Stoke and Staffordshire 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

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 Stoke and Staffordshire 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 Stoke and Staffordshire 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 Stoke and Staffordshire LEP are listed below:

Formal name	Shortened label
Staffordshire Moorlands DC	Staffordshire Moorlands
Stoke-on-Trent City C	Stoke-on-Trent
Stafford BC	Stafford
South Staffordshire C	South Staffordshire
Cannock Chase DC	Cannock Chase
Newcastle-under-Lyme DC	Newcastle-under-Lyme
East Staffordshire BC	East Staffordshire
Lichfield DC	Lichfield
Tamworth BC	Tamworth

Table of Contents

Executive Summary

Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services (LCEGS) sector was worth £2.7bn to the Stoke and Staffordshire LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 900 businesses that employed over 18,500 people in the sector in 2019/20.

Sales and growth

The Low Carbon and Environmental Goods and Services sector in the Stoke and Staffordshire LEP grew year on year since 2017/18. In 2017/18 total sales in the sector were worth £2.4bn have now reached £2.7bn in 2019/20.

The sector in the Stoke and Staffordshire LEP grew by 5.9% during the financial year 2017/18 to 2018/19 and 6.6% 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 Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was 18,740, up from 17,460 in 2017/18. Annual growth rate in employment was 2.4% between 2017/18 and 2018/19 and 4.8% between 2018/19 and 2019/20. This rate of growth is slower than both the MEH average (5.7% and 5.0% respectively) and 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 Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was 932, up from 822 in 2017/18. Annual growth rate in the number of companies was 5.2% between 2017/18 and 2018/19 and 7.8% between 2018/19 and 2019/20. This rate of growth is stronger than the MEH average (3.7% and 6.9% respectively), but slower than 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.

Stoke and Staffordshire LEP's sub-sectors

In 2019/20 Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services sector was made up by the following proportions: Renewable Energy 40%, Low Carbon 38% and Environmental 22%.

Stoke and Staffordshire LEP's sub-sector strengths

The four largest sub-sectors in the Low Carbon and Environmental Goods and Services sector by sales account for 57% of the Stoke and Staffordshire LEP's total sales and are made up of:

- Wind (£441m) – 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 (£417m) - this includes head office functions, building systems design and consultancy and building systems providers and installers

- Alternative Fuels (£381m) – this includes R&D functions, alternative fuel providers, designers and consultancy, process implementation, sales and accounting and application development specialists
- Photovoltaic (£284m) - this includes head office functions, systems developers, providers and installers.

The next seven largest sub-sectors by sales account for a further 39% of Stoke and Staffordshire LEP's total sales and are made up of:

- Water & Waste Water Treatment (£203m) - development and implementation by utilities along with supply, consultancy and implementation by independent consulting engineers
- Biomass (£199m) - this includes systems development, supply, implementation and R&D
- Waste Management (£177m) - 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 (£149m) - include selling agencies, alternative fuel development companies and consulting and applications development for vehicle conversion specialists
- Recovery and Recycling (£147m) – this includes waste collection, glass stock processing and paper feedstock processing
- Geothermal (£119m) - 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
- Energy Management (£55m) – this includes registered gas engineers, measurement and control systems and fitting and maintenance

Sub-sector growth

Stoke and Staffordshire LEP's four 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 £391m to £441m (12.6%), number of employees by 7.2% and number of companies by 13.8%
- Building Technologies – sales have grown from £370m to £417m (12.9%), number of employees by 7.4% and number of companies by 13.4%
- Alternative Fuels – sales have grown from £336m to £381m (13.3% increase), number of employees by 7.8% and number of companies by 14.3%
- Photovoltaic – sales have grown from £252m to £284m (12.5% increase), number of employees by 7.0% and number of companies by 12.5%

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

- Marine Pollution Control with 16.7% (MEH 11.4%, UK 12.7%)
- Environmental Monitoring with 14.3% (MEH 11.3%, UK 12.2%)
- Air Pollution with 13.3% (MEH 11.4%, UK 5.8%)
- Renewable Energy General Consultancy with 13.3% (MEH 11.3%, UK 10.8%)
- Water and Waste Water Treatment with 13.2% (MEH 11.3%, UK 12.7%)
- Contaminated Land Reclamation and Remediation with 12.9% (MEH 11.4%, UK 1.0%)
- Energy Management with 12.8% (MEH 11.4%, UK 5.7%)
- Alternative Fuel Vehicle with 12.8% (MEH 11.4%, UK 5.7%)
- Hydro with 11.7% (MEH 11.0%, UK 1.8%)

Sub-sectors which saw weaker growth than the UK average between 2017/18 and 2019/20 include:
Environmental Consultancy with 12.9% (MEH 11.3%, UK 16.8%)

- Noise & Vibration Control with 13.0% (MEH 11.4%, UK 23.3%)

- Carbon Capture & Storage with 13.0% (MEH 11.3%, UK 19.0%)
- Biomass with 12.7% (MEH 11.3%, UK 28.2%)
- Geothermal with 12.8% (MEH 11.3%, UK 18.8%)
- Photovoltaic with 12.5% (MEH 11.3%, UK 24.3%)
- Wave & Tidal with 11.8% (MEH 11.2%, UK 24.9%)
- Wind with 12.8% (MEH 11.3%, UK 42.2%)

Investment in R&D

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

- Private Equity Investment in R&D grew 6.9 from £121m in 2017/18 to £128m in 2019/20
- Venture capital Investment in R&D grew 10.7% from £241m in 2017/18 to £267m in 2019/20
- Other Investment in R&D grew 6.3% from £380m in 2017/18 to £404m 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
- Renewable Energy General Consultancy has a slightly higher growth than the UK average, and above average market size
- Contaminated Land has a significantly stronger growth than the UK average, but below average market size
- Hydro has a significantly 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
- Waste Management has a similar growth to the UK, but significantly above average market size
- Photovoltaic has weaker growth than the UK, but significantly above average market size
- Water & Waste Water Treatment has a similar growth to the UK, but significantly above average market size.
- Building Technologies has a similar growth to the UK, but significantly above average market size
- Biomass has weaker growth than the UK, but significantly above 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

Scalability of sub-sectors

Scalability of the sub-sectors within the Stoke and Staffordshire LEP is variable and when combined with GVA, strengths include:

- Water and Waste Water Treatment with good GVA and high Scalability (stronger position than the MEH average)
- Building Technologies with high GVA and high Scalability (stronger position than the MEH average)
- Photovoltaic with high GVA and high Scalability (stronger position than the MEH average)
- Geothermal with good GVA and good Scalability (stronger position than the MEH average)
- Alternative Fuel Vehicle with good GVA and good Scalability (stronger position than the MEH average)

- Waste Management with good GVA and good Scalability (stronger position than the MEH average)
- Recovery and Recycling with reasonable GVA and good 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 Stoke and Staffordshire LEP being 8.6% (MEH 8.7%).

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

- Production Engineers 35.3% (MEH 35.7%)
- Power Distribution Engineers 30.3% (MEH 29.8%)
- Technicians 22.1% (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 3.2% (MEH 3.3%)
- Administrative Workers 2.1% (MEH 2.1%)

Level 1 shortages

Skills shortages within the Stoke and Staffordshire LEP at Level 1:

- Low Carbon 10.2% (MEH 10.5%)
- Renewable Energy 7.1% (MEH 7.0%)
- Environmental 10.1% (MEH 10.3%)

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

Production Engineers:

- Low Carbon 45.3% (MEH 47.3%)
- Renewable Energy 28.6% (MEH 27.9%)
- Environmental 34.8% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 33.4% (MEH 33.7%)
- Renewable Energy 28.4% (MEH 27.1%)
- Environmental 31.8% (MEH 32.6%)

Technicians:

- Low Carbon 27.2% (MEH 27.9%)
- Renewable Energy 17.6% (MEH 17.3%)
- Environmental 22.9% (22.9%)

Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Stoke and Staffordshire LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.5% (MEH 20.3%)
- Best-case scenario for the UK economy is 57.9% (MEH 57.9%)

Estimated growth in employees for the Stoke and Staffordshire LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 85.9% (MEH 86.0%)
- Best-case scenario for the UK economy is 341.9% (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 19.2% (MEH 17.0%)
- Renewable Energy 34.2% (MEH 34.5%)
- Environmental 26.6% (MEH 27.0%)

Power Distribution Engineers:

- Low Carbon 28.9% (MEH 28.1%)
- Renewable Energy 33.2% (MEH 35.1%)
- Environmental 30.0% (MEH 29.3%)

Technicians:

- Low Carbon 34.6% (MEH 34.2%)
- Renewable Energy 45.4% (MEH 45.9%)
- Environmental 39.1% (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 Stoke and Staffordshire LEP include:

- Geothermal with good training capacity and strong potential for upskilling
- Recovery and Recycling with very good training capacity and good upskilling potential
- Alternative Fuels with good training capacity and good upskilling potential
- Alternative Fuels Vehicle with good training capacity and average upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Stoke and Staffordshire LEP include:

- Water and Waste Water Treatment with poor training capacity but average potential for upskilling
- Additional Energy Sources with poor training capacity but average potential for upskilling

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 very high estimated potential impact
- Building Technologies with large market and high estimated potential impact
- Alternative Fuels with large market and high estimated potential impact

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

- Environmental Consultancy with low estimated potential impact and small market

Stoke and Staffordshire LEP's Exports

The value of exports in Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was £287m, an increase from £250m in 2017/18. This accounted for 9% of the MEH's LCEGS exports in 2019/20 and is in line with Stoke and Staffordshire LEP's 10% share of the overall MEH LCEGS market.

Stoke and Staffordshire LEP's LCEGS exports grew by 5.8% and 8.7% 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.

Stoke and Staffordshire LEP's top Export sub-sectors which saw large export market and strong growth include:

- Wind - £47m
- Building Technologies - £45m
- Alternative Fuels - £43m
- Biomass - £21m
- Geothermal - £13m

Stoke and Staffordshire LEP's Imports

The value of imports in Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was £276m, an increase from £237m in 2017/18. This accounted for 10% of the MEH's LCEGS imports in 2019/20 and is in line with the Stoke and Staffordshire LEP's 10% share of the overall MEH LCEGS market.

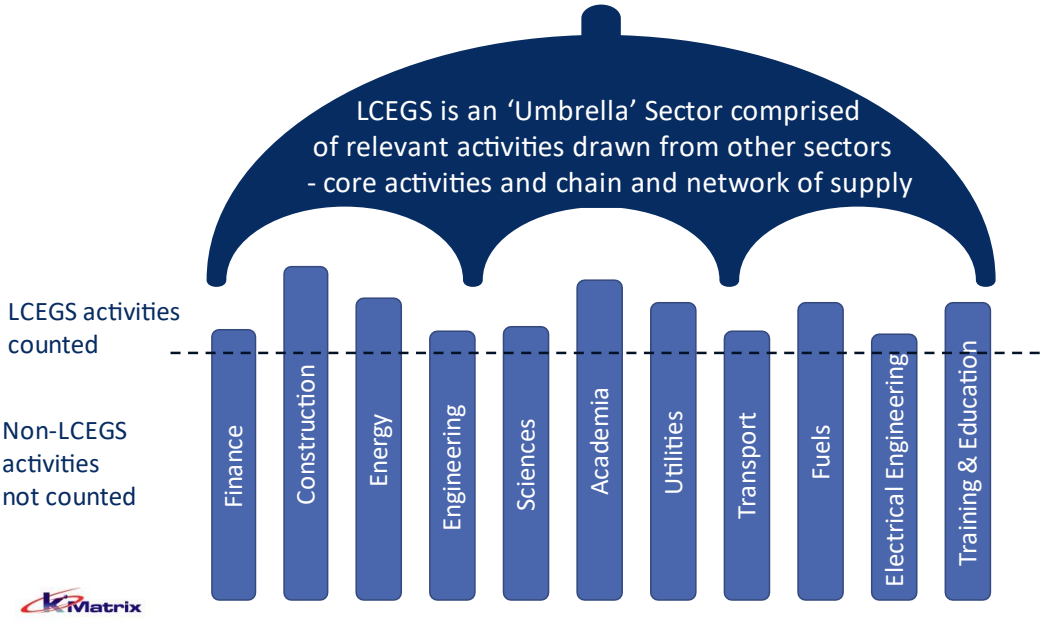
Stoke and Staffordshire LEP's LCEGS imports grew by 5.4% and 10.4% over the last three years which compared with MEH growth of 5.8% and 5.9% and UK growth of approximately 10.0% and 7.4% respectively.

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:



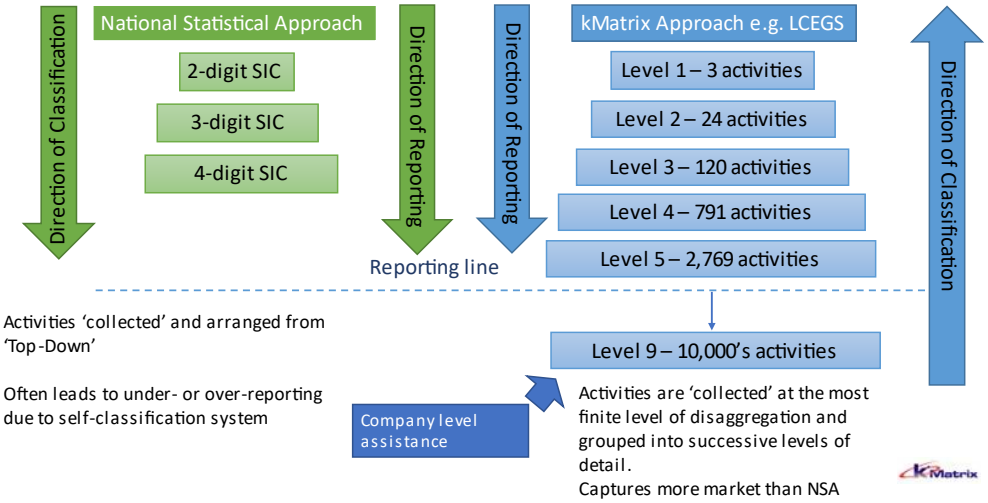
The sector is comprised of both core elements and those in the chain and network of supply, without whom the sector could not function.

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

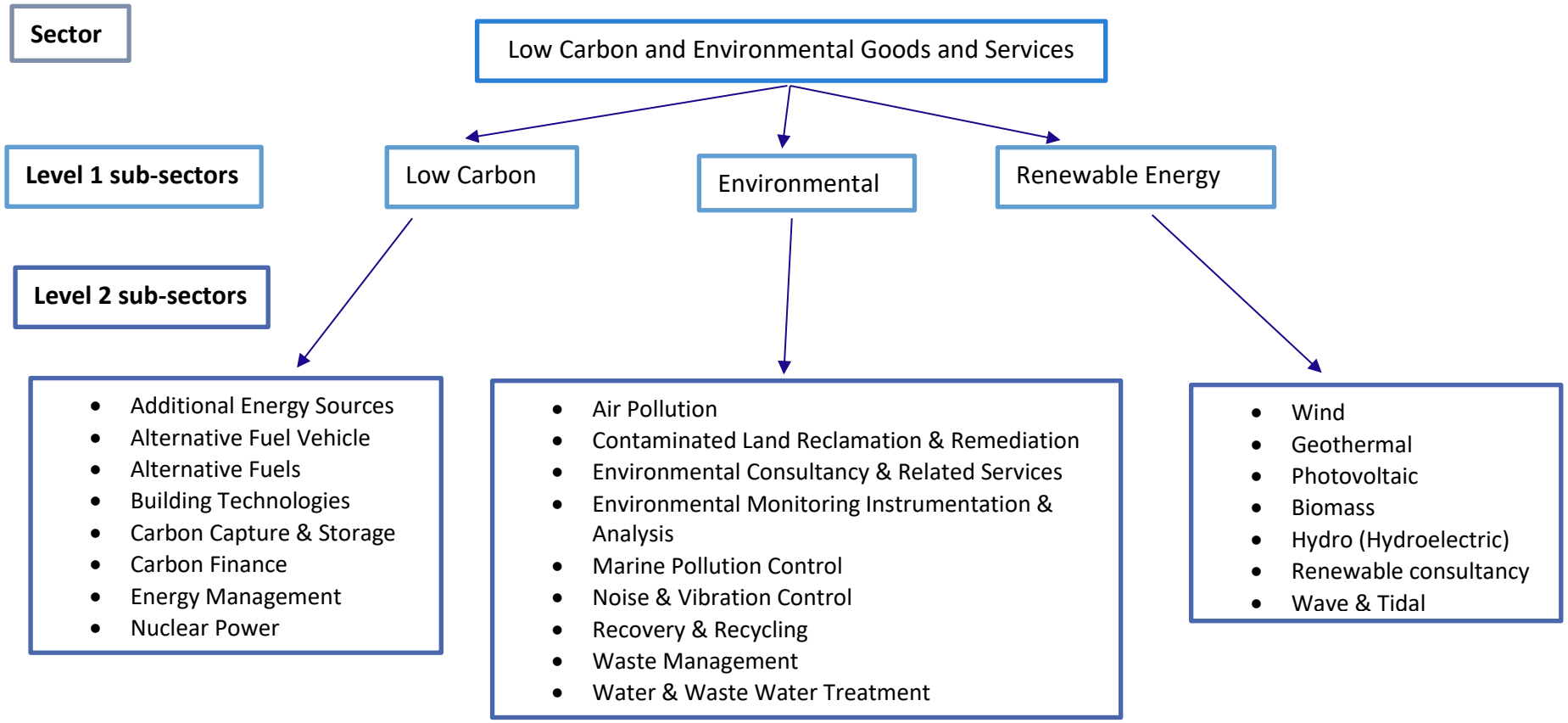
The data used in this report is based upon the work and methodology used by kMatrix to provide datasets on the UK's Low Carbon Environmental Goods and Services (LCEGS) sector for UK Government reported annually by the Department for Business, Innovation and Skills (BIS) from 2008/09 to 2011/12 and further 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?

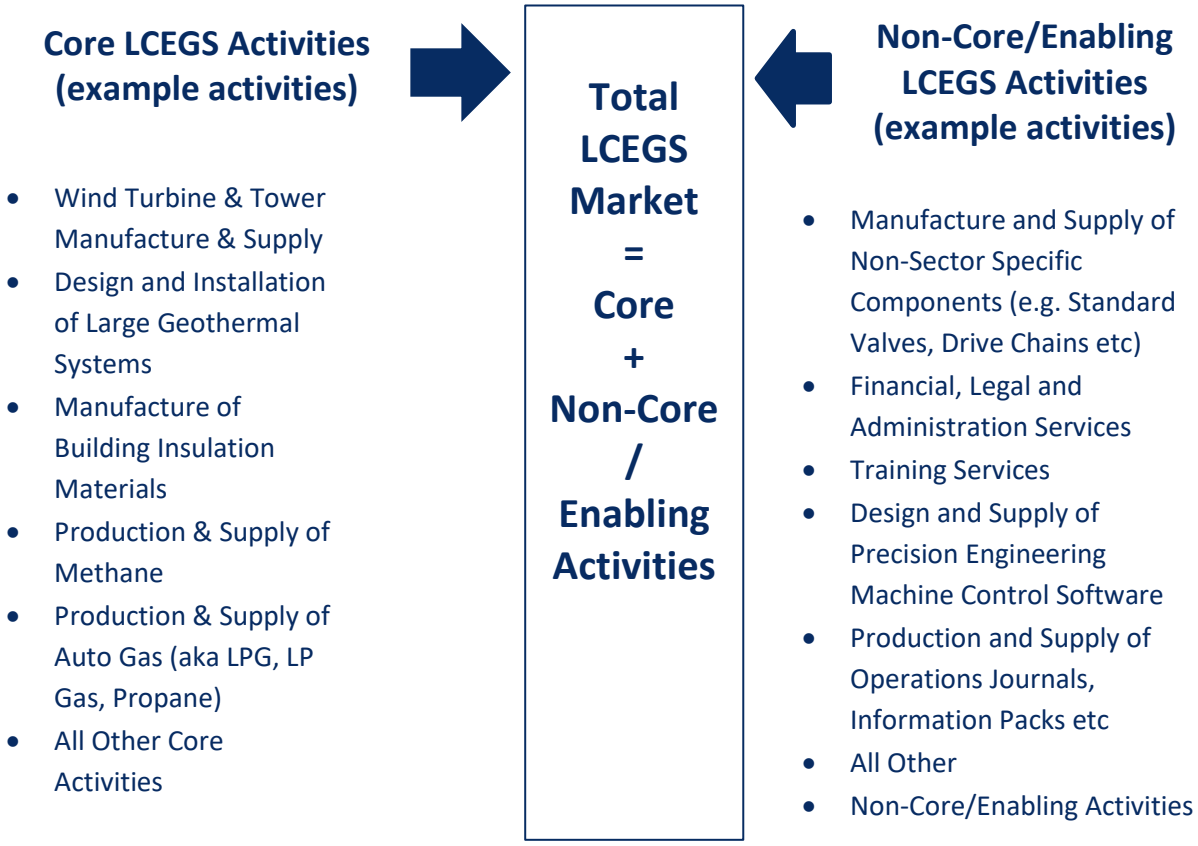
The dataset measures the core activities of the sector along with enabling activities in the supply chain, without whom the LCEGS sector could not operate. For example, the Wind sector includes those companies which develop the systems integration software enabling the power generated though turbines 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

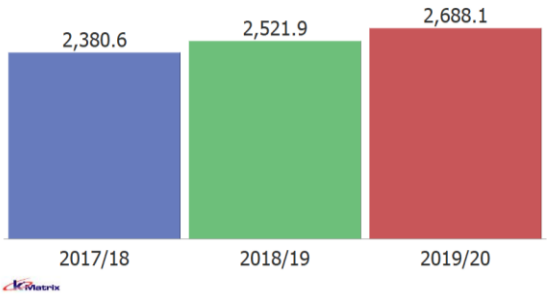
1. Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services (LCEGS) Analysis

This section of the report analyses the Stoke and Staffordshire 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 Stoke and Staffordshire 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

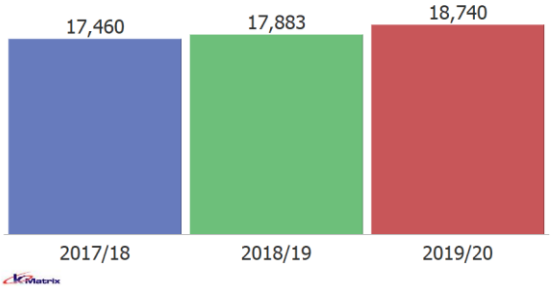


Stoke and Staffordshire LEP's LCEGS sales in 2019/20 were £2.7bn, up from £2.4bn in 2017/18.

Annual sales growth in Stoke and Staffordshire LEP's LCEGS was 5.9% from 2017/18 to 2018/19 and 6.6% 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

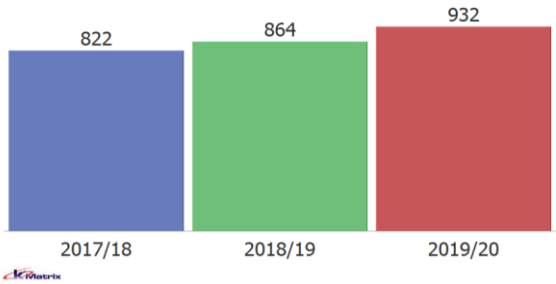


Stoke and Staffordshire LEP's LCEGS employment in 2019/20 was 18,740, up from 17,460 in 2017/18.

Annual employment growth in Stoke and Staffordshire LEP's LCEGS was 2.4% from 2017/18 to 2018/19 and 4.8% 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



Stoke and Staffordshire LEP's LCEGS company count in 2019/20 was 932, up from 822 in 2017/18.

Annual company growth in Stoke and Staffordshire LEP's LCEGS was 5.2% from 2017/18 to 2018/19 and 7.8% from 2018/19 to 2019/20.

