire | 311.9 | 5.7% | 329.8 | 6.4% | 350.9 |
| Lichfield | 228.0 | 1.7% | 231.8 | 2.0% | 236.4 |
| Redditch | 199.8 | 13.4% | 226.6 | 14.6% | 259.6 |
| Solihull | 893.7 | 5.5% | 943.0 | 6.1% | 1,000.6 |
| Tamworth | 155.4 | 14.7% | 178.3 | 14.8% | 204.8 |
| Wyre Forest | 157.3 | 1.7% | 160.0 | 1.9% | 163.0 |
| **Total** | **5,455.6** | **6.6%** | **5,815.1** | **7.6%** | **6,255.4** |

| | Available Sales £m | | | | |
|---|---|---|---|---|---|
| | | Growth | | Growth | |
| Local Authority | 2017/18 | % | 2018/19 | % | 2019/20 |
| Birmingham | 1,758.1 | 9.5% | 1,925.8 | 6.7% | 2,054.1 |
| Bromsgrove | 174.5 | 1.5% | 177.1 | 5.9% | 187.6 |
| Cannock Chase | 132.5 | 1.1% | 134.0 | -1.1% | 132.6 |
| East Staffordshire | 185.0 | 7.6% | 199.1 | 6.0% | 211.0 |
| Lichfield | 139.3 | -0.4% | 138.7 | 1.8% | 141.2 |
| Redditch | 121.0 | 13.4% | 137.2 | 11.3% | 152.6 |
| Solihull | 520.8 | 8.2% | 563.7 | 5.0% | 591.7 |
| Tamworth | 93.3 | 12.9% | 105.4 | 16.5% | 122.7 |
| Wyre Forest | 94.4 | 2.4% | 96.7 | 0.9% | 97.5 |
| **Total** | **3,218.8** | **8.0%** | **3,477.7** | **6.1%** | **3,691.1** |

| | GVA £m | | | | |
|---|---|---|---|---|---|
| | | Growth | | Growth | |
| Local Authority | 2017/18 | % | 2018/19 | % | 2019/20 |
| Birmingham | 2,423.2 | 7.3% | 2,600.9 | 8.5% | 2,821.4 |
| Bromsgrove | 224.4 | 4.0% | 233.4 | 4.6% | 244.1 |
| Cannock Chase | 170.6 | 1.0% | 172.3 | 1.1% | 174.3 |
| East Staffordshire | 247.5 | 5.7% | 261.7 | 6.4% | 278.5 |
| Lichfield | 179.6 | 1.7% | 182.6 | 2.0% | 186.2 |
| Redditch | 159.4 | 13.4% | 180.8 | 14.5% | 207.1 |
| Solihull | 693.0 | 5.5% | 731.3 | 6.1% | 775.9 |
| Tamworth | 119.2 | 14.7% | 136.8 | 14.8% | 157.0 |
| Wyre Forest | 122.5 | 1.7% | 124.6 | 1.9% | 127.0 |
| **Total** | **4,339.5** | **6.6%** | **4,624.5** | **7.5%** | **4,971.5** |

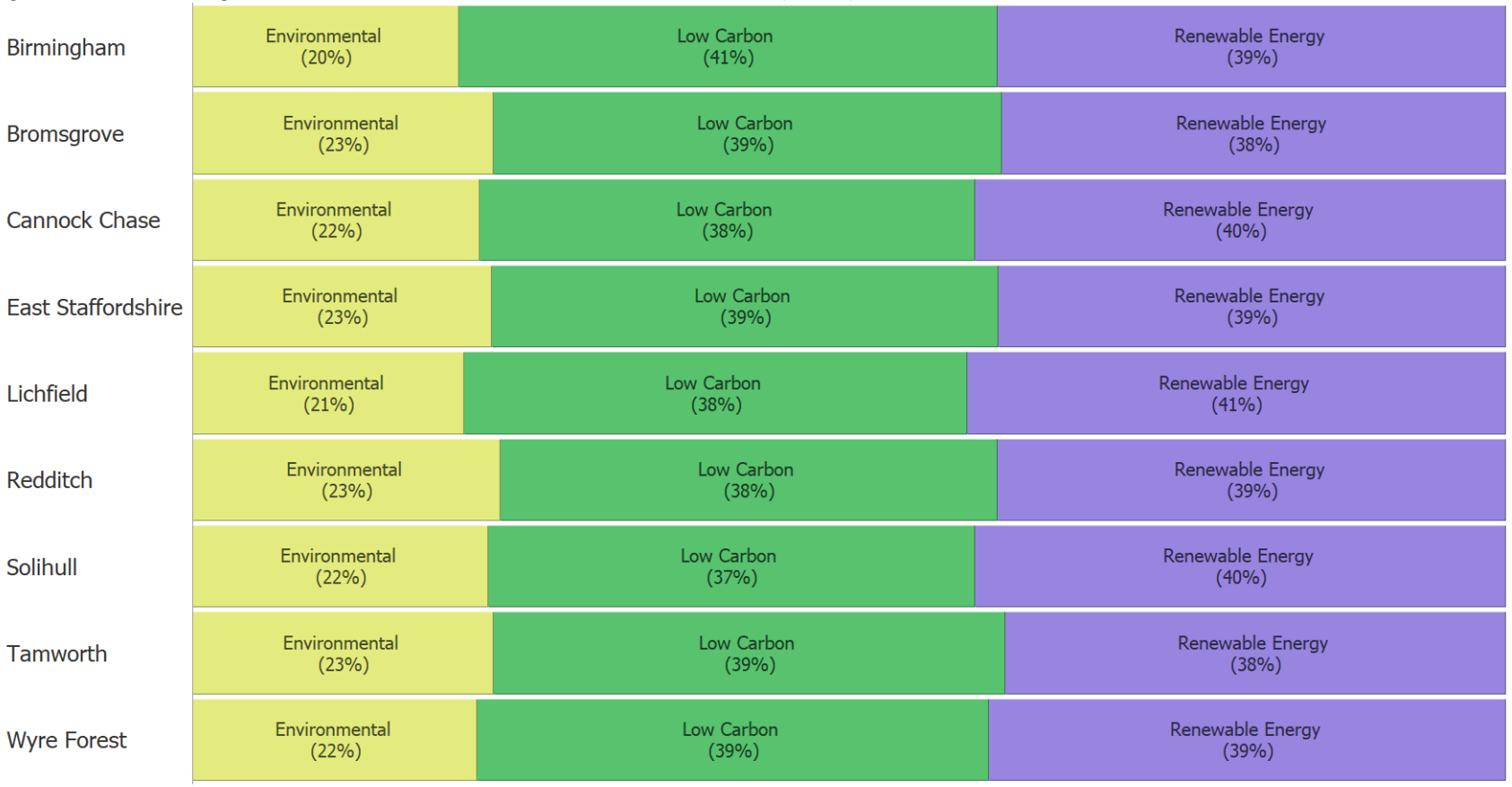
| | # Employees | | | | |
|---|---|---|---|---|---|
| | | Growth | | Growth | |
| Local Authority | 2017/18 | % | 2018/19 | % | 2019/20 |
| Birmingham | 22,680 | 16.2% | 26,358 | 3.4% | 27,267 |
| Bromsgrove | 2,429 | 14.0% | 2,770 | 7.0% | 2,964 |
| Cannock Chase | 1,531 | -8.0% | 1,409 | -1.0% | 1,395 |
| East Staffordshire | 2,441 | -2.2% | 2,387 | 7.7% | 2,572 |
| Lichfield | 1,796 | -5.3% | 1,701 | -6.3% | 1,593 |
| Reddich | 1,388 | 11.4% | 1,547 | 4.4% | 1,615 |
| Solihull | 6,996 | 5.5% | 7,383 | 12.5% | 8,307 |
| Tamworth | 1,086 | 17.7% | 1,279 | 10.7% | 1,416 |
| Wyre Forest | 1,059 | 5.7% | 1,119 | 6.7% | 1,194 |
| **Total** | **41,408** | **11.0%** | **45,952** | **5.2%** | **48,322** |

| | # Companies | | | | |
|---|---|---|---|---|---|
| | | Growth | | Growth | |
| Local Authority | 2017/18 | % | 2018/19 | % | 2019/20 |
| Birmingham | 1,458 | 0.6% | 1,468 | 15.0% | 1,688 |
| Bromsgrove | 111 | -6.0% | 105 | 6.0% | 111 |
| Cannock Chase | 79 | 6.0% | 84 | 0.0% | 84 |
| East Staffordshire | 100 | 8.8% | 109 | 12.7% | 122 |
| Lichfield | 101 | -6.3% | 95 | -0.3% | 94 |
| Reddich | 115 | 23.4% | 142 | 22.4% | 174 |
| Solihull | 388 | 9.5% | 425 | 8.5% | 461 |
| Tamworth | 53 | 14.7% | 61 | 24.7% | 76 |
| Wyre Forest | 49 | 11.7% | 55 | -1.3% | 54 |
| **Total** | **2,455** | **3.6%** | **2,542** | **12.7%** | **2,864** |

## 2.3 Local Authority Analysis by Year – Level 1

Figure 42 shows the different profiles of the Greater Birmingham and Solihull LEP's Local Authorities when sales is split at Level 1. The Local authorities show variation in Environmental of 23% for Bromsgrove, East Staffordshire, Redditch and Tamworth, to 20% for Birmingham; Low carbon from 41% for Birmingham, to 37% for Solihull; and Renewable Energy from 41% for Lichfield to 38% for Bromsgrove and Tamworth. This highlights that Greater Birmingham and Solihull LEP's Local Authorities are not a homogeneous market, but they actually show subtle regional variations in activity within the LCEGS sector. This is further confirmed by Figure 42 below.

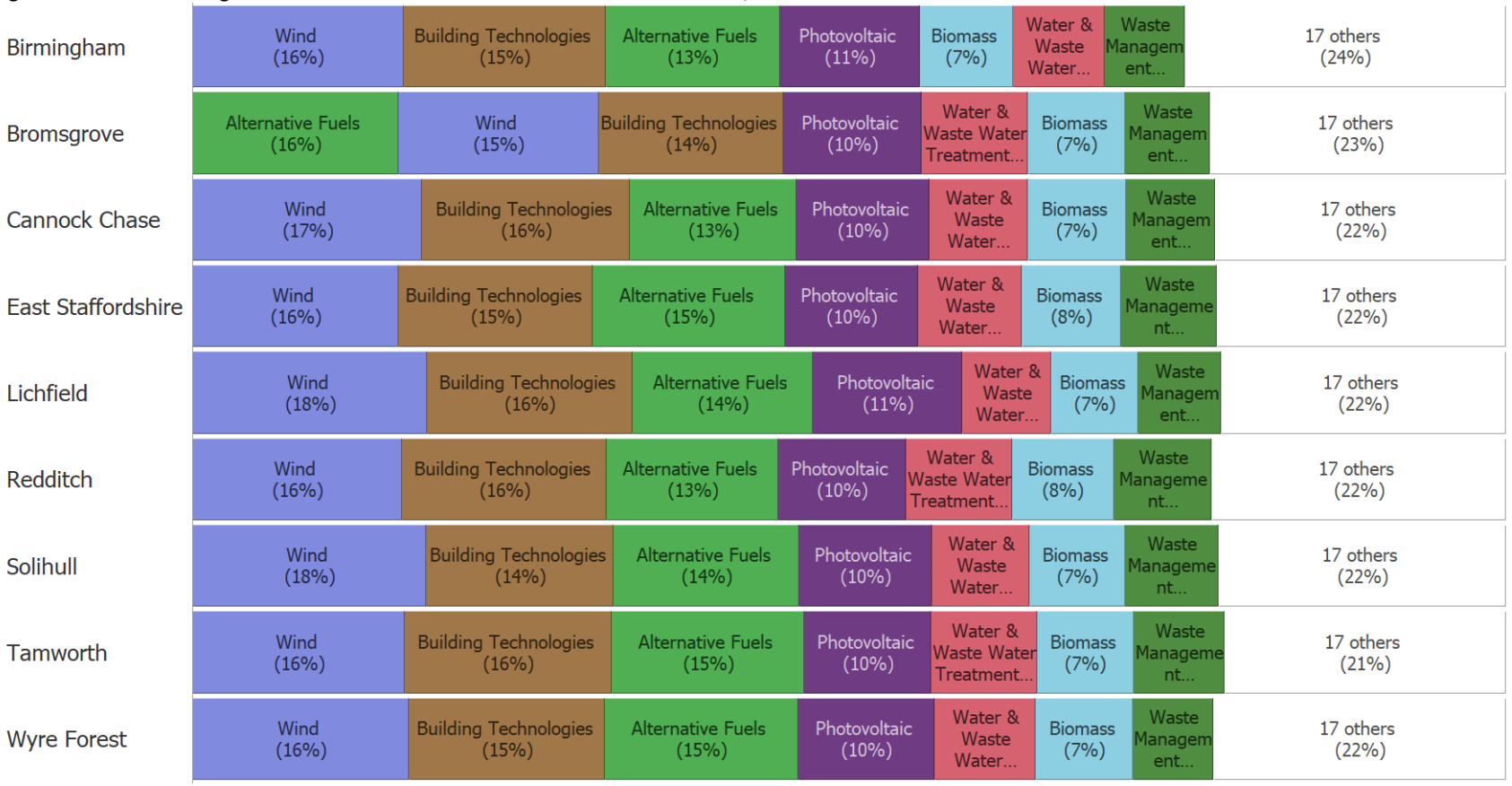
**Figure 42: Greater Birmingham and Solihull LEP's Local Authorities LCEGS Sales 2019/20 (Level 1)**



## 2.4 Local Authority Analysis by Year – Level 2

Figure 43 extends the analysis to include the Top 7 sub-sectors for each of Greater Birmingham and Solihull LEP's Local Authorities. Typically, seven sub-sectors account for over 75% of the total value, but the sub-sectors and their rankings do differ across the 9 Local Authorities. There are consistent sub-sectors running through many of the Greater Birmingham and Solihull LEP's Local Authorities and these include Wind, Building Technologies, Alternative Fuels and Photovoltaic, they are represented in all of Greater Birmingham and Solihull LEP's Local Authorities and are consistent with the LEP's top four sub-sectors.

**Figure 43: Greater Birmingham and Solihull LEP's Local Authorities LCEGS Sales 2019/20 at Level 2**



## 2.5 Local Authority LCEGS Company Size

In Section we look at the sizes of companies within each Local Authority, with Table 13 showing a good range of growth rates between the Local Authorities.

**Table 13: Local Authorities Companies by Size from 2017/18 to 2019/20**

| | # Start-up | | | | | # Micro | | | | | # SMEs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Local Authority | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 |
| Birmingham | 74 | -0.4% | 73 | 14.8% | 84 | 440 | 0.6% | 442 | 14.3% | 506 | 727 | 0.7% | 732 | 15.4% | 845 |
| Bromsgrove | 6 | -4.9% | 5 | 5.9% | 6 | 33 | -5.5% | 31 | 6.9% | 33 | 56 | -6.2% | 53 | 5.2% | 55 |
| Cannock Chase | 4 | 4.5% | 4 | 1.5% | 4 | 24 | 6.9% | 25 | -1.6% | 25 | 40 | 5.5% | 42 | 1.1% | 42 |
| East Staffordshire | 5 | 9.2% | 5 | 12.2% | 6 | 30 | 8.8% | 33 | 13.3% | 37 | 50 | 8.5% | 54 | 12.4% | 61 |
| Lichfield | 5 | -6.6% | 5 | 0.0% | 5 | 30 | -6.2% | 28 | 0.7% | 29 | 51 | -6.4% | 47 | -0.9% | 47 |
| Redditch | 6 | 24.4% | 7 | 22.3% | 9 | 34 | 24.1% | 43 | 22.0% | 52 | 58 | 22.8% | 71 | 22.6% | 87 |
| Solihull | 19 | 8.4% | 21 | 8.9% | 23 | 117 | 9.4% | 128 | 8.1% | 138 | 193 | 9.6% | 212 | 8.8% | 230 |
| Tamworth | 3 | 15.0% | 3 | 24.4% | 4 | 16 | 15.2% | 18 | 24.2% | 23 | 27 | 14.5% | 31 | 24.8% | 38 |
| Wyre Forest | 2 | 11.3% | 3 | -1.8% | 3 | 15 | 11.5% | 16 | -1.0% | 16 | 25 | 11.6% | 27 | -1.2% | 27 |
| **Total** | **123** | **2.8%** | **127** | **12.7%** | **143** | **739** | **3.6%** | **765** | **12.2%** | **859** | **1,225** | **3.5%** | **1,268** | **13.0%** | **1,433** |

| | # Large | | | | | # Corporations | | | | | Total # Companies | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Local Authority | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 | 2017/18 | Growth % | 2018/19 | Growth % | 2019/20 |
| Birmingham | 145 | 2.0% | 148 | 13.9% | 169 | 73 | -1.0% | 72 | 16.8% | 85 | 1,458 | 0.6% | 1,468 | 15.0% | 1,688 |
| Bromsgrove | 11 | -6.4% | 10 | 7.0% | 11 | 6 | -6.6% | 5 | 7.0% | 6 | 111 | -6.0% | 105 | 6.0% | 111 |
| Cannock Chase | 8 | 6.3% | 8 | -0.8% | 8 | 4 | 7.2% | 4 | -0.5% | 4 | 79 | 6.0% | 84 | 0.0% | 84 |
| East Staffordshire | 10 | 8.9% | 11 | 13.3% | 12 | 5 | 10.1% | 5 | 12.1% | 6 | 100 | 8.8% | 109 | 12.7% | 122 |
| Lichfield | 10 | -6.2% | 9 | -0.2% | 9 | 5 | -5.5% | 5 | -1.2% | 5 | 101 | -6.3% | 95 | -0.3% | 94 |
| Reddich | 11 | 23.8% | 14 | 22.3% | 17 | 6 | 23.9% | 7 | 23.6% | 9 | 115 | 23.4% | 142 | 22.4% | 174 |
| Solihull | 39 | 9.7% | 43 | 8.1% | 46 | 19 | 9.7% | 21 | 9.1% | 23 | 388 | 9.5% | 425 | 8.5% | 461 |
| Tamworth | 5 | 14.8% | 6 | 26.0% | 8 | 3 | 14.0% | 3 | 24.0% | 4 | 53 | 14.7% | 61 | 24.7% | 76 |
| Wyre Forest | 5 | 12.9% | 6 | -2.1% | 5 | 2 | 12.1% | 3 | -1.9% | 3 | 49 | 11.7% | 55 | -1.3% | 54 |
| **Total** | **245** | **4.5%** | **256** | **12.0%** | **286** | **123** | **2.7%** | **126** | **13.8%** | **143** | **2,455** | **3.6%** | **2,542** | **12.7%** | **2,864** |

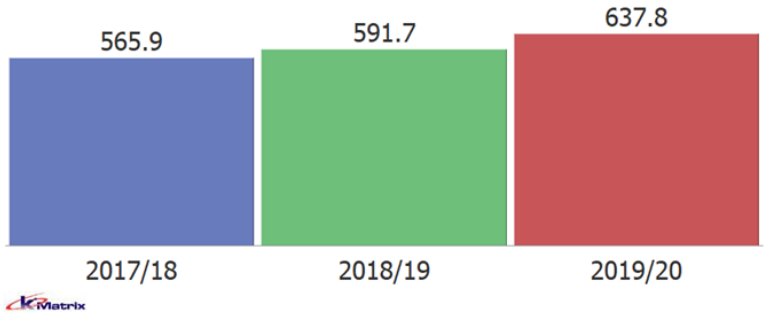
Company number fluctuations may represent companies in more than one sector (such as automotive), who trade sporadically within the LCEGS sector. Decreases in company numbers can therefore be a result of trading in other sectors, not that the company itself has ceased to trade.

# 3. Greater Birmingham and Solihull LEP's LCEGS and International Trade

## 3.1 Greater Birmingham and Solihull LEP's LCEGS Exports

This section of the report addresses Greater Birmingham and Solihull LEP's LCEGS Exports over the past three years when compared with UK totals and then identifies leading LCEGS export products and services and their destination markets.

**Figure 44: Greater Birmingham and Solihull LEP's Exports (£m) 2015/16 to 2017/18**

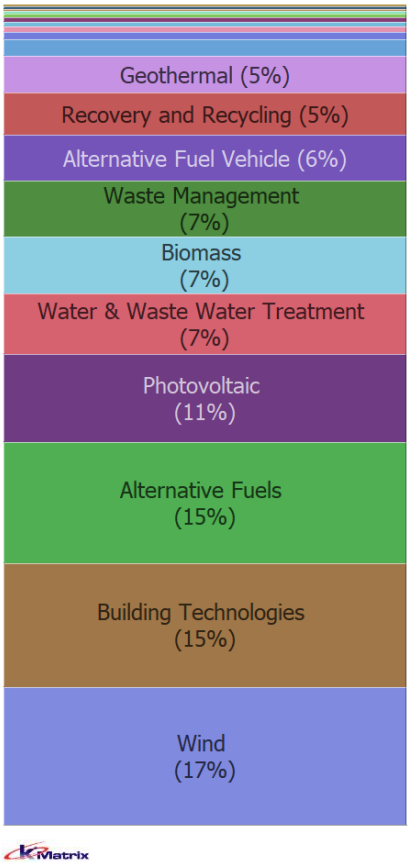



The value of Greater Birmingham and Solihull LEP's LCEGS Exports was £567m in 2017/18 and has grown to £639m in 2019/20.

Growth between 2017/18 and 2018/19 was 4.6% and growth between 2018/19 and 2019/20 was 7.8%.

This is compared with MEH growth of 4.5% and 6.2% and UK growth of approximately 8.7% and 9.5% respectively.

**Figure 45: Greater Birmingham and Solihull LEP's Exports (%) by Sub-Sector 2019/20**

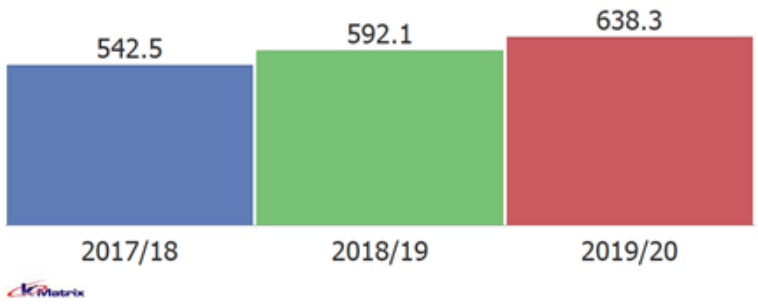



Greater Birmingham and Solihull LEP represented 21% of all MEH LCEGS exports in 2019/20. This is lower than Greater Birmingham and Solihull LEP's 24% of overall MEH Sales. This means that the Greater Birmingham and Solihull LEP has a smaller share of the export market than the MEH domestic market.