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

Growth in the Stoke and Staffordshire LEP was higher for sales and companies and lower for employment between 2017/18 and 2019/20 when compared with the MEH Region as a whole.

1.2 Stoke and Staffordshire 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 Stoke and Staffordshire LEP for each of the last three years.

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

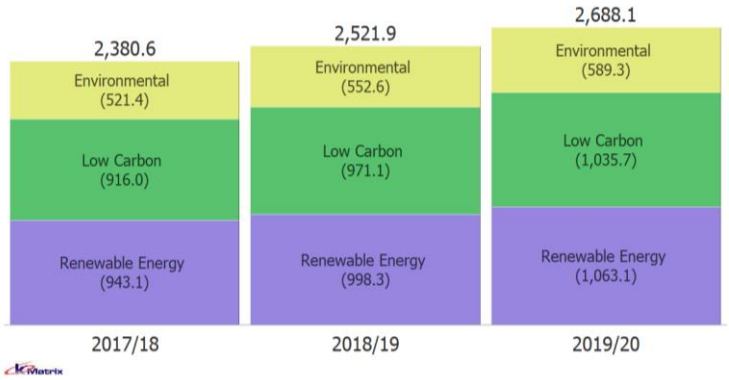


Figure 4 shows the three-year LCEGS sales split by Level 1.

In 2017/18 the split was 40% Renewable Energy, 38% Low Carbon and 22% Environmental. The split had changed 2019/20 to 40%, 39% 22%.

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

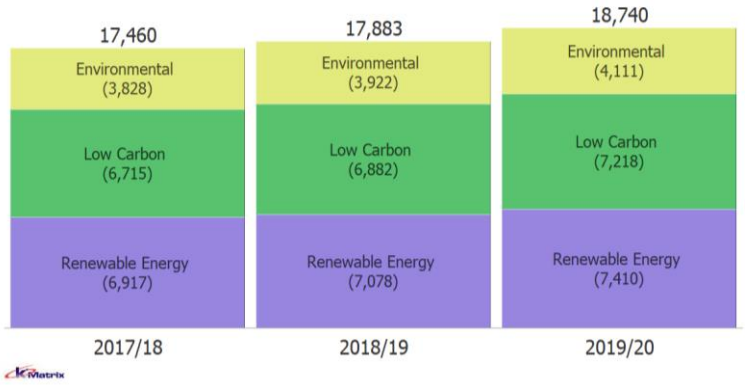


Figure 5 shows the three-year employment split by Level 1.

In 2017/18 the split was 40% Renewable Energy, 38% Low Carbon and 22% Environmental. The split had changed 2019/20 to 40%, 39% 22%.

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

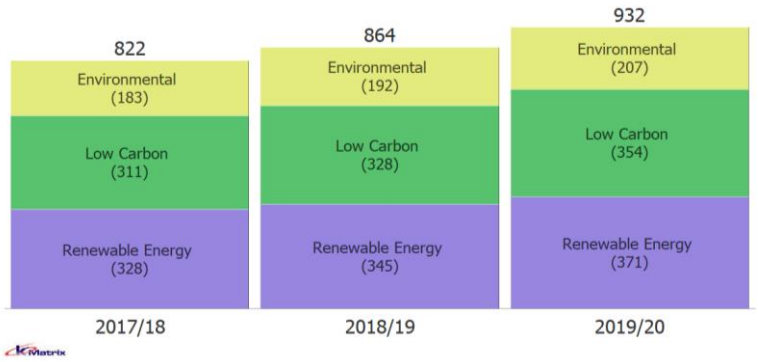


Figure 6 shows the three-year company split by Level 1.

In 2017/18 the split was 40% Renewable Energy, 38% Low Carbon and 22% Environmental. The split had not changed in 2019/20.

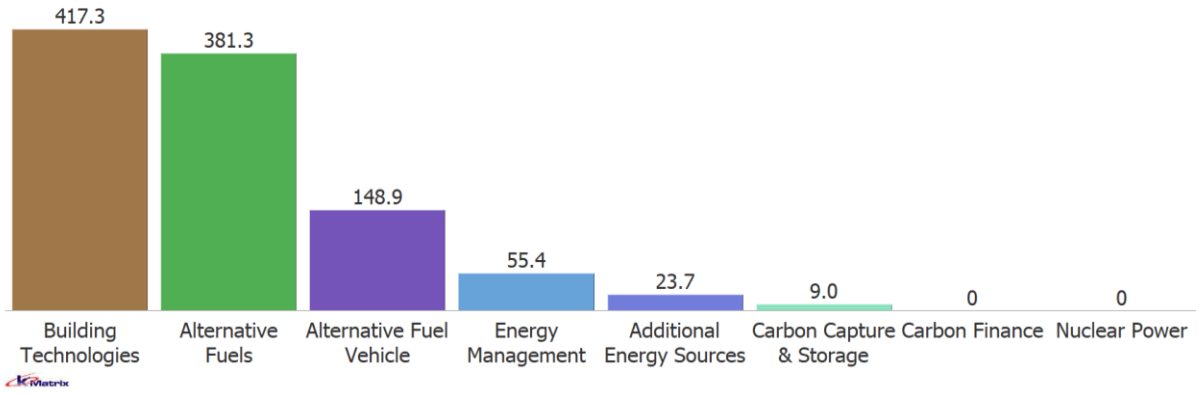
In 2019/20 MEH Regional LCEGS sales was split - Renewable Energy 39%, Low Carbon 39% and Environmental 22%.

1.3 Stoke and Staffordshire 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)

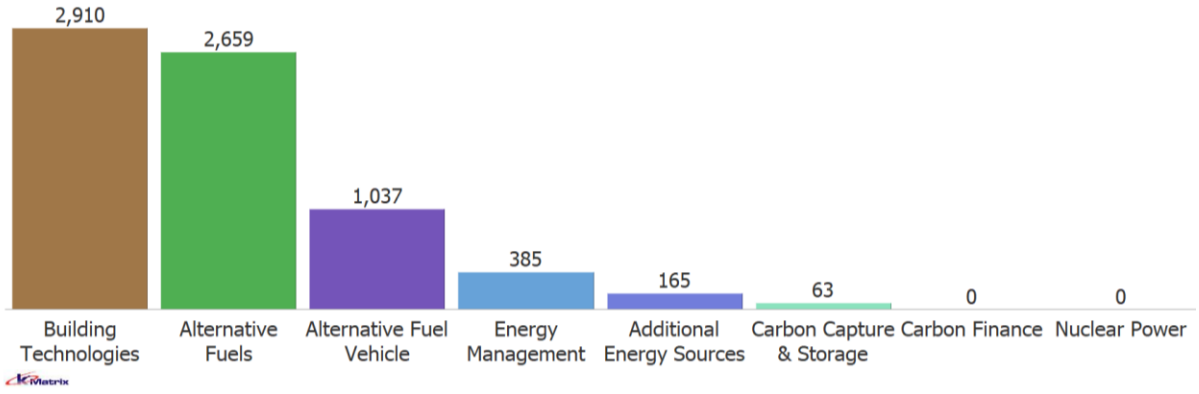
Figure 7: Sales 2019/20 in £m (Level 2)



Low Carbon is further sub-divided into eight sub-sectors, of which four account for 97% of sales (Figure 7). These four are made up of Building Technologies 40%, Alternative Fuels 37%, Alternative Fuel Vehicle 14% and Energy Management 5%.

Each of these four sub-sectors grew between 2017/18 and 2019/20: Building Technologies from £369.6m to £417.3m; Alternative Fuels from £336.3m to £381.3m; Alternative Fuel Vehicle from £132.0m to £148.9m and Energy Management from £49.1m to £55.4m.

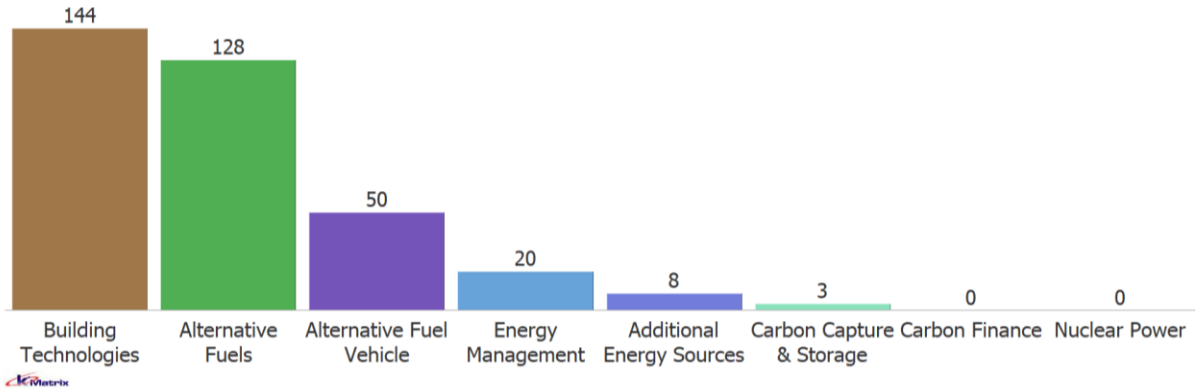
Figure 8: Employment 2019/20 (Level 2)



The same four sub-sectors account for 97% of employment (Figure 8). They are Building Technologies 40%, Alternative Fuels 37%, Alternative Fuel Vehicle 14% and Energy Management 5%.

Each of these four sub-sectors grew between 2017/18 and 2019/20: Building Technologies from 2,709 to 2,910; Alternative Fuels from 2,466 to 2,659; Alternative Fuel Vehicle from 969 to 1,037 and Energy Management from 359 to 385.

Figure 9: Companies 2019/20 (Level 2)

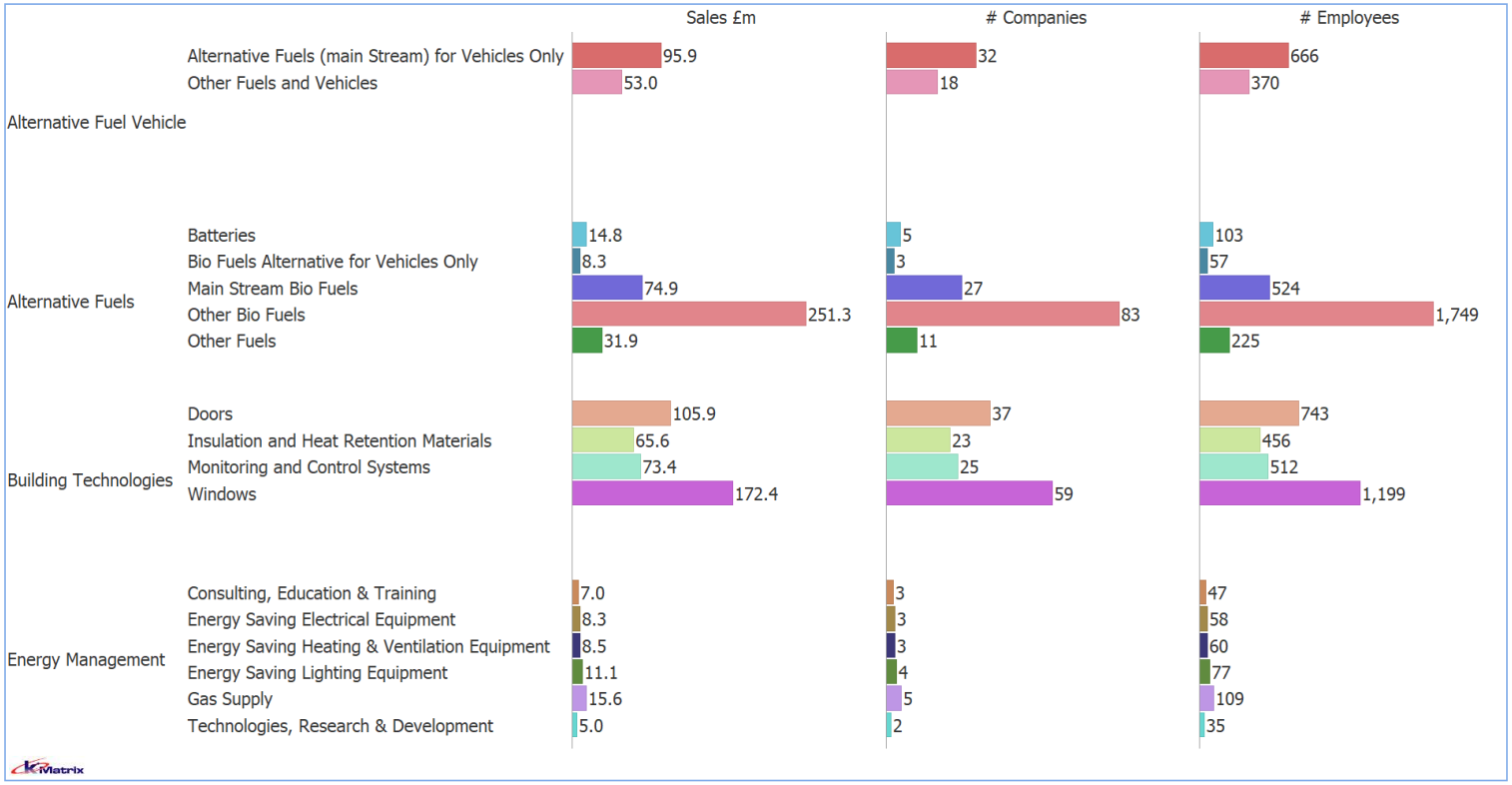


The same four sub-sectors again account for 97% of companies (Figure 9). They are Building Technologies 41%, Alternative Fuels 36%, Alternative Fuel Vehicle 14% and Energy Management 6%.

Each of these four sub-sectors grew between 2017/18 and 2019/20: Building Technologies from 127 to 144; Alternative Fuels from 112 to 128; Alternative Fuel Vehicle from 44 to 50 and Energy Management from 17 to 20.

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 four Level 2 sub-sectors for Low Carbon are Alternative Fuel Vehicle, Alternative Fuels, Building Technologies and Energy Management, making up 97% of the Low Carbon market in the Stoke and Staffordshire 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 41% 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.

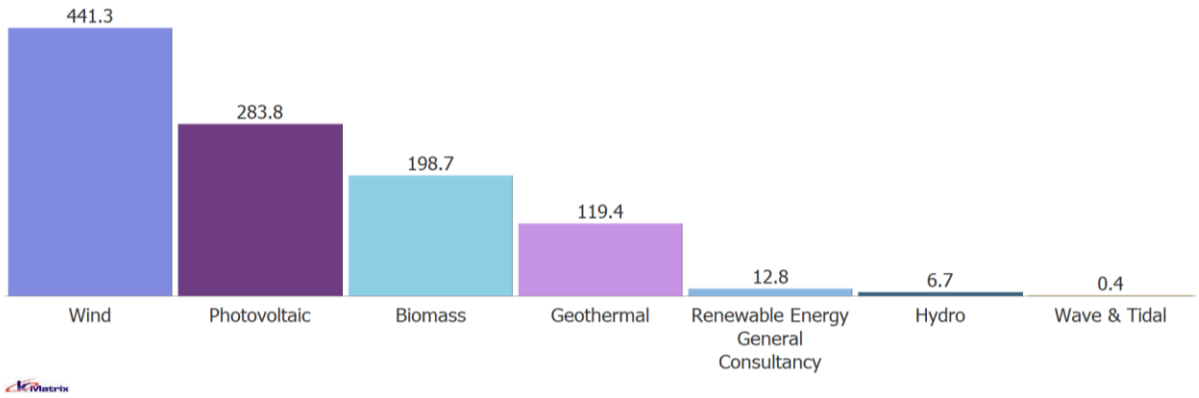
Energy Management has six sub-sectors at level 3, with Gas Supply holding 28% of the market share. Example companies in this sub-sector would include registered gas engineers, measurement and control systems and fitting and maintenance.

1.4 Stoke and Staffordshire 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

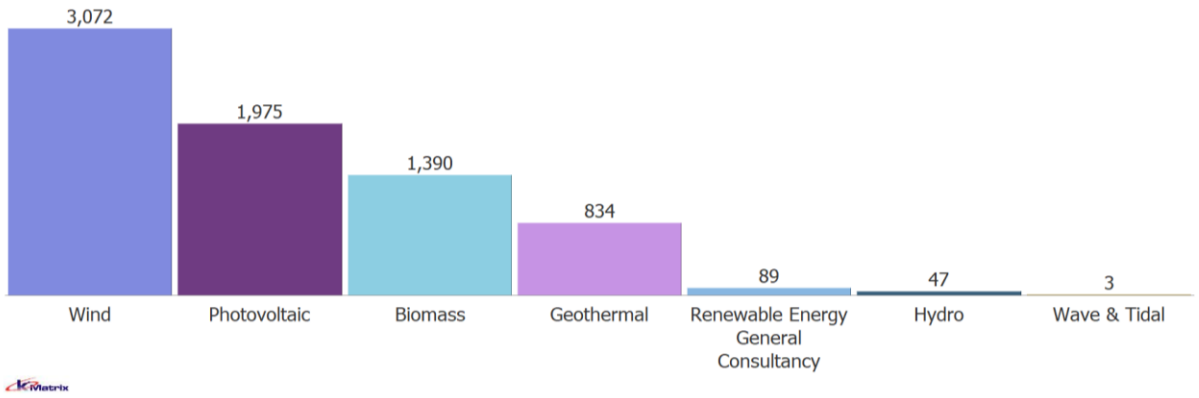
Figure 11: Sales 2019/20 in £m (Level 2)



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 19% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from £391.1m to £441.3m; Photovoltaic from £252.2m to £283.8m; Biomass from £176.3m to £198.7m and Geothermal from £105.9m to £119.4m.

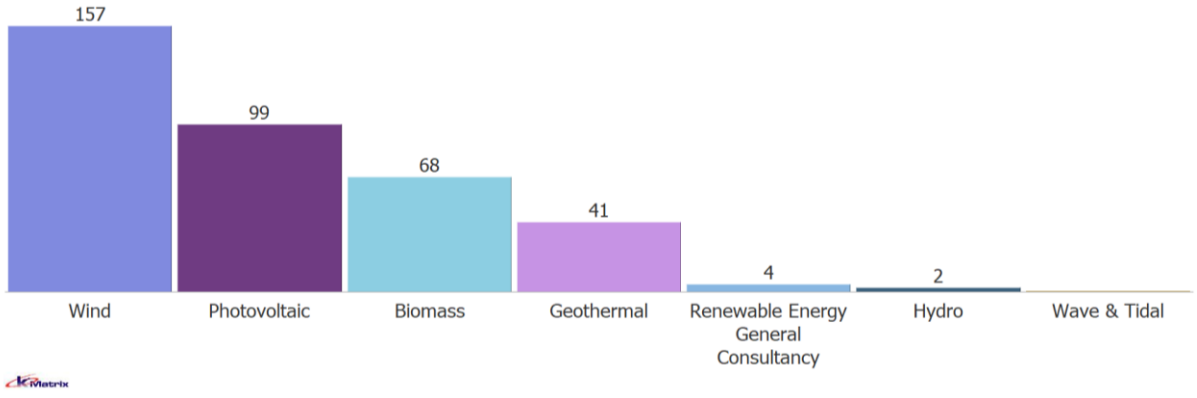
Figure 12: Employment 2019/20 (Level 2)



The same four sub-sectors account for 98% of employment (Figure 12). They are made up of Wind 41%, Photovoltaic 27%, Biomass 19% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from 2,867 to 3,072; Photovoltaic from 1,845 to 1,975; Biomass from 1,297 to 1,390 and Geothermal from 778 to 834.

Figure 13: Companies 2019/20 (Level 2)



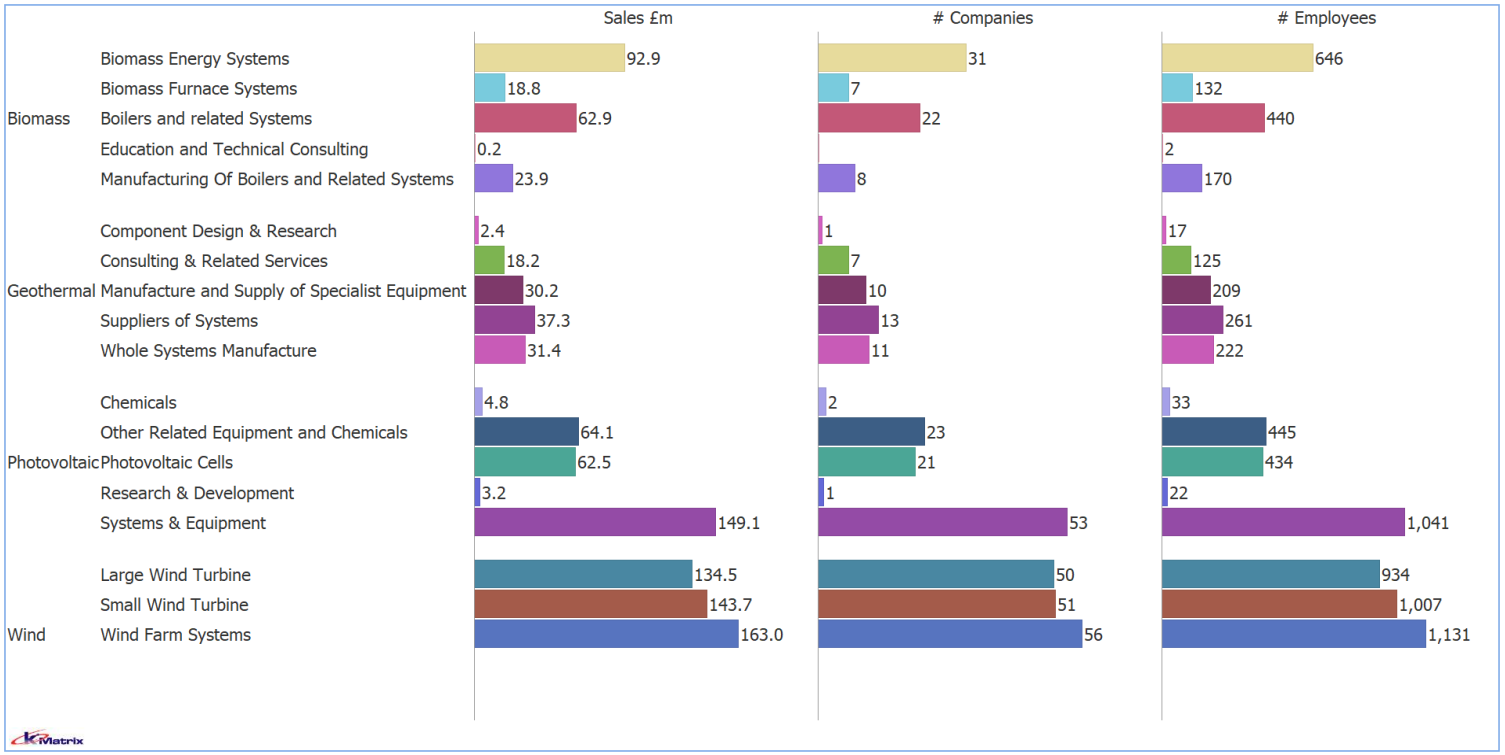
The same four sub-sectors also account for 98% of companies (Figure 13). They are made up of Wind 42%, Photovoltaic 27%, Biomass 18% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from 138 to 157; Photovoltaic from 88 to 99; Biomass from 59 to 68 and Geothermal from 36 to 41.

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 3 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 Stoke and Staffordshire 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 37% 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.

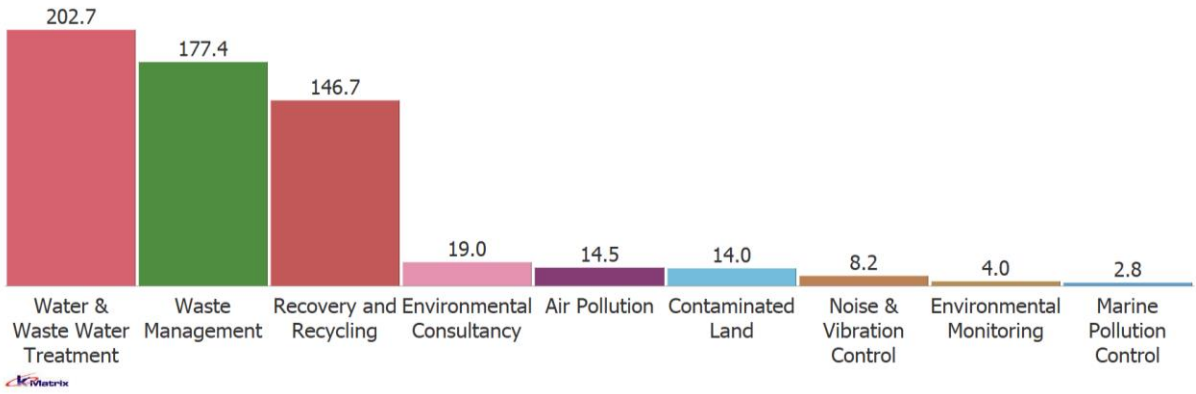
Geothermal has five sub-sectors at Level 3, the largest being Suppliers of Systems which makes up 31% of the sales in this market. Example companies include lateral geothermal systems providers and installers at the domestic and small commercial level and vertical control systems developers and suppliers.

1.5 Stoke and Staffordshire 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

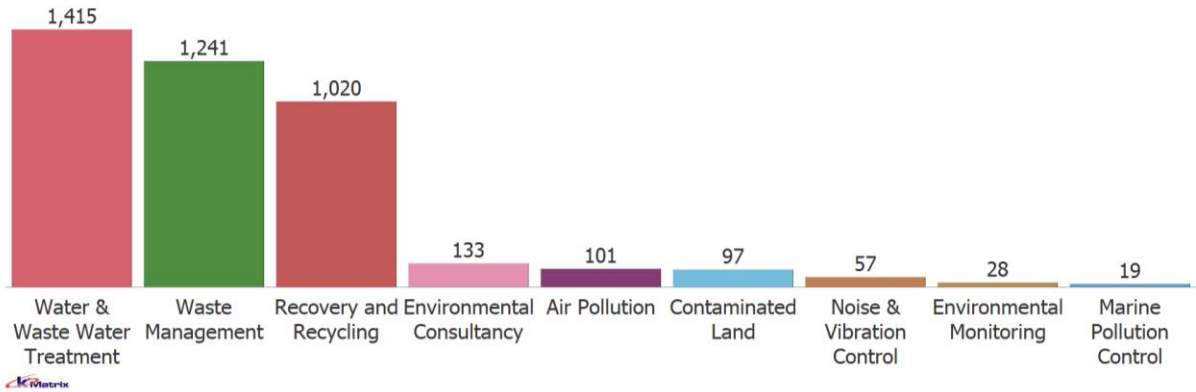
Figure 15: Sales 2019/20 in £m (Level 2)



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 £179.1m to £202.7m; Waste Management from £157.4m to £177.4m and Recovery and Recycling from £129.6m to £146.7m.

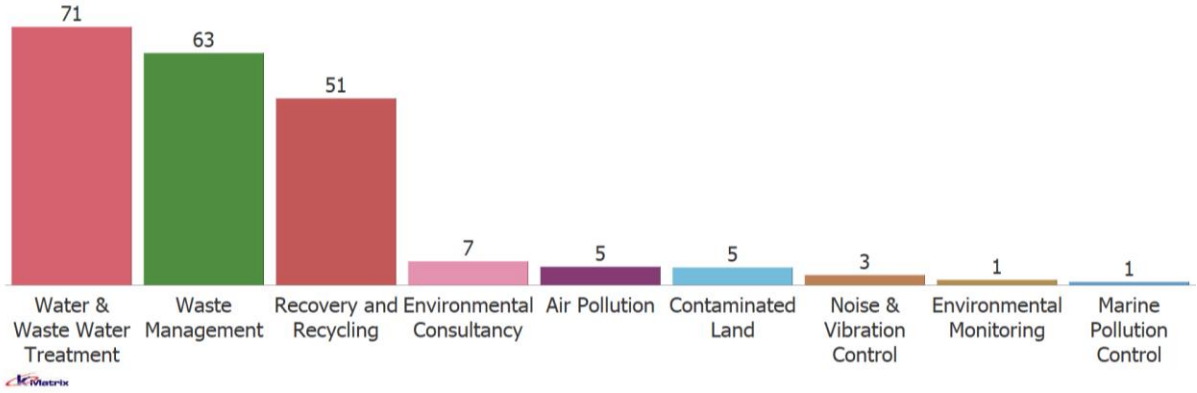
Figure 16: Employment 2019/20 (Level 2)



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 1,316 to 1,415; Waste Management from 1,159 to 1,241 and Recovery and Recycling from 948 to 1,020.

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 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 62 to 71; Waste Management from 56 to 63 and Recovery and Recycling from 45 to 51.

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

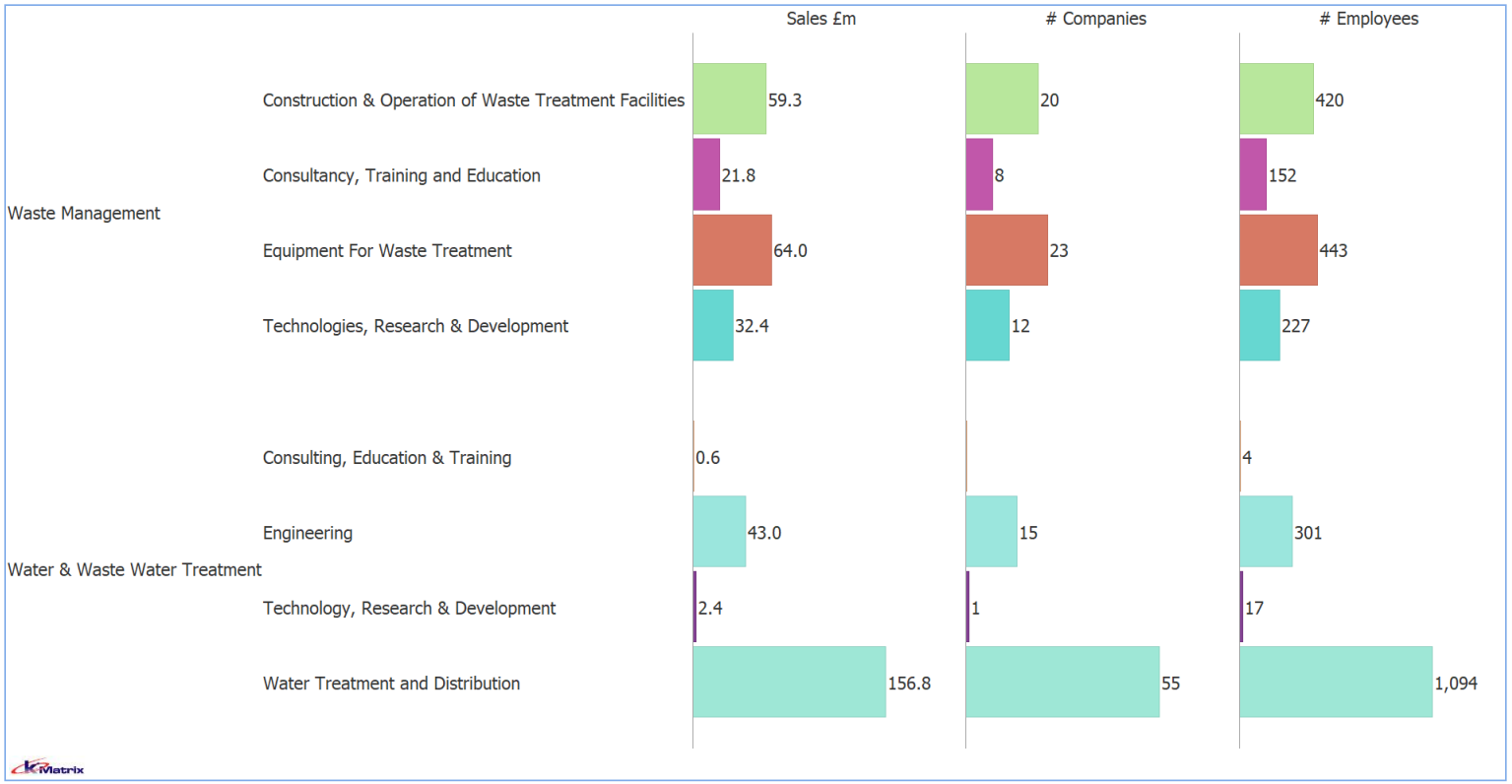


Figure 18 shows the Sales, Companies and Employees for the Waste Management and Water & Waste Water Treatment Level 2 sub-sectors broken down into their Level 3 sub-sectors.

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

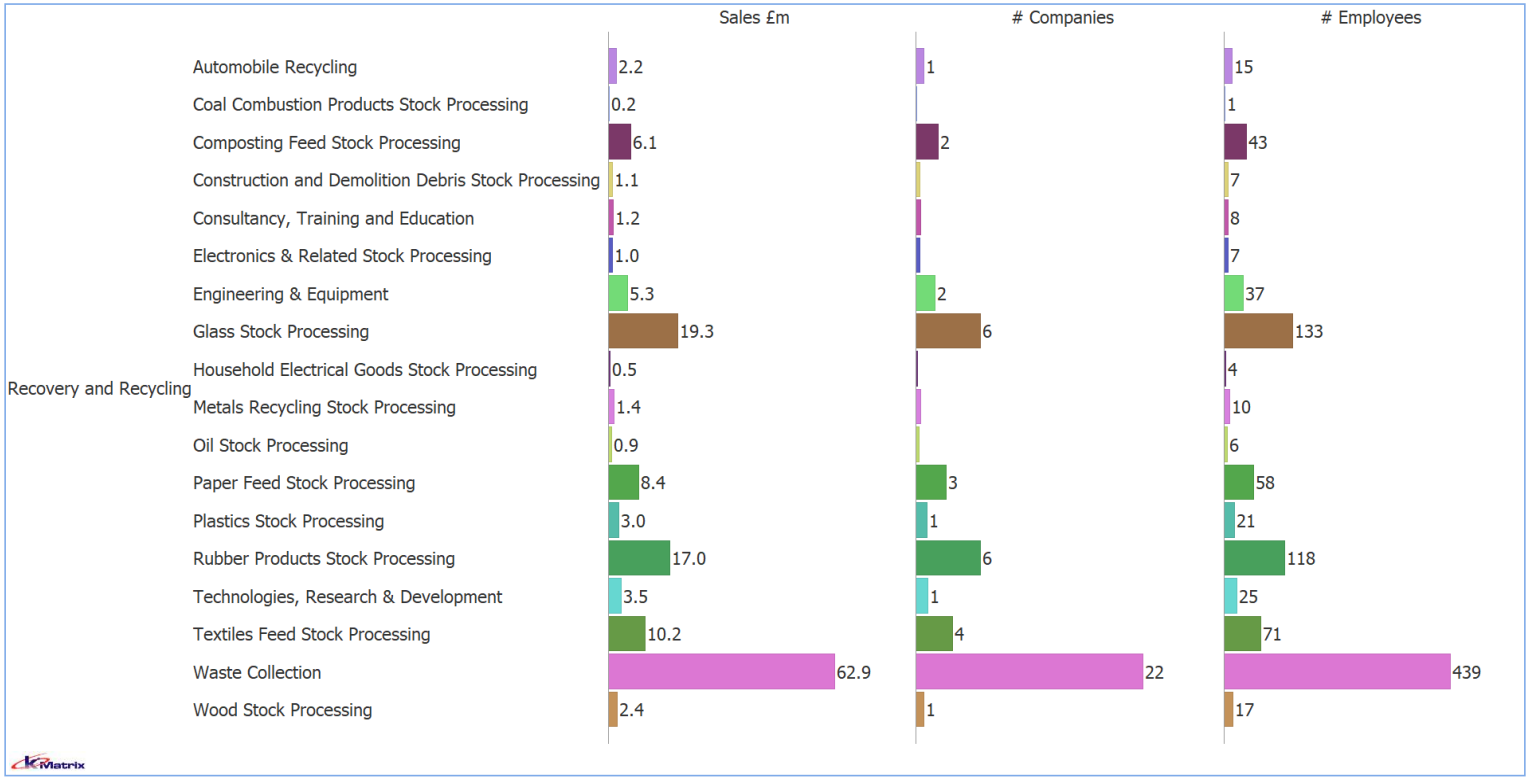


Figure 19 shows the Sales, Companies and Employees for the Level 2 Recovery & Recycling sub-sector broken down into its Level 3 sub-sectors. There are eighteen Level 3 sub-sectors and Waste Collection, including the collection of all waste, both municipal and commercial (landfill and recyclates), is clearly the largest sub-sector making up 43% 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.

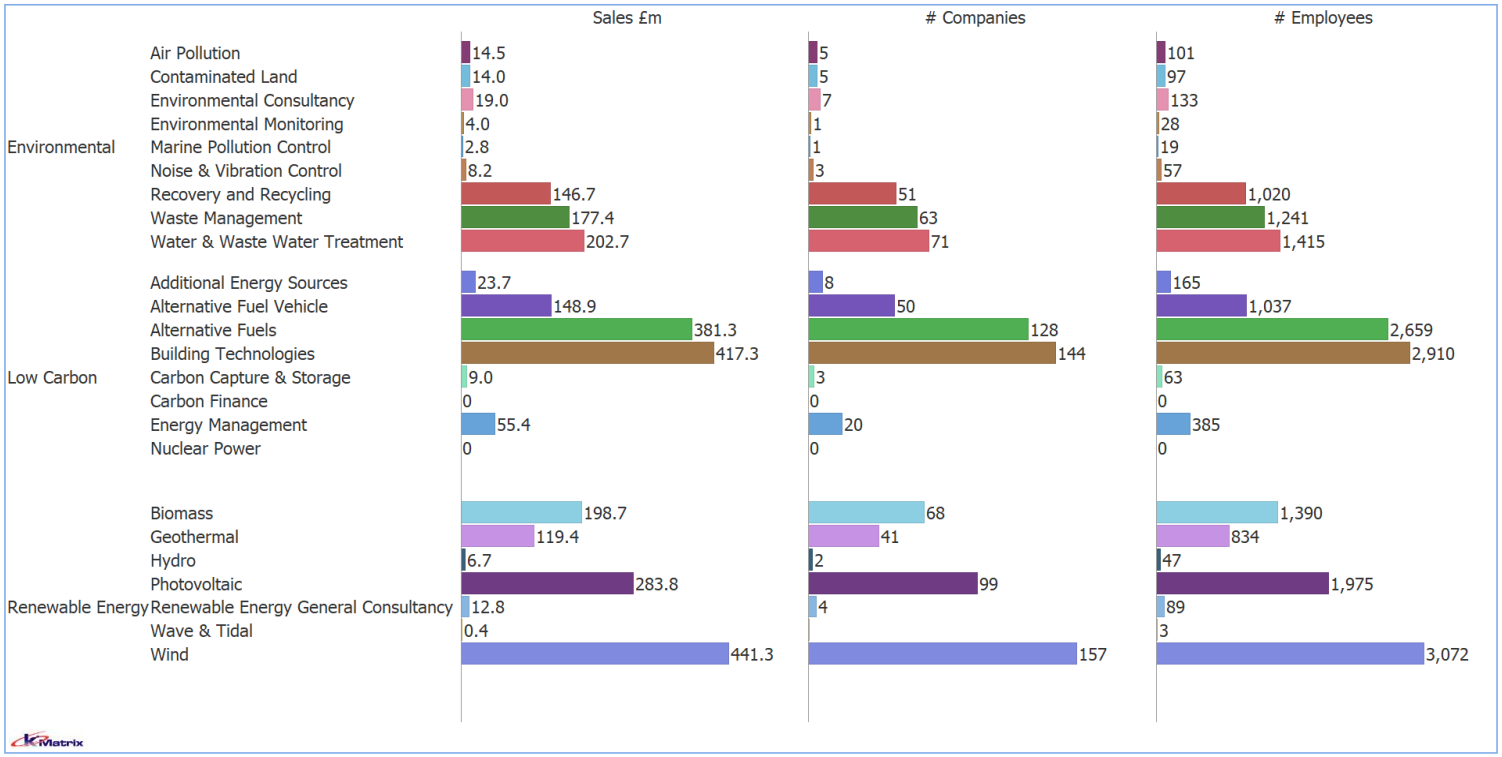
1.6 Stoke and Staffordshire LEP's LCEGS Level 2 Summary

Figure 20 compares all 24 sub-sectors of LCEGS and shows that the four leading sub-sectors: Wind (16%), Building Technologies (16%), Alternative Fuels (14%) and Photovoltaic (11%) and have the largest share in terms of sales, company numbers and employment and accounted for 57% of Stoke and Staffordshire LEP's LCEGS sector activity in 2019/20.

There is then a second grouping of seven sub-sectors that are: Water & Waste Water Treatment 8%, Biomass 7%, Waste Management 7%, Alternative Fuel Vehicle 6%, Recovery and Recycling 5%, Geothermal 4% and Energy Management 2%, and that make up a further 39% of the LCEGS sector sales in 2019/20.

These 11 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 Stoke and Staffordshire LEP and the MEH's LCEGS compared

The Stoke and Staffordshire LEP accounts for 10% of the Midlands Energy Hub Region's LCEGS sector.

Figure 21: Stoke and Staffordshire LEP Measures 2019/20 by Level 1

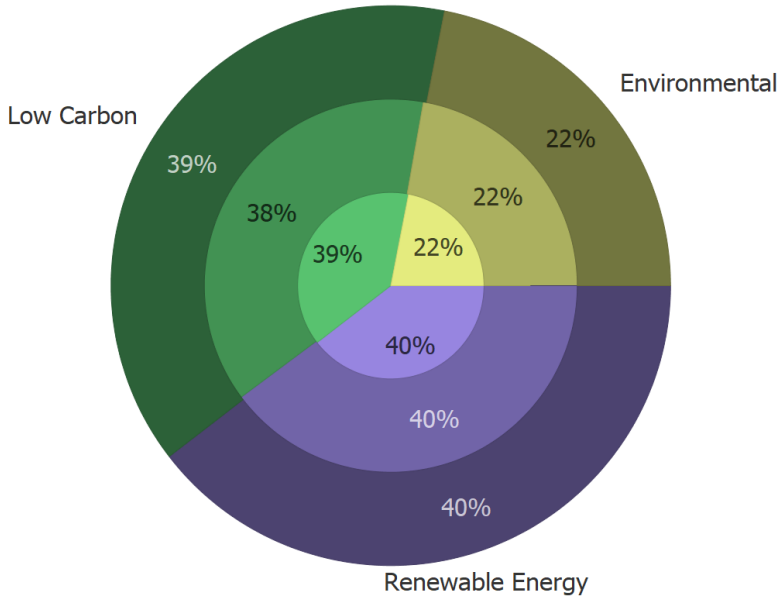
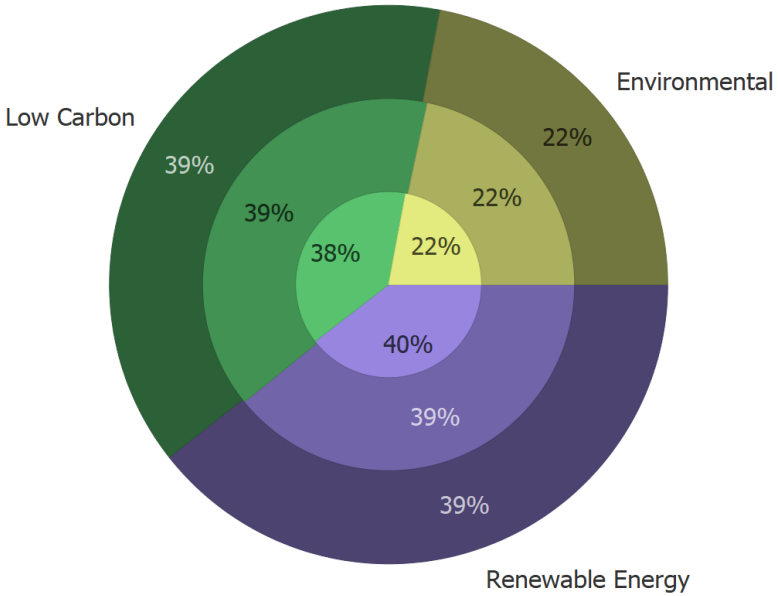


Figure 22: MEH Measures 2019/20 by Level 1



Figures 21 and 22 compare the profile of the Stoke and Staffordshire LEP and the MEH region's LCEGS activities at Level 1 for sales (outer circle), companies (middle circle) and employment (inner circle). Stoke and Staffordshire LEP is broadly in line with the MEH LCEGS sector, with slightly more market within the Renewable Energy sub-sector than the regional average.