Figure 45 shows the proportion of Greater Birmingham and Solihull LEP's LCEGS exports by Level 2 sub-sector, with Wind (17%), Building Technologies (15%), Alternative Fuels (15%), Photovoltaic (11%) and Water & Waste Water Treatment (7%) being the leading sub-sectors and accounting for 65% of all Greater Birmingham and Solihull LEP's LCEGS exports.

This compares with the MEH proportions of Wind (17%), Building Technologies (15%), Alternative Fuels (15%), Photovoltaic (11%) and Water & Waste Water Treatment (8%) accounting for 66% of exports.

**Figure 46: Greater Birmingham and Solihull LEP's Imports (£m) 2015/16 to 2017/18**

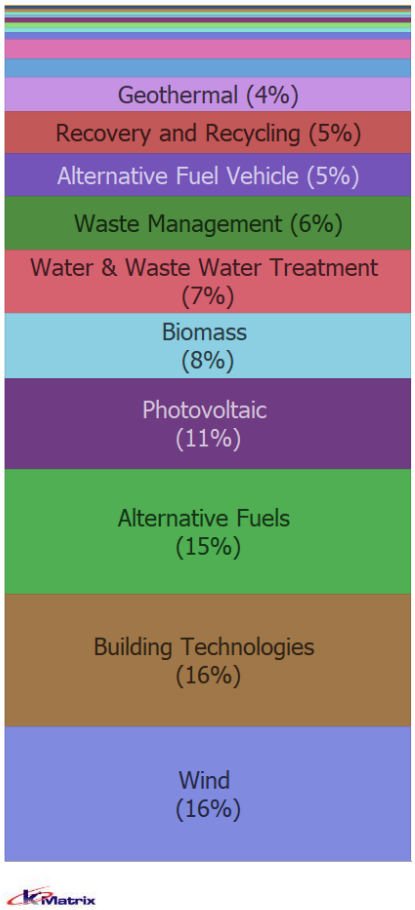



The value of Greater Birmingham and Solihull LEP's LCEGS Imports was £543m in 2017/18 and has grown to £638m in 2019/20.

Growth between 2017/18 and 2018/19 was 9.2% and growth between 2018/19 and 2019/20 was 7.8%.

This is compared with MEH growth of approximately 5.8% and 5.9% and UK growth of approximately 10.0% and 7.4% respectively.

**Figure 47: Greater Birmingham and Solihull LEP's Imports (%) by Sub-Sector 2019/20**




Greater Birmingham and Solihull LEP represented 24% of all MEH LCEGS imports in 2019/20. This is in line with Greater Birmingham and Solihull LEP's 24% of overall MEH Sales.

Figure 47 shows the proportion of Greater Birmingham and Solihull LEP's LCEGS imports by Level 2 sub-sector, with Wind (16%), Building Technologies (16%), Alternative Fuels (15%), Photovoltaic (11%) and Biomass (8%) being the leading sub-sectors and accounting for 66% of all Greater Birmingham and Solihull LEP's LCEGS imports.

In Table 14 Greater Birmingham and Solihull LEP's LCEGS exports are shown by sub-sector for each of the three years of the report and have been expressed as a percentage of that sub-sector's overall sales. The overall average for 2019/20 is 10.2%, with less than 1.5 percentage point variation between sub-sectors, which is consistent across the three years, indicating a stable and established export market.

**Table 14: Greater Birmingham and Solihull LEP's LCEGS Exports as a % of Sales 2017/18 to 2019/20**

| | | 2017/18 | | | 2018/19 | | | 2019/20 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Level 1 | Level 2 | Sales £m | Exports £m | Exports as a % of Sales | Sales £m | Exports £m | Exports as a % of Sales | Sales £m | Exports £m | Exports as a % of Sales |
| **Environmental** | Air Pollution | 29.3 | 3.2 | 10.8% | 31.2 | 3.2 | 10.4% | 33.6 | 3.5 | 10.4% |
| **Environmental** | Contaminated Land | 30.0 | 3.1 | 10.2% | 32.0 | 3.3 | 10.3% | 34.4 | 3.6 | 10.5% |
| **Environmental** | Environmental Consultancy | 35.8 | 3.9 | 11.0% | 38.2 | 3.9 | 10.3% | 41.0 | 4.3 | 10.4% |
| **Environmental** | Environmental Monitoring | 7.6 | 0.8 | 10.1% | 8.1 | 0.9 | 10.7% | 8.7 | 0.9 | 10.8% |
| **Environmental** | Marine Pollution Control | 5.8 | 0.6 | 9.9% | 6.2 | 0.6 | 10.0% | 6.6 | 0.7 | 10.0% |
| **Environmental** | Noise & Vibration Control | 16.1 | 1.7 | 10.6% | 17.2 | 1.8 | 10.6% | 18.5 | 2.0 | 10.7% |
| **Environmental** | Recovery and Recycling | 283.7 | 30.7 | 10.8% | 302.2 | 31.0 | 10.3% | 324.8 | 33.1 | 10.2% |
| **Environmental** | Waste Management | 351.3 | 39.9 | 11.4% | 374.6 | 38.5 | 10.3% | 402.9 | 43.4 | 10.8% |
| **Environmental** | Water & Waste Water Treatment | 396.6 | 40.6 | 10.2% | 422.8 | 44.9 | 10.6% | 454.8 | 47.0 | 10.3% |
| **Low Carbon** | Additional Energy Sources | 47.0 | 4.9 | 10.5% | 50.1 | 5.2 | 10.3% | 53.8 | 5.5 | 10.2% |
| **Low Carbon** | Alternative Fuel Vehicle | 297.7 | 27.1 | 9.1% | 317.1 | 31.2 | 9.8% | 340.8 | 35.2 | 10.3% |
| **Low Carbon** | Alternative Fuels | 747.1 | 81.8 | 11.0% | 795.9 | 82.1 | 10.3% | 856.1 | 93.9 | 11.0% |
| **Low Carbon** | Building Technologies | 825.5 | 90.5 | 11.0% | 880.0 | 89.3 | 10.1% | 946.8 | 96.3 | 10.2% |
| **Low Carbon** | Carbon Capture & Storage | 17.8 | 1.8 | 10.4% | 19.0 | 1.9 | 10.1% | 20.4 | 2.1 | 10.5% |
| **Low Carbon** | Carbon Finance | 113.7 | 0.0 | 0.0% | 122.8 | 0.0 | 0.0% | 133.9 | 0.0 | 0.0% |
| **Low Carbon** | Energy Management | 114.5 | 11.5 | 10.1% | 122.1 | 12.6 | 10.3% | 131.4 | 12.5 | 9.5% |
| **Low Carbon** | Nuclear Power | 0.0 | 0.0 | 0.0% | 0.0 | 0.0 | 0.0% | 0.0 | 0.0 | 0.0% |
| **Renewable Energy** | Biomass | 394.1 | 43.9 | 11.1% | 420.0 | 43.8 | 10.4% | 451.9 | 44.3 | 9.8% |
| **Renewable Energy** | Geothermal | 236.8 | 24.1 | 10.2% | 252.3 | 27.6 | 10.9% | 271.2 | 28.9 | 10.7% |
| **Renewable Energy** | Hydro | 13.4 | 1.4 | 10.4% | 14.2 | 1.5 | 10.7% | 15.3 | 1.6 | 10.4% |
| **Renewable Energy** | Photovoltaic | 571.7 | 59.4 | 10.4% | 609.1 | 68.1 | 11.2% | 654.8 | 68.6 | 10.5% |
| **Renewable Energy** | Renewable Consultancy | 25.0 | 2.7 | 10.9% | 26.7 | 2.8 | 10.3% | 28.6 | 2.9 | 10.0% |
| **Renewable Energy** | Wave & Tidal | 0.8 | 0.1 | 9.6% | 0.8 | 0.1 | 10.4% | 0.9 | 0.1 | 10.7% |
| **Renewable Energy** | Wind | 894.1 | 92.0 | 10.3% | 952.7 | 97.4 | 10.2% | 1,024.1 | 107.3 | 10.5% |
| **Total** | | **5,455.4** | **565.9** | **10.4%** | **5,815.3** | **591.7** | **10.2%** | **6,255.3** | **637.8** | **10.2%** |

In Table 15 Greater Birmingham and Solihull LEP's LCEGS available exports are shown by sub-sector for each of the three years of the report and have been expressed as a percentage of that sub-sector's overall exports. The overall average for 2019/20 is 24.9%, with subtle variation between sub-sectors.

**Table 15: Greater Birmingham and Solihull LEP's LCEGS Available Exports and Available Exports as a % of Exports 2017/18 to 2019/20**

| | | 2017/18 | | | 2018/19 | | | 2019/20 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Level 1 | Level 2 | Exports £m | Available Exports £m | Available Exports as a % of Exports | Exports £m | Available Exports £m | Available Exports as a % of Exports | Exports £m | Available Exports £m | Available Exports as a % of Exports |
| **Environmental** | Air Pollution | 3.2 | 0.8 | 25.3% | 3.2 | 0.8 | 24.7% | 3.5 | 0.8 | 23.9% |
| **Environmental** | Contaminated Land | 3.1 | 0.7 | 23.1% | 3.3 | 0.8 | 25.4% | 3.6 | 0.9 | 23.8% |
| **Environmental** | Environmental Consultancy | 3.9 | 1.0 | 24.2% | 3.9 | 0.9 | 24.1% | 4.3 | 1.0 | 24.4% |
| **Environmental** | Environmental Monitoring | 0.8 | 0.2 | 23.7% | 0.9 | 0.2 | 22.7% | 0.9 | 0.2 | 25.6% |
| **Environmental** | Marine Pollution Control | 0.6 | 0.1 | 24.4% | 0.6 | 0.2 | 26.5% | 0.7 | 0.2 | 25.2% |
| **Environmental** | Noise & Vibration Control | 1.7 | 0.4 | 24.6% | 1.8 | 0.4 | 23.4% | 2.0 | 0.5 | 22.8% |
| **Environmental** | Recovery and Recycling | 30.7 | 7.3 | 23.9% | 31.0 | 7.6 | 24.4% | 33.1 | 7.8 | 23.7% |
| **Environmental** | Waste Management | 39.9 | 10.7 | 26.7% | 38.5 | 9.7 | 25.3% | 43.4 | 10.7 | 24.6% |
| **Environmental** | Water & Waste Water Treatment | 40.6 | 9.4 | 23.2% | 44.9 | 10.7 | 23.8% | 47.0 | 11.7 | 24.8% |
| **Low Carbon** | Additional Energy Sources | 4.9 | 1.2 | 24.4% | 5.2 | 1.3 | 25.4% | 5.5 | 1.3 | 23.2% |
| **Low Carbon** | Alternative Fuel Vehicle | 27.1 | 7.2 | 26.5% | 31.2 | 8.0 | 25.6% | 35.2 | 8.9 | 25.1% |
| **Low Carbon** | Alternative Fuels | 81.8 | 22.6 | 27.6% | 82.1 | 17.1 | 20.8% | 93.9 | 23.7 | 25.2% |
| **Low Carbon** | Building Technologies | 90.5 | 20.0 | 22.1% | 89.3 | 23.4 | 26.2% | 96.3 | 24.8 | 25.7% |
| **Low Carbon** | Carbon Capture & Storage | 1.8 | 0.5 | 25.0% | 1.9 | 0.5 | 23.8% | 2.1 | 0.6 | 26.4% |
| **Low Carbon** | Carbon Finance | 0.0 | 0.0 | 0.0% | 0.0 | 0.0 | 0.0% | 0.0 | 0.0 | 0.0% |
| **Low Carbon** | Energy Management | 11.5 | 2.9 | 24.9% | 12.6 | 3.0 | 23.6% | 12.5 | 3.0 | 23.8% |
| **Low Carbon** | Nuclear Power | 0.0 | 0.0 | 0.0% | 0.0 | 0.0 | 0.0% | 0.0 | 0.0 | 0.0% |
| **Renewable Energy** | Biomass | 43.9 | 11.4 | 25.9% | 43.8 | 11.4 | 26.1% | 44.3 | 11.0 | 24.8% |
| **Renewable Energy** | Geothermal | 24.1 | 6.3 | 26.3% | 27.6 | 6.9 | 24.9% | 28.9 | 7.4 | 25.6% |
| **Renewable Energy** | Hydro | 1.4 | 0.3 | 24.1% | 1.5 | 0.4 | 26.1% | 1.6 | 0.4 | 25.4% |
| **Renewable Energy** | Photovoltaic | 59.4 | 14.5 | 24.3% | 68.1 | 16.6 | 24.4% | 68.6 | 17.1 | 24.9% |
| **Renewable Energy** | Renewable Consultancy | 2.7 | 0.7 | 24.9% | 2.8 | 0.7 | 25.8% | 2.9 | 0.7 | 25.5% |
| **Renewable Energy** | Wave & Tidal | 0.1 | 0.0 | 24.4% | 0.1 | 0.0 | 24.0% | 0.1 | 0.0 | 23.6% |
| **Renewable Energy** | Wind | 92.0 | 22.6 | 24.6% | 97.4 | 22.4 | 23.0% | 107.3 | 26.2 | 24.4% |
| **Total** | | **565.9** | **140.7** | **24.9%** | **591.7** | **142.9** | **24.2%** | **637.8** | **158.7** | **24.9%** |

The sub-sectors with the highest available export to export ratio in 2019/20 are: Carbon Capture and Storage 26.4%; Building Technologies 25.7%; Geothermal 25.6%; Environmental Monitoring 25.6%; Renewable consultancy 25.5%; Hydro 25.4% and Alternative Fuels 25.2%.

This compares with the MEH sub-sectors with the highest available export to export ratio in 2019/20 of: Geothermal 25.0%; Building Technologies 24.9%; Marine Pollution Control 24.9%; Carbon Capture and Storage 24.9%; Environmental Consultancy 24.8% and Environmental Monitoring 24.7%.

In Table 16 Greater Birmingham and Solihull LEP's LCEGS imports are shown by sub-sector for each of the three years of the report and have been expressed as a percentage of that sub-sector's overall sales. The overall average for 2019/20 is 10.2%, with less than 1.0 percentage point variation between sub-sectors, which is consistent across the three years, indicating a stable and established import market.

**Table 16: Greater Birmingham and Solihull LEP's LCEGS Imports as a % of Sales 2017/18 to 2019/20**

| | | 2017/18 | | | 2018/19 | | | 2019/20 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Level 1 | Level 2 | Sales £m | Imports £m | Imports as a % of Sales | Sales £m | Imports £m | Imports as a % of Sales | Sales £m | Imports £m | Imports as a % of Sales |
| Environmental | Air Pollution | 29.3 | 3.1 | 10.6% | 31.2 | 3.1 | 9.8% | 33.6 | 3.3 | 10.0% |
| Environmental | Contaminated Land | 30.0 | 3.3 | 11.0% | 32.0 | 3.2 | 10.1% | 34.4 | 3.3 | 9.7% |
| Environmental | Environmental Consultancy | 35.8 | 3.5 | 9.6% | 38.2 | 3.6 | 9.6% | 41.0 | 3.8 | 9.2% |
| Environmental | Environmental Monitoring | 7.6 | 0.8 | 10.3% | 8.1 | 0.9 | 10.8% | 8.7 | 0.9 | 10.4% |
| Environmental | Marine Pollution Control | 5.8 | 0.5 | 9.2% | 6.2 | 0.6 | 9.7% | 6.6 | 0.7 | 10.6% |
| Environmental | Noise & Vibration Control | 16.1 | 1.7 | 10.8% | 17.2 | 1.8 | 10.4% | 18.5 | 2.0 | 10.7% |
| Environmental | Recovery and Recycling | 283.7 | 29.5 | 10.4% | 302.2 | 29.4 | 9.7% | 324.8 | 31.1 | 9.6% |
| Environmental | Waste Management | 351.3 | 34.1 | 9.7% | 374.6 | 38.5 | 10.3% | 402.9 | 40.1 | 10.0% |
| Environmental | Water & Waste Water Treatment | 396.6 | 39.9 | 10.1% | 422.8 | 38.8 | 9.2% | 454.8 | 47.3 | 10.4% |
| Low Carbon | Additional Energy Sources | 47.0 | 4.8 | 10.2% | 50.1 | 5.5 | 11.0% | 53.8 | 5.6 | 10.4% |
| Low Carbon | Alternative Fuel Vehicle | 297.7 | 30.4 | 10.2% | 317.1 | 29.6 | 9.4% | 340.8 | 32.1 | 9.4% |
| Low Carbon | Alternative Fuels | 747.1 | 69.0 | 9.2% | 795.9 | 86.6 | 10.9% | 856.1 | 93.3 | 10.9% |
| Low Carbon | Building Technologies | 825.5 | 85.1 | 10.3% | 880.0 | 90.2 | 10.3% | 946.8 | 99.2 | 10.5% |
| Low Carbon | Carbon Capture & Storage | 17.8 | 1.8 | 10.2% | 19.0 | 2.0 | 10.4% | 20.4 | 2.2 | 10.6% |
| Low Carbon | Carbon Finance | 113.7 | 12.4 | 10.9% | 122.8 | 12.4 | 10.1% | 133.9 | 14.0 | 10.4% |
| Low Carbon | Energy Management | 114.5 | 10.7 | 9.4% | 122.1 | 12.5 | 10.2% | 131.4 | 14.1 | 10.7% |
| Low Carbon | Nuclear Power | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 |
| Renewable Energy | Biomass | 394.1 | 37.0 | 9.4% | 420.0 | 39.7 | 9.5% | 451.9 | 48.1 | 10.6% |
| Renewable Energy | Geothermal | 236.8 | 25.5 | 10.8% | 252.3 | 26.8 | 10.6% | 271.2 | 25.6 | 9.4% |
| Renewable Energy | Hydro | 13.4 | 1.4 | 10.4% | 14.2 | 1.4 | 9.8% | 15.3 | 1.4 | 8.8% |
| Renewable Energy | Photovoltaic | 571.7 | 59.2 | 10.4% | 609.1 | 58.8 | 9.7% | 654.8 | 67.7 | 10.3% |
| Renewable Energy | Renewable Consultancy | 25.0 | 2.5 | 10.1% | 26.7 | 2.7 | 10.3% | 28.6 | 2.5 | 8.9% |
| Renewable Energy | Wave & Tidal | 0.8 | 0.1 | 10.4% | 0.8 | 0.1 | 10.3% | 0.9 | 0.1 | 10.0% |
| Renewable Energy | Wind | 894.1 | 86.0 | 9.6% | 952.7 | 103.9 | 10.9% | 1,024.1 | 100.0 | 9.8% |
| **Total** | | **5,455.6** | **542.5** | **9.9%** | **5,815.1** | **592.1** | **10.2%** | **6,255.4** | **638.3** | **10.2%** |

Figure 48 shows the Exports plotted against the Greater Birmingham and Solihull LEP's Growth from to 2018/19 to 2019/20 for all Level 2 sub-sectors, with the bubbles sized according to the size of the Exports. Here we can see that the Wind, building Technologies and Alternative Fuels are large market, but in the lower half of the growth scale. Alternative Fuel Vehicle, Waste Management and Biomass are within the top 11 sub-sectors and have good export market and high growth. Markets that should be considered Export strengths include: Alternative Fuel Vehicle, Waste Management and Biomass due to their strong growth and Wind, Building Technologies and Alternative Fuels due to their large size.