Figure 23: Stoke and Staffordshire LEP's LCEGS sub-sectors for 2019/20 at Level 2

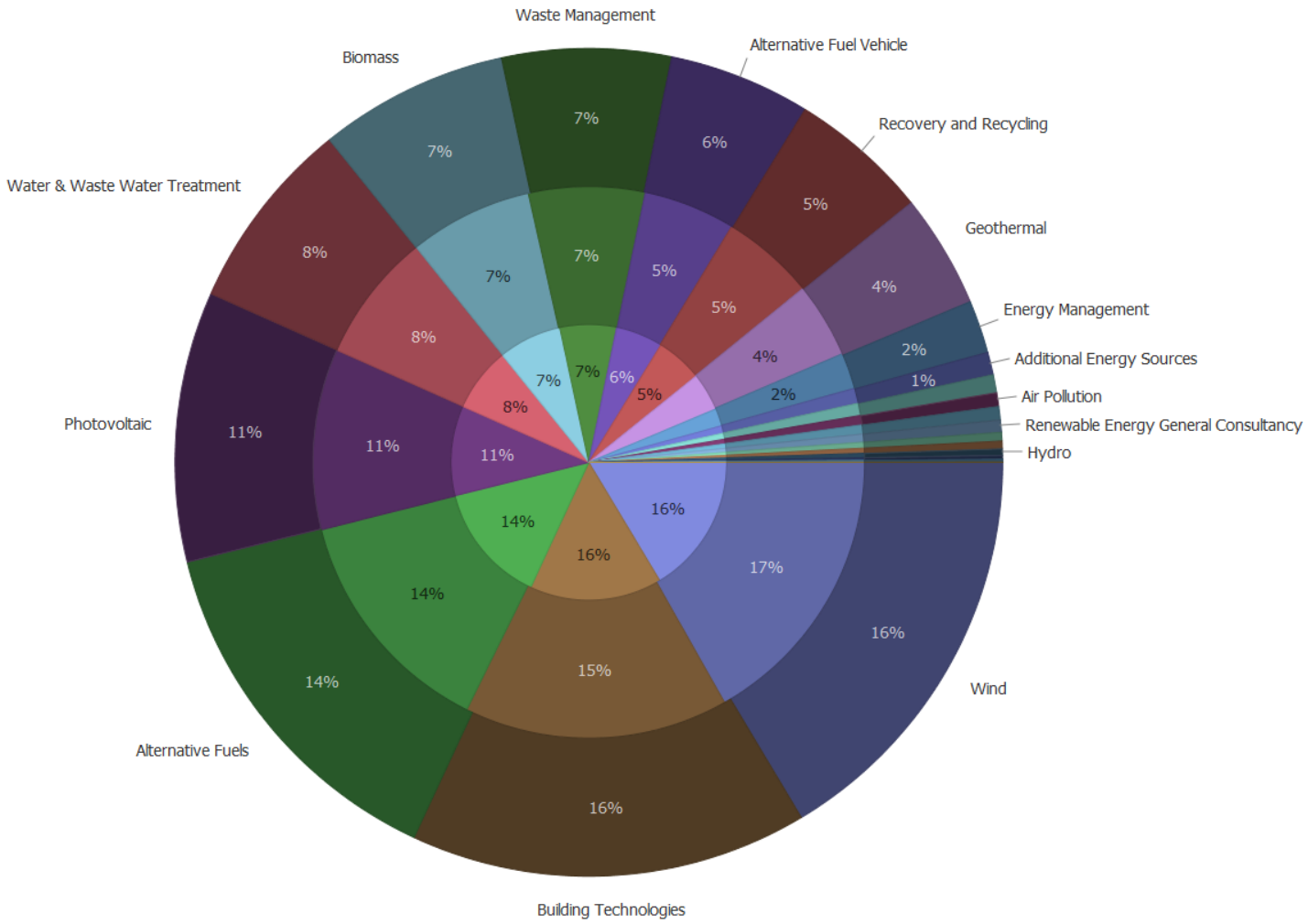
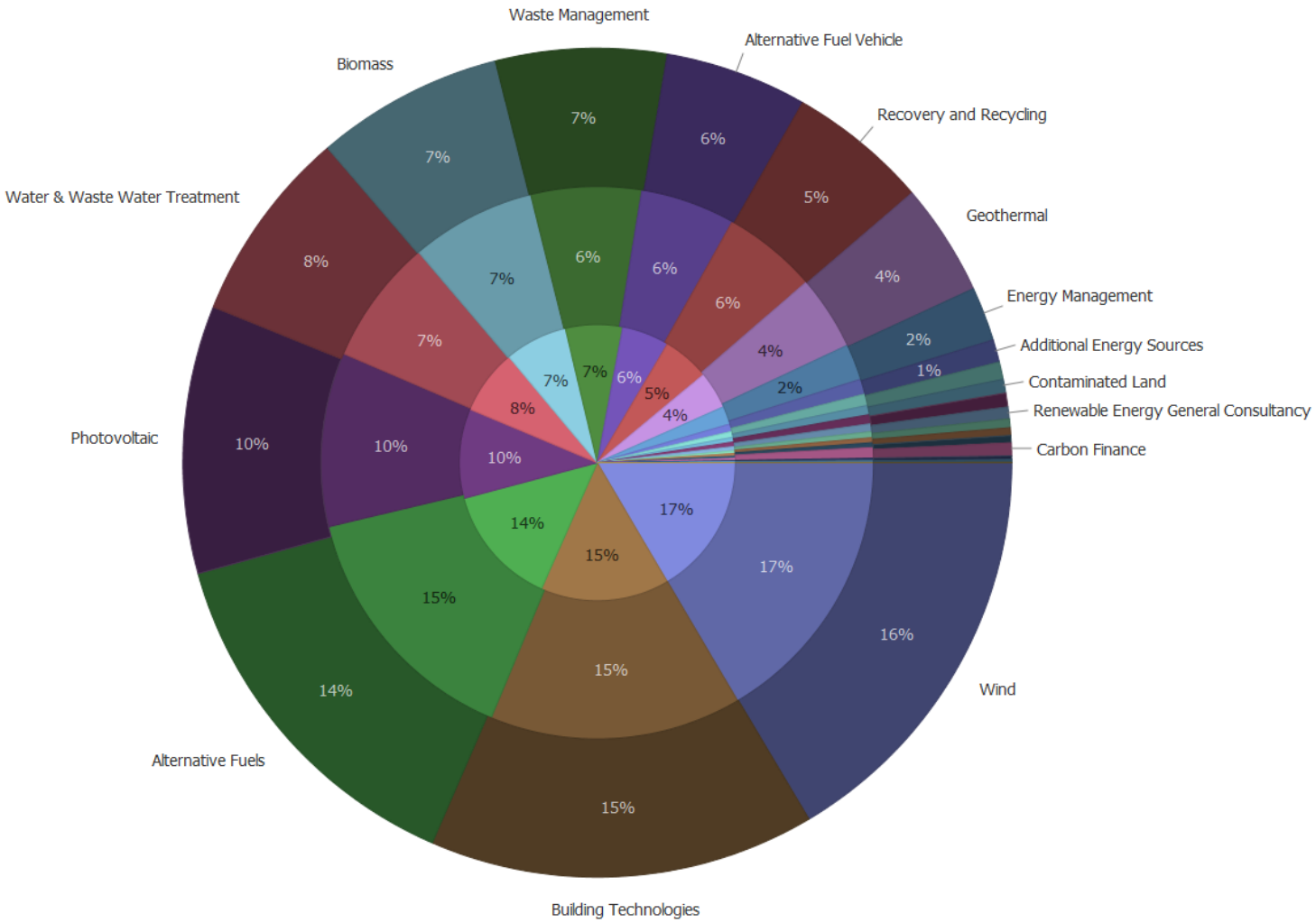


Figure 24: MEH's LCEGS sub-sectors for 2019/20 at Level 2



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

There are only subtle differences between the two, such as slightly stronger Building Technologies and Photovoltaic in the Stoke and Staffordshire 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 Stoke and Staffordshire LEP's LCEGS Investment in R&D

This section examines the investment profile of the Stoke and Staffordshire 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: Stoke and Staffordshire LEP's LCEGS Investment in R&D by Fiscal Year

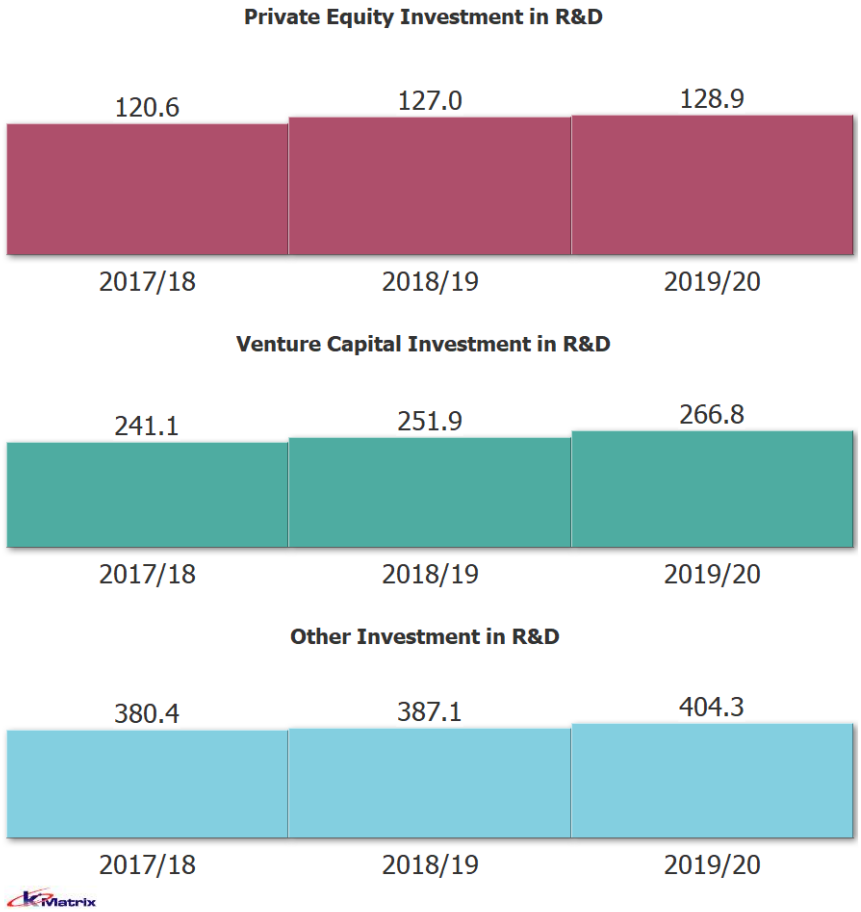


Figure 25 shows the investment for the three financial years of the sector study, made into the whole LCEGS sector.

Private Equity Investment has grown from £121m in 2017/18 to £129m in 2019/20, representing 5.3% growth between 2017/18 and 2018/19 and 1.5% growth between 2018/19 and 2019/20.

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

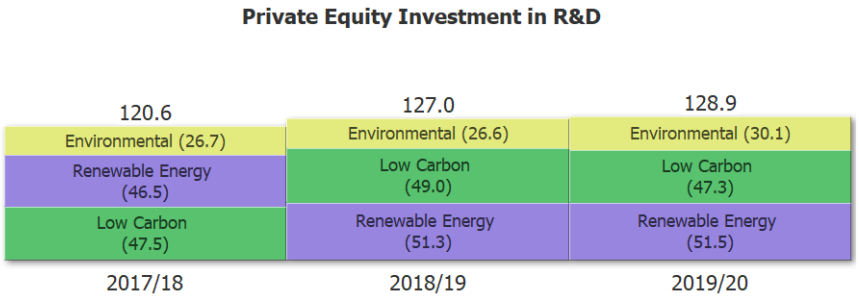
Venture Capital Investment has grown from £241m in 2017/18 to £267m in 2019/20, representing 4.5% growth between 2017/18 and 2018/19 and 5.9% growth between 2018/19 and 2019/20.

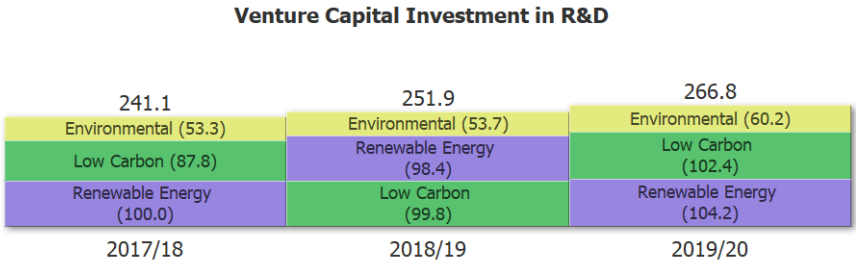
By comparison, the MEH region's growth rates were 5.4% and 6.2%.

Other Investment has grown from £380m in 2017/18 to £404m in 2019/20, representing 1.8% growth between 2017/18 and 2018/19 and 4.4% growth between 2018/19 and 2019/20.

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

Figure 26: Stoke and Staffordshire LEP's LCEGS Investment in R&D by Fiscal Year – Level 1





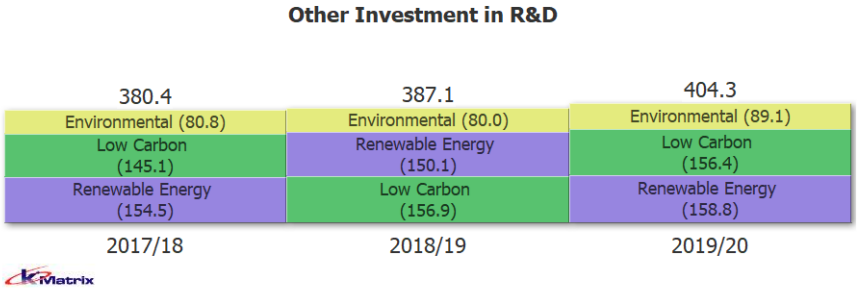


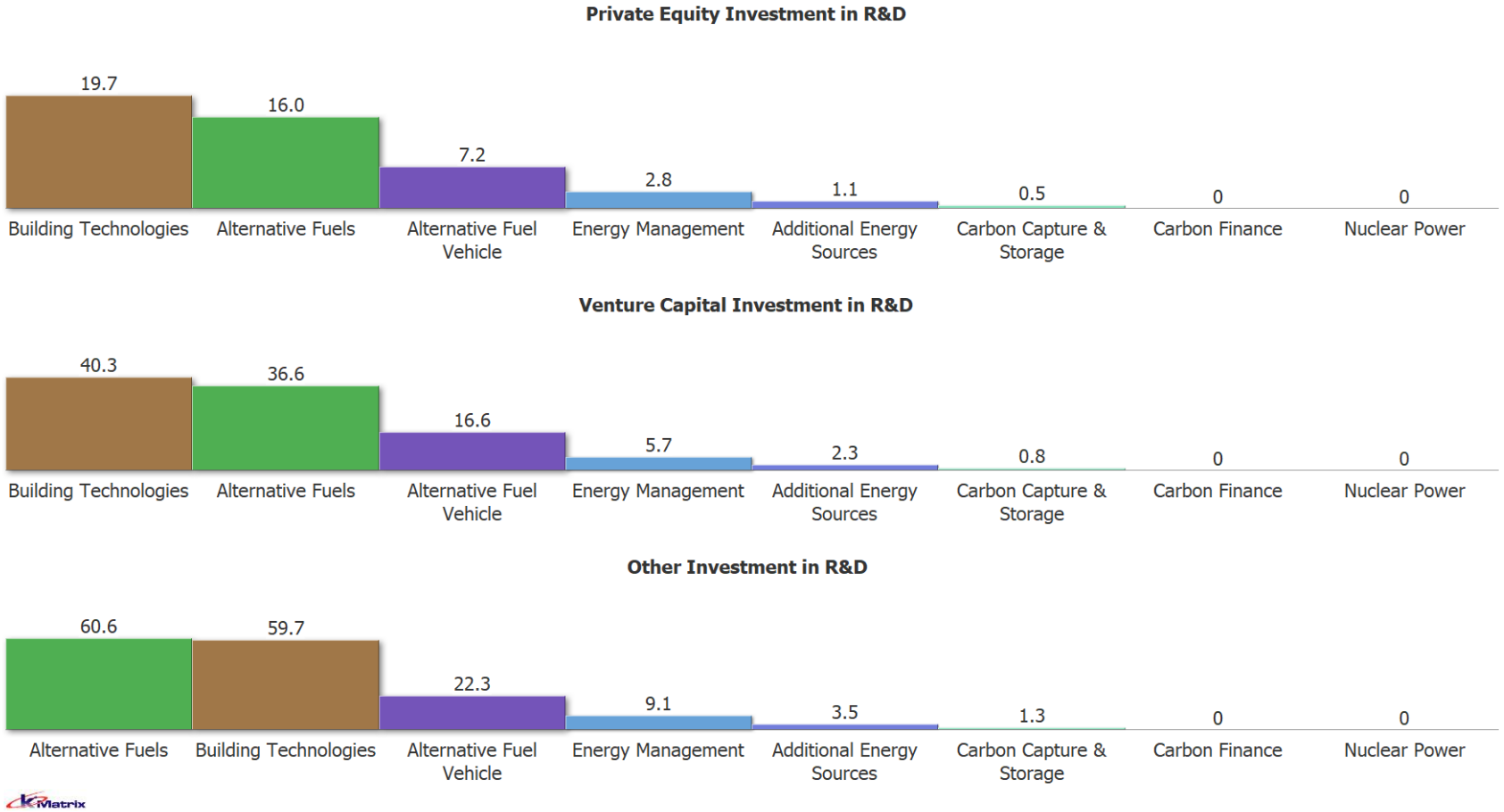
Figure 26 shows the investment for the three financial years of the sector study, made into the LCEGS sector, split into Level 1.

Private Equity Investment was split in 2019/20 Renewable Energy 40%, Low Carbon 37% and Environmental 23%. This is broadly in line with the sales split of 40%, 38% and 22%.

Venture Capital Investment was split in 2019/20 Renewable Energy 39%, Low Carbon 38% and Environmental 23%. This is broadly in line with the sales split of 40%, 38% and 22%.

Other Investment was split in 2019/20 Renewable Energy 39%, Low Carbon 39% and Environmental 22%. This is broadly in line with the sales split of 40%, 38% and 22%.

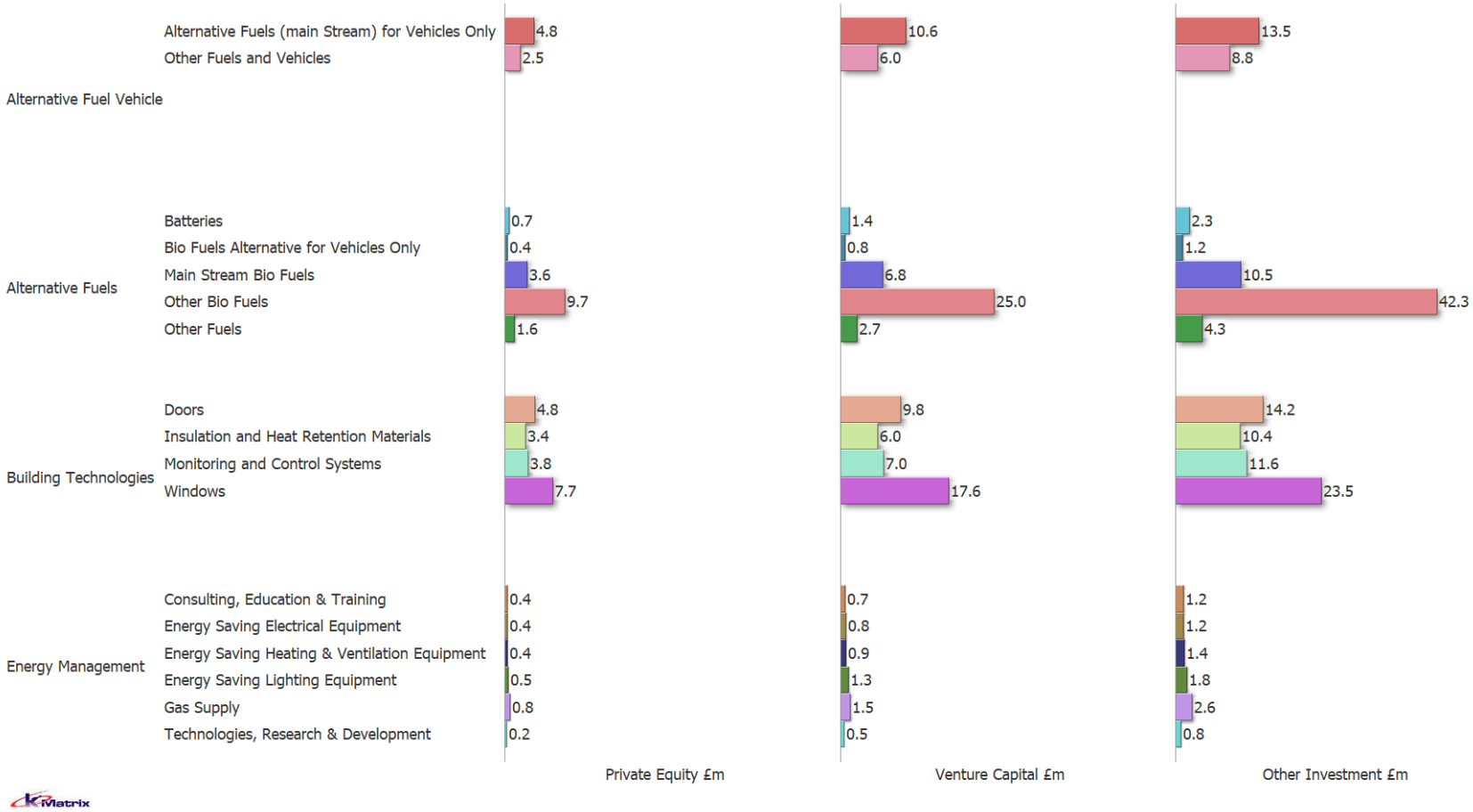
Figure 27: Stoke and Staffordshire LEP's LCEGS Investment in R&D 2019/20 – Level 2 Low Carbon



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

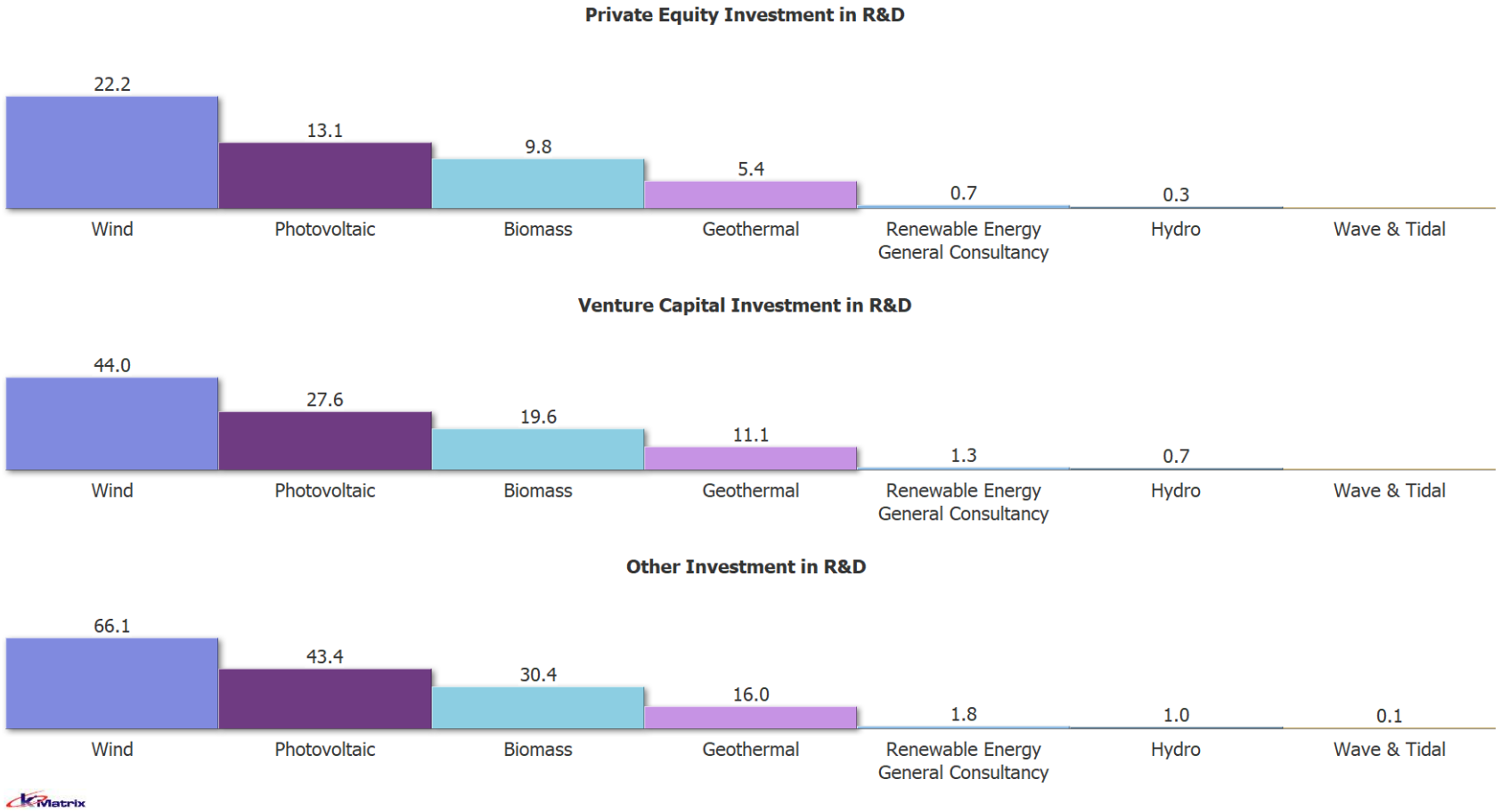
- Building Technologies from £19m to £20m for Private Equity, £35m to £40m for Venture Capital and £55m to £60m for Other Investment
- Alternative Fuels fell from £18m to £16m for Private Equity, grew from £29m to £37m for Venture Capital and £57m to £61m for Other Investment
- Alternative Fuel Vehicle was steady at £7m for Private Equity, grew from £15m to £17m for Venture Capital and £21m to £22m for Other Investment
- Energy Management was steady at £3m for Private Equity, grew from £5m to £6m for Venture Capital and £8m to £9m for Other Investment

Figure 28: Stoke and Staffordshire 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.