**Figure 48: Greater Birmingham and Solihull LEP's LCEGS Exports vs Greater Birmingham and Solihull LEP's Level 2 Growth for 2019/20**

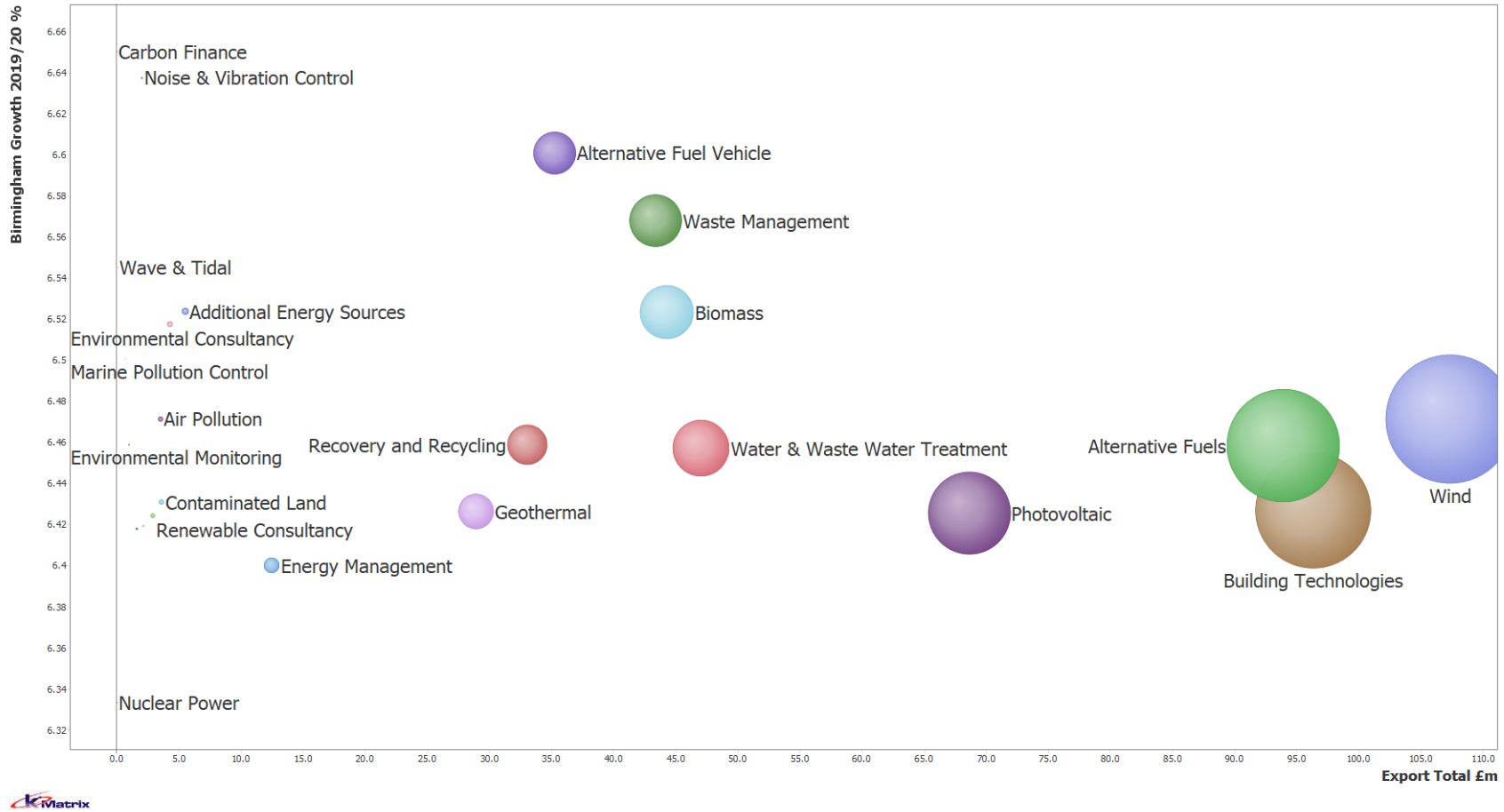
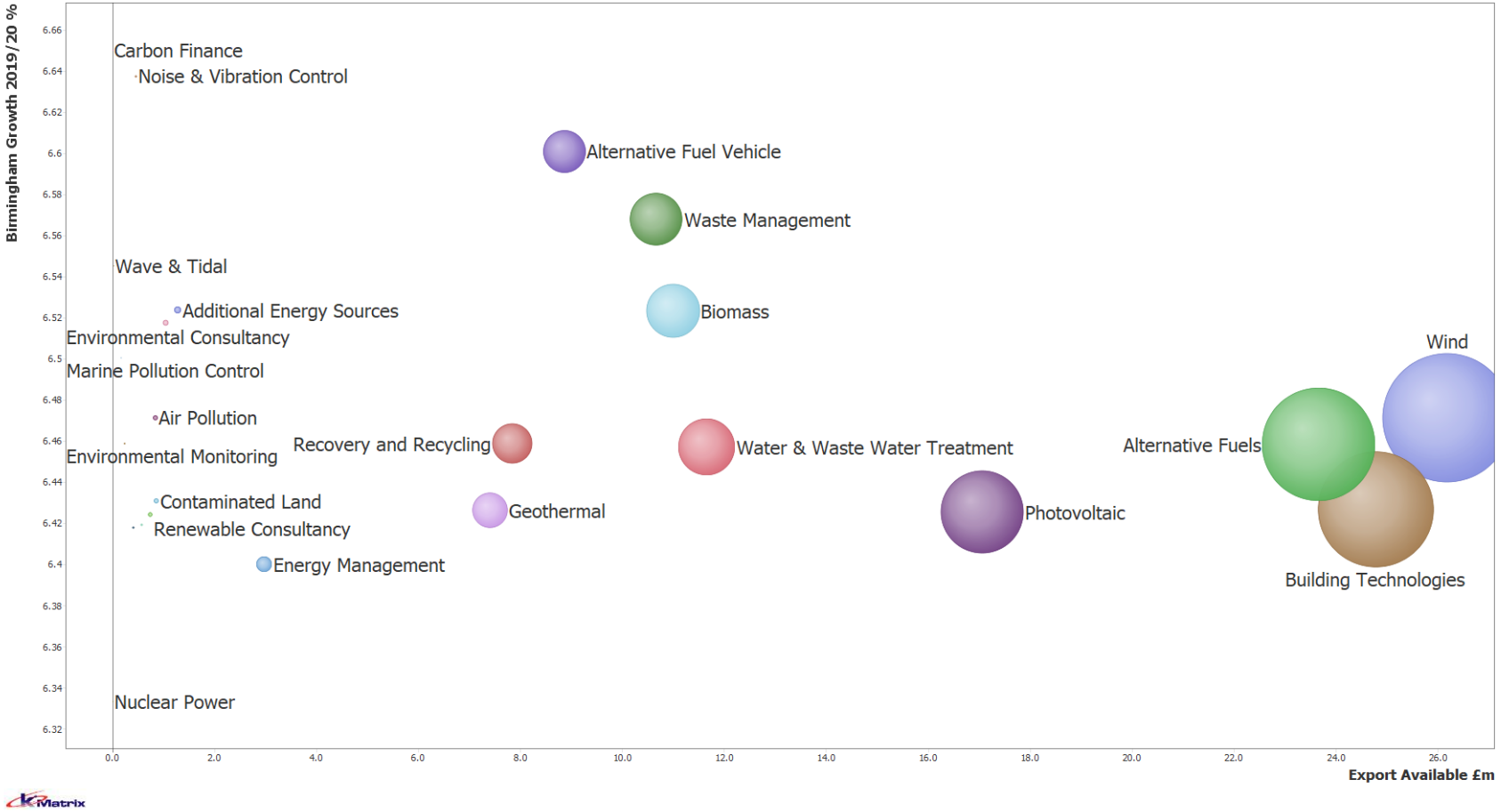


Figure 49 shows the Available Exports plotted against the Greater Birmingham and Solihull LEP's Growth from to 2018/19 to 2019/20 for all Level 2 sub-sectors, with the bubbles sized according to the size of the Exports. Here we can see that the pattern is slightly different from the Export graph in figure 48, Alternative Fuels and Building Technologies have moved to the right as there is good Export Market Available.

**Figure 49: Greater Birmingham and Solihull LEP's LCEGS Available Exports vs Greater Birmingham and Solihull LEP's Level 2 Growth for 2019/20**

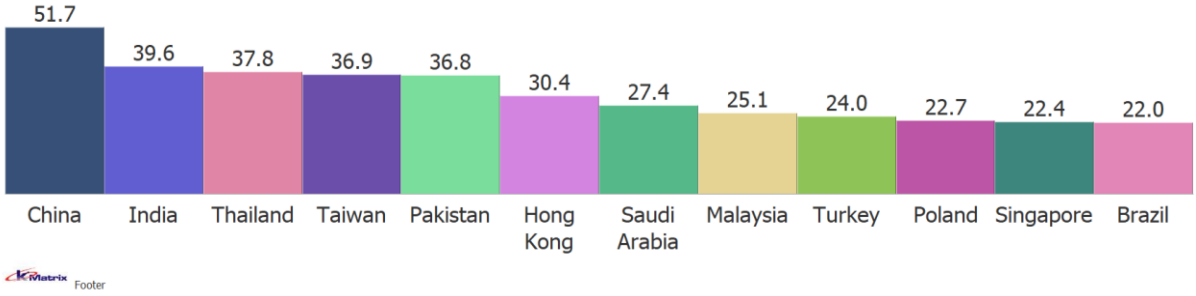


The Top 12 destinations for Greater Birmingham and Solihull LEP's LCEGS exports are shown in Figure 50. China is the top destination, followed by India, Thailand, Taiwan, Pakistan, Hong Kong, Saudi Arabia, Malaysia, Turkey, Poland, Singapore and Brazil.

The USA, Germany and France, who are three of the UK's largest trading partners, are conspicuously absent from the Top 12 destinations for LCEGS and this has been a feature of international trade in LCEGS since 2007/08 when the analysis first began.

The LCEGS sector has a very different trading pattern to other mainstream UK sectors, predominantly due to long term, historic trading relationships within this sector.

**Figure 50: Top 12 Greater Birmingham and Solihull LEP's LCEGS Export Destinations 2019/20**



## 3.2 Greater Birmingham and Solihull LEP's LCEGS Priority Markets

Table 17 combines analysis of Greater Birmingham and Solihull LEP's LCEGS product and service exports with destination countries using a heat map. The table shows the value of exports in £m and then colour codes the values – dark green for higher values and white for lower values. The table has been simplified by excluding the lowest value destination countries and lowest value products/services. The results show the top 32 export destinations and the top 12 (out of 24) sub-sectors.

**Table 17: Greater Birmingham and Solihull LEP's Level 2 Exports by Country for 2019/20 in £m**

| Level 1 | Level 2 | Australia | Brazil | Canada | Chile | China | Denmark | France | Germany | Hong Kong | Hungary | India | Indonesia | Italy | Japan | Malaysia | Mexico |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Environmental | Recovery and Recycling | 0.43 | 0.98 | 0.78 | 0.11 | 2.49 | 0.59 | 0.51 | 0.54 | 1.37 | 0.72 | 1.70 | 0.43 | 0.49 | 0.54 | 1.09 | 0.26 |
| Environmental | Waste Management | 0.59 | 1.23 | 0.97 | 0.13 | 3.04 | 0.67 | 0.60 | 0.62 | 1.64 | 0.94 | 2.16 | 0.53 | 0.65 | 0.64 | 1.36 | 0.33 |
| Environmental | Water & Waste Water Treatment | 0.85 | 1.97 | 1.48 | 0.21 | 4.19 | 1.16 | 1.01 | 1.18 | 2.62 | 1.48 | 3.51 | 0.87 | 0.96 | 1.13 | 2.20 | 0.53 |
| Low Carbon | Alternative Fuel Vehicle | 0.76 | 1.75 | 1.38 | 0.20 | 4.05 | 1.09 | 0.89 | 0.97 | 2.36 | 1.35 | 3.17 | 0.81 | 1.01 | 1.04 | 2.05 | 0.49 |
| Low Carbon | Alternative Fuels | 1.36 | 3.86 | 2.65 | 0.38 | 7.33 | 2.06 | 1.95 | 1.78 | 5.10 | 2.56 | 6.65 | 1.71 | 1.47 | 1.81 | 4.34 | 0.88 |
| Low Carbon | Building Technologies | 1.16 | 2.65 | 2.18 | 0.32 | 7.30 | 1.71 | 1.43 | 1.65 | 3.84 | 2.15 | 5.10 | 1.28 | 1.48 | 1.50 | 3.22 | 0.81 |
| Low Carbon | Carbon Finance | 0.34 | 0.79 | 0.71 | 0.10 | 1.84 | 0.43 | 0.37 | 0.50 | 1.05 | 0.61 | 1.08 | 0.32 | 0.43 | 0.33 | 0.98 | 0.22 |
| Low Carbon | Energy Management | 0.22 | 0.55 | 0.42 | 0.06 | 1.26 | 0.31 | 0.27 | 0.30 | 0.75 | 0.41 | 1.15 | 0.24 | 0.25 | 0.32 | 0.59 | 0.15 |
| Renewable Energy | Biomass | 0.47 | 1.06 | 0.85 | 0.12 | 2.71 | 0.61 | 0.59 | 0.62 | 1.68 | 0.86 | 1.80 | 0.50 | 0.52 | 0.54 | 1.24 | 0.28 |
| Renewable Energy | Geothermal | 1.15 | 2.46 | 1.91 | 0.30 | 6.28 | 1.46 | 1.19 | 1.40 | 3.54 | 1.87 | 4.42 | 1.11 | 1.14 | 1.34 | 2.75 | 0.69 |
| Renewable Energy | Photovoltaic | 0.75 | 1.52 | 1.29 | 0.18 | 3.79 | 0.85 | 0.80 | 0.86 | 2.16 | 1.32 | 3.16 | 0.75 | 0.83 | 0.91 | 1.73 | 0.42 |
| Renewable Energy | Wind | 0.84 | 1.87 | 1.53 | 0.20 | 4.39 | 1.01 | 0.82 | 1.01 | 2.52 | 1.40 | 3.18 | 0.81 | 0.89 | 0.99 | 1.98 | 0.51 |

| Level 1 | Level 2 | Netherlands | Pakistan | Poland | Portugal | Romania | Russia | Saudi Arabia | Singapore | A Africa | S Korea | Sweden | Taiwan | Thailand | Turkey | UAE | US |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Environmental | Recovery and Recycling | 0.68 | 1.71 | 1.03 | 0.44 | 0.65 | 0.51 | 1.30 | 1.09 | 0.51 | 0.52 | 0.34 | 1.73 | 1.76 | 1.08 | 0.91 | 0.35 |
| Environmental | Waste Management | 0.77 | 2.04 | 1.24 | 0.50 | 0.84 | 0.58 | 1.47 | 1.25 | 0.58 | 0.64 | 0.39 | 2.11 | 2.25 | 1.27 | 1.16 | 0.42 |
| Environmental | Water & Waste Water Treatment | 1.32 | 3.20 | 2.05 | 0.83 | 1.19 | 0.92 | 2.44 | 1.87 | 0.96 | 1.09 | 0.62 | 3.33 | 3.35 | 1.98 | 1.86 | 0.66 |
| Low Carbon | Alternative Fuel Vehicle | 1.28 | 3.32 | 1.64 | 0.83 | 1.20 | 0.98 | 2.22 | 1.93 | 0.80 | 1.04 | 0.66 | 2.49 | 2.65 | 1.92 | 1.79 | 0.65 |
| Low Carbon | Alternative Fuels | 2.22 | 5.64 | 3.75 | 1.36 | 2.46 | 1.54 | 4.46 | 3.22 | 2.09 | 2.22 | 1.31 | 5.48 | 6.38 | 4.00 | 3.44 | 1.22 |
| Low Carbon | Building Technologies | 1.93 | 4.54 | 2.84 | 1.41 | 1.80 | 1.50 | 3.75 | 3.01 | 1.48 | 1.56 | 0.92 | 4.77 | 4.55 | 3.19 | 2.69 | 1.00 |
| Low Carbon | Carbon Finance | 0.50 | 1.45 | 0.86 | 0.39 | 0.55 | 0.34 | 0.92 | 0.89 | 0.37 | 0.46 | 0.32 | 1.18 | 1.51 | 0.81 | 0.64 | 0.29 |
| Low Carbon | Energy Management | 0.33 | 1.01 | 0.57 | 0.26 | 0.36 | 0.29 | 0.69 | 0.56 | 0.25 | 0.30 | 0.19 | 0.98 | 0.94 | 0.60 | 0.53 | 0.19 |
| Renewable Energy | Biomass | 0.73 | 1.65 | 1.19 | 0.47 | 0.77 | 0.55 | 1.39 | 1.19 | 0.64 | 0.60 | 0.39 | 1.95 | 1.95 | 1.18 | 1.00 | 0.39 |
| Renewable Energy | Geothermal | 1.54 | 4.19 | 2.48 | 1.17 | 1.65 | 1.30 | 2.97 | 2.66 | 1.18 | 1.31 | 0.85 | 4.42 | 4.15 | 2.67 | 2.34 | 0.91 |
| Renewable Energy | Photovoltaic | 1.09 | 2.62 | 1.69 | 0.79 | 1.18 | 0.85 | 2.03 | 1.65 | 0.86 | 0.94 | 0.55 | 2.95 | 2.76 | 1.80 | 1.49 | 0.55 |
| Renewable Energy | Wind | 1.20 | 3.14 | 1.94 | 0.74 | 1.19 | 0.97 | 2.08 | 1.67 | 0.93 | 1.00 | 0.61 | 3.20 | 3.24 | 2.03 | 1.59 | 0.63 |

Table 17 can be read horizontally to identify the strongest exporting sub-sectors i.e. Alternative Fuels, vertically to identify the strongest trading partners i.e. China, and using both vertical and horizontal you can identify strong niches like Geothermal to Taiwan and Alternative Fuels to India.

Tables 18a, 18b and 18c apply the same conventions as Table 13, but this time broken down to Level 3, which reveals Greater Birmingham and Solihull LEP's priority exports in more detail. The tables show the same 32 destination countries but for 30 out of a total of 126 Level 3 market activities.

**Table 18a: Greater Birmingham and Solihull LEP's Level 3 Exports by Country for 2019/20 in £m**

| Level 2 | Level 3 | Australia | Brazil | Canada | Chile | China | Denmark | France | Germany | Hong Kong | Hungary | India |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recovery and Recycling | Consultancy, Training and Education | 0.00 | 0.01 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |
| Recovery and Recycling | Glass Stock Processing | 0.06 | 0.15 | 0.10 | 0.02 | 0.37 | 0.09 | 0.07 | 0.06 | 0.16 | 0.09 | 0.24 |
| Recovery and Recycling | Technologies, Research & Development | 0.01 | 0.02 | 0.02 | 0.00 | 0.06 | 0.01 | 0.01 | 0.01 | 0.04 | 0.02 | 0.05 |
| Recovery and Recycling | Waste Collection | 0.19 | 0.40 | 0.34 | 0.04 | 1.06 | 0.26 | 0.22 | 0.24 | 0.59 | 0.32 | 0.71 |
| Waste Management | Construction & Operation of Waste Treatment Facilities | 0.18 | 0.39 | 0.30 | 0.04 | 0.86 | 0.22 | 0.23 | 0.20 | 0.58 | 0.28 | 0.60 |
| Waste Management | Consultancy, Training and Education | 0.07 | 0.16 | 0.14 | 0.02 | 0.39 | 0.08 | 0.08 | 0.09 | 0.17 | 0.10 | 0.33 |
| Waste Management | Equipment For Waste Treatment | 0.22 | 0.47 | 0.37 | 0.05 | 1.15 | 0.25 | 0.18 | 0.20 | 0.63 | 0.37 | 0.79 |
| Waste Management | Technologies, Research & Development | 0.12 | 0.21 | 0.16 | 0.02 | 0.64 | 0.12 | 0.10 | 0.13 | 0.26 | 0.18 | 0.45 |
| Water & Waste Water Treatment | Engineering | 0.19 | 0.36 | 0.29 | 0.04 | 0.90 | 0.27 | 0.23 | 0.26 | 0.60 | 0.29 | 0.69 |
| Water & Waste Water Treatment | Water Treatment and Distribution | 0.65 | 1.59 | 1.18 | 0.17 | 3.23 | 0.87 | 0.76 | 0.91 | 1.99 | 1.18 | 2.77 |
| Alternative Fuel Vehicle | Alternative Fuels (main Stream) for Vehicles Only | 0.56 | 1.29 | 1.09 | 0.15 | 3.06 | 0.86 | 0.67 | 0.73 | 1.73 | 1.05 | 2.37 |
| Alternative Fuel Vehicle | Other Fuels and Vehicles | 0.20 | 0.46 | 0.30 | 0.05 | 0.99 | 0.23 | 0.22 | 0.24 | 0.63 | 0.30 | 0.80 |
| Alternative Fuels | Main Stream Bio Fuels | 0.23 | 0.63 | 0.56 | 0.08 | 1.30 | 0.32 | 0.31 | 0.34 | 0.85 | 0.57 | 1.05 |
| Alternative Fuels | Other Bio Fuels | 0.94 | 2.74 | 1.77 | 0.26 | 4.73 | 1.54 | 1.45 | 1.20 | 3.58 | 1.71 | 4.78 |
| Alternative Fuels | Other Fuels | 0.10 | 0.30 | 0.18 | 0.03 | 0.83 | 0.09 | 0.09 | 0.14 | 0.41 | 0.14 | 0.48 |
| Building Technologies | Doors | 0.26 | 0.64 | 0.55 | 0.09 | 1.92 | 0.51 | 0.32 | 0.46 | 1.05 | 0.52 | 1.37 |
| Building Technologies | Insulation and Heat Retention Materials | 0.23 | 0.49 | 0.43 | 0.06 | 1.24 | 0.29 | 0.24 | 0.32 | 0.63 | 0.36 | 0.91 |
| Building Technologies | Monitoring and Control Systems | 0.23 | 0.50 | 0.34 | 0.06 | 1.11 | 0.30 | 0.21 | 0.26 | 0.72 | 0.38 | 0.88 |
| Building Technologies | Windows | 0.45 | 1.02 | 0.85 | 0.12 | 3.03 | 0.60 | 0.66 | 0.61 | 1.44 | 0.89 | 1.93 |
| Energy Management | Technologies, Research & Development | 0.02 | 0.05 | 0.03 | 0.00 | 0.09 | 0.03 | 0.02 | 0.02 | 0.06 | 0.03 | 0.08 |
| Biomass | Biomass Energy Systems | 0.18 | 0.47 | 0.34 | 0.06 | 1.24 | 0.27 | 0.27 | 0.29 | 0.82 | 0.39 | 0.77 |
| Biomass | Biomass Furnace Systems | 0.05 | 0.09 | 0.08 | 0.01 | 0.24 | 0.05 | 0.06 | 0.05 | 0.14 | 0.07 | 0.18 |
| Biomass | Boilers and related Systems | 0.16 | 0.34 | 0.28 | 0.04 | 0.92 | 0.20 | 0.18 | 0.19 | 0.52 | 0.28 | 0.63 |
| Biomass | Manufacturing Of Boilers and Related Systems | 0.08 | 0.15 | 0.15 | 0.02 | 0.31 | 0.08 | 0.08 | 0.08 | 0.19 | 0.12 | 0.22 |
| Geothermal | Manufacture and Supply of Specialist Equipment | 0.33 | 0.77 | 0.50 | 0.08 | 1.82 | 0.45 | 0.36 | 0.37 | 0.94 | 0.52 | 1.12 |
| Geothermal | Suppliers of Systems | 0.33 | 0.69 | 0.51 | 0.09 | 1.88 | 0.42 | 0.39 | 0.40 | 1.08 | 0.50 | 1.38 |
| Geothermal | Whole Systems Manufacture | 0.29 | 0.63 | 0.57 | 0.07 | 1.62 | 0.36 | 0.22 | 0.38 | 0.96 | 0.50 | 1.07 |
| Photovoltaic | Other Related Equipment and Chemicals | 0.17 | 0.33 | 0.26 | 0.04 | 0.90 | 0.20 | 0.18 | 0.22 | 0.53 | 0.28 | 0.70 |
| Photovoltaic | Photovoltaic Cells | 0.19 | 0.31 | 0.35 | 0.04 | 0.74 | 0.18 | 0.16 | 0.21 | 0.43 | 0.28 | 0.66 |
| Photovoltaic | Systems & Equipment | 0.36 | 0.83 | 0.62 | 0.10 | 1.96 | 0.44 | 0.43 | 0.40 | 1.11 | 0.71 | 1.68 |
| Wind | Large Wind Turbine | 0.35 | 0.86 | 0.58 | 0.08 | 1.79 | 0.42 | 0.28 | 0.37 | 1.10 | 0.63 | 1.25 |
| Wind | Small Wind Turbine | 0.20 | 0.44 | 0.45 | 0.06 | 1.10 | 0.30 | 0.26 | 0.30 | 0.72 | 0.41 | 0.94 |
| Wind | Wind Farm Systems | 0.29 | 0.58 | 0.50 | 0.06 | 1.50 | 0.30 | 0.28 | 0.33 | 0.70 | 0.37 | 0.99 |

At Level 3 greater levels of detail are created that reveal more niche export markets, i.e. Other Bio Fuels to India, Large Wind Turbine to Taiwan and Thailand, Alternative Fuels (Main Stream for Vehicles Only) to Pakistan and Water Treatment and Distribution to China.

**Table 18b: Greater Birmingham and Solihull LEP's Level 3 Exports by Country for 2019/20 in £m**

| Level 2 | Level 3 | Indonesia | Italy | Japan | Malaysia | Mexico | Netherlands | Pakistan | Poland | Portugal | Romania | Russia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recovery and Recycling | Consultancy, Training and Education | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 |
| Recovery and Recycling | Glass Stock Processing | 0.05 | 0.06 | 0.08 | 0.13 | 0.03 | 0.09 | 0.26 | 0.15 | 0.05 | 0.07 | 0.07 |
| Recovery and Recycling | Technologies, Research & Development | 0.01 | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.04 | 0.03 | 0.01 | 0.02 | 0.02 |
| Recovery and Recycling | Waste Collection | 0.19 | 0.21 | 0.23 | 0.46 | 0.12 | 0.29 | 0.73 | 0.42 | 0.20 | 0.26 | 0.22 |
| Waste Management | Construction & Operation of Waste Treatment Facilities | 0.16 | 0.21 | 0.19 | 0.44 | 0.11 | 0.26 | 0.66 | 0.37 | 0.17 | 0.28 | 0.16 |
| Waste Management | Consultancy, Training and Education | 0.08 | 0.08 | 0.07 | 0.18 | 0.04 | 0.10 | 0.28 | 0.15 | 0.06 | 0.10 | 0.08 |
| Waste Management | Equipment For Waste Treatment | 0.20 | 0.26 | 0.25 | 0.50 | 0.12 | 0.30 | 0.73 | 0.49 | 0.19 | 0.33 | 0.24 |
| Waste Management | Technologies, Research & Development | 0.09 | 0.10 | 0.12 | 0.24 | 0.07 | 0.11 | 0.37 | 0.22 | 0.09 | 0.13 | 0.10 |
| Water & Waste Water Treatment | Engineering | 0.18 | 0.19 | 0.23 | 0.42 | 0.11 | 0.25 | 0.72 | 0.39 | 0.16 | 0.25 | 0.16 |
| Water & Waste Water Treatment | Water Treatment and Distribution | 0.68 | 0.75 | 0.88 | 1.75 | 0.42 | 1.05 | 2.43 | 1.64 | 0.67 | 0.92 | 0.75 |
| Alternative Fuel Vehicle | Alternative Fuels (main Stream) for Vehicles Only | 0.60 | 0.82 | 0.80 | 1.61 | 0.37 | 0.99 | 2.60 | 1.26 | 0.62 | 0.91 | 0.75 |
| Alternative Fuel Vehicle | Other Fuels and Vehicles | 0.21 | 0.19 | 0.24 | 0.44 | 0.12 | 0.29 | 0.71 | 0.38 | 0.21 | 0.29 | 0.23 |
| Alternative Fuels | Main Stream Bio Fuels | 0.25 | 0.34 | 0.36 | 0.68 | 0.18 | 0.39 | 1.10 | 0.70 | 0.28 | 0.38 | 0.23 |
| Alternative Fuels | Other Bio Fuels | 1.23 | 0.94 | 1.22 | 3.18 | 0.57 | 1.56 | 3.86 | 2.57 | 0.90 | 1.84 | 1.08 |
| Alternative Fuels | Other Fuels | 0.15 | 0.10 | 0.13 | 0.26 | 0.07 | 0.15 | 0.37 | 0.28 | 0.10 | 0.11 | 0.13 |
| Building Technologies | Doors | 0.29 | 0.33 | 0.35 | 0.73 | 0.21 | 0.47 | 1.20 | 0.72 | 0.35 | 0.50 | 0.39 |
| Building Technologies | Insulation and Heat Retention Materials | 0.24 | 0.25 | 0.26 | 0.54 | 0.14 | 0.33 | 0.82 | 0.54 | 0.24 | 0.33 | 0.26 |
| Building Technologies | Monitoring and Control Systems | 0.20 | 0.27 | 0.26 | 0.52 | 0.14 | 0.35 | 0.90 | 0.50 | 0.22 | 0.27 | 0.23 |
| Building Technologies | Windows | 0.55 | 0.63 | 0.64 | 1.43 | 0.32 | 0.78 | 1.61 | 1.08 | 0.59 | 0.70 | 0.62 |
| Energy Management | Technologies, Research & Development | 0.02 | 0.02 | 0.02 | 0.04 | 0.01 | 0.02 | 0.08 | 0.04 | 0.02 | 0.03 | 0.02 |
| Biomass | Biomass Energy Systems | 0.22 | 0.23 | 0.22 | 0.55 | 0.13 | 0.32 | 0.73 | 0.48 | 0.21 | 0.32 | 0.24 |
| Biomass | Biomass Furnace Systems | 0.05 | 0.05 | 0.06 | 0.13 | 0.02 | 0.07 | 0.14 | 0.09 | 0.04 | 0.07 | 0.04 |
| Biomass | Boilers and related Systems | 0.16 | 0.16 | 0.19 | 0.40 | 0.09 | 0.22 | 0.58 | 0.43 | 0.15 | 0.27 | 0.20 |
| Biomass | Manufacturing Of Boilers and Related Systems | 0.07 | 0.07 | 0.08 | 0.16 | 0.04 | 0.12 | 0.21 | 0.19 | 0.06 | 0.11 | 0.07 |
| Geothermal | Manufacture and Supply of Specialist Equipment | 0.33 | 0.30 | 0.37 | 0.75 | 0.21 | 0.44 | 1.04 | 0.63 | 0.33 | 0.42 | 0.32 |
| Geothermal | Suppliers of Systems | 0.32 | 0.32 | 0.39 | 0.85 | 0.19 | 0.41 | 1.31 | 0.80 | 0.34 | 0.49 | 0.38 |
| Geothermal | Whole Systems Manufacture | 0.26 | 0.29 | 0.33 | 0.66 | 0.18 | 0.39 | 1.04 | 0.60 | 0.30 | 0.46 | 0.35 |
| Photovoltaic | Other Related Equipment and Chemicals | 0.16 | 0.19 | 0.20 | 0.36 | 0.09 | 0.25 | 0.65 | 0.41 | 0.18 | 0.26 | 0.20 |
| Photovoltaic | Photovoltaic Cells | 0.17 | 0.15 | 0.21 | 0.44 | 0.12 | 0.28 | 0.52 | 0.39 | 0.19 | 0.32 | 0.20 |
| Photovoltaic | Systems & Equipment | 0.39 | 0.44 | 0.47 | 0.87 | 0.19 | 0.53 | 1.36 | 0.82 | 0.40 | 0.57 | 0.41 |
| Wind | Large Wind Turbine | 0.34 | 0.36 | 0.39 | 0.81 | 0.22 | 0.48 | 1.33 | 0.75 | 0.30 | 0.47 | 0.41 |
| Wind | Small Wind Turbine | 0.20 | 0.24 | 0.26 | 0.57 | 0.14 | 0.33 | 0.81 | 0.52 | 0.22 | 0.32 | 0.24 |
| Wind | Wind Farm Systems | 0.27 | 0.30 | 0.34 | 0.59 | 0.15 | 0.39 | 1.00 | 0.66 | 0.22 | 0.39 | 0.32 |

**Table 18c: Greater Birmingham and Solihull LEP's Level 3 Exports by Country for 2019/20 in £m**

| Level 2 | Level 3 | Saudi Arabia | Singapore | South Africa | South Kor | Sweden | Taiwan | Thailand | Turkey | UAE | US |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Recovery and Recycling | Consultancy, Training and Education | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| Recovery and Recycling | Glass Stock Processing | 0.18 | 0.14 | 0.07 | 0.06 | 0.03 | 0.27 | 0.23 | 0.18 | 0.11 | 0.04 |
| Recovery and Recycling | Technologies, Research & Development | 0.03 | 0.03 | 0.01 | 0.02 | 0.01 | 0.05 | 0.04 | 0.03 | 0.03 | 0.01 |
| Recovery and Recycling | Waste Collection | 0.57 | 0.49 | 0.23 | 0.24 | 0.15 | 0.76 | 0.74 | 0.43 | 0.42 | 0.16 |
| Waste Management | Construction & Operation of Waste Treatment Facilities | 0.49 | 0.41 | 0.19 | 0.21 | 0.13 | 0.64 | 0.73 | 0.42 | 0.36 | 0.12 |
| Waste Management | Consultancy, Training and Education | 0.19 | 0.15 | 0.08 | 0.07 | 0.05 | 0.26 | 0.28 | 0.16 | 0.16 | 0.07 |
| Waste Management | Equipment For Waste Treatment | 0.54 | 0.43 | 0.22 | 0.24 | 0.15 | 0.83 | 0.81 | 0.43 | 0.48 | 0.16 |
| Waste Management | Technologies, Research & Development | 0.25 | 0.25 | 0.10 | 0.12 | 0.07 | 0.39 | 0.43 | 0.26 | 0.16 | 0.07 |
| Water & Waste Water Treatment | Engineering | 0.51 | 0.38 | 0.22 | 0.24 | 0.14 | 0.69 | 0.75 | 0.39 | 0.39 | 0.12 |
| Water & Waste Water Treatment | Water Treatment and Distribution | 1.89 | 1.46 | 0.72 | 0.84 | 0.47 | 2.59 | 2.56 | 1.56 | 1.45 | 0.53 |
| Alternative Fuel Vehicle | Alternative Fuels (main Stream) for Vehicles Only | 1.73 | 1.51 | 0.60 | 0.84 | 0.53 | 1.77 | 1.94 | 1.52 | 1.40 | 0.50 |
| Alternative Fuel Vehicle | Other Fuels and Vehicles | 0.49 | 0.41 | 0.21 | 0.20 | 0.13 | 0.72 | 0.70 | 0.41 | 0.39 | 0.14 |
| Alternative Fuels | Main Stream Bio Fuels | 0.71 | 0.59 | 0.35 | 0.28 | 0.23 | 0.95 | 1.04 | 0.57 | 0.59 | 0.20 |
| Alternative Fuels | Other Bio Fuels | 3.25 | 2.18 | 1.49 | 1.71 | 0.93 | 3.88 | 4.60 | 2.89 | 2.42 | 0.84 |
| Alternative Fuels | Other Fuels | 0.28 | 0.26 | 0.15 | 0.14 | 0.08 | 0.32 | 0.41 | 0.34 | 0.24 | 0.11 |
| Building Technologies | Doors | 1.08 | 0.71 | 0.34 | 0.40 | 0.26 | 1.27 | 1.20 | 0.83 | 0.63 | 0.23 |
| Building Technologies | Insulation and Heat Retention Materials | 0.57 | 0.48 | 0.26 | 0.29 | 0.17 | 0.88 | 0.69 | 0.57 | 0.52 | 0.19 |
| Building Technologies | Monitoring and Control Systems | 0.62 | 0.56 | 0.27 | 0.27 | 0.17 | 0.82 | 0.83 | 0.51 | 0.39 | 0.19 |
| Building Technologies | Windows | 1.48 | 1.25 | 0.61 | 0.61 | 0.33 | 1.80 | 1.83 | 1.28 | 1.15 | 0.39 |
| Energy Management | Technologies, Research & Development | 0.05 | 0.04 | 0.02 | 0.02 | 0.01 | 0.07 | 0.07 | 0.04 | 0.04 | 0.02 |
| Biomass | Biomass Energy Systems | 0.67 | 0.51 | 0.31 | 0.27 | 0.19 | 0.90 | 0.94 | 0.44 | 0.45 | 0.17 |
| Biomass | Biomass Furnace Systems | 0.12 | 0.09 | 0.05 | 0.05 | 0.03 | 0.19 | 0.17 | 0.10 | 0.11 | 0.03 |
| Biomass | Boilers and related Systems | 0.43 | 0.42 | 0.19 | 0.19 | 0.12 | 0.63 | 0.62 | 0.44 | 0.31 | 0.13 |
| Biomass | Manufacturing Of Boilers and Related Systems | 0.17 | 0.17 | 0.08 | 0.09 | 0.05 | 0.24 | 0.22 | 0.19 | 0.13 | 0.06 |
| Geothermal | Manufacture and Supply of Specialist Equipment | 0.95 | 0.78 | 0.35 | 0.35 | 0.22 | 1.12 | 1.30 | 0.70 | 0.56 | 0.28 |
| Geothermal | Suppliers of Systems | 0.86 | 0.81 | 0.40 | 0.42 | 0.26 | 1.22 | 1.26 | 0.72 | 0.69 | 0.28 |
| Geothermal | Whole Systems Manufacture | 0.58 | 0.65 | 0.24 | 0.31 | 0.22 | 1.26 | 0.83 | 0.75 | 0.67 | 0.20 |
| Photovoltaic | Other Related Equipment and Chemicals | 0.46 | 0.38 | 0.18 | 0.21 | 0.13 | 0.63 | 0.64 | 0.44 | 0.36 | 0.13 |
| Photovoltaic | Photovoltaic Cells | 0.42 | 0.40 | 0.24 | 0.21 | 0.13 | 0.72 | 0.56 | 0.36 | 0.31 | 0.11 |
| Photovoltaic | Systems & Equipment | 1.08 | 0.82 | 0.42 | 0.48 | 0.27 | 1.49 | 1.46 | 0.93 | 0.77 | 0.29 |
| Wind | Large Wind Turbine | 0.89 | 0.64 | 0.40 | 0.38 | 0.24 | 1.29 | 1.31 | 0.81 | 0.66 | 0.27 |
| Wind | Small Wind Turbine | 0.58 | 0.46 | 0.25 | 0.29 | 0.17 | 0.90 | 0.96 | 0.57 | 0.46 | 0.17 |
| Wind | Wind Farm Systems | 0.62 | 0.58 | 0.28 | 0.34 | 0.20 | 1.00 | 0.97 | 0.65 | 0.46 | 0.19 |

# Appendix 1

## LCEGS Sector Definition

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

- The Environmental sub-sector is made up of the following: Air Pollution Control, Contaminated Land Reclamation & Remediation, Environmental Consultancy, Environmental Monitoring, Marine Pollution Control, Noise & Vibration Control, Recovery & Recycling, Waste Management and Water Supply & Waste Water Treatment.

- The Renewable Energy sub-sector is made up of the following: Biomass, Geothermal, Hydro, Photovoltaic, Renewable Energy Consultancy, Wave & Tidal and Wind.

- The Low Carbon sub-sector is made up of the following: Additional Energy Sources, Alternative Fuels & Vehicles, Alternative Fuels, Building Technologies, Carbon Capture & Storage, Carbon Finance, Energy Management and Nuclear Power.

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

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

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

- Carbon Finance includes Credits Finance, Fund Management, Trading and Research
- Carbon Capture & Storage includes Capture, Pipeline, Storage and Engineering.
- Energy Management includes Lighting, Heating & Ventilation and Engineering.
- Nuclear Power includes Construction, Commissioning, Operations, Engineering and Testing Services.
- Additional Energy Sources include Energy Storage Research, Fuel Cells & Hydrogen.
- Alternative Fuels & Vehicles includes main stream and other vehicle fuels.
- Alternative Fuels includes Main Stream and other Bio Fuels, Batteries and Other Fuels.
- Building Technologies includes Doors, Windows, Monitoring & Control Systems and Insulation/Heat Retention Materials.

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

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

## Further detail on the Level 2 sub-sectors are provided below in their Level 1 groupings:

## Environmental

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- Waste collection - manufacture, supply, installation and operation of equipment and services for collection of household, industrial and hazardous waste, treatment of waste prior to landfill and supply of pre-treated recyclates.

- Engineering & equipment - engineering services and process control for the complete range of recycling stock
- Consulting & training - collection and processing consultancy and training, publishing, legal & insurance advice.
- R&D - metals recovery, pyrolysis, bio-based systems, new recyclable materials, new collection & processing technologies.
- Recycling stock - recovery, recycling, processing, sorting, supply and packaging of rubber, plastics, paper, oil, electrical, electronics, glass, composting, construction & demolition, automotive, wood and textiles stocks.

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

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

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

- Water treatment and distribution, manufacture, supply, installation and maintenance of systems for activated sludge, aerobic & anaerobic treatment, biological odour & corrosion control, demand management & leakage reduction, effluent treatment, filters, microbial treatment, screens, sequencing batch reactors, water disinfection and storm/grey water treatment.
- Engineering - field engineering, pipe & valve maintenance, fitting & construction, fabrication & welding and engineering design.
- R&D - water purification, water management, black/grey water treatment, biocides, bio reactors and aerobic/anaerobic treatment technologies.
- Consulting and training - engineering and water management training, publishing and specialist consulting for water systems treatment, management and engineering.

## Renewable Energy

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

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

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

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

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

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

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

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

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

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

- Chemicals - production and supply of solar chemicals and solar pond salt.

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

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

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

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

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

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

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

## Low Carbon

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

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

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

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

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

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

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

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

- Windows - the manufacture, supply, distribution, installation and development of double glazed, electro chromatic, insulated alloy, honeycomb and triple glazed units.
- Doors - the manufacture, supply, distribution, installation and development of insulated alloy and plastic doors.
- Insulation and heat retention materials - the manufacture, supply, distribution, installation and development of insulation materials, heat retention surfaces & ceramics, electronic control systems and controlled venting and ducting systems.
- Monitoring and control systems - the manufacture, supply, distribution, installation and development of energy and distributed energy control, monitoring, management and analysis systems.

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

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

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

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

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

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

# Appendix 2

# The kMatrix Methodology

## 2.1 Introduction

This sector (until 2015) has not been well documented by government statistics, so the methodology works beyond standard industrial and market classifications and looks for multiple sources of industrial-based evidence to quantify market values. kMatrix is unique in how it identifies, assembles, evaluates, monitors and develops rules for the use of those sources to quantify 'difficult-to-measure' markets.

Market activities are only included when there are multiple data sources. These sources are screened to remove duplicate references to any single source and then shortlisted by removing outliers and unreliable sources. This shortlist is then screened again until some consistency in value is achieved.

Market values created in this way are then "reality tested" by comparing these values within and across sectors, against known national/regional industrial specialism, across nations, against known trade flows and recognised industry benchmarks.

This methodology is quantitative and data intensive. Its uniqueness resides in the ability to manage and select reliable sources that are specific to each market activity. The data sources are global in nature and derive from government, private sector, institutional, industrial, trade, advertising, HR, financial, investor, academic and other (unpublished) sources. Up to 900 sources are used to compile the national LCEGS data set.

Sources are carefully managed. kMatrix measure and rate their sources' accuracy and reliability over time and exclude sources that are outdated or without a measurable track record. They use no less than seven qualified sources showing some consistency in results for deriving any values that they print. They create a mean value from these selected values and then assign a confidence level (generally of about 85%) based upon the spread of selected values around the mean

In contrast to most research or consulting reports kMatrix do not identify, copy and then acknowledge single data sources for specific tables or analytical comments. This is impossible for them to do because they multi-source every aspect of their data and then "transform" it into a new value. This makes single source attribution meaningless.

## 2.2 Measures

Throughout this dataset the focus is on a small number of key measures. To summarise, these are:

- **Sales** – This is the estimate (in £m) of economic activity by identified companies in a defined region within the supply/value chain for market products and services. The estimate is based upon where sales activity takes place rather than where it is reported.

- **Companies** – This is a measure of the total number of companies in a defined region that match, or fit within, the market activity headings.

- **Employment** – This is a measure of the estimated employment numbers across all aspects of the supply/value chain. National, regional and other economic data sources have been used to estimate current employment levels for each area of market activity.

- **Growth** – This is a multi-year measure that includes historical AND forecast growth. The growth measure is derived from live, rapidly changing and multi-sourced data links and is specifically based upon growth in Sales. Growth is generally a measure of increased market opportunity and can be used for trend analysis, comparison across different markets or as a moving indicator of market confidence (growth time series).

- **Exports** – This is a measure of products and services sold overseas and is calculated using in-country/out-of-country data and additional data from the logistics and freight forwarding industry.

## 2.3 kMatrix's Methodology

The methodology for sector analysis is definition and source-driven. The definition determines WHAT gets measured and the source model determines HOW it gets measured.

All of the data measures are multi-sourced, and the process starts by defining the financial value of the sector (based upon our inclusive definition) from a wide variety of sources.

When kMatrix create a sector definition they always check that multiple sources of economic data exist for each included activity. This financial value is checked against existing sector values and also against the value of other economic sectors.

This is an iterative process that continues until they arrive at robust values and comparisons for all activities within the sector (comparative values of Wind vs. Photovoltaic vs. Biomass) that can then be meaningfully compared across global economies (UK vs. US vs. China etc.) and across different sectors (environmental consultancy vs. other specialist consulting activities). It is important that the methodology triangulates economic values in this way so that they:

a) Can exclude the research bias that often occurs from focusing on a single sector in a single country and
b) Ensure that they are effectively monitoring a sector that is still evolving by absorbing activities often included in other sectors.

**Sales**

The key measure that is used for financial value is Sales i.e., the value of sector products and services sold either to other businesses or directly to consumers from the geographically located company base, whether it be national, regional, sub-regional or Local Authority. This means that the analysis only includes activities where there is a measurable economic footprint. It does not include publicly-funded research or pre-commercial consumption of funds, except where those activities result in the purchase of product and services from third parties

As they derive the financial value for the sector they also assemble and assess the UK company base that is contributing to this value. In the first case they identify all "significant" or "specialist" companies, these are companies where LCEGS account for over 80% of company sales, and then the supply/value chain companies where LCEGS sales is an

important and measurable component of their overall sales - (over 20%). These percentages are indicative and vary for different LCEGS activities.

**Companies**

The company count acts as a further reality check on the financial value of the sector by comparing company turnover values in this and other sectors and also assists in the geographical analysis of where LCEGS value is created. For company counts and company listings we use standard data sources (FAME, Companies House etc), international sources, industry/trade sources, the advertising industry (YELL etc.) and, with caution, company-published information.

One important fact about the methodology is that in a typical SIC approach to sector analysis, a company is counted once and the value of its activities are very often assigned to a single category (which may or may not reflect what a company actually sells now), within a single sector and from a single geographical location.

This approach is to identify and assign value to different activities within a company that may fall within the same sector and to exclude values associated with different sectors. Where possible, they also break the reported activity down within larger multi-site companies so that only the value created within a region/LA is reported for that region/LA.