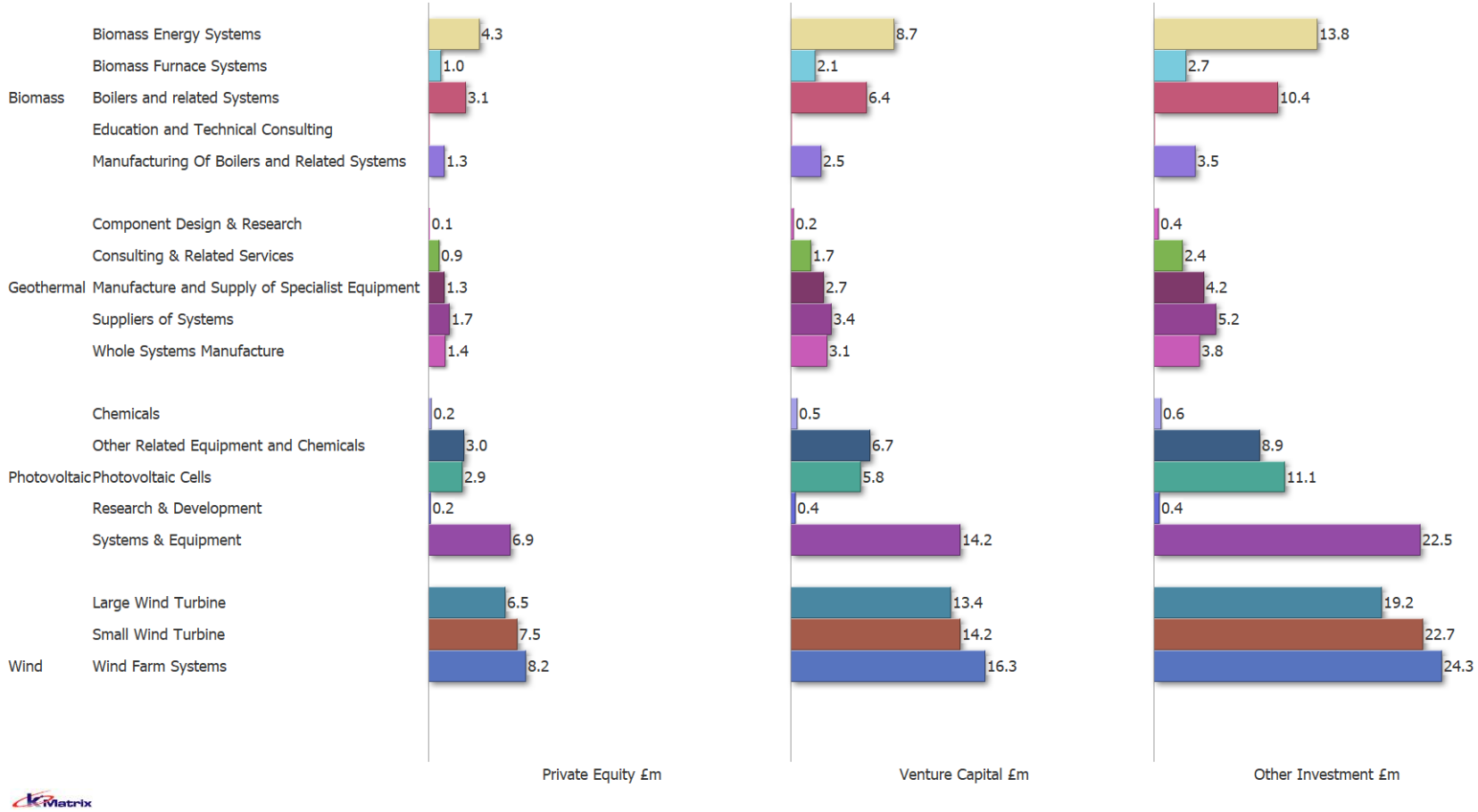
Figure 29: Stoke and Staffordshire LEP's LCEGS Investment in R&D 2019/20 – Level 2 Renewable Energy



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

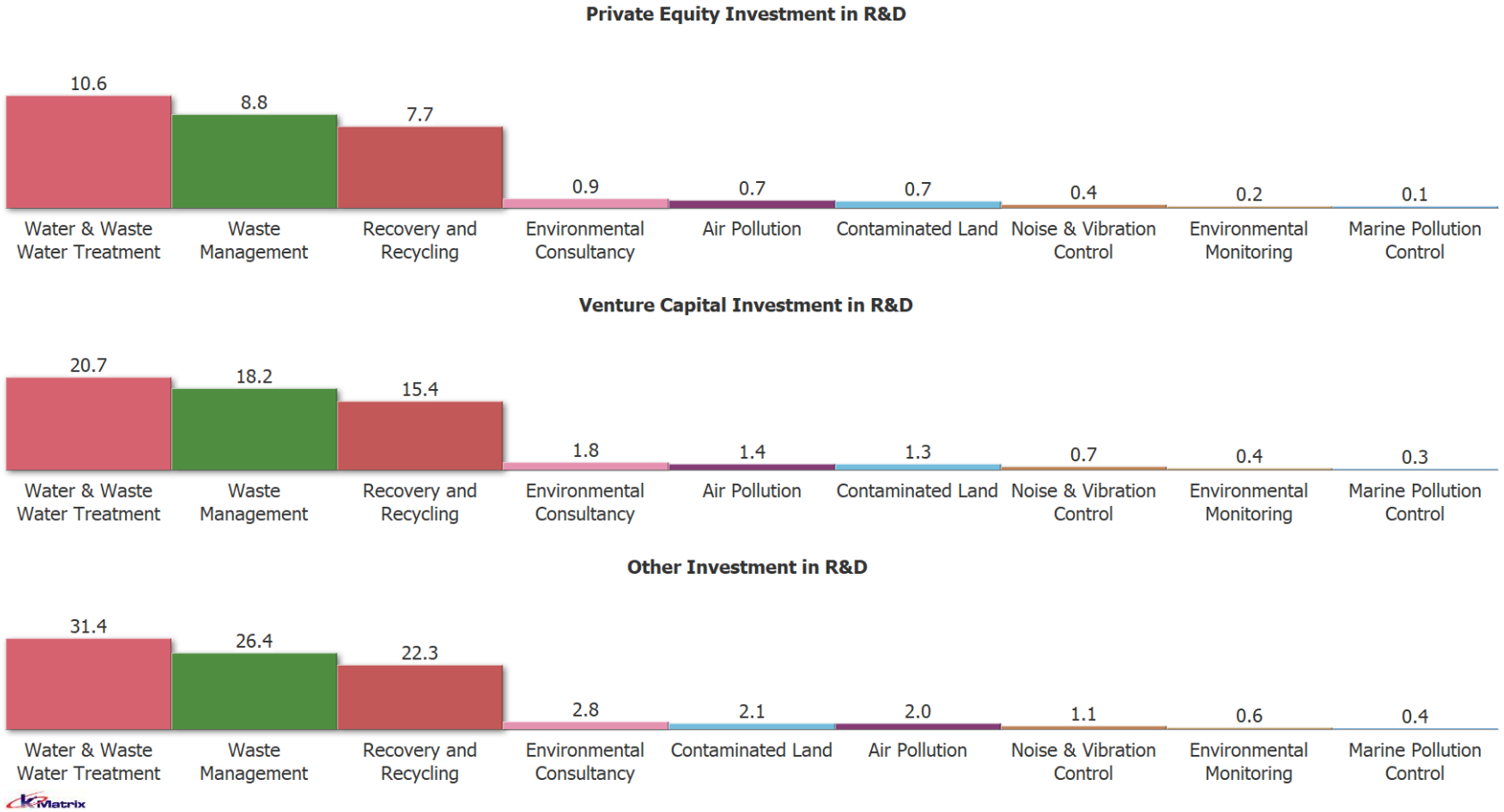
- Wind from £18m to £22m for Private Equity, £43m to £44m for Venture Capital and £65m to £66m for Other Investment
- Photovoltaic was steady at £13m for Private Equity, grew from £26m to £28m for Venture Capital and £40m to £43m for Other Investment
- Biomass grew from £9m to £10m for Private Equity, £18m to £20m for Venture Capital and was steady at £30m for Other Investment
- Geothermal was steady at £5m for Private Equity, £11m for Venture Capital and fell from £17m to £16m for Other Investment

Figure 30: Stoke and Staffordshire 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.

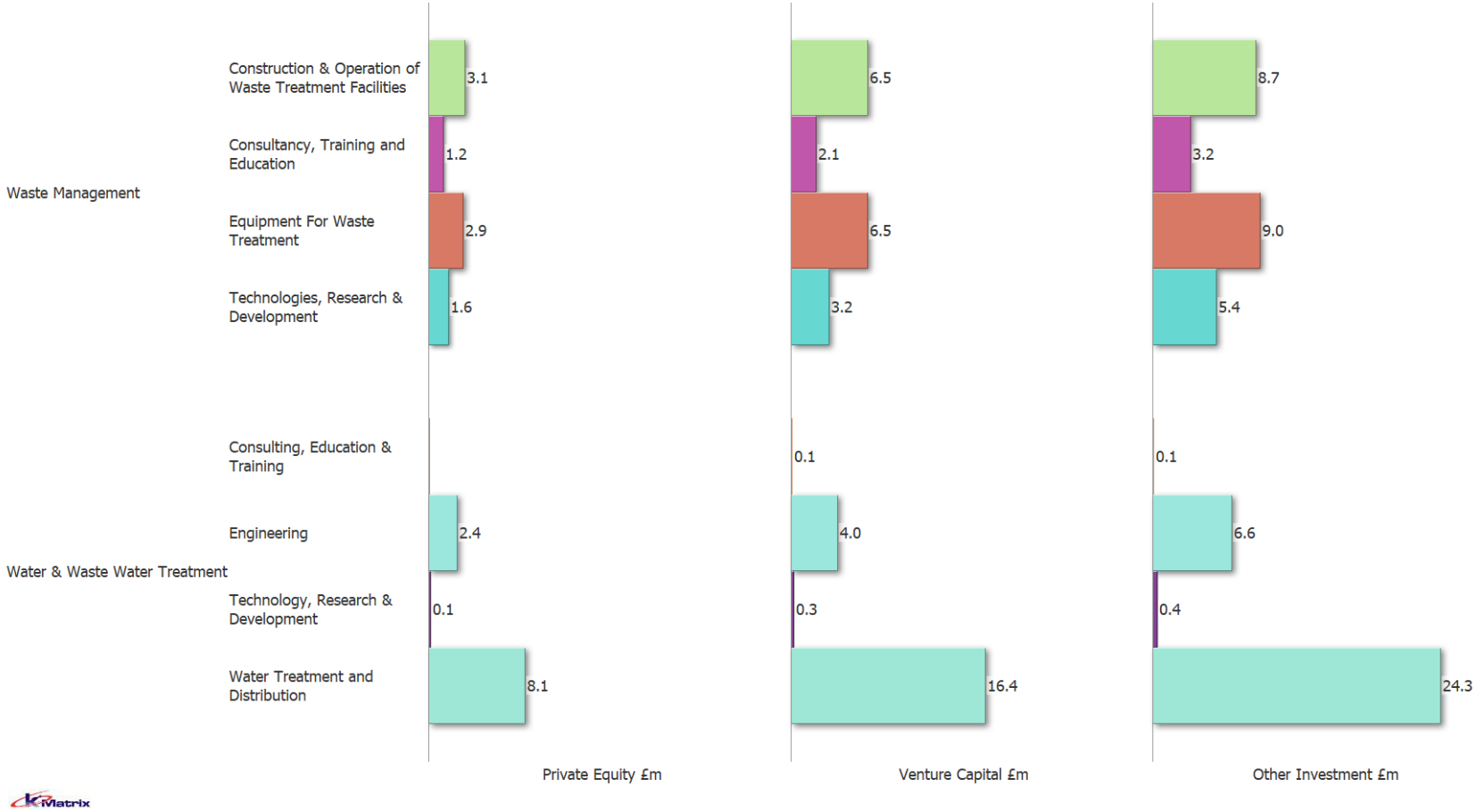
Figure 31: Stoke and Staffordshire LEP's LCEGS Investment in R&D 2019/20 – Level 2 Environmental



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

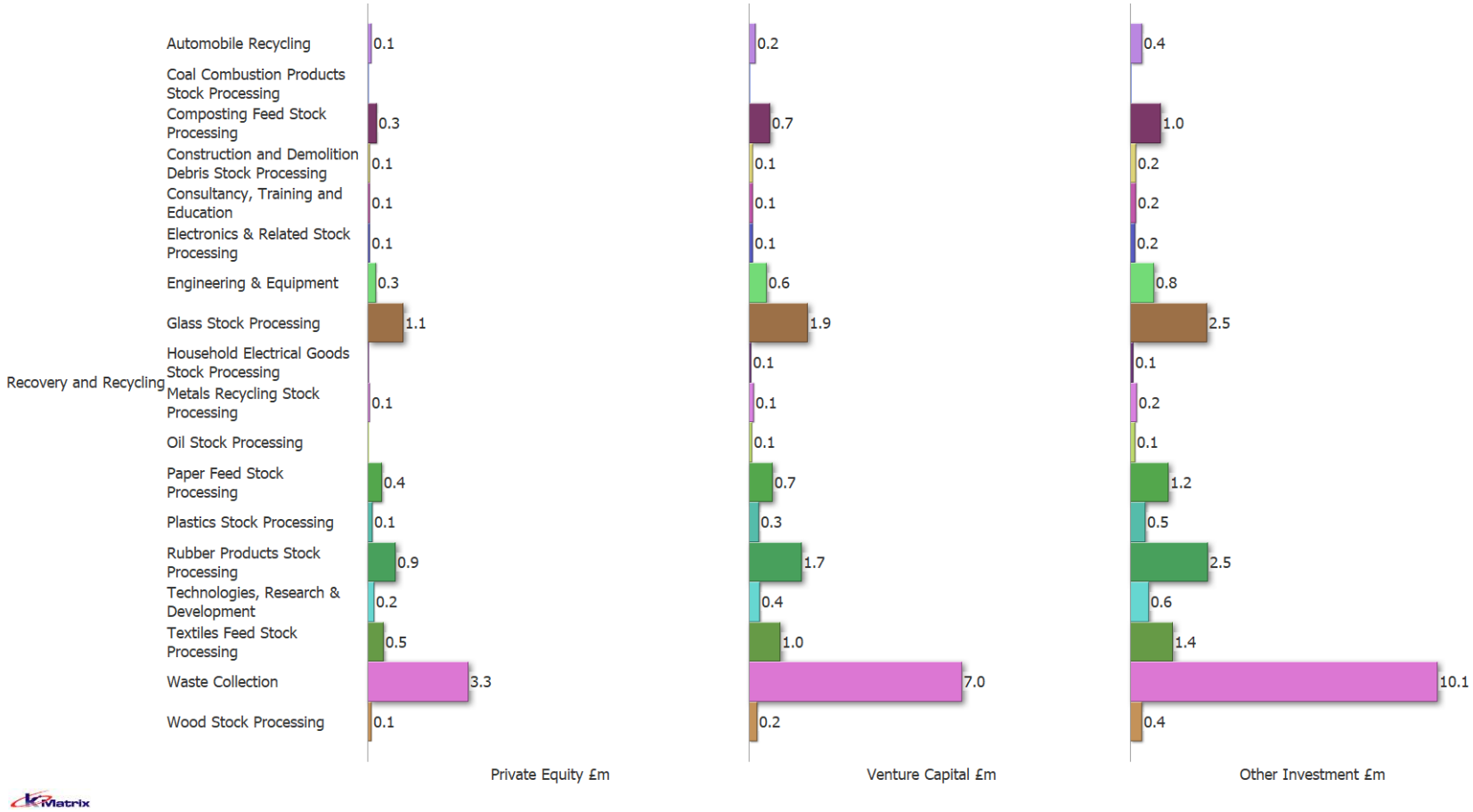
- Water & Waste Water Treatment from £9m to £11m for Private Equity, £18m to £21m for Venture Capital and £28m to £31m for Other Investment
- Waste Management was steady at £9m for Private Equity, £18m for Venture Capital and £26m for Other Investment
- Recovery and Recycling grew from £6m to £8m for Private Equity, £12m to £15m for Venture Capital and £19m to £22m for Other Investment

Figure 32: Stoke and Staffordshire 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: Stoke and Staffordshire 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 Stoke and Staffordshire LEP's LCEGS Company Size

In this section we look at the number of companies within the Stoke and Staffordshire 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 Stoke and Staffordshire 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: Stoke and Staffordshire LEP's LCEGS Number of Companies Split by Company Size, with Growth 2017/18 to 2019/20 – Level 1

	# Start-up					# Micro					# SMEs				
		Growth		Growth			Growth		Growth			Growth		Growth	
Level 1	2017/18	%	2018/19	%	2019/20	2017/18	%	2018/19	%	2019/20	2017/18	%	2018/19	%	2019/20
Environmental	9	5.1%	10	7.5%	10	55	5.1%	58	7.5%	62	91	5.2%	96	7.9%	104
Low Carbon	16	5.7%	16	8.1%	18	93	5.7%	99	7.6%	106	156	4.9%	164	8.2%	177
Renewable Energy	16	4.5%	17	8.3%	19	98	5.2%	103	8.2%	112	164	5.0%	172	7.4%	185
Total	**41**	**5.1%**	**43**	**8.1%**	**47**	**247**	**5.4%**	**260**	**7.8%**	**280**	**411**	**5.0%**	**432**	**7.8%**	**465**

	# Large					# Corporations					Total # Companies				
		Growth		Growth			Growth		Growth			Growth		Growth	
Level 1	2017/18	%	2018/19	%	2019/20	2017/18	%	2018/19	%	2019/20	2017/18	%	2018/19	%	2019/20
Environmental	18	5.3%	19	7.5%	21	9	5.4%	10	7.5%	10	183	5.2%	192	7.7%	207
Low Carbon	31	5.2%	33	8.0%	35	15	6.3%	16	7.9%	18	311	5.3%	328	8.0%	354
Renewable Energy	33	5.5%	35	7.5%	37	16	5.3%	17	7.4%	19	328	5.1%	345	7.7%	371
Total	**82**	**5.4%**	**86**	**7.7%**	**93**	**41**	**5.7%**	**43**	**7.6%**	**47**	**822**	**5.2%**	**864**	**7.8%**	**932**

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 8.3% was seen in Start-ups in the Renewable Energy sub-sector, with the weakest growth of 7.4% was seen in SME's and corporations in the Renewable Energy sub-sector.

Tables 2a and 2b show the company count for the LCEGS sector across the Stoke and Staffordshire 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: Stoke and Staffordshire 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	0	0.0%	0	0.0%	0	1	0.0%	1	100.0%	2	2	0.0%	2	50.0%	3
Environmental	Contaminated Land	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	2	0.0%	2	0.0%	2
Environmental	Environmental Consultancy	0	0.0%	0	0.0%	0	2	0.0%	2	0.0%	2	3	0.0%	3	0.0%	3
Environmental	Environmental Monitoring	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1
Environmental	Marine Pollution Control	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Environmental	Noise & Vibration Control	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	1	0.0%	1	0.0%	1
Environmental	Recovery and Recycling	2	0.0%	2	50.0%	3	14	0.0%	14	7.1%	15	22	9.1%	24	4.2%	25
Environmental	Waste Management	3	0.0%	3	0.0%	3	17	5.9%	18	5.6%	19	28	7.1%	30	6.7%	32
Environmental	Water & Waste Water Treatment	3	0.0%	3	33.3%	4	19	5.3%	20	5.0%	21	31	6.5%	33	6.1%	35
Low Carbon	Additional Energy Sources	0	0.0%	0	0.0%	0	2	0.0%	2	0.0%	2	4	0.0%	4	0.0%	4
Low Carbon	Alternative Fuel Vehicle	2	0.0%	2	0.0%	2	13	7.7%	14	7.1%	15	22	4.5%	23	8.7%	25
Low Carbon	Alternative Fuels	6	0.0%	6	0.0%	6	34	5.9%	36	5.6%	38	56	5.4%	59	8.5%	64
Low Carbon	Building Technologies	6	16.7%	7	0.0%	7	38	5.3%	40	7.5%	43	64	4.7%	67	7.5%	72
Low Carbon	Carbon Capture & Storage	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	1	0.0%	1	100.0%	2
Low Carbon	Carbon Finance	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Low Carbon	Energy Management	1	0.0%	1	0.0%	1	5	0.0%	5	20.0%	6	9	0.0%	9	11.1%	10
Low Carbon	Nuclear Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewable Energy	Biomass	3	0.0%	3	0.0%	3	18	5.6%	19	5.3%	20	30	3.3%	31	9.7%	34
Renewable Energy	Geothermal	2	0.0%	2	0.0%	2	11	0.0%	11	9.1%	12	18	5.6%	19	10.5%	21
Renewable Energy	Hydro	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	1	0.0%	1	0.0%	1
Renewable Energy	Photovoltaic	4	25.0%	5	0.0%	5	26	7.7%	28	7.1%	30	44	4.5%	46	6.5%	49
Renewable Energy	Renewable Consultancy	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	2	0.0%	2	0.0%	2
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	7	0.0%	7	14.3%	8	42	4.8%	44	6.8%	47	69	5.8%	73	6.8%	78
Total		**39**	**5.1%**	**41**	**7.3%**	**44**	**247**	**4.9%**	**259**	**6.9%**	**277**	**410**	**5.1%**	**431**	**7.7%**	**464**

Table 2b: Stoke and Staffordshire 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	0	0.0%	0	0.0%	1	0	0.0%	0	0.0%	0	5	0.0%	5	0.0%	5
Environmental	Contaminated Land	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	4	25.0%	5	0.0%	5
Environmental	Environmental Consultancy	1	0.0%	1	0.0%	1	0	0.0%	0	0.0%	0	6	0.0%	6	16.7%	7
Environmental	Environmental Monitoring	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1
Environmental	Marine Pollution Control	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1
Environmental	Noise & Vibration Control	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	2	50.0%	3	0.0%	3
Environmental	Recovery and Recycling	5	0.0%	5	0.0%	5	2	0.0%	2	50.0%	3	45	4.4%	47	8.5%	51
Environmental	Waste Management	6	0.0%	6	0.0%	6	3	0.0%	3	0.0%	3	56	5.4%	59	6.8%	63
Environmental	Water & Waste Water Treatment	6	16.7%	7	0.0%	7	3	0.0%	3	33.3%	4	62	4.8%	65	9.2%	71
Low Carbon	Additional Energy Sources	1	0.0%	1	0.0%	1	0	0.0%	0	0.0%	0	7	14.3%	8	0.0%	8
Low Carbon	Alternative Fuel Vehicle	4	25.0%	5	0.0%	5	2	0.0%	2	50.0%	3	44	4.5%	46	8.7%	50
Low Carbon	Alternative Fuels	11	9.1%	12	8.3%	13	6	0.0%	6	0.0%	6	112	6.3%	119	7.6%	128
Low Carbon	Building Technologies	13	0.0%	13	7.7%	14	6	16.7%	7	0.0%	7	127	5.5%	134	7.5%	144
Low Carbon	Carbon Capture & Storage	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	3	0.0%	3	0.0%	3
Low Carbon	Carbon Finance	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Low Carbon	Energy Management	2	0.0%	2	0.0%	2	1	0.0%	1	0.0%	1	17	5.9%	18	11.1%	20
Low Carbon	Nuclear Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewable Energy	Biomass	6	0.0%	6	16.7%	7	3	0.0%	3	0.0%	3	59	6.8%	63	7.9%	68
Renewable Energy	Geothermal	4	0.0%	4	0.0%	4	2	0.0%	2	0.0%	2	36	5.6%	38	7.9%	41
Renewable Energy	Hydro	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	2	0.0%	2	0.0%	2
Renewable Energy	Photovoltaic	9	0.0%	9	11.1%	10	4	25.0%	5	0.0%	5	88	4.5%	92	7.6%	99
Renewable Energy	Renewable Consultancy	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	4	0.0%	4	0.0%	4
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	14	7.1%	15	6.7%	16	7	0.0%	7	14.3%	8	138	5.1%	145	8.3%	157
Total		**82**	**4.9%**	**86**	**7.0%**	**92**	**39**	**5.1%**	**41**	**9.8%**	**45**	**819**	**5.5%**	**864**	**7.8%**	**931**

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 50% increase in Alternative Fuel Vehicle is seen in the Corporations category when 2 companies grew to 3.