By analysing a sector in this way, they are able to capture the economic value generated by all "specialist" and supply/value chain companies, without any double counting of value. However, the methodology does mean that a single company may contribute value to multiple activities, and we have to be careful not to double-count companies. To avoid this we assign a company, for counting purposes, to the activity that accounts for most of its sector sales. This does mean that on some occasions some of the smaller activities in our analysis may have a financial value in the sales column but a zero in the company column.

**Employment**

When financial values and company numbers have been calculated the methodology then looks at the employment base for the sector. The analysis of employment includes HR/Recruitment industry data, trade/industry data, government statistics, company reported employment levels and a variety of industry benchmarks that show employee input ratios into different products and processes. They do not survey companies directly for this information.

From these different sources we calculate employment numbers for LCEGS sector activities, taking into account how staff can operate processes that produce products for different markets. We, therefore, measure our employment numbers in Whole Time Equivalents (WTE).

**Growth**

Sales Growth is both an historical and a forecast measure and the methodology applies the same multi-source rigour to assessing growth that has already occurred as to growth that may occur. Growth forecasting shows the importance of both multi sourcing AND tracking the historical reliability/accuracy of sources used. It is based upon continuous monitoring of forecast "opinions" that are constantly being updated and re-evaluated, as a result "in-year" measurements of predicted growth can vary depending on when the sample is taken and change as sources respond to events like recession.

For this reason, we measure annual growth as a) a value frozen at a point in time and b) a time series (monthly or quarterly) measured throughout the year. In this file we include only the single

(frozen) forecast. Separate files with detailed time series forecasts and trend analysis for the LCEGS sector are available.

Annual growth figures are useful in calculating and comparing the future contribution of sector activities beyond the current baseline. The percentage growth shows the RATE of change, the application of growth rates to the current sales baseline shows the IMPACT of change. Measuring the impact of change in financial terms shows how the ranking and importance of existing activities to the region/local authority may change over time and suggests when and where action may need to be taken to accommodate changes in the employment and company base.

The quoted growth rates in this dataset apply specifically to sales value. A growth in sales is indicative of changes in company numbers/employment but 5% sales growth does not necessarily equate to 5% employment growth. Companies can achieve growth in different ways and the recession has shown that companies will consume any “slack” before creating new jobs.

**Geography**

The methodology is designed to locate and measure economic activity at various geographical levels. The smallest unit of measurement is the Local Authority, but it can analyse data at county, sub-regional, LEP, regional and UK level.

When the methodology calculates and measures economic activity at the local authority level it takes into account existing local government boundaries, local GDP calculations and demographics, the postcode location of companies in the sector and any other local data that is available and relevant to the sector. When we measure sales and employment, therefore, our numbers are based upon where the business is located, rather than where people live.

There are some limits to what economic measures can be meaningfully or accurately applied at the local level. This is due to the range and specificity of data sources. Most of the economic development measures within this dataset can be accurately represented at a local level. Growth is an exception because rates cannot meaningfully be differentiated at a local level, therefore we apply regional growth rates throughout.

# Appendix 3

## LCEGS and Office of National Statistics Environmental Goods and Services Sector Comparison

The purpose of this appendix is to provide a brief description of some of the differences between the Office of National Statistics (ONS) Environmental Goods and Services Sector (EGSS) data and the LCEGS data provided by kMatrix. The two methodologies differ in the way data is collected, their methodologies, and in terms of their sector definitions.

kMatrix is a data house that specialises in providing evidential data for business modelling and analysis on a multi-sectoral basis. We provide back room services to the likes of Deloitte and PWC amongst others in the UK, New Zealand, Australia, US and the EU for sectoral analysis and due diligence for sectoral development and investment. We also provide our business and technology profiling services through these channels to market, as well as direct to universities for technology spinouts and individual businesses for development purposes. Further customers include government departments such as BEIS, Home Office and various local and regional government departments.

The ONS EGSS data is produced primarily for the purpose of national accounting. It is sector-specific, using narrow sector definitions and takes no account of the value or supply chains in a sector. In contrast, the kMatrix methodology was originally designed to help companies by measuring technologies or activities using small taxonomies, to assist with investment and developmental planning. This capability was expanded to provide market data for a number of economic sectors, by creating larger taxonomies to capture as much of the market as possible, including the supply and value chains. Each taxonomy for a sector will draw relevant activities from many other sectors, to fully capture all activity. In this way, the LCEGS taxonomy captures activities across multiple sectors and down the value and supply chains. This difference in *what* is being measured is the fundamental reason why the definitions used by ONS and LCEGS do not align.

The kMatrix methodology uses a unique process of 'triangulation' to measure metrics such as employment and other characteristics of a sector at varying levels of detail. This process has been developed over 30 years and has been adopted by various governments, universities and major corporates to provide economic industry data for hard to measure sectors. It is similar in concept to the triangulation of satellites to work GPS satellite navigation systems. The methodology uses multiple data points which can be economic or non-economic in origin, from a number of different sources to 'triangulate' the value of a product or service in question.

This process is different to the methodology used by the ONS to produce the EGSS data, predominantly because the ONS data relies on self-certification of companies into SIC codes, whereas the kMatrix methodology calculates values based on multiple sources of data. The ONS data is based on where companies choose to classify themselves. kMatrix data looks at the activities of companies and attributes those activities to different sub-sectors. In effect, the ONS system is limited to the ability or willingness of companies to list which sectors their products or services are used in, this method is likely to produce both over and underestimates of market size as companies will attribute more or less of their activities to relevant SIC codes. The kMatrix methodology does not rely on company cooperation but looks at their activities and breaks them down into the levels or sub-sectors they are relevant to.

The kMatrix process operates on a 'bottom up' basis, meaning we look at products and services delivered, rather than company classifications and turnover, which is classed as 'top down' (SIC system). The bottom up process was developed to assist individual companies based on sectoral analysis findings and provide evidential data and advice. By looking at the sector from the bottom up (by each activity, product or service), the sector can be determined in accordance with the relevant sector definition, whilst allowing the flexibility to 'add in' or 'opt out' of various activities depending on the purpose of the reporting. ONS data itself is not used to produce kMatrix figures, but the kMatrix values can be reported out through the ONS classification system if required.

Table 1 shows a comparison between employment analysis for the London region using the SIC classification methodology and the kMatrix methodology for the Manufacturing sector and the Construction sector.

**Table 1: Comparison of 2011 - 2016 Employment Data for SIC and kMatrix in London**

| Methodology | Sector | 2011 Jobs | 2012 Jobs | 2013 Jobs | 2014 Jobs | 2015 Jobs | 2016 Jobs |
|---|---|---|---|---|---|---|---|
| SIC based | Manufacturing | 106,750 | 108,250 | 106,750 | 112,000 | 108,000 | 105,250 |
| SIC based | Construction | 133,250 | 150,500 | 146,500 | 146,250 | 145,250 | 155,750 |
| kMatrix | Manufacturing | 137,351 | 135,943 | 138,951 | 141,873 | 140,308 | 131,230 |
| kMatrix | Construction | 166,629 | 195,334 | 177,915 | 184,022 | 184,317 | 199,038 |
| | | | | | | | |
| ***Indexed numbers for the rows above show that growth in the manufacturing and construction sectors is similar for both the SIC and kMatrix definitions*** | | 100 | 101.4 | 100.0 | 104.9 | 101.2 | 98.6 |
| | | 100 | 112.9 | 109.9 | 109.8 | 109.0 | 116.9 |
| | | 100 | 99.0 | 101.2 | 103.3 | 102.2 | 95.5 |
| | | 100 | 117.2 | 106.8 | 110.4 | 110.6 | 119.4 |

**Sector** - LCEGS is made up of elements from many different traditional sectors (including manufacturing, finance, construction, consulting and energy) therefore as a grouping it includes products and services from those sectors that together amount to the total value of the LCEGS grouping.

**Scale** - The ONS system only produces estimates of the sector size at the country level, whereas the LCEGS data can be provided by Country, Region, City, Local Authority etc.

Table 2 shows a summary of the main differences between the kMatrix data and the ONS EGSS data.

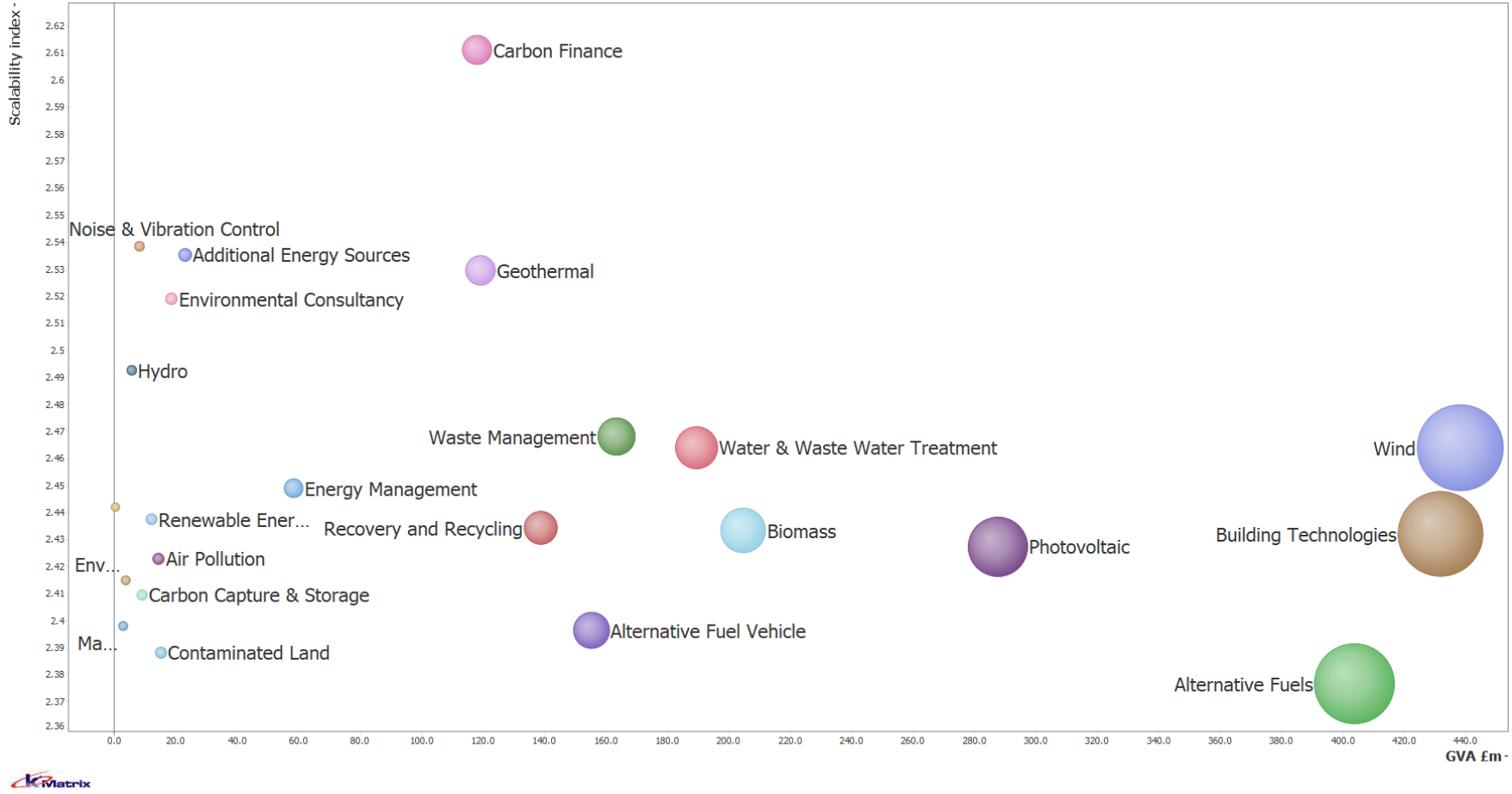
**Table 2: kMatrix and ONS – EGSS Comparison Summary Table**

| | kMatrix - LCEGS | ONS - EGSS |
|---|---|---|
| **Sector definition** | The LCEGS sector includes the EGSS definition but expands it to include all activities that contribute and enable growth in the sector. Those elements which are excluded from EGSS which are produced for purposes that, while beneficial to the environment, primarily satisfy technical, human and economic needs or that are requirements for health and safety are included in LCEGS if they contribute to the sector. For more information please see Appendix 3 and Appendix 4 of this report. | The environmental goods and services sector is made up of areas of the economy engaged in producing goods and services for environmental protection purposes, as well as those engaged in conserving and maintaining natural resources. Excluded from the scope of EGSS are goods and services produced for purposes that, while beneficial to the environment, primarily satisfy technical, human and economic needs or that are requirements for health and safety. |
| **Sector size measurement** | Triangulation of data from multiple sources | Company surveys via company self-certification |
| **Sector sales coverage** | Full value of sales for the sector, including supply and value chain | Only sector sales, not including supply or value chains |
| **Geographic range of coverage** | Global, Country, Regional, City & Local Authority | Country |
| **Available data includes** | Sales, number of employees, number of companies, exports, growth rates (historical and forecast) & 60+ more metrics | Output, GVA, employee count and exports |
| For further information and detail on the ONS – EGSS definition:<br><br>https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2010to2015 | | |

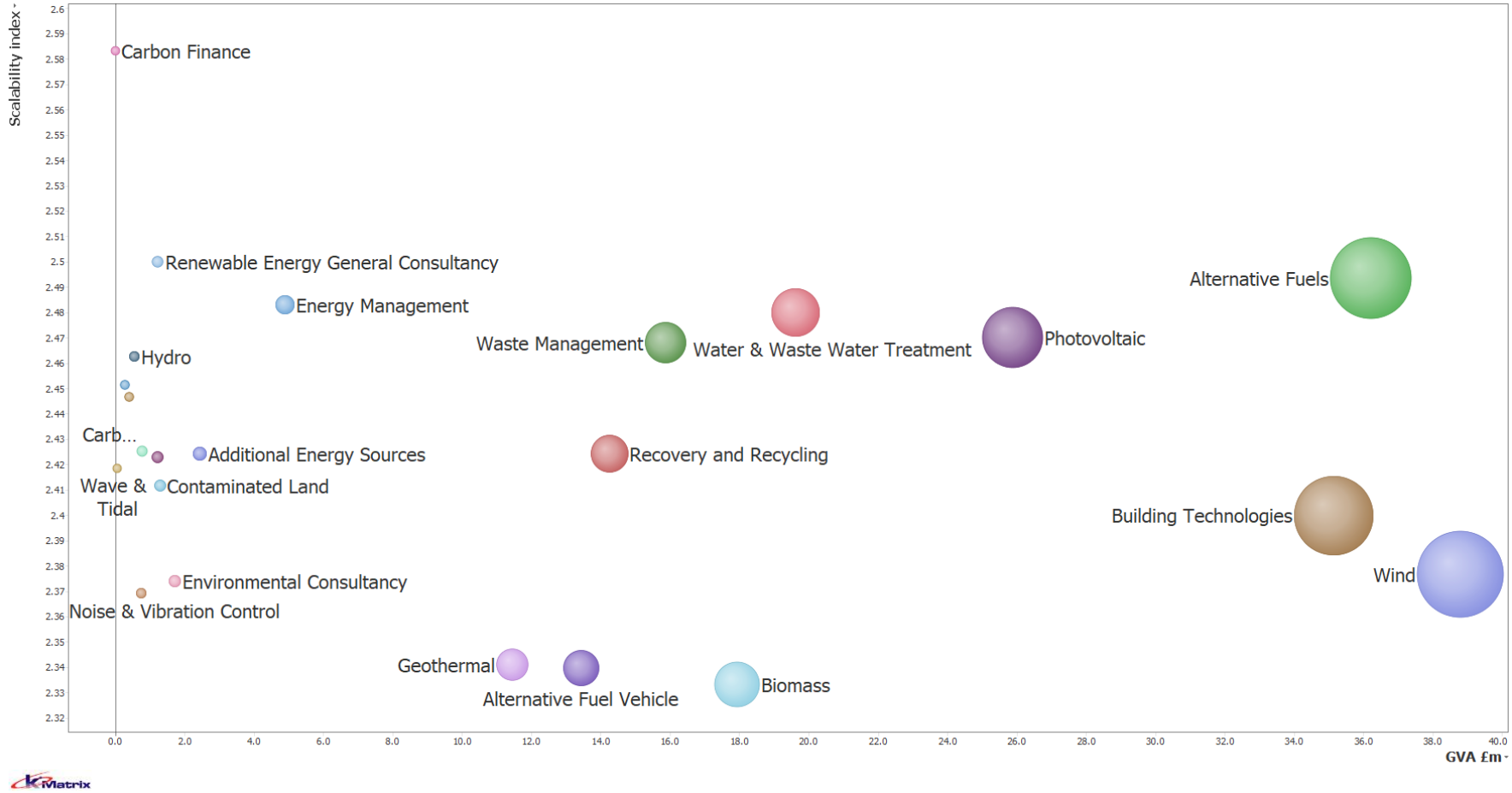
# Appendix 4

## LCEGS Scalability vs. GVA by Local Authority for Level 2

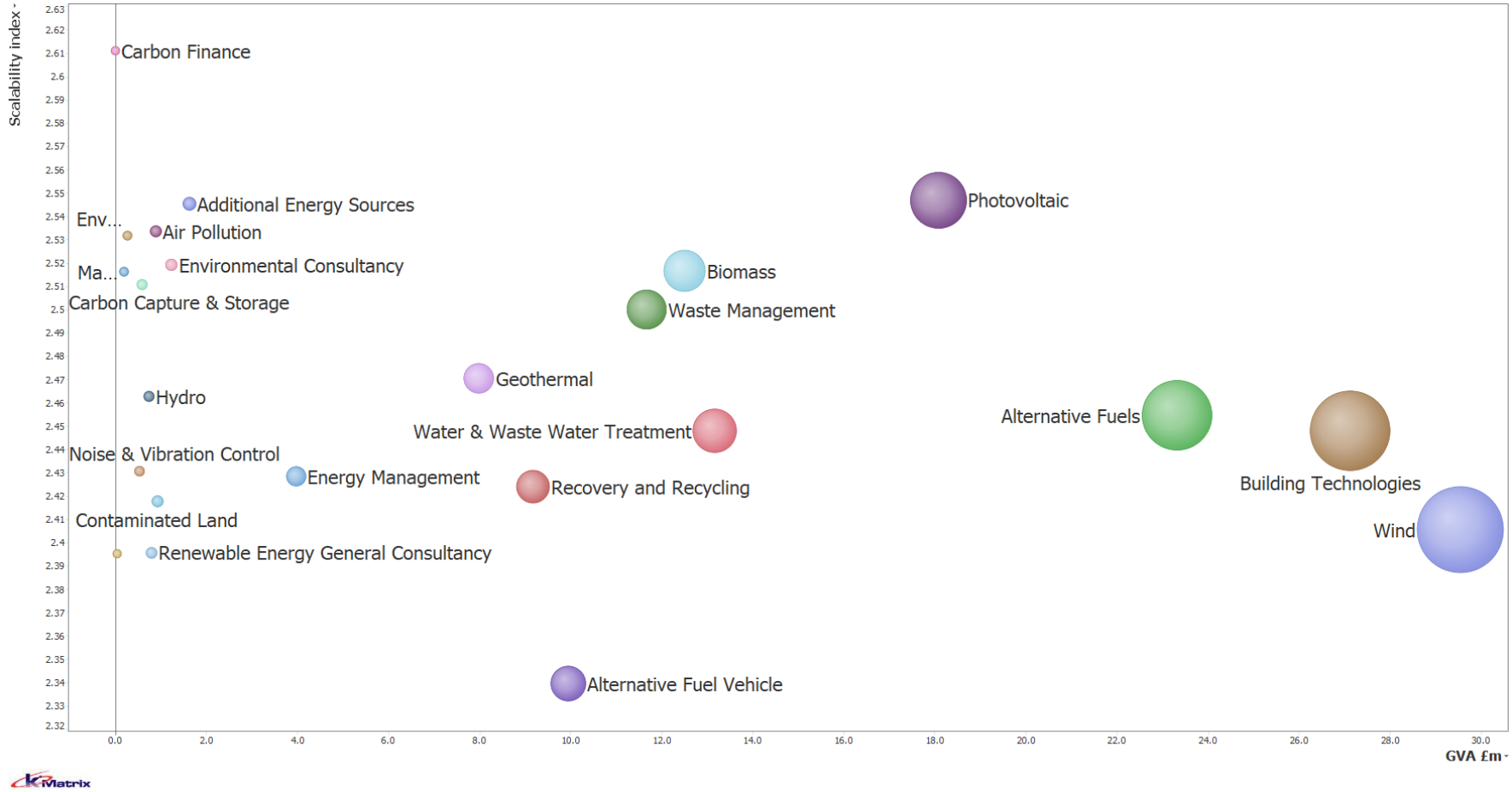
### Birmingham – Scalability Index vs. GVA for 2019/20



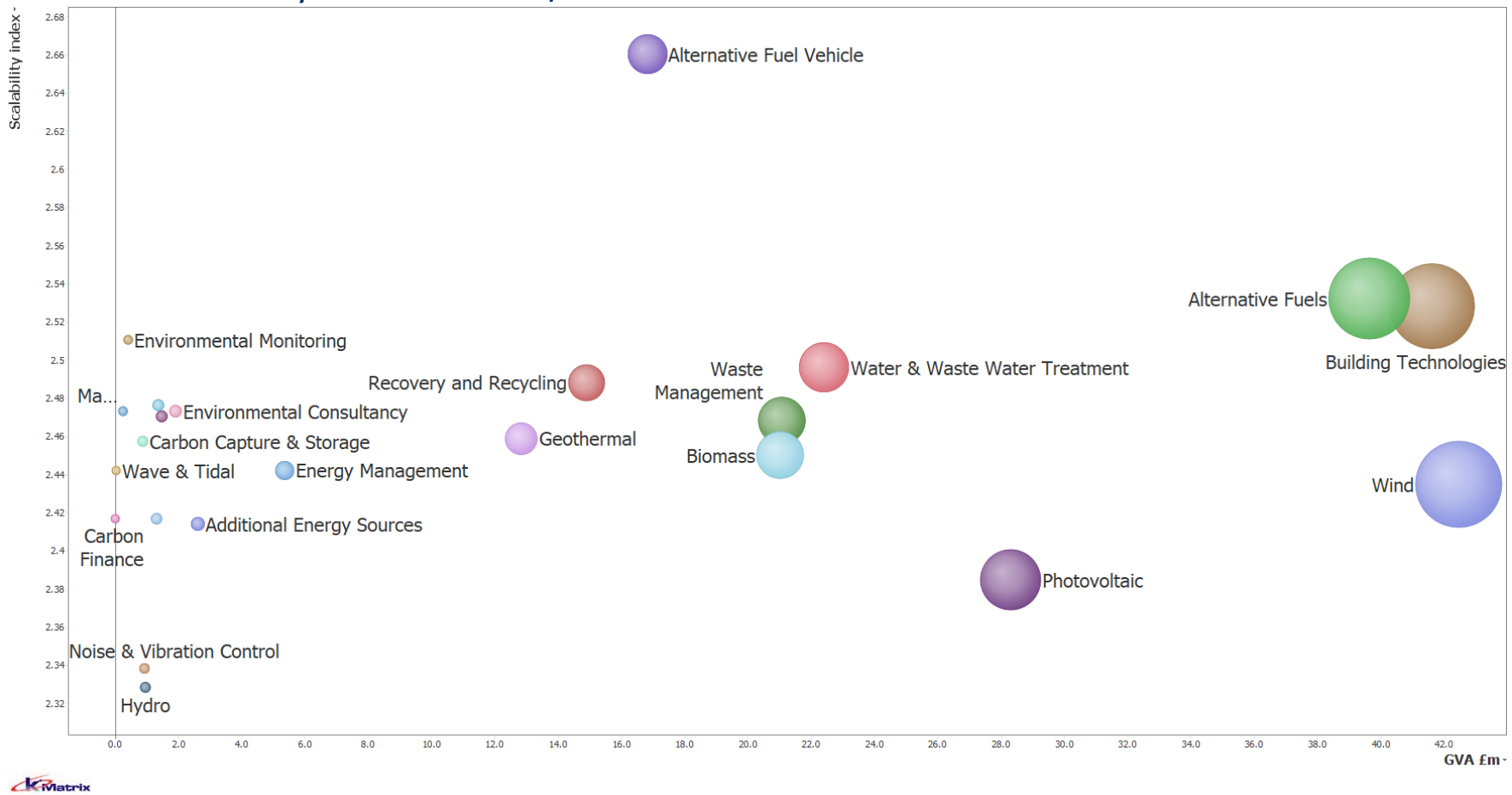
## Bromsgrove – Scalability Index vs. GVA for 2019/20



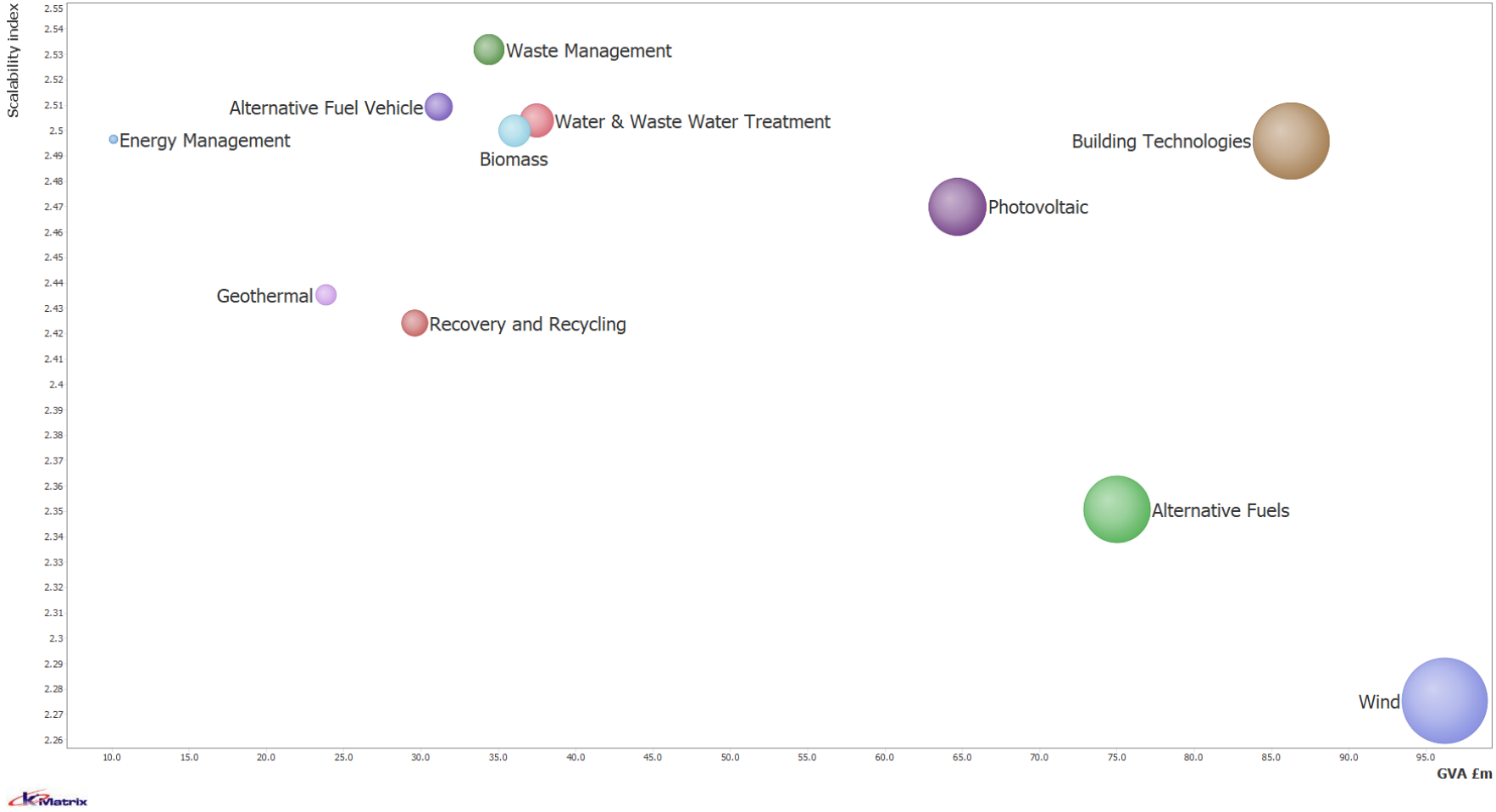
## Cannock Chase – Scalability Index vs. GVA for 2019/20



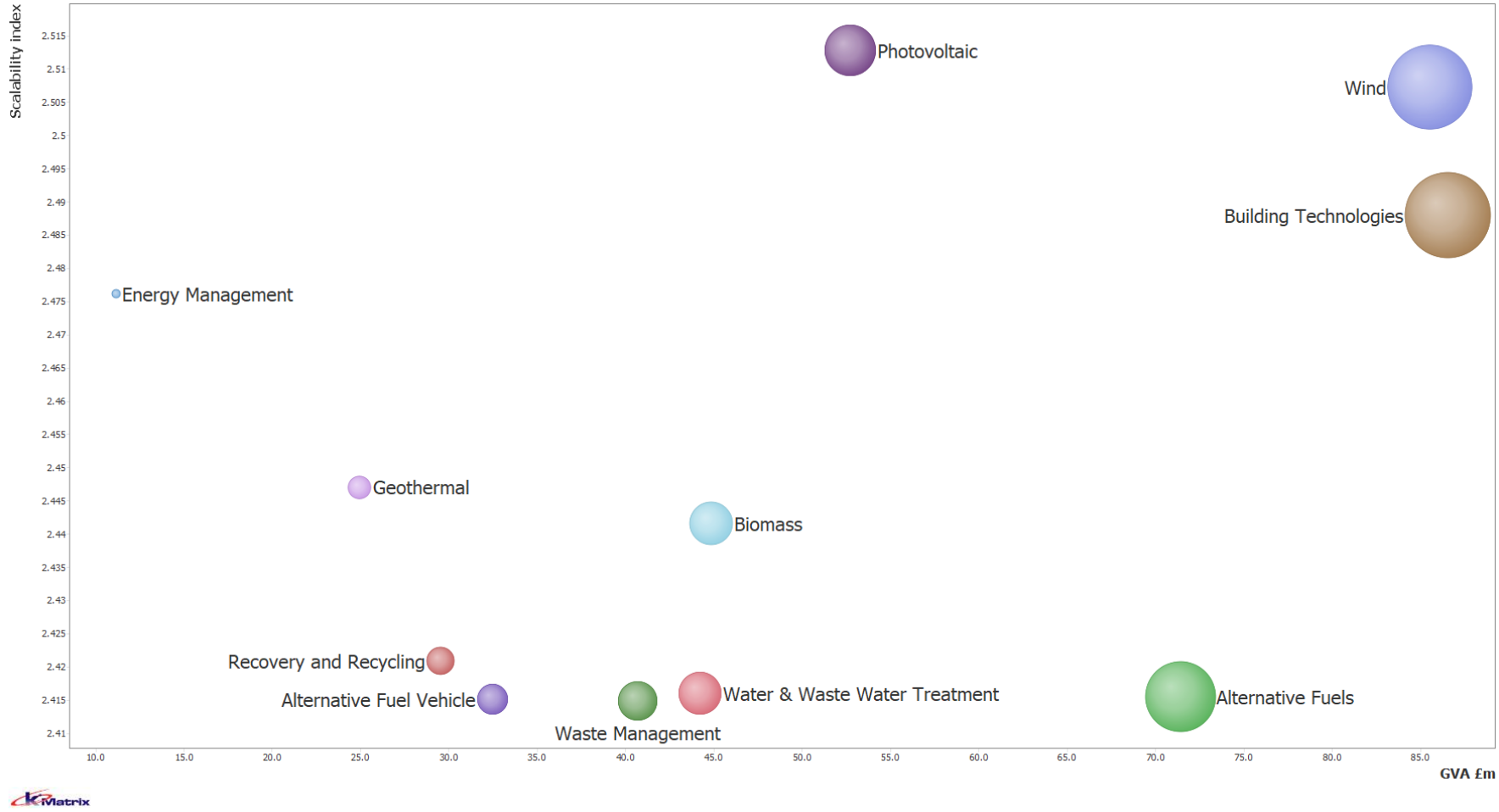
## East Staffordshire – Scalability Index vs. GVA for 2019/20



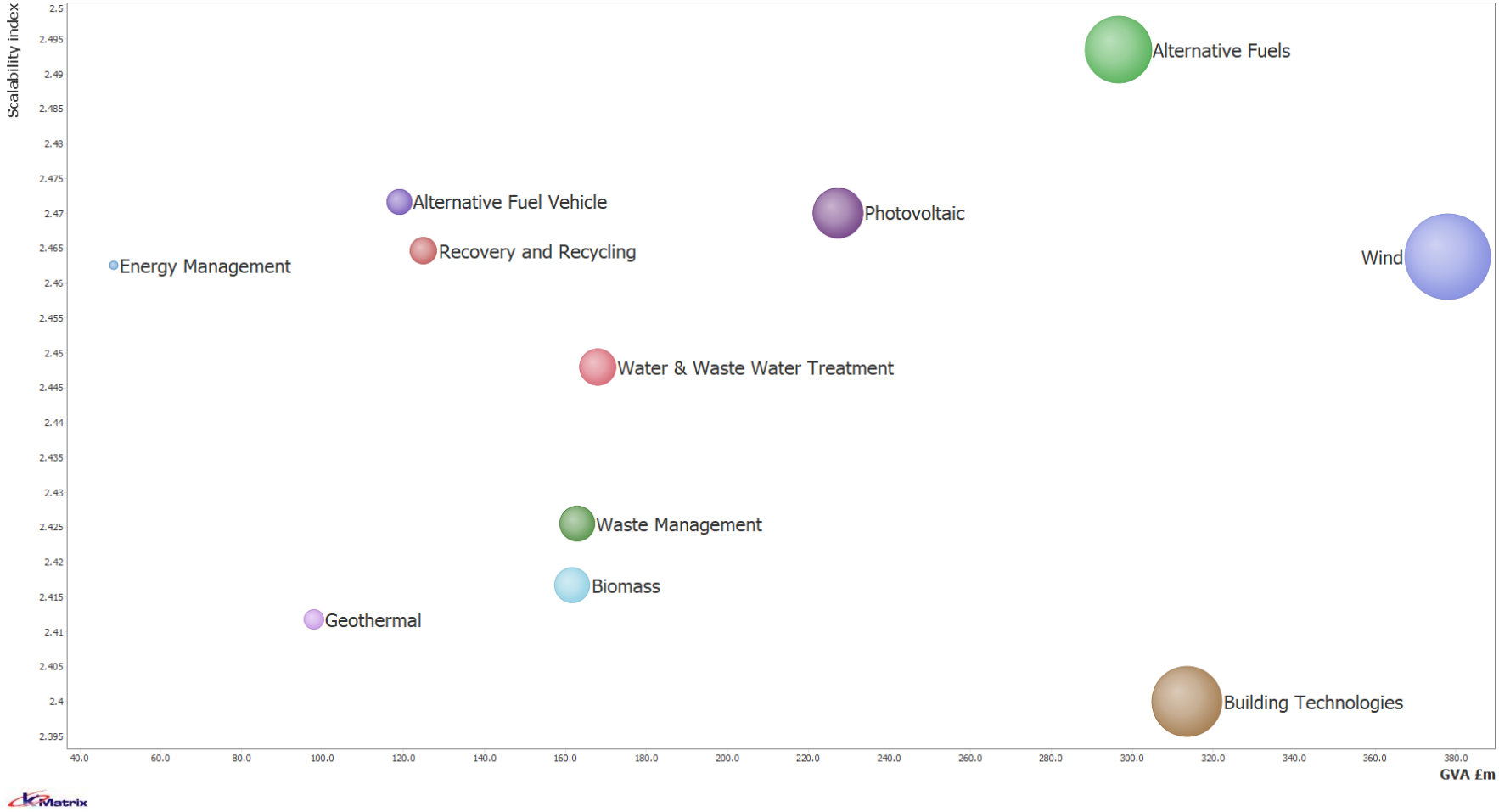
## Lichfield – Scalability Index vs. GVA for 2019/20



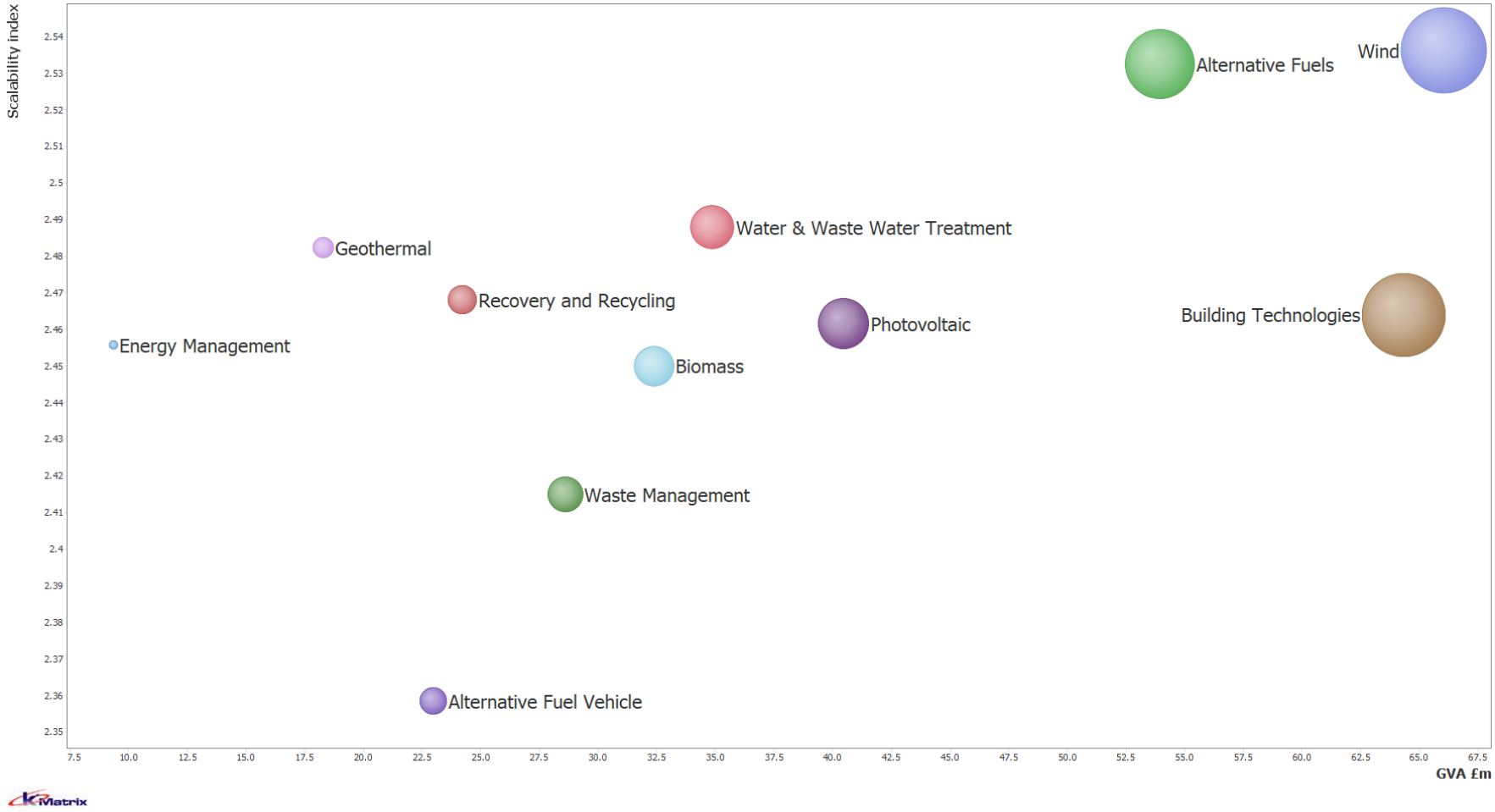
## Redditch – Scalability Index vs. GVA for 2019/20



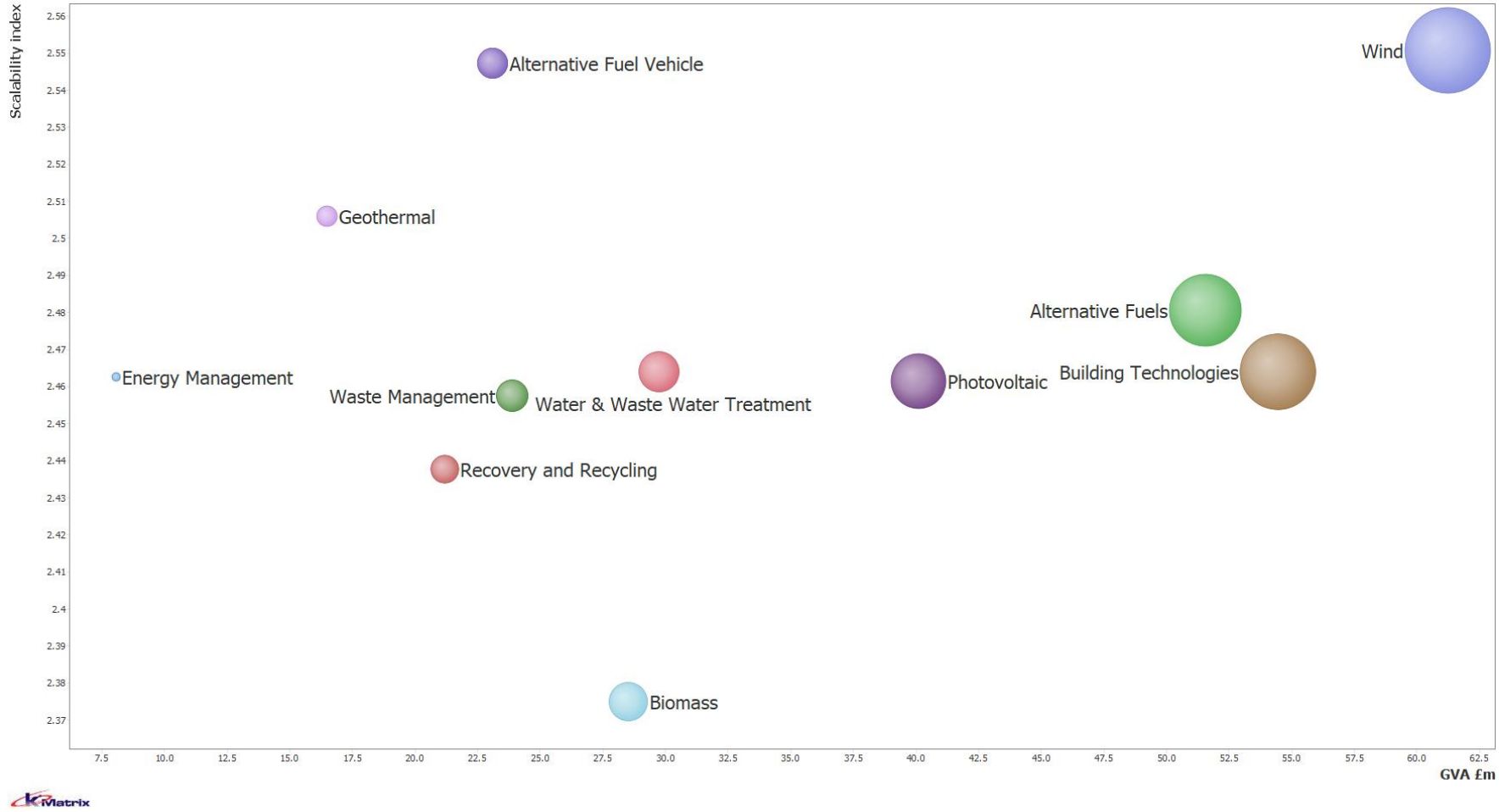
## Solihull – Scalability Index vs. GVA for 2019/20