1.10 Stoke and Staffordshire LEP's LCEGS by Skills

In this section we look at the skills within the Stoke and Staffordshire 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: Stoke and Staffordshire LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – LCEGS Sector

	LCEGS Sector Totals				
		Growth		Growth	
Skill	2017/18	%	2018/19	%	2019/20
Technicians	426	0.0%	426	15.3%	492
Snr Management SME	990	4.0%	1,030	7.2%	1,104
Supervisory	993	12.4%	1,115	-1.4%	1,099
Middle / Junior Management	996	8.3%	1,078	4.3%	1,124
Designer / Developer	145	10.5%	160	3.2%	166
Clerical	510	13.2%	578	-0.3%	576
Self Employed	136	3.5%	141	0.7%	142
Advisor or Agent	98	-2.3%	95	3.3%	99
Educator	3	1.5%	3	12.7%	4
Specialist or Consultant	524	11.2%	582	-5.2%	552
Editor	16	9.1%	18	5.5%	19
Industrial Researchers	170	4.7%	178	7.1%	191
Scientist	74	11.0%	82	5.4%	87
Maintenance Engineer	1,121	9.9%	1,233	-0.5%	1,226
Civil Engineer	83	12.8%	93	-3.7%	90
Production Engineer	213	9.1%	233	2.4%	238
Power distribution Engineer	525	7.2%	563	-1.0%	558
Construction Engineer	115	-0.1%	115	16.3%	134
Sales Exec	545	4.5%	569	12.1%	637
Marketing Personnel	530	10.1%	583	3.2%	601
General Semi Skilled Worker	1,102	6.2%	1,170	8.0%	1,263
General Labour	1,331	2.2%	1,360	18.3%	1,609
Other Employees	1,485	-5.1%	1,409	18.0%	1,662
Administrative workers	580	8.6%	629	1.0%	636
Total Number of Employees	**17,460**	**2.4%**	**17,883**	**4.8%**	**18,740**

At the sector-level we can see that the number of employees per occupational classification varies considerably between each year. For example, the Specialist or Consultant classification saw growth of 11.2% between 2017/18 and -5.2% 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: Stoke and Staffordshire 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	136	0.0%	136	15.6%	157	173	-0.1%	173	15.4%	200	117	0.3%	117	14.8%	135
Snr Management SME	237	4.2%	247	7.0%	264	571	4.0%	595	7.2%	638	181	3.8%	188	7.5%	203
Supervisory	246	12.5%	277	-1.5%	273	557	12.2%	625	-1.4%	616	190	12.6%	214	-1.3%	211
Middle / Junior Management	246	8.4%	267	4.3%	278	560	8.2%	606	4.2%	632	189	8.4%	205	4.2%	214
Designer / Developer	37	10.3%	41	3.4%	42	44	10.6%	49	2.8%	50	64	10.4%	71	3.5%	73
Clerical	128	13.2%	145	-0.2%	145	284	13.2%	321	-0.4%	320	98	13.5%	111	-0.1%	111
Self Employed	49	3.6%	50	0.7%	51	36	3.4%	37	0.8%	38	51	3.4%	53	0.7%	53
Advisor or Agent	48	-2.3%	47	3.2%	48	13	-2.4%	12	3.4%	13	37	-2.2%	36	3.4%	38
Educator	0	1.5%	0	12.5%	0	0	1.9%	0	13.0%	0	3	1.5%	3	12.8%	4
Specialist or Consultant	136	11.1%	151	-4.9%	143	272	11.2%	303	-5.4%	287	116	11.2%	129	-5.1%	122
Editor	3	9.1%	4	5.5%	4	4	8.9%	4	5.6%	5	9	9.2%	10	5.4%	10
Industrial Researchers	97	4.8%	101	7.1%	109	20	4.5%	21	7.3%	22	54	4.6%	56	7.1%	60
Scientist	49	11.0%	55	5.6%	58	7	11.0%	8	5.0%	8	18	11.1%	20	5.0%	21
Maintenance Engineer	276	9.9%	303	-0.4%	302	602	9.9%	661	-0.7%	656	244	10.0%	268	-0.3%	267
Civil Engineer	19	12.9%	22	-3.9%	21	20	12.9%	22	-4.1%	21	44	12.8%	50	-3.5%	48
Production Engineer	65	8.9%	70	2.7%	72	91	9.2%	99	2.2%	101	58	9.1%	63	2.5%	65
Power distribution Engineer	112	7.3%	121	-1.1%	119	290	7.2%	311	-1.1%	308	123	7.1%	131	-0.6%	130
Construction Engineer	24	-0.2%	24	16.2%	28	39	0.1%	39	16.0%	45	52	-0.2%	52	16.5%	60
Sales Exec	163	4.6%	171	12.0%	191	274	4.5%	287	11.9%	321	107	4.3%	112	12.5%	126
Marketing Personnel	161	9.9%	177	3.3%	183	272	10.2%	300	3.0%	309	97	10.3%	107	3.2%	110
General Semi Skilled Worker	280	6.1%	297	8.0%	321	581	6.2%	617	7.8%	666	241	6.2%	256	8.2%	277
General Labour	452	2.3%	462	18.5%	548	707	2.1%	722	18.1%	852	173	2.1%	176	18.6%	209
Other Employees	348	-4.1%	334	13.4%	378	848	-5.2%	805	18.0%	949	289	-6.1%	271	23.4%	334
Administrative workers	155	8.6%	168	1.2%	170	299	8.6%	325	0.9%	328	126	8.5%	136	0.9%	137
Total Number of Employees	**6,715**	**2.5%**	**6,882**	**4.9%**	**7,218**	**6,917**	**2.3%**	**7,078**	**4.7%**	**7,410**	**3,828**	**2.5%**	**3,922**	**4.8%**	**4,111**

A similar pattern is seen the Level 1 figures, with natural fluctuations in employee numbers. The numbers 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 94% of employment in the LCEGS sector in the Stoke and Staffordshire LEP LEP. Tables 5a-5d shows the number of employees within each standard Occupational Class for the top 11 Level 2 sub-sectors of the LCEGS sector.

Table 5a: Stoke and Staffordshire 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	7	-0.2%	7	15.1%	8	53	0.2%	53	15.9%	62	31	0.1%	31	14.7%	35
Snr Management SME	13	3.9%	13	7.4%	14	45	4.4%	47	7.1%	50	127	3.7%	132	7.6%	142
Supervisory	16	12.4%	18	-1.9%	18	55	12.8%	62	-1.5%	61	124	12.3%	140	-1.1%	138
Middle / Junior Management	16	7.7%	17	5.0%	18	55	8.9%	60	4.2%	62	123	8.3%	133	4.1%	138
Designer / Developer	2	10.7%	2	2.8%	2	10	9.8%	11	4.5%	11	14	10.6%	16	2.7%	16
Clerical	10	13.6%	11	-0.3%	11	27	13.2%	31	0.0%	31	63	13.3%	71	-0.3%	71
Self Employed	10	3.4%	10	0.7%	10	15	3.9%	15	1.1%	15	6	2.8%	6	1.0%	7
Advisor or Agent	17	-2.1%	17	3.3%	17	1	-1.8%	1	3.1%	1	2	-2.5%	2	3.4%	2
Educator	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	1.9%	0	13.0%	0
Specialist or Consultant	2	11.6%	2	-1.9%	2	42	11.1%	47	-5.2%	45	67	11.3%	75	-5.4%	71
Editor	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	2	8.9%	2	5.5%	2
Industrial Researchers	28	4.6%	29	7.5%	31	21	5.0%	22	7.1%	24	3	4.9%	3	6.6%	3
Scientist	3	11.1%	3	5.2%	3	38	11.0%	42	5.6%	45	4	11.1%	4	4.7%	5
Maintenance Engineer	22	10.1%	25	-0.4%	24	68	10.2%	75	0.2%	75	123	9.9%	136	-0.4%	135
Civil Engineer	3	13.1%	4	-3.9%	4	0	13.0%	0	-3.4%	0	2	12.8%	2	-4.1%	2
Production Engineer	0	0.0%	0	0.0%	0	38	9.0%	42	2.7%	43	19	9.2%	21	2.0%	22
Power distribution Engineer	3	7.1%	4	-1.1%	4	13	7.3%	14	-0.4%	14	62	7.1%	66	-1.0%	65
Construction Engineer	3	0.3%	3	16.0%	4	0	-0.3%	0	17.3%	0	2	-0.2%	2	16.2%	2
Sales Exec	19	4.8%	20	11.8%	22	56	4.5%	59	12.6%	66	62	4.2%	64	12.4%	72
Marketing Personnel	19	10.5%	21	3.4%	22	55	9.7%	60	3.7%	63	61	10.4%	68	3.2%	70
General Semi Skilled Worker	16	6.5%	17	7.5%	18	73	5.8%	77	8.7%	84	123	6.3%	130	8.0%	141
General Labour	26	1.7%	26	18.5%	31	100	2.3%	102	19.0%	121	130	1.7%	133	18.5%	157
Other Employees	20	-0.6%	19	15.3%	22	67	-8.6%	61	13.1%	69	182	-6.4%	170	19.9%	204
Administrative workers	13	8.9%	14	0.3%	14	37	8.6%	40	1.6%	41	63	8.5%	68	0.7%	68
Total Number of Employees	**969**	**2.4%**	**992**	**4.5%**	**1,037**	**2,466**	**2.6%**	**2,530**	**5.1%**	**2,659**	**1,297**	**2.4%**	**1,328**	**4.7%**	**1,390**

Table 5b: Stoke and Staffordshire 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	60	-0.1%	60	15.5%	69	9	0.1%	9	14.9%	11	15	0.1%	15	15.2%	18
Snr Management SME	150	4.1%	157	7.1%	168	18	4.4%	18	6.4%	19	61	4.2%	63	7.0%	68
Supervisory	145	12.5%	163	-1.5%	161	18	12.1%	20	-0.9%	20	57	12.5%	65	-1.7%	63
Middle / Junior Management	145	8.4%	158	4.3%	164	18	8.3%	19	4.4%	20	59	8.4%	64	4.1%	66
Designer / Developer	17	10.6%	19	2.9%	20	5	10.1%	5	3.1%	5	7	10.6%	7	3.0%	8
Clerical	76	13.1%	85	-0.3%	85	9	13.0%	10	-0.2%	10	29	13.2%	33	-0.4%	33
Self Employed	17	3.5%	17	0.5%	18	4	3.6%	5	0.2%	5	3	3.3%	4	0.7%	4
Advisor or Agent	21	-2.4%	20	3.1%	21	4	-2.7%	4	3.5%	4	3	-2.5%	3	3.3%	3
Educator	0	0.0%	0	0.0%	0	0	1.4%	0	12.5%	0	0	0.0%	0	0.0%	0
Specialist or Consultant	75	11.2%	83	-4.7%	79	10	10.7%	11	-5.4%	11	30	11.1%	34	-5.3%	32
Editor	1	9.1%	1	5.6%	1	2	9.1%	2	5.4%	2	2	9.0%	2	5.6%	2
Industrial Researchers	39	5.1%	41	6.7%	43	4	4.0%	4	7.1%	4	2	4.8%	2	6.9%	3
Scientist	5	10.7%	6	5.5%	6	2	11.0%	2	5.4%	2	2	10.9%	2	5.3%	2
Maintenance Engineer	149	9.8%	163	-0.7%	162	22	9.9%	24	-0.1%	24	61	9.9%	67	-0.6%	67
Civil Engineer	9	12.9%	10	-4.0%	10	3	12.6%	4	-3.7%	4	3	12.8%	3	-3.9%	3
Production Engineer	19	8.9%	21	2.5%	21	4	8.2%	4	3.1%	5	10	9.1%	11	2.5%	12
Power distribution Engineer	78	7.3%	84	-1.2%	83	11	7.7%	11	-1.5%	11	30	7.4%	32	-1.0%	32
Construction Engineer	14	-0.3%	14	16.3%	17	4	-0.4%	4	16.4%	4	2	-0.1%	2	16.0%	3
Sales Exec	70	4.5%	73	11.7%	82	11	4.9%	12	11.5%	13	32	4.2%	33	12.3%	37
Marketing Personnel	70	9.9%	77	3.1%	79	10	10.1%	11	3.3%	12	31	10.2%	34	2.9%	35
General Semi Skilled Worker	156	6.1%	166	7.8%	179	21	6.2%	22	7.6%	24	61	6.3%	65	7.8%	70
General Labour	285	2.3%	291	18.4%	345	32	2.5%	33	17.9%	39	92	2.0%	94	18.3%	111
Other Employees	215	-2.8%	209	12.0%	234	27	-4.4%	26	16.5%	30	88	-5.1%	83	16.6%	97
Administrative workers	85	8.6%	92	1.2%	93	11	8.1%	12	1.3%	12	31	8.6%	34	1.0%	34
Total Number of Employees	**2,709**	**2.4%**	**2,775**	**4.8%**	**2,910**	**359**	**2.5%**	**368**	**4.7%**	**385**	**778**	**2.3%**	**796**	**4.8%**	**834**

Table 5c: Stoke and Staffordshire 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				
Skill	2017/18	Growth %	2018/19	Growth %	2019/20	2017/18	Growth %	2018/19	Growth %	2019/20	2017/18	Growth %	2018/19	Growth %	2019/20
Technicians	50	-0.4%	50	15.9%	58	35	0.3%	35	15.4%	40	30	0.1%	30	14.3%	34
Snr Management SME	151	3.7%	157	7.9%	169	41	4.2%	43	7.2%	46	53	3.6%	55	7.5%	59
Supervisory	146	12.3%	163	-1.7%	161	42	12.7%	48	-1.5%	47	58	12.3%	65	-1.3%	64
Middle / Junior Management	146	8.2%	158	4.2%	164	42	8.8%	46	3.9%	47	58	8.0%	62	4.4%	65
Designer / Developer	11	10.7%	12	2.5%	12	29	10.3%	33	3.8%	34	12	10.5%	14	3.0%	14
Clerical	75	13.2%	84	-0.8%	84	21	13.0%	24	0.0%	24	31	13.7%	35	-0.3%	35
Self Employed	8	3.3%	8	0.8%	8	10	3.7%	10	0.5%	11	15	3.3%	16	0.5%	16
Advisor or Agent	1	-3.0%	1	3.6%	1	4	-2.5%	4	3.4%	4	21	-2.1%	21	3.4%	21
Educator	0	0.0%	0	0.0%	0	0	2.4%	0	12.9%	0	1	1.0%	1	13.3%	1
Specialist or Consultant	68	11.5%	76	-5.5%	72	35	11.0%	38	-4.9%	36	30	11.4%	34	-5.3%	32
Editor	0	0.0%	0	0.0%	0	2	9.1%	2	5.8%	2	3	9.2%	4	5.2%	4
Industrial Researchers	5	4.8%	6	6.9%	6	9	4.8%	10	7.0%	10	29	4.5%	30	7.1%	32
Scientist	0	10.6%	0	5.5%	0	8	10.9%	9	5.4%	9	5	11.4%	6	4.5%	6
Maintenance Engineer	150	9.8%	165	-1.1%	163	53	9.9%	58	-0.4%	58	72	10.0%	79	-0.4%	79
Civil Engineer	4	13.0%	5	-4.4%	4	16	12.8%	18	-3.5%	17	11	12.8%	13	-3.8%	12
Production Engineer	21	9.7%	23	1.5%	23	19	9.0%	20	2.9%	21	13	9.1%	14	1.9%	14
Power distribution Engineer	76	7.1%	81	-1.3%	80	29	7.2%	31	-0.4%	31	36	7.2%	38	-1.2%	38
Construction Engineer	8	0.0%	8	15.8%	9	16	-0.3%	16	16.5%	18	14	-0.3%	14	16.3%	17
Sales Exec	73	4.3%	76	11.8%	85	35	4.3%	37	12.3%	41	29	4.3%	30	12.6%	34
Marketing Personnel	73	10.2%	80	2.6%	82	28	9.8%	31	3.1%	32	28	10.7%	30	3.4%	31
General Semi Skilled Worker	156	6.5%	167	7.3%	179	70	5.7%	74	8.7%	80	65	6.6%	70	7.6%	75
General Labour	204	2.1%	208	18.1%	245	69	2.5%	71	18.4%	84	41	1.7%	41	18.6%	49
Other Employees	214	-5.5%	203	16.8%	237	58	-7.8%	53	19.2%	64	91	-5.4%	86	24.3%	107
Administrative workers	78	8.7%	85	1.0%	86	29	8.2%	31	1.6%	32	39	8.6%	42	0.4%	42
Total Number of Employees	**1,845**	**2.3%**	**1,887**	**4.6%**	**1,975**	**948**	**2.5%**	**971**	**5.1%**	**1,020**	**1,159**	**2.4%**	**1,187**	**4.6%**	**1,241**

Table 5d: Stoke and Staffordshire 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	44	0.5%	44	14.4%	50	75	-0.1%	75	15.5%	87
Snr Management SME	72	3.7%	74	7.6%	80	229	4.4%	239	6.7%	255
Supervisory	72	12.7%	82	-1.2%	81	225	12.1%	252	-1.4%	249
Middle / Junior Management	72	8.4%	78	4.3%	82	229	8.2%	247	4.3%	258
Designer / Developer	17	10.6%	19	3.5%	20	11	10.6%	12	3.0%	13
Clerical	36	13.6%	41	0.1%	41	115	13.1%	130	-0.2%	129
Self Employed	20	3.3%	20	1.0%	20	17	3.6%	18	0.7%	18
Advisor or Agent	3	-1.9%	3	3.4%	3	2	-2.1%	2	3.1%	2
Educator	0	2.2%	0	12.1%	0	0	0.0%	0	0.0%	0
Specialist or Consultant	41	11.3%	46	-5.0%	43	104	11.1%	116	-5.3%	110
Editor	1	9.3%	1	5.5%	1	0	8.9%	0	5.9%	0
Industrial Researchers	3	4.6%	4	7.5%	4	3	4.5%	3	7.5%	3
Scientist	1	11.4%	2	4.8%	2	1	10.8%	1	5.8%	1
Maintenance Engineer	98	10.0%	107	0.0%	107	262	9.8%	288	-0.7%	286
Civil Engineer	12	12.7%	14	-3.2%	14	9	13.0%	10	-4.1%	10
Production Engineer	22	9.1%	24	2.5%	25	40	8.9%	43	2.6%	45
Power distribution Engineer	47	7.1%	51	-0.3%	50	120	7.3%	129	-1.0%	127
Construction Engineer	17	-0.2%	17	16.8%	20	25	0.1%	25	16.0%	29
Sales Exec	32	4.4%	34	12.8%	38	106	4.7%	111	11.5%	124
Marketing Personnel	32	10.5%	35	3.3%	36	105	10.0%	116	3.2%	120
General Semi Skilled Worker	86	6.2%	91	8.2%	99	236	5.9%	250	8.1%	271
General Labour	44	1.8%	45	18.9%	54	276	2.4%	282	17.9%	333
Other Employees	113	-6.3%	106	24.6%	132	358	-4.4%	342	18.0%	404
Administrative workers	45	8.5%	49	0.8%	49	124	8.6%	135	1.0%	137
Total Number of Employees	**1,316**	**2.5%**	**1,350**	**4.9%**	**1,415**	**2,867**	**2.4%**	**2,934**	**4.7%**	**3,072**

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 Stoke and Staffordshire LEP's LCEGS Growth

In Section 1.1 annual growth in Stoke and Staffordshire 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 Stoke and Staffordshire 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 Stoke and Staffordshire LEP covers 10% of the MEH's total LCEGS sector in terms of sales. The growth rates for the Stoke and Staffordshire LEP generally stronger than the MEH regional average and exhibit a different pattern to the MEH which is 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 Stoke and Staffordshire LEP's are less uniform than the MEH region, but not as volatile as the UK in general.

While annual growth in the LCEGS sector as a whole has varied between 2.4 and 7.8% for each of the three parameters, Table 6 shows that the sector has generally 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 Stoke and Staffordshire LEP has grown stronger than the MEH average and also is 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 Stoke and Staffordshire LEP's growth rates were 6.2% between 2017/18 and 2018/19 and 6.6% 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 Stoke and Staffordshire LEP's growth rates were 5.9% between 2017/18 and 2018/19 and 6.5% 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 Stoke and Staffordshire LEP's growth rates were 6.2% between 2017/18 and 2018/19 and 6.8% 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 Stoke and Staffordshire LEP's growth rates were 6.5% between 2017/18 and 2018/19 and 6.1% 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 Stoke and Staffordshire LEP's growth rates were 5.9% between 2017/18 and 2018/19 and 6.5% 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 Stoke and Staffordshire LEP's growth rates were 5.0% between 2017/18 and 2018/19 and 6.3% 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

- Hydro, where the Stoke and Staffordshire LEP's growth rates were 5.0% between 2017/18 and 2018/19 and 6.3% 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
- Marine Pollution Control, where the Stoke and Staffordshire LEP's growth rates were 8.3% between 2017/18 and 2018/19 and 7.7% between 2018/19 and 2019/20 and the UK growth rates were 7.4% between 2017/18 and 2018/19 and 4.9% between 2018/19 and 2019/20

Table 6: Stoke and Staffordshire 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	12.8	6.2%	13.6	6.6%	14.5	5	0.0%	5	0.0%	5	94	2.1%	96	5.2%	101
Environmental	Contaminated Land	12.4	6.5%	13.2	6.1%	14.0	4	25.0%	5	0.0%	5	91	2.2%	93	4.3%	97
Environmental	Environmental Consultancy	16.8	6.0%	17.8	6.7%	19.0	6	0.0%	6	16.7%	7	124	2.4%	127	4.7%	133
Environmental	Environmental Monitoring	3.5	5.7%	3.7	8.1%	4.0	1	0.0%	1	0.0%	1	26	0.0%	26	7.7%	28
Environmental	Marine Pollution Control	2.4	8.3%	2.6	7.7%	2.8	1	0.0%	1	0.0%	1	18	0.0%	18	5.6%	19
Environmental	Noise & Vibration Control	7.2	6.9%	7.7	6.5%	8.2	2	50.0%	3	0.0%	3	53	1.9%	54	5.6%	57
Environmental	Recovery and Recycling	129.6	6.1%	137.5	6.7%	146.7	45	4.4%	47	8.5%	51	948	2.4%	971	5.0%	1,020
Environmental	Waste Management	157.4	5.8%	166.6	6.5%	177.4	56	5.4%	59	6.8%	63	1,159	2.4%	1,187	4.5%	1,241
Environmental	Water & Waste Water Treatment	179.1	6.1%	190.0	6.7%	202.7	62	4.8%	65	9.2%	71	1,316	2.6%	1,350	4.8%	1,415
Low Carbon	Additional Energy Sources	21.0	6.2%	22.3	6.3%	23.7	7	14.3%	8	0.0%	8	154	2.6%	158	4.4%	165
Low Carbon	Alternative Fuel Vehicle	132.0	5.9%	139.8	6.5%	148.9	44	4.5%	46	8.7%	50	969	2.4%	992	4.5%	1,037
Low Carbon	Alternative Fuels	336.3	6.2%	357.0	6.8%	381.3	112	6.3%	119	7.6%	128	2,466	2.6%	2,530	5.1%	2,659
Low Carbon	Building Technologies	369.6	5.9%	391.5	6.6%	417.3	127	5.5%	134	7.5%	144	2,709	2.4%	2,775	4.9%	2,910
Low Carbon	Carbon Capture & Storage	8.0	6.3%	8.5	5.9%	9.0	3	0.0%	3	0.0%	3	59	1.7%	60	5.0%	63
Low Carbon	Carbon Finance	0.0	0.0%	0.0	0.0%	0.0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Low Carbon	Energy Management	49.1	5.9%	52.0	6.5%	55.4	17	5.9%	18	11.1%	20	359	2.5%	368	4.6%	385
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	176.3	5.8%	186.6	6.5%	198.7	59	6.8%	63	7.9%	68	1,297	2.4%	1,328	4.7%	1,390
Renewable Energy	Geothermal	105.9	5.9%	112.1	6.5%	119.4	36	5.6%	38	7.9%	41	778	2.3%	796	4.8%	834
Renewable Energy	Hydro	6.0	5.0%	6.3	6.3%	6.7	2	0.0%	2	0.0%	2	44	2.3%	45	4.4%	47
Renewable Energy	Photovoltaic	252.2	5.7%	266.7	6.4%	283.8	88	4.5%	92	7.6%	99	1,845	2.3%	1,887	4.7%	1,975
Renewable Energy	Renewable Consultancy	11.3	6.2%	12.0	6.7%	12.8	4	0.0%	4	0.0%	4	83	2.4%	85	4.7%	89
Renewable Energy	Wave & Tidal	0.4	0.0%	0.4	0.0%	0.4	0	0.0%	0	0.0%	0	3	0.0%	3	0.0%	3
Renewable Energy	Wind	391.1	5.9%	414.2	6.5%	441.3	138	5.1%	145	8.3%	157	2,867	2.3%	2,934	4.7%	3,072
Total		**2,380.4**	**6.0%**	**2,522.1**	**6.6%**	**2,688.0**	**819**	**5.5%**	**864**	**7.8%**	**931**	**17,462**	**2.4%**	**17,883**	**4.8%**	**18,740**

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:

- Marine Pollution Control with 16.7% (MEH 11.4%, UK 12.7%)
- Environmental Monitoring with 14.3% (MEH 11.3%, UK 12.2%)
- Air Pollution with 13.3% (MEH 11.4%, UK 5.8%)
- Renewable Energy General Consultancy wit 13.3% (MEH 11.3%, UK 10.8%)
- Water and Waste Water Treatment with 13.2% (MEH 11.3%, UK 12.7%)
- Contaminated Land Reclamation and Remediation with 12.9% (MEH 11.4%, UK 1.0%)
- Energy Management with 12.8% (MEH 11.4%, UK 5.7%)
- Alternative Fuel Vehicle with 12.8% (MEH 11.4%, UK 5.7%)
- Hydro with 11.7% (MEH 11.0%, UK 1.8%)

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

- Environmental Consultancy with 12.9% (MEH 11.3%, UK 16.8%)
- Noise & Vibration Control with 13.0% (MEH 11.4%, UK 23.3%)
- Carbon Capture & Storage with 13.0% (MEH 11.3%, UK 19.0%)
- Biomass with 12.7% (MEH 11.3%, UK 28.2%)
- Geothermal with 12.8% (MEH 11.3%, UK 18.8%)
- Photovoltaic with 12.5% (MEH 11.3%, UK 24.3%)
- Wave & Tidal with 11.8% (MEH 11.2%, UK 24.9%)
- Wind with 12.8% (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 Stoke and Staffordshire 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 (1.2% and 10.1% 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 Stoke and Staffordshire 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%	14.5	12.9%	1.1%	0.9	2.2	10.1%	1.1	1.0
Environmental	Contaminated Land Reclamation & Remediation	1,269.2	1.0%	143.3	11.4%	11.3%	14.0	12.7%	1.1%	0.9	13.1	9.8%	1.1	1.0
Environmental	Environmental Consultancy and Related Services	1,268.4	16.8%	179.9	11.3%	14.2%	19.0	12.9%	1.5%	1.2	0.8	10.6%	1.1	1.0
Environmental	Environmental Monitoring, Instrumentation and Analysis	247.6	12.2%	38.0	11.3%	15.4%	4.0	12.6%	1.6%	1.3	1.0	10.5%	1.1	1.0
Environmental	Marine Pollution Control	206.3	12.7%	27.7	11.4%	13.4%	2.8	13.0%	1.3%	1.1	1.0	10.0%	1.1	1.0
Environmental	Noise & Vibration Control	394.7	23.3%	79.5	11.4%	20.1%	8.2	13.0%	2.1%	1.7	0.6	10.3%	1.1	1.0
Environmental	Recovery and Recycling	11,071.7	13.7%	1,452.5	11.3%	13.1%	146.7	13.2%	1.3%	1.1	1.0	10.1%	1.2	1.0
Environmental	Waste Management	7,384.8	12.6%	1,769.7	11.2%	24.0%	177.4	12.8%	2.4%	2.0	1.0	10.0%	1.1	1.0
Environmental	Water Supply and Waste Water Treatment	10,943.9	12.7%	2,014.9	11.3%	18.4%	202.7	13.1%	1.9%	1.5	1.0	10.1%	1.2	1.0
Low Carbon	Additional Energy Sources	2,129.7	15.9%	234.7	11.3%	11.0%	23.7	12.9%	1.1%	0.9	0.8	10.1%	1.1	1.0
Low Carbon	Alternative Fuel Vehicle	19,578.8	5.7%	1,472.3	11.4%	7.5%	148.9	12.8%	0.8%	0.6	2.2	10.1%	1.1	1.0
Low Carbon	Alternative Fuels	32,416.4	13.8%	3,761.4	11.4%	11.6%	381.3	13.4%	1.2%	1.0	1.0	10.1%	1.2	1.0
Low Carbon	Building Technologies	24,963.7	13.7%	3,995.6	11.5%	16.0%	417.3	12.9%	1.7%	1.4	0.9	10.4%	1.1	1.0
Low Carbon	Carbon Capture & Storage	816.0	19.0%	90.3	11.3%	11.1%	9.0	13.0%	1.1%	0.9	0.7	10.0%	1.1	1.0
Low Carbon	Carbon Finance	16,336.5	27.6%	133.9	17.7%	0.8%	0.0	0.0%	0.0%	0.0	0.0	0.0%	0.0	0.0
Low Carbon	Energy Management	3,950.9	5.7%	559.7	11.4%	14.2%	55.4	12.9%	1.4%	1.1	2.3	9.9%	1.1	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%	198.7	12.7%	1.8%	1.4	0.5	10.2%	1.1	1.0
Renewable Energy	Geothermal	19,687.0	18.8%	1,163.0	11.3%	5.9%	119.4	12.8%	0.6%	0.5	0.7	10.3%	1.1	1.0
Renewable Energy	Hydro	703.5	1.8%	74.4	11.0%	10.6%	6.7	12.0%	1.0%	0.8	6.6	9.0%	1.1	0.9
Renewable Energy	Photovoltaic	11,132.4	24.3%	2,773.4	11.3%	24.9%	283.8	12.5%	2.5%	2.1	0.5	10.2%	1.1	1.0
Renewable Energy	Renewable Energy General Consultancy	722.1	10.8%	122.8	11.3%	17.0%	12.8	12.9%	1.8%	1.4	1.2	10.4%	1.1	1.0
Renewable Energy	Wave & Tidal	171.5	24.9%	4.1	11.2%	2.4%	0.4	11.8%	0.3%	0.2	0.5	10.5%	1.1	1.0
Renewable Energy	Wind	36,664.3	42.2%	4,373.1	11.3%	11.9%	441.3	12.8%	1.2%	1.0	0.3	10.1%	1.1	1.0
		219,523.9	**18.9%**	**26,556.2**	**11.4%**	**12.1%**	**2,688.1**	**12.9%**	**1.2%**			**10.1%**		

Figure 34 shows how the Stoke and Staffordshire 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 Stoke and Staffordshire 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 Stoke and Staffordshire LEP's 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 are strengths, because they are both close to the expected size of market (1.1 for Contaminated Land and 1.0 for Hydro) and are growing significantly stronger than the UK average (11.5% LEP vs. 1.0% UK for Contaminated Land and 11.3% 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

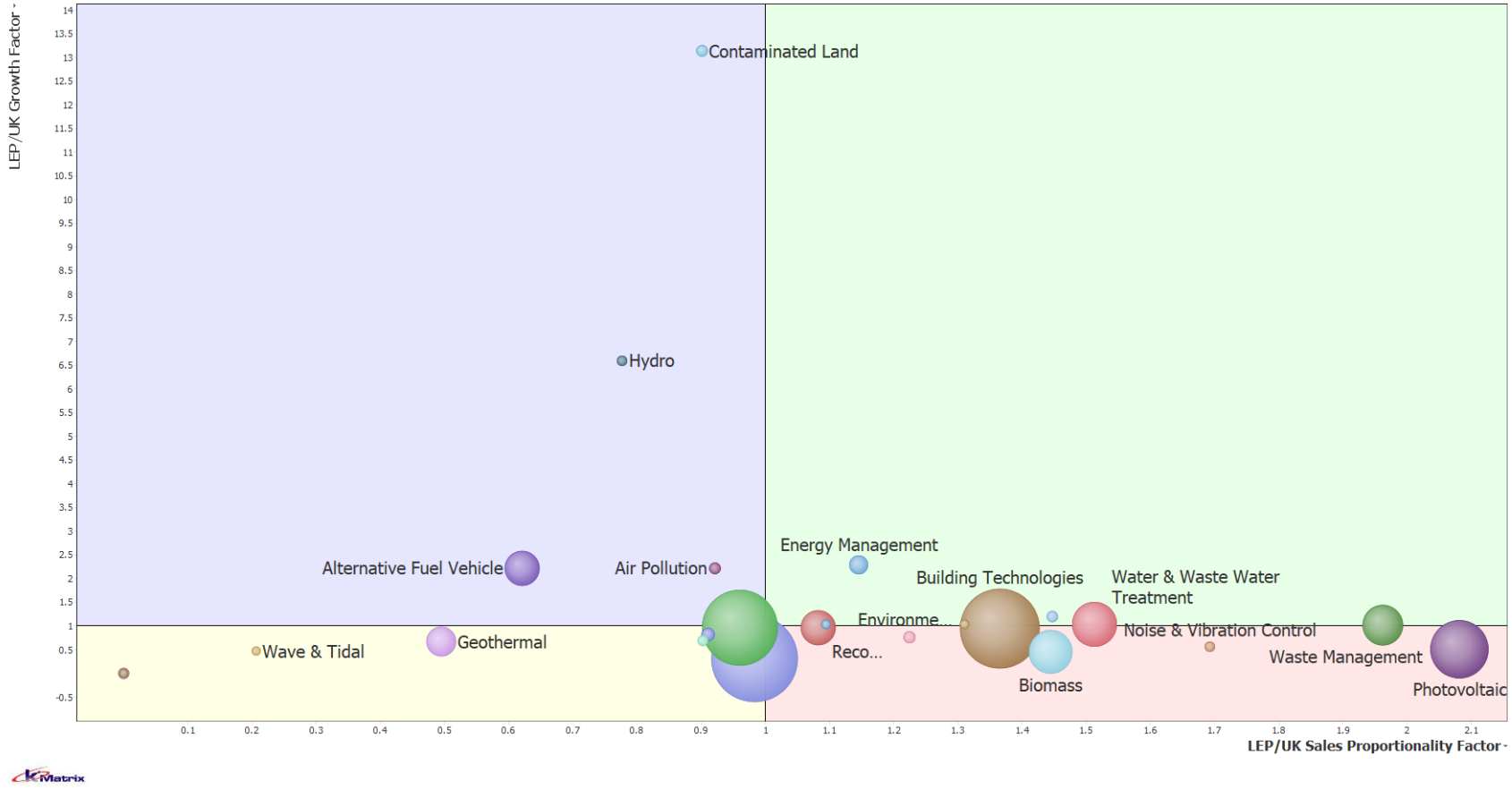
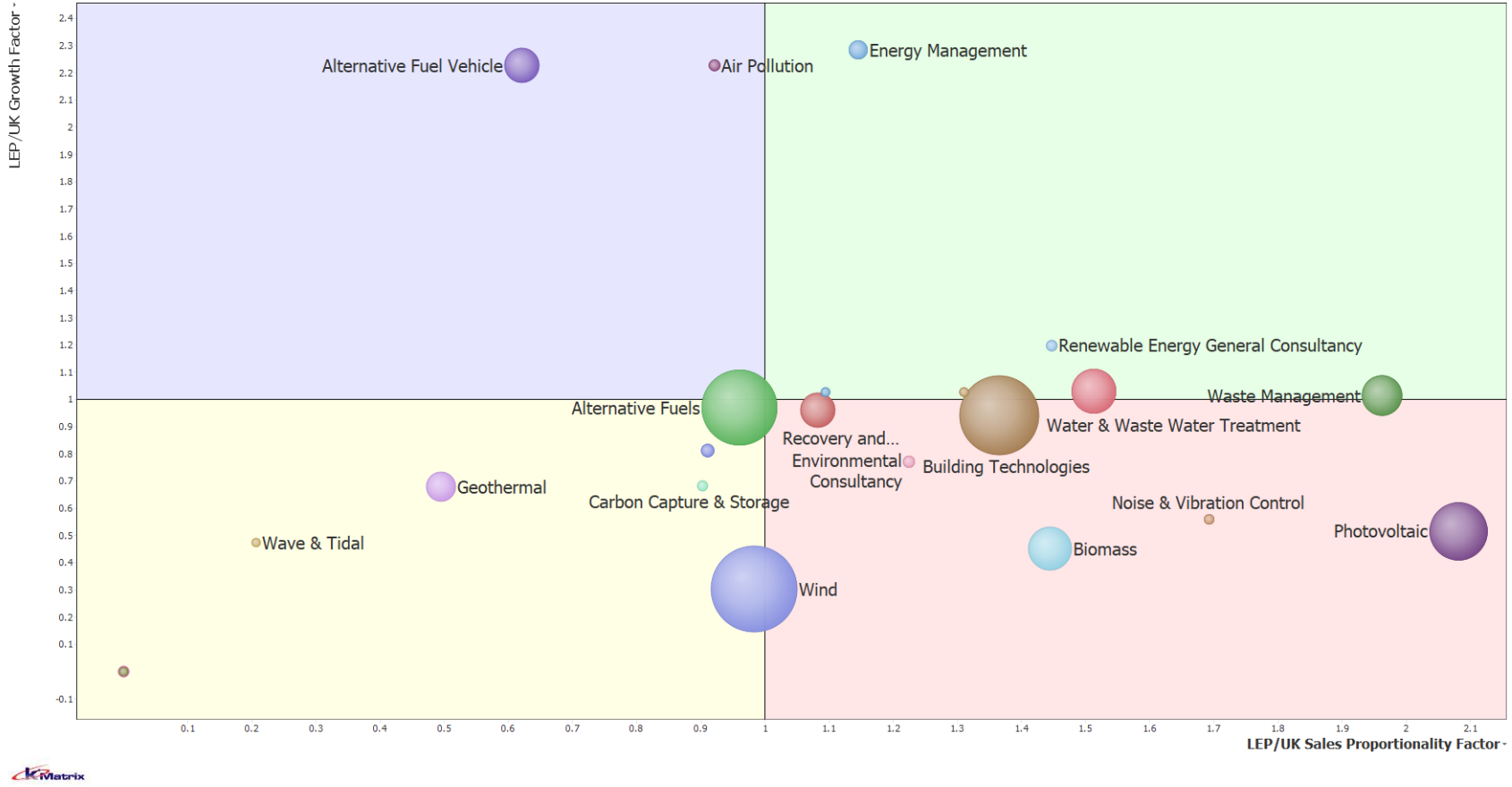


Figure 35 provides the same information as figure 1, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management and Renewable Consultancy have the ideal characteristics of above UK average growth and above LEP average size. Those in the lower right quadrant (red) hold a larger UK share than the average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Water & Waste Water Treatment, Waste Management and Biomass set these sub-sector apart as being strengths. Those in the lower left (yellow) quadrant such as Geothermal and Wave & tidal 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, Nuclear and Hydro



1.12 Stoke and Staffordshire 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 Stoke and Staffordshire LEP, 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 Building Technologies sub-sector has a good combination of size and scalability, while Water & Waste Water Treatment may be smaller in terms of market, but is highly scalable. Wind 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: Stoke and Staffordshire LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA

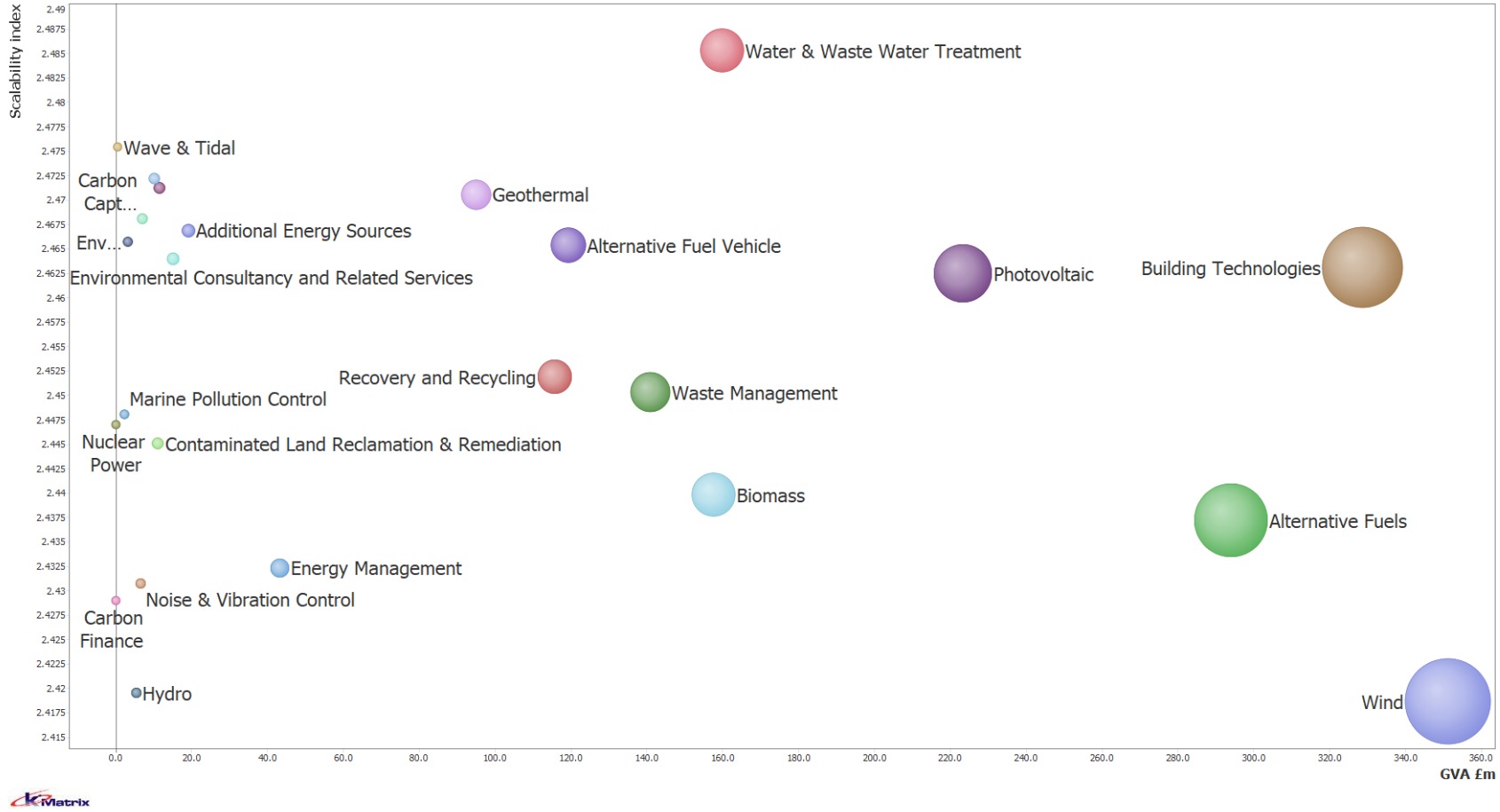
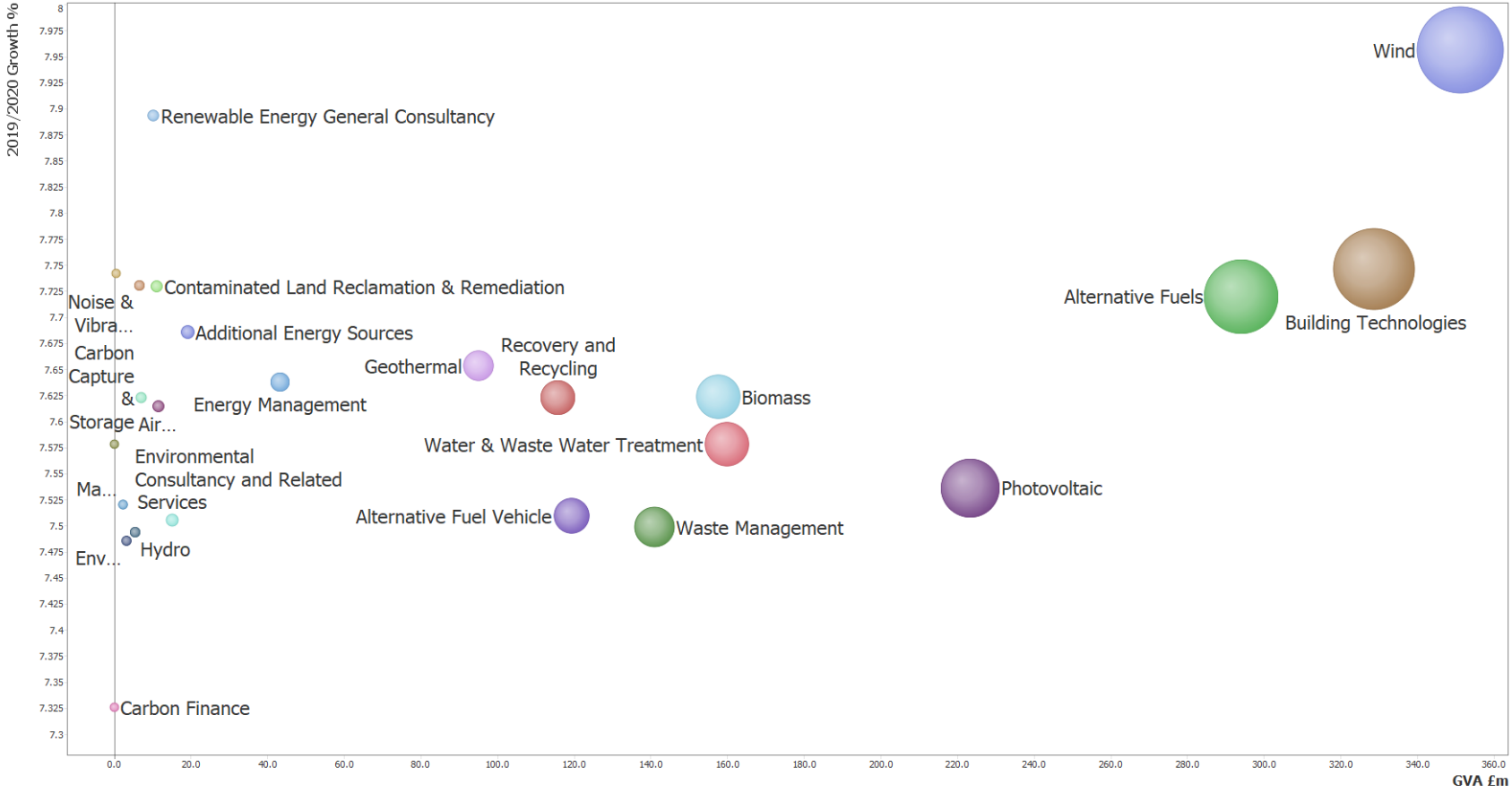


Figure 37 shows the same principle as Figure 36, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies the most favourable position of large size and high growth. 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: Stoke and Staffordshire LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA



1.12 Stoke and Staffordshire 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:

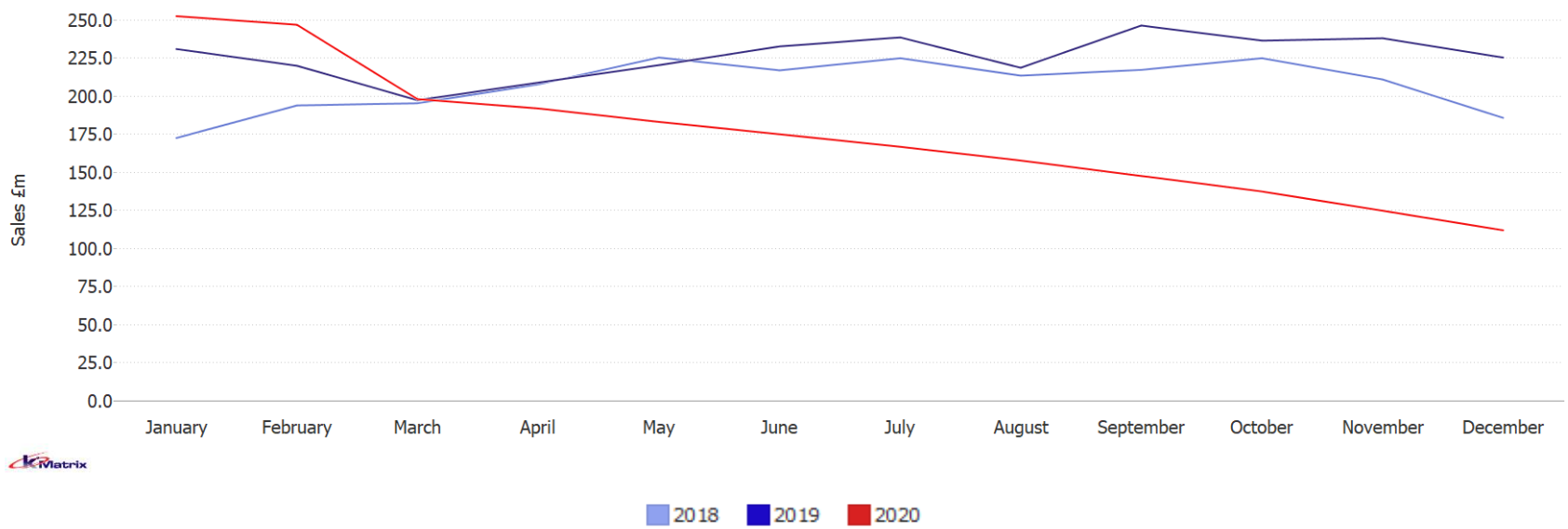
- 1.12.1 Current employment and growth required for 2030 and 2050 net zero targets
- 1.12.2 Current training provision and potential for upskilling of the current workforce within each Level 2 sub-sector
- 1.12.3 Potential of Level 2 sub-sectors to impact on CO2 reduction

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 Stoke and Staffordshire 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.