## Tamworth – Scalability Index vs. GVA for 2019/20



## Wyre Forest – Scalability Index vs. GVA for 2019/20



# Appendix 5

## LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios for Top Level 2 Sub-sectors

### Alternative Fuel Vehicle

| | Alternative Fuel Vehicle | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 19 | 9 | 46.5% | 28 | 25 | -11.0% | 33 | 18.9% | 39 | 40.4% | 91 | 228.8% |
| Snr Management SME | 32 | 7 | 21.9% | 39 | 41 | 6.6% | 55 | 42.2% | 65 | 68.3% | 157 | 304.0% |
| Supervisory | 44 | 10 | 22.0% | 54 | 57 | 6.0% | 76 | 39.7% | 89 | 63.8% | 214 | 294.6% |
| Middle / Junior Management | 44 | 11 | 23.9% | 55 | 59 | 7.6% | 75 | 36.8% | 89 | 62.7% | 209 | 281.2% |
| Designer / Developer | 5 | 2 | 45.3% | 7 | 6 | -10.0% | 8 | 20.8% | 10 | 41.2% | 22 | 225.4% |
| Clerical | 27 | 0 | 0.4% | 27 | 35 | 30.9% | 46 | 70.9% | 54 | 98.4% | 129 | 375.8% |
| Self Employed | 29 | 7 | 24.3% | 36 | 38 | 7.5% | 49 | 36.5% | 57 | 60.6% | 140 | 291.9% |
| Advisor or Agent | 47 | 11 | 23.2% | 58 | 62 | 6.3% | 80 | 38.2% | 96 | 64.8% | 227 | 290.2% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 27 | 1 | 5.5% | 28 | 35 | 24.9% | 45 | 60.1% | 55 | 94.7% | 135 | 377.6% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 66 | 8 | 11.5% | 73 | 88 | 19.4% | 113 | 53.7% | 135 | 83.2% | 322 | 337.8% |
| Scientist | 7 | 3 | 46.3% | 10 | 9 | -10.1% | 12 | 17.1% | 14 | 39.5% | 34 | 233.9% |
| Maintenance Engineer | 62 | 8 | 13.3% | 70 | 81 | 16.1% | 105 | 51.1% | 125 | 79.6% | 289 | 314.4% |
| Civil Engineer | 8 | 4 | 47.4% | 12 | 11 | -11.6% | 14 | 16.2% | 17 | 37.3% | 40 | 228.6% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 9 | 6 | 64.6% | 15 | 12 | -20.4% | 16 | 5.1% | 18 | 21.2% | 44 | 195.6% |
| Construction Engineer | 10 | 3 | 34.7% | 13 | 13 | -3.0% | 17 | 27.5% | 19 | 48.5% | 47 | 258.6% |
| Sales Exec | 47 | 11 | 22.5% | 58 | 63 | 7.9% | 83 | 42.9% | 96 | 65.3% | 230 | 296.0% |
| Marketing Personnel | 51 | 12 | 23.8% | 64 | 66 | 4.2% | 90 | 40.9% | 107 | 68.0% | 250 | 292.4% |
| General Semi Skilled Worker | 44 | 2 | 4.4% | 46 | 57 | 25.3% | 74 | 63.2% | 88 | 94.2% | 209 | 358.5% |
| General Labour | 65 | 0 | 0.0% | 65 | 87 | 34.2% | 110 | 69.7% | 132 | 104.0% | 311 | 379.5% |
| Other Employees | 55 | 7 | 12.0% | 61 | 73 | 19.2% | 94 | 52.8% | 112 | 82.2% | 268 | 336.4% |
| Administrative workers | 36 | 2 | 4.8% | 38 | 46 | 22.9% | 62 | 63.7% | 73 | 92.9% | 172 | 356.0% |
| **Total** | **733** | **123** | **16.8%** | **856** | **965** | **12.7%** | **1,256** | **46.8%** | **1,490** | **74.0%** | **3,537** | **313.2%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 140 | 50 | 35.5% | 190 | 181 | -4.8% | 249 | 31.1% | 292 | 53.9% | 684 | 260.2% |
| Snr Management SME | 110 | 19 | 17.4% | 129 | 142 | 9.8% | 189 | 46.5% | 220 | 69.9% | 529 | 309.5% |
| Supervisory | 156 | 26 | 16.9% | 182 | 199 | 9.0% | 268 | 47.1% | 310 | 70.1% | 751 | 311.9% |
| Middle / Junior Management | 150 | 24 | 15.9% | 173 | 193 | 11.0% | 263 | 51.3% | 300 | 72.7% | 739 | 325.7% |
| Designer / Developer | 26 | 9 | 33.5% | 34 | 33 | -3.7% | 45 | 30.3% | 51 | 48.7% | 128 | 272.4% |
| Clerical | 76 | 0 | 0.4% | 76 | 101 | 32.4% | 128 | 68.6% | 153 | 100.9% | 376 | 394.5% |
| Self Employed | 44 | 8 | 18.3% | 52 | 58 | 11.8% | 73 | 42.1% | 88 | 70.3% | 207 | 301.7% |
| Advisor or Agent | 3 | 1 | 19.2% | 4 | 5 | 12.0% | 6 | 42.9% | 7 | 71.4% | 17 | 310.8% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 132 | 6 | 4.8% | 139 | 166 | 19.2% | 225 | 61.8% | 268 | 93.1% | 626 | 351.1% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 47 | 4 | 9.5% | 52 | 60 | 16.4% | 79 | 53.5% | 97 | 87.5% | 231 | 347.6% |
| Scientist | 90 | 29 | 32.7% | 119 | 117 | -2.5% | 152 | 27.5% | 188 | 57.0% | 436 | 265.1% |
| Maintenance Engineer | 185 | 21 | 11.6% | 206 | 238 | 15.4% | 320 | 55.1% | 374 | 81.3% | 879 | 325.9% |
| Civil Engineer | 1 | 0 | 36.1% | 1 | 1 | -5.5% | 1 | 25.4% | 1 | 47.2% | 3 | 246.4% |
| Production Engineer | 100 | 58 | 57.6% | 158 | 126 | -20.7% | 173 | 9.1% | 197 | 24.7% | 480 | 203.0% |
| Power distribution Engineer | 32 | 15 | 47.5% | 48 | 41 | -13.9% | 54 | 12.5% | 65 | 36.8% | 153 | 220.4% |
| Construction Engineer | 1 | 0 | 31.1% | 1 | 1 | -3.3% | 1 | 29.2% | 1 | 50.3% | 3 | 260.7% |
| Sales Exec | 144 | 27 | 18.7% | 171 | 194 | 13.2% | 248 | 45.0% | 286 | 66.9% | 695 | 305.5% |
| Marketing Personnel | 153 | 24 | 15.9% | 177 | 199 | 12.7% | 267 | 51.1% | 305 | 72.5% | 751 | 324.9% |
| General Semi Skilled Worker | 198 | 7 | 3.4% | 204 | 263 | 28.7% | 342 | 67.2% | 407 | 98.9% | 958 | 368.7% |
| General Labour | 256 | 0 | 0.0% | 256 | 334 | 30.9% | 447 | 75.1% | 513 | 100.7% | 1,230 | 381.4% |
| Other Employees | 188 | 18 | 9.4% | 206 | 243 | 18.0% | 323 | 57.0% | 379 | 83.9% | 895 | 334.6% |
| Administrative workers | 99 | 3 | 3.4% | 103 | 130 | 26.5% | 169 | 63.9% | 198 | 92.3% | 491 | 377.2% |
| **Total** | **2,331** | **351** | **15.1%** | **2,682** | **3,022** | **12.7%** | **4,023** | **50.0%** | **4,699** | **75.2%** | **11,263** | **319.9%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 81 | 19 | 23.6% | 100 | 108 | 8.0% | 141 | 40.1% | 165 | 64.9% | 393 | 291.5% |
| **Snr Management SME** | 326 | 38 | 11.6% | 363 | 416 | 14.4% | 563 | 54.9% | 657 | 80.7% | 1,541 | 323.9% |
| **Supervisory** | 367 | 40 | 10.9% | 407 | 476 | 17.0% | 631 | 55.2% | 743 | 82.7% | 1,794 | 341.2% |
| **Middle / Junior Management** | 352 | 40 | 11.4% | 392 | 459 | 17.0% | 605 | 54.3% | 714 | 81.9% | 1,669 | 325.5% |
| **Designer / Developer** | 39 | 9 | 24.4% | 48 | 50 | 3.8% | 68 | 40.4% | 78 | 60.8% | 188 | 289.0% |
| **Clerical** | 177 | 0 | 0.2% | 178 | 236 | 32.5% | 309 | 73.9% | 357 | 100.8% | 863 | 385.2% |
| **Self Employed** | 19 | 2 | 12.9% | 21 | 24 | 14.4% | 32 | 49.5% | 38 | 77.5% | 90 | 326.0% |
| **Advisor or Agent** | 6 | 1 | 11.5% | 6 | 7 | 16.9% | 10 | 54.4% | 11 | 79.7% | 27 | 334.8% |
| **Educator** | 0 | 0 | 12.0% | 0 | 0 | 19.0% | 0 | 48.6% | 0 | 94.9% | 0 | 335.4% |
| **Specialist or Consultant** | 194 | 7 | 3.4% | 201 | 258 | 28.7% | 332 | 65.4% | 385 | 91.8% | 941 | 368.5% |
| **Editor** | 5 | 0 | 2.5% | 5 | 6 | 26.5% | 9 | 68.1% | 10 | 99.1% | 23 | 360.3% |
| **Industrial Researchers** | 6 | 0 | 6.0% | 7 | 8 | 22.9% | 11 | 61.8% | 13 | 91.8% | 30 | 355.8% |
| **Scientist** | 9 | 2 | 23.1% | 12 | 12 | 6.7% | 16 | 41.8% | 19 | 67.5% | 44 | 280.3% |
| **Maintenance Engineer** | 347 | 24 | 6.9% | 371 | 454 | 22.4% | 608 | 64.2% | 708 | 91.1% | 1,690 | 356.2% |
| **Civil Engineer** | 5 | 1 | 23.7% | 6 | 6 | 3.6% | 9 | 38.9% | 10 | 63.4% | 24 | 287.2% |
| **Production Engineer** | 53 | 18 | 33.6% | 70 | 70 | -0.5% | 93 | 31.8% | 107 | 53.1% | 251 | 258.1% |
| **Power distribution Engineer** | 163 | 52 | 32.0% | 215 | 212 | -1.2% | 280 | 30.6% | 331 | 54.3% | 799 | 272.3% |
| **Construction Engineer** | 5 | 1 | 17.0% | 6 | 7 | 13.3% | 9 | 47.7% | 10 | 73.1% | 25 | 314.2% |
| **Sales Exec** | 160 | 18 | 11.1% | 178 | 212 | 19.3% | 273 | 54.0% | 325 | 83.1% | 773 | 335.3% |
| **Marketing Personnel** | 177 | 20 | 11.4% | 197 | 231 | 17.4% | 301 | 53.2% | 354 | 79.9% | 862 | 338.2% |
| **General Semi Skilled Worker** | 345 | 7 | 2.2% | 352 | 447 | 26.9% | 598 | 69.6% | 697 | 97.9% | 1,694 | 380.9% |
| **General Labour** | 333 | 0 | 0.0% | 333 | 436 | 30.7% | 575 | 72.6% | 667 | 100.1% | 1,618 | 385.4% |
| **Other Employees** | 503 | 30 | 6.0% | 533 | 662 | 24.3% | 845 | 58.7% | 1,029 | 93.1% | 2,446 | 359.1% |
| **Administrative workers** | 179 | 4 | 2.2% | 182 | 232 | 27.1% | 305 | 67.2% | 364 | 99.3% | 860 | 371.5% |
| **Total** | **3,849** | **334** | **8.7%** | **4,183** | **5,030** | **20.2%** | **6,623** | **58.3%** | **7,793** | **86.3%** | **18,647** | **345.8%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 159 | 22 | 13.6% | 181 | 204 | 12.5% | 273 | 50.6% | 321 | 77.3% | 771 | 325.6% |
| Snr Management SME | 372 | 24 | 6.5% | 396 | 485 | 22.5% | 648 | 63.5% | 748 | 88.9% | 1,794 | 352.9% |
| Supervisory | 415 | 27 | 6.6% | 442 | 550 | 24.4% | 720 | 62.8% | 842 | 90.4% | 1,982 | 348.3% |
| Middle / Junior Management | 400 | 27 | 6.8% | 427 | 527 | 23.4% | 684 | 60.2% | 793 | 85.8% | 1,945 | 355.7% |
| Designer / Developer | 46 | 7 | 14.3% | 53 | 60 | 13.2% | 79 | 49.1% | 93 | 75.6% | 221 | 317.6% |
| Clerical | 213 | 0 | 0.1% | 213 | 280 | 31.4% | 363 | 70.5% | 432 | 102.7% | 1,005 | 371.4% |
| Self Employed | 50 | 3 | 7.0% | 54 | 65 | 21.3% | 87 | 62.1% | 100 | 87.5% | 238 | 344.8% |
| Advisor or Agent | 55 | 4 | 7.0% | 59 | 74 | 25.3% | 96 | 61.5% | 112 | 88.3% | 268 | 352.0% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 329 | 7 | 2.3% | 337 | 442 | 31.3% | 578 | 71.6% | 659 | 95.6% | 1,563 | 364.2% |
| Editor | 2 | 0 | 1.4% | 2 | 2 | 29.3% | 3 | 70.7% | 3 | 99.9% | 8 | 371.6% |
| Industrial Researchers | 88 | 3 | 3.6% | 91 | 114 | 25.1% | 152 | 67.2% | 177 | 94.2% | 425 | 366.8% |
| Scientist | 13 | 2 | 14.5% | 14 | 17 | 14.2% | 22 | 49.8% | 25 | 73.2% | 61 | 320.6% |
| Maintenance Engineer | 403 | 16 | 4.0% | 420 | 528 | 25.8% | 695 | 65.7% | 829 | 97.6% | 1,960 | 366.9% |
| Civil Engineer | 22 | 3 | 15.0% | 25 | 28 | 13.7% | 37 | 47.6% | 45 | 79.0% | 105 | 320.0% |
| Production Engineer | 50 | 11 | 21.6% | 60 | 65 | 7.0% | 86 | 41.6% | 102 | 68.1% | 243 | 302.0% |
| Power distribution Engineer | 202 | 45 | 22.4% | 247 | 266 | 7.5% | 348 | 40.8% | 409 | 65.6% | 972 | 293.2% |
| Construction Engineer | 41 | 4 | 10.1% | 45 | 54 | 20.5% | 70 | 57.7% | 81 | 81.9% | 195 | 337.6% |
| Sales Exec | 176 | 12 | 6.9% | 188 | 228 | 21.4% | 303 | 61.3% | 363 | 92.8% | 818 | 334.5% |
| Marketing Personnel | 191 | 13 | 6.8% | 204 | 254 | 24.3% | 330 | 61.5% | 398 | 95.2% | 916 | 348.9% |
| General Semi Skilled Worker | 415 | 6 | 1.4% | 420 | 532 | 26.6% | 715 | 70.0% | 838 | 99.4% | 1,967 | 367.9% |
| General Labour | 735 | 0 | 0.0% | 735 | 964 | 31.2% | 1,260 | 71.5% | 1,485 | 102.2% | 3,500 | 376.4% |
| Other Employees | 567 | 21 | 3.7% | 588 | 743 | 26.3% | 985 | 67.3% | 1,138 | 93.4% | 2,727 | 363.4% |
| Administrative workers | 232 | 3 | 1.3% | 235 | 309 | 31.5% | 399 | 69.7% | 465 | 97.6% | 1,122 | 376.9% |
| **Total** | **5,175** | **262** | **5.1%** | **5,437** | **6,791** | **24.9%** | **8,932** | **64.3%** | **10,459** | **92.4%** | **24,805** | **356.2%** |

## Carbon Finance

| | Carbon Finance | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Snr Management SME | 24 | 5 | 21.1% | 30 | 32 | 7.9% | 43 | 45.8% | 50 | 68.3% | 116 | 291.2% |
| Supervisory | 81 | 17 | 20.9% | 98 | 106 | 8.2% | 142 | 44.1% | 166 | 68.8% | 391 | 297.0% |
| Middle / Junior Management | 55 | 13 | 22.9% | 68 | 73 | 6.6% | 95 | 38.6% | 113 | 65.2% | 264 | 287.1% |
| Designer / Developer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Clerical | 52 | 0 | 0.5% | 52 | 68 | 31.2% | 91 | 74.9% | 105 | 101.4% | 251 | 382.6% |
| Self Employed | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Advisor or Agent | 19 | 4 | 22.6% | 24 | 25 | 6.8% | 33 | 40.3% | 40 | 68.0% | 91 | 285.1% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 107 | 8 | 7.7% | 115 | 139 | 20.9% | 182 | 58.5% | 210 | 82.6% | 509 | 343.5% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Scientist | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Maintenance Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Civil Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Construction Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Sales Exec | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Marketing Personnel | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| General Semi Skilled Worker | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| General Labour | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Other Employees | 20 | 2 | 9.9% | 22 | 27 | 21.2% | 34 | 55.8% | 41 | 86.8% | 99 | 349.7% |
| Administrative workers | 76 | 3 | 4.4% | 80 | 98 | 23.5% | 134 | 67.6% | 154 | 93.1% | 368 | 361.4% |
| **Total** | **435** | **53** | **12.2%** | **488** | **568** | **16.4%** | **753** | **54.3%** | **878** | **79.7%** | **2,088** | **327.6%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 25 | 11 | 44.8% | 37 | 33 | -9.0% | 44 | 19.3% | 51 | 39.3% | 121 | 230.8% |
| Snr Management SME | 46 | 11 | 23.0% | 56 | 58 | 4.1% | 78 | 39.7% | 93 | 65.8% | 218 | 288.5% |
| Supervisory | 54 | 12 | 22.2% | 66 | 72 | 9.9% | 92 | 38.9% | 108 | 64.1% | 260 | 295.2% |
| Middle / Junior Management | 52 | 12 | 23.3% | 64 | 68 | 5.9% | 90 | 39.9% | 106 | 65.1% | 255 | 295.0% |
| Designer / Developer | 13 | 7 | 48.6% | 20 | 17 | -12.2% | 22 | 12.7% | 27 | 37.2% | 65 | 225.4% |
| Clerical | 27 | 0 | 0.5% | 27 | 35 | 30.6% | 46 | 70.7% | 53 | 98.2% | 129 | 377.7% |
| Self Employed | 14 | 3 | 21.8% | 17 | 19 | 8.7% | 24 | 40.4% | 28 | 63.0% | 67 | 289.9% |
| Advisor or Agent | 12 | 3 | 23.0% | 14 | 15 | 6.1% | 20 | 38.5% | 23 | 61.0% | 55 | 288.2% |
| Educator | 0 | 0 | 21.9% | 0 | 0 | 5.0% | 1 | 43.5% | 1 | 56.8% | 2 | 291.0% |
| Specialist or Consultant | 34 | 2 | 6.5% | 36 | 46 | 25.6% | 60 | 64.6% | 67 | 84.7% | 166 | 355.3% |
| Editor | 5 | 0 | 4.1% | 5 | 6 | 27.4% | 8 | 64.2% | 10 | 93.9% | 22 | 348.9% |
| Industrial Researchers | 9 | 1 | 11.8% | 10 | 12 | 17.2% | 16 | 55.8% | 18 | 81.9% | 43 | 325.1% |
| Scientist | 5 | 2 | 49.0% | 8 | 7 | -13.0% | 9 | 16.8% | 10 | 37.3% | 24 | 214.4% |
| Maintenance Engineer | 62 | 9 | 13.8% | 71 | 82 | 14.9% | 106 | 49.6% | 125 | 75.3% | 300 | 321.8% |
| Civil Engineer | 9 | 4 | 42.9% | 13 | 12 | -9.0% | 15 | 19.2% | 18 | 43.8% | 42 | 227.6% |
| Production Engineer | 11 | 8 | 72.2% | 19 | 15 | -24.7% | 19 | -1.1% | 23 | 18.2% | 54 | 179.5% |
| Power distribution Engineer | 29 | 20 | 68.3% | 48 | 37 | -22.7% | 50 | 3.4% | 58 | 20.1% | 140 | 188.7% |
| Construction Engineer | 11 | 4 | 34.9% | 15 | 14 | -4.7% | 19 | 28.0% | 22 | 46.7% | 53 | 254.1% |
| Sales Exec | 30 | 7 | 21.9% | 36 | 39 | 7.5% | 51 | 41.4% | 60 | 66.1% | 143 | 295.3% |
| Marketing Personnel | 30 | 6 | 21.7% | 36 | 39 | 6.9% | 50 | 38.7% | 60 | 64.5% | 142 | 292.0% |
| General Semi Skilled Worker | 58 | 3 | 4.6% | 61 | 77 | 26.6% | 100 | 63.5% | 116 | 89.8% | 279 | 356.8% |
| General Labour | 85 | 0 | 0.0% | 85 | 112 | 32.2% | 146 | 71.7% | 171 | 101.1% | 410 | 382.6% |
| Other Employees | 78 | 9 | 12.0% | 87 | 102 | 17.1% | 133 | 53.0% | 156 | 78.8% | 377 | 332.9% |
| Administrative workers | 32 | 1 | 4.6% | 34 | 41 | 23.5% | 55 | 62.7% | 65 | 92.7% | 154 | 360.0% |
| **Total** | **731** | **135** | **18.4%** | **866** | **960** | **10.8%** | **1,254** | **44.8%** | **1,469** | **69.6%** | **3,520** | **306.3%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 41 | 18 | 44.7% | 59 | 53 | -10.0% | 70 | 18.6% | 82 | 39.2% | 195 | 232.0% |
| Snr Management SME | 153 | 37 | 24.1% | 189 | 200 | 5.4% | 263 | 39.1% | 306 | 61.8% | 728 | 284.4% |
| Supervisory | 167 | 38 | 22.6% | 205 | 214 | 4.5% | 288 | 40.8% | 334 | 63.4% | 813 | 297.4% |
| Middle / Junior Management | 164 | 38 | 23.3% | 203 | 212 | 4.8% | 278 | 37.1% | 336 | 65.8% | 785 | 287.7% |
| Designer / Developer | 18 | 8 | 45.8% | 27 | 24 | -10.3% | 31 | 16.8% | 37 | 37.8% | 88 | 228.5% |
| Clerical | 84 | 0 | 0.5% | 84 | 110 | 30.9% | 144 | 71.0% | 173 | 106.2% | 403 | 378.8% |
| Self Employed | 10 | 2 | 22.8% | 13 | 13 | 5.6% | 18 | 41.5% | 21 | 62.8% | 50 | 293.5% |
| Advisor or Agent | 9 | 2 | 22.2% | 11 | 12 | 7.7% | 16 | 40.3% | 18 | 64.1% | 43 | 290.4% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 87 | 6 | 7.3% | 93 | 113 | 21.3% | 151 | 61.7% | 174 | 86.4% | 425 | 355.7% |
| Editor | 4 | 0 | 4.5% | 5 | 6 | 25.4% | 8 | 66.3% | 9 | 94.6% | 21 | 360.8% |
| Industrial Researchers | 6 | 1 | 11.2% | 6 | 7 | 18.9% | 10 | 54.3% | 11 | 82.7% | 27 | 332.4% |
| Scientist | 4 | 2 | 45.3% | 6 | 6 | -10.8% | 8 | 17.6% | 9 | 40.6% | 21 | 232.7% |
| Maintenance Engineer | 168 | 25 | 14.6% | 193 | 222 | 15.3% | 281 | 45.7% | 338 | 75.3% | 805 | 317.1% |
| Civil Engineer | 7 | 3 | 46.6% | 11 | 10 | -11.3% | 13 | 15.9% | 15 | 39.7% | 35 | 227.4% |
| Production Engineer | 28 | 20 | 70.7% | 47 | 36 | -23.1% | 47 | 0.5% | 56 | 18.2% | 131 | 177.4% |
| Power distribution Engineer | 78 | 51 | 64.4% | 129 | 102 | -20.7% | 134 | 4.3% | 158 | 22.8% | 376 | 191.7% |
| Construction Engineer | 7 | 2 | 31.1% | 9 | 9 | 0.3% | 12 | 31.0% | 15 | 56.5% | 35 | 271.5% |
| Sales Exec | 81 | 19 | 23.8% | 100 | 106 | 6.5% | 136 | 36.3% | 161 | 61.0% | 392 | 292.2% |
| Marketing Personnel | 87 | 21 | 23.7% | 107 | 114 | 5.8% | 148 | 37.9% | 174 | 62.5% | 416 | 287.8% |
| General Semi Skilled Worker | 167 | 7 | 4.5% | 175 | 218 | 24.9% | 287 | 64.5% | 341 | 95.1% | 815 | 366.6% |
| General Labour | 237 | 0 | 0.0% | 237 | 310 | 30.8% | 403 | 70.1% | 478 | 102.1% | 1,141 | 382.0% |
| Other Employees | 240 | 27 | 11.1% | 267 | 310 | 16.5% | 412 | 54.7% | 478 | 79.5% | 1,122 | 321.0% |
| Administrative workers | 86 | 4 | 4.5% | 90 | 113 | 25.6% | 149 | 64.5% | 175 | 93.6% | 418 | 362.8% |
| **Total** | **1,934** | **331** | **17.1%** | **2,265** | **2,521** | **11.3%** | **3,306** | **45.9%** | **3,900** | **72.2%** | **9,286** | **309.9%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 135 | 11 | 8.3% | 147 | 177 | 20.8% | 231 | 57.6% | 280 | 90.9% | 652 | 344.5% |
| Snr Management SME | 384 | 16 | 4.3% | 401 | 510 | 27.2% | 670 | 67.3% | 796 | 98.6% | 1,835 | 357.9% |
| Supervisory | 420 | 19 | 4.6% | 439 | 543 | 23.8% | 727 | 65.7% | 848 | 93.1% | 2,058 | 368.7% |
| Middle / Junior Management | 411 | 16 | 3.9% | 427 | 544 | 27.3% | 703 | 64.6% | 831 | 94.5% | 1,952 | 356.8% |
| Designer / Developer | 30 | 2 | 8.3% | 32 | 40 | 22.3% | 52 | 60.7% | 61 | 89.4% | 143 | 342.7% |
| Clerical | 206 | 0 | 0.1% | 207 | 273 | 32.1% | 354 | 71.4% | 419 | 103.0% | 982 | 375.6% |
| Self Employed | 24 | 1 | 4.4% | 26 | 32 | 23.7% | 42 | 64.2% | 49 | 90.6% | 118 | 360.2% |
| Advisor or Agent | 3 | 0 | 4.3% | 3 | 4 | 19.4% | 5 | 71.4% | 6 | 93.6% | 14 | 366.8% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 199 | 3 | 1.4% | 201 | 265 | 31.5% | 333 | 65.5% | 402 | 99.8% | 945 | 369.1% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 13 | 0 | 2.5% | 14 | 18 | 27.9% | 23 | 69.4% | 27 | 96.9% | 65 | 370.6% |
| Scientist | 0 | 0 | 8.0% | 0 | 1 | 20.4% | 1 | 63.0% | 1 | 83.7% | 2 | 355.2% |
| Maintenance Engineer | 406 | 11 | 2.6% | 417 | 527 | 26.4% | 707 | 69.5% | 823 | 97.5% | 1,954 | 368.9% |
| Civil Engineer | 10 | 1 | 9.1% | 11 | 13 | 20.5% | 17 | 55.3% | 21 | 88.2% | 49 | 349.4% |
| Production Engineer | 53 | 7 | 13.2% | 60 | 69 | 14.6% | 90 | 50.2% | 109 | 80.8% | 256 | 326.2% |
| Power distribution Engineer | 198 | 28 | 13.9% | 226 | 258 | 14.5% | 342 | 51.8% | 388 | 71.9% | 951 | 321.7% |
| Construction Engineer | 23 | 2 | 7.1% | 25 | 30 | 22.4% | 39 | 59.1% | 47 | 89.6% | 112 | 352.6% |
| Sales Exec | 184 | 8 | 4.5% | 192 | 235 | 22.4% | 315 | 64.0% | 375 | 95.3% | 873 | 354.7% |
| Marketing Personnel | 206 | 10 | 4.6% | 216 | 268 | 24.1% | 357 | 65.3% | 418 | 93.6% | 980 | 353.8% |
| General Semi Skilled Worker | 425 | 4 | 0.9% | 428 | 552 | 28.9% | 738 | 72.2% | 845 | 97.4% | 2,002 | 367.6% |
| General Labour | 527 | 0 | 0.0% | 527 | 688 | 30.7% | 907 | 72.2% | 1,072 | 103.6% | 2,529 | 380.4% |
| Other Employees | 571 | 11 | 2.0% | 583 | 744 | 27.8% | 960 | 64.8% | 1,158 | 98.8% | 2,730 | 368.5% |
| Administrative workers | 222 | 2 | 0.9% | 224 | 289 | 29.1% | 375 | 67.4% | 441 | 96.7% | 1,053 | 369.9% |
| **Total** | **4,652** | **152** | **3.3%** | **4,804** | **6,079** | **26.5%** | **7,989** | **66.3%** | **9,416** | **96.0%** | **22,255** | **363.2%** |

## Recovery and Recycling

| | Recovery and Recycling | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 91 | 33 | 36.8% | 124 | 119 | -4.3% | 155 | 25.0% | 185 | 49.0% | 434 | 249.3% |
| Snr Management SME | 98 | 19 | 19.2% | 116 | 127 | 9.0% | 164 | 41.1% | 194 | 66.6% | 468 | 302.1% |
| Supervisory | 115 | 22 | 19.3% | 137 | 149 | 8.5% | 201 | 46.2% | 228 | 66.3% | 555 | 304.6% |
| Middle / Junior Management | 113 | 22 | 19.9% | 135 | 145 | 7.4% | 194 | 44.1% | 228 | 68.8% | 548 | 306.0% |
| Designer / Developer | 79 | 29 | 36.0% | 108 | 104 | -3.4% | 136 | 26.1% | 158 | 46.3% | 381 | 252.3% |
| Clerical | 57 | 0 | 0.4% | 57 | 75 | 31.3% | 98 | 72.3% | 117 | 104.9% | 269 | 371.5% |
| Self Employed | 30 | 6 | 18.4% | 36 | 39 | 9.9% | 52 | 45.1% | 61 | 70.7% | 147 | 313.1% |
| Advisor or Agent | 10 | 2 | 19.2% | 12 | 14 | 10.0% | 18 | 42.7% | 20 | 66.6% | 49 | 296.8% |
| Educator | 0 | 0 | 18.4% | 0 | 1 | 13.7% | 1 | 42.4% | 1 | 67.2% | 2 | 290.0% |
| Specialist or Consultant | 95 | 6 | 6.0% | 101 | 123 | 22.2% | 161 | 59.9% | 192 | 90.7% | 460 | 357.2% |
| Editor | 4 | 0 | 3.7% | 4 | 6 | 27.0% | 7 | 61.1% | 9 | 97.9% | 21 | 361.1% |
| Industrial Researchers | 22 | 2 | 9.1% | 24 | 28 | 20.2% | 37 | 56.6% | 44 | 85.7% | 103 | 337.7% |
| Scientist | 20 | 7 | 36.8% | 27 | 26 | -3.8% | 34 | 25.8% | 40 | 48.0% | 96 | 252.2% |
| Maintenance Engineer | 140 | 16 | 11.3% | 155 | 183 | 18.0% | 241 | 55.0% | 282 | 81.6% | 675 | 334.1% |
| Civil Engineer | 38 | 14 | 36.0% | 51 | 49 | -3.8% | 65 | 26.6% | 77 | 50.0% | 182 | 255.0% |
| Production Engineer | 48 | 26 | 54.9% | 75 | 63 | -14.9% | 82 | 10.4% | 98 | 30.9% | 233 | 213.0% |
| Power distribution Engineer | 72 | 42 | 57.9% | 113 | 93 | -17.7% | 121 | 7.2% | 144 | 27.0% | 348 | 207.3% |
| Construction Engineer | 44 | 12 | 27.7% | 57 | 57 | 1.5% | 77 | 35.6% | 90 | 59.4% | 213 | 275.7% |
| Sales Exec | 88 | 16 | 18.5% | 104 | 115 | 10.1% | 152 | 45.9% | 175 | 67.9% | 422 | 304.9% |
| Marketing Personnel | 77 | 15 | 19.0% | 91 | 100 | 9.6% | 131 | 43.6% | 156 | 71.6% | 365 | 300.7% |
| General Semi Skilled Worker | 183 | 7 | 3.8% | 190 | 243 | 27.9% | 319 | 67.9% | 369 | 93.8% | 883 | 364.2% |
| General Labour | 178 | 0 | 0.0% | 178 | 232 | 30.2% | 306 | 71.6% | 361 | 102.6% | 855 | 379.9% |
| Other Employees | 152 | 14 | 9.2% | 166 | 197 | 18.3% | 259 | 55.9% | 310 | 86.3% | 740 | 345.1% |
| Administrative workers | 77 | 3 | 3.8% | 80 | 100 | 24.8% | 132 | 64.9% | 156 | 95.9% | 375 | 368.8% |
| **Total** | **1,830** | **313** | **17.1%** | **2,143** | **2,388** | **11.4%** | **3,143** | **46.7%** | **3,695** | **72.4%** | **8,822** | **311.7%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 76 | 11 | 13.9% | 87 | 99 | 14.1% | 131 | 50.6% | 156 | 79.9% | 372 | 327.6% |
| Snr Management SME | 129 | 9 | 7.2% | 138 | 168 | 21.6% | 226 | 63.1% | 264 | 90.4% | 620 | 347.8% |
| Supervisory | 158 | 12 | 7.5% | 170 | 205 | 20.5% | 273 | 60.2% | 319 | 87.5% | 759 | 345.5% |
| Middle / Junior Management | 158 | 11 | 6.7% | 169 | 205 | 21.2% | 274 | 62.2% | 316 | 87.1% | 758 | 348.6% |
| Designer / Developer | 32 | 4 | 13.1% | 36 | 42 | 14.1% | 56 | 53.0% | 65 | 79.7% | 153 | 321.6% |
| Clerical | 82 | 0 | 0.1% | 82 | 106 | 28.8% | 143 | 73.4% | 166 | 101.7% | 389 | 371.8% |
| Self Employed | 45 | 3 | 6.6% | 48 | 59 | 22.5% | 77 | 59.4% | 91 | 88.7% | 218 | 350.9% |
| Advisor or Agent | 58 | 4 | 6.6% | 61 | 76 | 24.3% | 99 | 61.8% | 115 | 87.4% | 279 | 353.4% |
| Educator | 3 | 0 | 6.8% | 3 | 4 | 21.6% | 5 | 59.6% | 7 | 95.4% | 15 | 338.4% |
| Specialist or Consultant | 100 | 2 | 2.2% | 102 | 130 | 27.1% | 171 | 67.8% | 203 | 98.9% | 476 | 365.9% |
| Editor | 8 | 0 | 1.2% | 9 | 11 | 28.7% | 15 | 70.6% | 17 | 101.2% | 41 | 381.6% |
| Industrial Researchers | 69 | 2 | 3.5% | 71 | 89 | 24.8% | 118 | 66.3% | 137 | 92.8% | 324 | 355.6% |
| Scientist | 13 | 2 | 12.8% | 15 | 17 | 14.8% | 23 | 52.2% | 27 | 79.1% | 64 | 330.0% |
| Maintenance Engineer | 188 | 8 | 4.3% | 196 | 245 | 25.2% | 321 | 64.0% | 377 | 92.2% | 900 | 359.3% |
| Civil Engineer | 27 | 4 | 13.1% | 30 | 35 | 13.9% | 46 | 51.1% | 54 | 78.3% | 129 | 326.8% |
| Production Engineer | 33 | 7 | 20.8% | 40 | 43 | 8.2% | 56 | 40.6% | 67 | 68.1% | 159 | 298.9% |
| Power distribution Engineer | 88 | 20 | 22.3% | 108 | 116 | 7.4% | 151 | 40.1% | 180 | 66.1% | 423 | 291.2% |
| Construction Engineer | 40 | 4 | 10.6% | 44 | 52 | 18.0% | 69 | 55.1% | 80 | 81.4% | 191 | 332.6% |
| Sales Exec | 73 | 5 | 6.6% | 78 | 98 | 25.2% | 125 | 60.4% | 149 | 90.8% | 357 | 357.1% |
| Marketing Personnel | 74 | 5 | 7.1% | 79 | 96 | 21.5% | 128 | 62.5% | 147 | 87.1% | 354 | 349.1% |
| General Semi Skilled Worker | 175 | 2 | 1.4% | 177 | 227 | 28.0% | 299 | 68.7% | 354 | 100.2% | 849 | 379.2% |
| General Labour | 105 | 0 | 0.0% | 105 | 136 | 30.0% | 180 | 71.2% | 211 | 101.6% | 502 | 378.3% |
| Other Employees | 232 | 9 | 3.8% | 240 | 301 | 25.1% | 395 | 64.2% | 476 | 97.9% | 1,112 | 362.8% |
| Administrative workers | 105 | 1 | 1.4% | 106 | 137 | 28.6% | 178 | 67.2% | 211 | 98.3% | 497 | 368.0% |
| **Total** | **2,072** | **125** | **6.1%** | **2,197** | **2,697** | **22.7%** | **3,558** | **61.9%** | **4,190** | **90.7%** | **9,941** | **352.4%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 113 | 11 | 9.4% | 123 | 147 | 19.1% | 195 | 58.4% | 226 | 83.2% | 541 | 338.3% |
| Snr Management SME | 175 | 8 | 4.8% | 184 | 233 | 26.8% | 307 | 67.3% | 355 | 93.0% | 839 | 356.7% |
| Supervisory | 205 | 9 | 4.2% | 213 | 263 | 23.5% | 350 | 64.1% | 418 | 96.1% | 992 | 365.2% |
| Middle / Junior Management | 194 | 8 | 4.1% | 202 | 254 | 26.1% | 332 | 64.3% | 396 | 96.1% | 923 | 357.4% |
| Designer / Developer | 46 | 4 | 9.5% | 50 | 60 | 20.0% | 78 | 55.2% | 92 | 83.0% | 220 | 337.0% |
| Clerical | 98 | 0 | 0.1% | 99 | 128 | 29.4% | 170 | 72.9% | 198 | 100.6% | 469 | 376.1% |
| Self Employed | 58 | 3 | 4.5% | 60 | 73 | 22.0% | 99 | 65.1% | 116 | 93.6% | 276 | 358.0% |
| Advisor or Agent | 7 | 0 | 4.7% | 8 | 10 | 25.7% | 13 | 63.2% | 15 | 88.1% | 35 | 349.3% |
| Educator | 0 | 0 | 4.7% | 0 | 0 | 27.2% | 0 | 68.1% | 0 | 93.6% | 1 | 360.7% |
| Specialist or Consultant | 116 | 2 | 1.5% | 118 | 154 | 30.9% | 196 | 66.9% | 233 | 98.5% | 562 | 378.2% |
| Editor | 3 | 0 | 1.0% | 3 | 4 | 27.1% | 6 | 68.4% | 7 | 98.5% | 17 | 374.7% |
| Industrial Researchers | 8 | 0 | 2.3% | 8 | 10 | 28.2% | 13 | 67.8% | 16 | 98.8% | 37 | 372.8% |
| Scientist | 3 | 0 | 10.3% | 4 | 4 | 17.4% | 6 | 56.2% | 7 | 85.7% | 17 | 334.7% |
| Maintenance Engineer | 260 | 7 | 2.7% | 267 | 337 | 25.9% | 451 | 68.7% | 531 | 98.5% | 1,244 | 365.2% |
| Civil Engineer | 29 | 3 | 9.6% | 32 | 38 | 17.9% | 51 | 57.3% | 60 | 84.7% | 141 | 336.2% |
| Production Engineer | 57 | 8 | 14.0% | 65 | 74 | 13.7% | 98 | 51.6% | 115 | 76.9% | 276 | 325.7% |
| Power distribution Engineer | 119 | 17 | 14.4% | 136 | 158 | 16.3% | 206 | 51.8% | 241 | 77.8% | 563 | 314.7% |
| Construction Engineer | 48 | 3 | 7.2% | 52 | 63 | 22.8% | 83 | 61.4% | 98 | 89.1% | 232 | 349.6% |
| Sales Exec | 81 | 4 | 4.6% | 85 | 107 | 25.9% | 141 | 67.2% | 163 | 92.7% | 394 | 365.7% |
| Marketing Personnel | 85 | 4 | 5.1% | 90 | 115 | 27.9% | 147 | 64.0% | 175 | 94.3% | 409 | 354.9% |
| General Semi Skilled Worker | 225 | 2 | 0.9% | 227 | 297 | 30.7% | 393 | 73.1% | 461 | 103.2% | 1,092 | 380.9% |
| General Labour | 112 | 0 | 0.0% | 112 | 149 | 32.7% | 193 | 71.6% | 226 | 101.3% | 543 | 383.0% |
| Other Employees | 282 | 7 | 2.3% | 289 | 366 | 26.8% | 479 | 65.8% | 567 | 96.3% | 1,358 | 370.0% |
| Administrative workers | 119 | 1 | 1.0% | 120 | 154 | 28.0% | 202 | 67.8% | 238 | 98.1% | 572 | 375.7% |
| **Total** | **2,446** | **101** | **4.1%** | **2,547** | **3,200** | **25.6%** | **4,211** | **65.4%** | **4,953** | **94.5%** | **11,751** | **361.4%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 199 | 26 | 13.0% | 225 | 260 | 15.6% | 337 | 50.1% | 401 | 78.5% | 959 | 327.0% |
| Snr Management SME | 582 | 41 | 7.0% | 623 | 766 | 22.9% | 993 | 59.4% | 1,186 | 90.4% | 2,766 | 344.0% |
| Supervisory | 638 | 41 | 6.5% | 679 | 822 | 21.0% | 1,054 | 55.2% | 1,311 | 93.0% | 3,078 | 353.0% |
| Middle / Junior Management | 640 | 43 | 6.8% | 683 | 833 | 21.9% | 1,085 | 58.8% | 1,268 | 85.6% | 3,108 | 355.0% |
| Designer / Developer | 30 | 4 | 13.4% | 34 | 40 | 17.1% | 51 | 48.4% | 62 | 80.0% | 146 | 324.5% |
| Clerical | 320 | 0 | 0.1% | 320 | 423 | 32.0% | 548 | 71.1% | 641 | 100.2% | 1,531 | 378.3% |
| Self Employed | 53 | 3 | 6.0% | 56 | 70 | 24.4% | 92 | 63.5% | 107 | 89.4% | 253 | 349.7% |
| Advisor or Agent | 6 | 0 | 6.6% | 6 | 8 | 23.4% | 11 | 70.4% | 12 | 89.2% | 29 | 359.5% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 294 | 6 | 2.0% | 300 | 383 | 27.5% | 502 | 67.2% | 593 | 97.6% | 1,386 | 361.9% |
| Editor | 1 | 0 | 1.2% | 1 | 1 | 32.2% | 1 | 71.5% | 1 | 109.3% | 3 | 365.2% |
| Industrial Researchers | 7 | 0 | 3.1% | 7 | 9 | 22.9% | 12 | 74.2% | 13 | 86.7% | 32 | 354.4% |
| Scientist | 1 | 0 | 12.3% | 1 | 2 | 21.8% | 2 | 56.3% | 3 | 80.4% | 7 | 344.6% |
| Maintenance Engineer | 708 | 29 | 4.1% | 737 | 922 | 25.0% | 1,198 | 62.5% | 1,443 | 95.6% | 3,414 | 362.9% |
| Civil Engineer | 22 | 3 | 12.9% | 24 | 28 | 16.4% | 37 | 50.4% | 44 | 79.5% | 105 | 328.5% |
| Production Engineer | 105 | 20 | 19.2% | 125 | 138 | 10.5% | 181 | 44.9% | 212 | 69.7% | 508 | 306.5% |
| Power distribution Engineer | 312 | 54 | 17.5% | 366 | 410 | 12.1% | 529 | 44.6% | 641 | 75.1% | 1,508 | 312.0% |
| Construction Engineer | 73 | 8 | 10.3% | 81 | 97 | 20.0% | 124 | 54.1% | 151 | 86.7% | 356 | 341.2% |
| Sales Exec | 276 | 18 | 6.5% | 294 | 357 | 21.7% | 473 | 61.1% | 557 | 89.8% | 1,327 | 352.0% |
| Marketing Personnel | 295 | 19 | 6.5% | 314 | 373 | 18.6% | 513 | 63.3% | 589 | 87.5% | 1,414 | 350.0% |
| General Semi Skilled Worker | 646 | 9 | 1.3% | 654 | 847 | 29.5% | 1,093 | 67.1% | 1,307 | 99.8% | 3,186 | 387.0% |
| General Labour | 738 | 0 | 0.0% | 738 | 980 | 32.8% | 1,278 | 73.3% | 1,486 | 101.4% | 3,566 | 383.3% |
| Other Employees | 975 | 33 | 3.4% | 1,008 | 1,280 | 27.0% | 1,691 | 67.7% | 1,971 | 95.5% | 4,768 | 372.9% |
| Administrative workers | 348 | 4 | 1.3% | 353 | 456 | 29.2% | 592 | 67.7% | 703 | 99.2% | 1,687 | 378.0% |
| **Total** | **7,268** | **363** | **5.0%** | **7,631** | **9,504** | **24.5%** | **12,399** | **62.5%** | **14,701** | **92.6%** | **35,136** | **360.4%** |