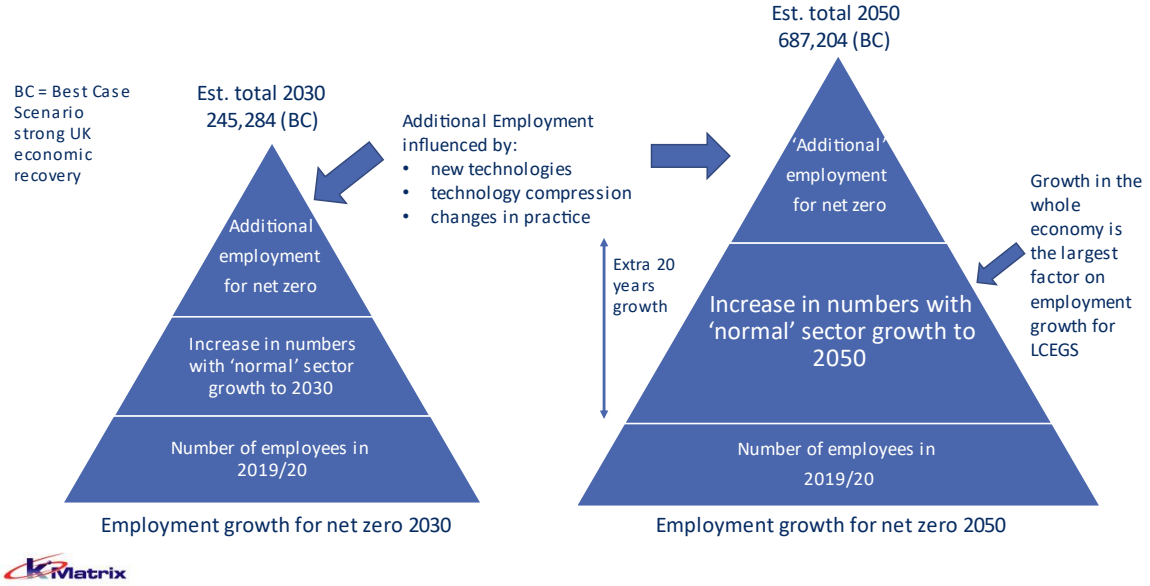
Figure 38: Stoke and Staffordshire LEP LCEGS Sales, by month 2018, 2019 and 2020



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 Stoke and Staffordshire 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 4 Educators listed, with a shortage of 1, making a total of 5 in the region, this will equate to over 50 people providing 'pockets' of time, to equate to 5 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: Stoke and Staffordshire 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	492	109	22.1%	600	643	7.1%	841	40.1%	994	65.5%	2,349	291.3%
Snr Management SME	1,104	111	10.1%	1,215	1,449	19.2%	1,890	55.5%	2,228	83.3%	5,287	335.0%
Supervisory	1,099	111	10.1%	1,210	1,439	18.9%	1,885	55.7%	2,218	83.2%	5,266	335.1%
Middle / Junior Management	1,124	115	10.2%	1,239	1,471	18.7%	1,928	55.6%	2,271	83.3%	5,412	336.9%
Designer / Developer	166	43	25.9%	208	216	3.7%	284	36.1%	335	60.8%	795	281.5%
Clerical	576	1	0.2%	577	754	30.6%	990	71.5%	1,168	102.4%	2,767	379.5%
Self Employed	142	18	13.0%	160	185	15.6%	242	51.0%	287	79.5%	683	326.1%
Advisor or Agent	99	16	16.1%	114	129	12.8%	169	47.4%	200	74.7%	472	312.8%
Educator	4	1	29.9%	5	5	-0.4%	7	32.5%	8	54.8%	19	271.4%
Specialist or Consultant	552	18	3.2%	570	721	26.5%	947	66.2%	1,120	96.6%	2,651	365.1%
Editor	19	1	3.8%	19	24	25.9%	32	65.0%	38	94.7%	90	364.0%
Industrial Researchers	191	15	7.6%	205	249	21.4%	329	60.2%	386	88.0%	915	346.0%
Scientist	87	30	35.1%	117	113	-3.4%	150	27.7%	172	46.5%	415	253.7%
Maintenance Engineer	1,226	77	6.3%	1,303	1,613	23.8%	2,101	61.2%	2,469	89.5%	5,886	351.7%
Civil Engineer	90	24	26.5%	113	117	3.2%	154	35.7%	181	59.8%	429	278.3%
Production Engineer	238	84	35.3%	322	312	-3.4%	410	27.3%	480	48.9%	1,141	254.0%
Power distribution Engineer	558	169	30.3%	726	730	0.4%	955	31.5%	1,127	55.2%	2,674	268.1%
Construction Engineer	134	23	16.8%	156	175	12.3%	230	47.1%	270	72.8%	643	311.5%
Sales Exec	637	73	11.5%	711	835	17.5%	1,098	54.5%	1,287	81.1%	3,059	330.4%
Marketing Personnel	601	68	11.3%	669	789	17.8%	1,032	54.1%	1,219	82.1%	2,884	330.8%
General Semi Skilled Worker	1,263	27	2.1%	1,290	1,649	27.8%	2,166	67.9%	2,549	97.6%	6,072	370.8%
General Labour	1,609	0	0.0%	1,609	2,107	30.9%	2,765	71.8%	3,248	101.8%	7,736	380.7%
Other Employees	1,662	85	5.1%	1,747	2,173	24.4%	2,851	63.2%	3,353	91.9%	7,966	356.0%
Administrative workers	636	13	2.1%	649	830	28.0%	1,088	67.7%	1,281	97.3%	3,058	371.2%
Total	**14,308**	**1,232**	**8.6%**	**15,539**	**18,728**	**20.5%**	**24,543**	**57.9%**	**28,890**	**85.9%**	**68,672**	**341.9%**

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 35.3% (MEH 35.7%), Power Distribution Engineer 30.3% (MEH 29.8%) and Technicians 22.1% (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 3.2% (MEH 3.3%) and Administrative Workers 2.1% (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 20.5% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 57.9% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 85.9% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 341.9% (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 – 10.2% (MEH 10.5%)
Renewable Energy – 7.1% (MEH 7.0%)
Environmental – 10.1% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 45.3% (MEH 47.3%); Renewable Energy 28.6% (MEH 27.9%) and Environmental 34.8% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 33.4% (MEH 33.7%); Renewable Energy 28.4% (MEH 27.1%) and Environmental 31.8% (MEH 32.6%)
Technicians: Low Carbon 27.2% (MEH 27.9%); Renewable Energy 17.6% (MEH 17.3%) and Environmental 22.9% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 69.9% (MEH 68.8%), but only 13.3% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 5 of the Stoke and Staffordshire 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 19.2% (MEH 17.0%); Renewable Energy 34.2% (MEH 34.5%) and Environmental 26.6% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 28.9% (MEH 28.1%); Renewable Energy 33.2% (MEH 35.1%) and Environmental 30.0% (MEH 29.3%)
Technicians of: Low Carbon 34.6% (MEH 34.2%); Renewable Energy 45.4% (MEH 45.9%) and Environmental 39.1% (MEH 39.6%)

Table 9: Stoke and Staffordshire 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	157	43	27.2%	200	206	3.1%	269	34.6%	318	59.0%	748	273.9%
Snr Management SME	264	31	11.8%	295	343	16.3%	451	52.9%	534	80.8%	1,261	327.0%
Supervisory	273	33	12.2%	306	353	15.5%	468	53.0%	550	80.0%	1,306	326.8%
Middle / Junior Management	278	35	12.4%	313	364	16.4%	477	52.6%	561	79.5%	1,347	330.9%
Designer / Developer	42	11	26.3%	53	55	2.9%	72	35.9%	85	60.2%	203	280.6%
Clerical	145	0	0.3%	145	190	31.0%	248	71.4%	291	101.0%	696	380.0%
Self Employed	51	8	16.3%	59	66	11.8%	87	46.8%	103	74.5%	245	314.4%
Advisor or Agent	48	7	15.4%	56	63	13.4%	82	47.6%	98	76.6%	231	314.5%
Educator	0	0	23.2%	0	0	4.8%	0	41.0%	0	65.1%	1	290.3%
Specialist or Consultant	143	5	3.7%	149	187	25.9%	246	65.4%	291	95.5%	681	358.2%
Editor	4	0	3.8%	4	5	25.1%	7	64.3%	8	95.0%	19	365.8%
Industrial Researchers	109	8	7.6%	117	142	21.6%	188	61.0%	220	88.5%	520	345.0%
Scientist	58	21	36.0%	79	75	-4.4%	100	27.1%	114	44.1%	276	249.8%
Maintenance Engineer	302	23	7.8%	326	396	21.7%	516	58.4%	610	87.3%	1,453	346.1%
Civil Engineer	21	6	28.7%	27	27	1.8%	36	33.5%	42	56.9%	99	269.8%
Production Engineer	72	33	45.3%	105	94	-10.4%	125	19.2%	146	39.1%	343	227.4%
Power distribution Engineer	119	40	33.4%	159	156	-2.3%	205	28.9%	241	51.1%	573	260.0%
Construction Engineer	28	6	19.6%	34	37	9.8%	49	44.5%	57	68.1%	137	301.8%
Sales Exec	191	27	14.3%	218	250	14.4%	329	50.9%	385	76.5%	926	324.0%
Marketing Personnel	183	26	14.4%	209	240	15.0%	312	49.4%	371	77.8%	877	319.7%
General Semi Skilled Worker	321	8	2.5%	329	416	26.4%	553	68.1%	647	96.9%	1,537	367.5%
General Labour	548	0	0.0%	548	715	30.6%	941	71.8%	1,104	101.6%	2,632	380.5%
Other Employees	378	23	6.0%	401	499	24.2%	654	62.9%	759	89.0%	1,820	353.4%
Administrative workers	170	4	2.5%	174	223	28.0%	292	67.7%	343	97.1%	815	368.3%
Total	**3,905**	**400**	**10.2%**	**4,305**	**5,103**	**18.5%**	**6,708**	**55.8%**	**7,881**	**83.1%**	**18,744**	**335.4%**

Table 10: Stoke and Staffordshire 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	200	35	17.6%	235	261	11.2%	341	45.4%	403	71.7%	956	307.0%
Snr Management SME	638	60	9.4%	697	839	20.3%	1,091	56.5%	1,287	84.5%	3,050	337.5%
Supervisory	616	56	9.0%	671	810	20.7%	1,055	57.2%	1,242	85.0%	2,945	338.7%
Middle / Junior Management	632	58	9.2%	690	827	19.8%	1,083	57.0%	1,280	85.4%	3,035	339.8%
Designer / Developer	50	11	22.1%	61	65	6.6%	86	40.7%	102	66.1%	241	293.7%
Clerical	320	1	0.2%	321	419	30.5%	550	71.6%	653	103.7%	1,538	379.7%
Self Employed	38	4	9.5%	41	50	20.1%	64	55.7%	77	85.3%	182	339.5%
Advisor or Agent	13	2	17.0%	15	17	11.6%	22	47.2%	26	72.5%	61	311.4%
Educator	0	0	10.8%	0	0	17.1%	0	59.7%	0	91.1%	0	333.5%
Specialist or Consultant	287	8	2.9%	295	375	27.0%	492	66.8%	582	97.3%	1,379	367.8%
Editor	5	0	3.4%	5	6	25.5%	8	64.6%	9	95.4%	22	363.7%
Industrial Researchers	22	2	7.1%	24	29	21.3%	38	60.1%	45	90.2%	106	348.2%
Scientist	8	3	30.1%	11	11	0.9%	15	33.0%	17	55.6%	40	269.0%
Maintenance Engineer	656	37	5.7%	693	867	25.1%	1,126	62.4%	1,319	90.2%	3,149	354.1%
Civil Engineer	21	5	21.8%	26	28	7.3%	36	40.5%	43	66.5%	102	294.5%
Production Engineer	101	29	28.6%	130	133	2.2%	175	34.2%	204	56.7%	487	273.1%
Power distribution Engineer	308	87	28.4%	395	403	2.1%	527	33.2%	623	57.6%	1,475	273.2%
Construction Engineer	45	6	12.6%	51	59	17.3%	77	52.8%	91	80.1%	216	326.9%
Sales Exec	321	31	9.6%	352	421	19.8%	552	56.9%	647	84.1%	1,529	334.9%
Marketing Personnel	309	29	9.5%	338	405	19.9%	530	56.8%	625	85.1%	1,480	338.2%
General Semi Skilled Worker	666	12	1.8%	678	872	28.6%	1,139	68.1%	1,346	98.5%	3,203	372.5%
General Labour	852	0	0.0%	852	1,118	31.2%	1,465	71.8%	1,721	101.9%	4,096	380.5%
Other Employees	949	45	4.7%	994	1,236	24.3%	1,624	63.4%	1,922	93.3%	4,544	357.1%
Administrative workers	328	6	1.9%	334	428	28.0%	561	67.7%	660	97.3%	1,580	372.6%
Total	**7,383**	**525**	**7.1%**	**7,909**	**9,678**	**22.4%**	**12,656**	**60.0%**	**14,921**	**88.7%**	**35,414**	**347.8%**

Table 11: Stoke and Staffordshire 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	135	31	22.9%	166	176	6.2%	230	39.1%	273	64.6%	646	289.9%
Snr Management SME	203	20	10.1%	223	267	19.6%	347	55.8%	408	82.8%	976	337.9%
Supervisory	211	22	10.5%	233	276	18.1%	362	55.2%	426	82.6%	1,016	335.4%
Middle / Junior Management	214	22	10.3%	236	280	18.7%	367	55.5%	430	82.1%	1,030	336.3%
Designer / Developer	73	21	28.2%	94	96	2.2%	125	33.2%	148	57.7%	351	274.1%
Clerical	111	0	0.2%	112	145	30.2%	191	71.6%	224	100.7%	533	378.2%
Self Employed	53	7	12.3%	60	70	16.3%	91	51.8%	108	80.3%	256	328.4%
Advisor or Agent	38	6	16.6%	44	49	12.4%	65	47.2%	76	72.9%	180	311.2%
Educator	4	1	30.2%	5	5	-0.6%	6	32.1%	7	54.3%	18	270.5%
Specialist or Consultant	122	4	3.5%	126	159	25.8%	210	65.8%	248	96.2%	590	366.7%
Editor	10	0	3.9%	11	13	26.4%	17	65.4%	20	94.2%	49	363.4%
Industrial Researchers	60	5	7.9%	65	79	21.2%	103	58.8%	121	86.3%	290	347.1%
Scientist	21	7	34.4%	28	27	-2.3%	35	27.2%	41	49.5%	99	258.7%
Maintenance Engineer	267	17	6.2%	284	349	23.0%	459	61.7%	540	90.1%	1,284	352.2%
Civil Engineer	48	13	27.7%	61	62	2.0%	82	34.6%	97	58.3%	229	275.1%
Production Engineer	65	23	34.8%	87	84	-3.3%	110	26.6%	130	49.2%	312	257.3%
Power distribution Engineer	130	42	31.8%	172	171	-0.8%	223	30.0%	264	53.6%	626	263.9%
Construction Engineer	60	11	18.7%	72	79	9.9%	104	44.4%	122	69.8%	291	305.2%
Sales Exec	126	15	12.1%	141	165	16.8%	217	53.8%	255	80.6%	605	329.0%
Marketing Personnel	110	13	11.4%	123	144	17.0%	190	54.5%	223	81.4%	527	329.5%
General Semi Skilled Worker	277	6	2.3%	283	362	27.7%	475	67.6%	556	96.3%	1,333	370.5%
General Labour	209	0	0.0%	209	273	30.6%	360	71.9%	423	102.2%	1,008	382.0%
Other Employees	334	17	5.1%	352	438	24.6%	573	63.1%	672	91.3%	1,603	355.9%
Administrative workers	137	3	2.2%	140	179	27.7%	235	67.4%	278	97.8%	662	371.5%
Total	**3,019**	**306**	**10.1%**	**3,325**	**3,947**	**18.7%**	**5,178**	**55.7%**	**6,089**	**83.1%**	**14,514**	**336.5%**

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 Stoke and Staffordshire 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 Stoke and Staffordshire LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Stoke and Staffordshire 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: Stoke and Staffordshire LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector

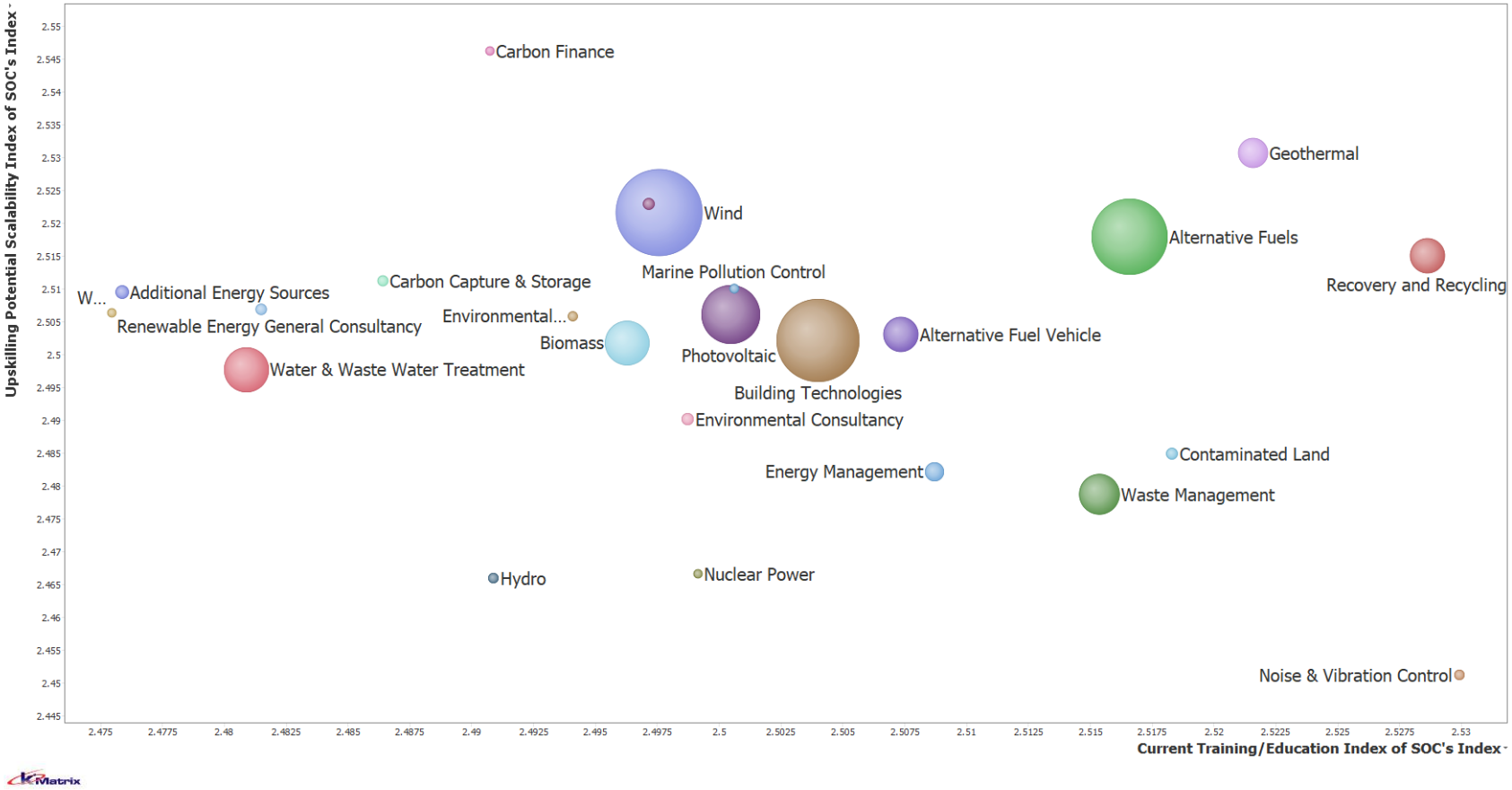


Figure 39 shows that Geothermal holds a strong position, with good current training capacity combined with a strong potential for upskilling. Alternative Fuels and Recovery and Recycling are also strong. Building Technologies holds a middle position. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.

1.13.3 LCEGS Estimated CO_2 Reduction Potential of Sub-sectors

In this section we estimate CO_2 reduction potential for Level 2 sub-sectors within the Stoke and Staffordshire 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.

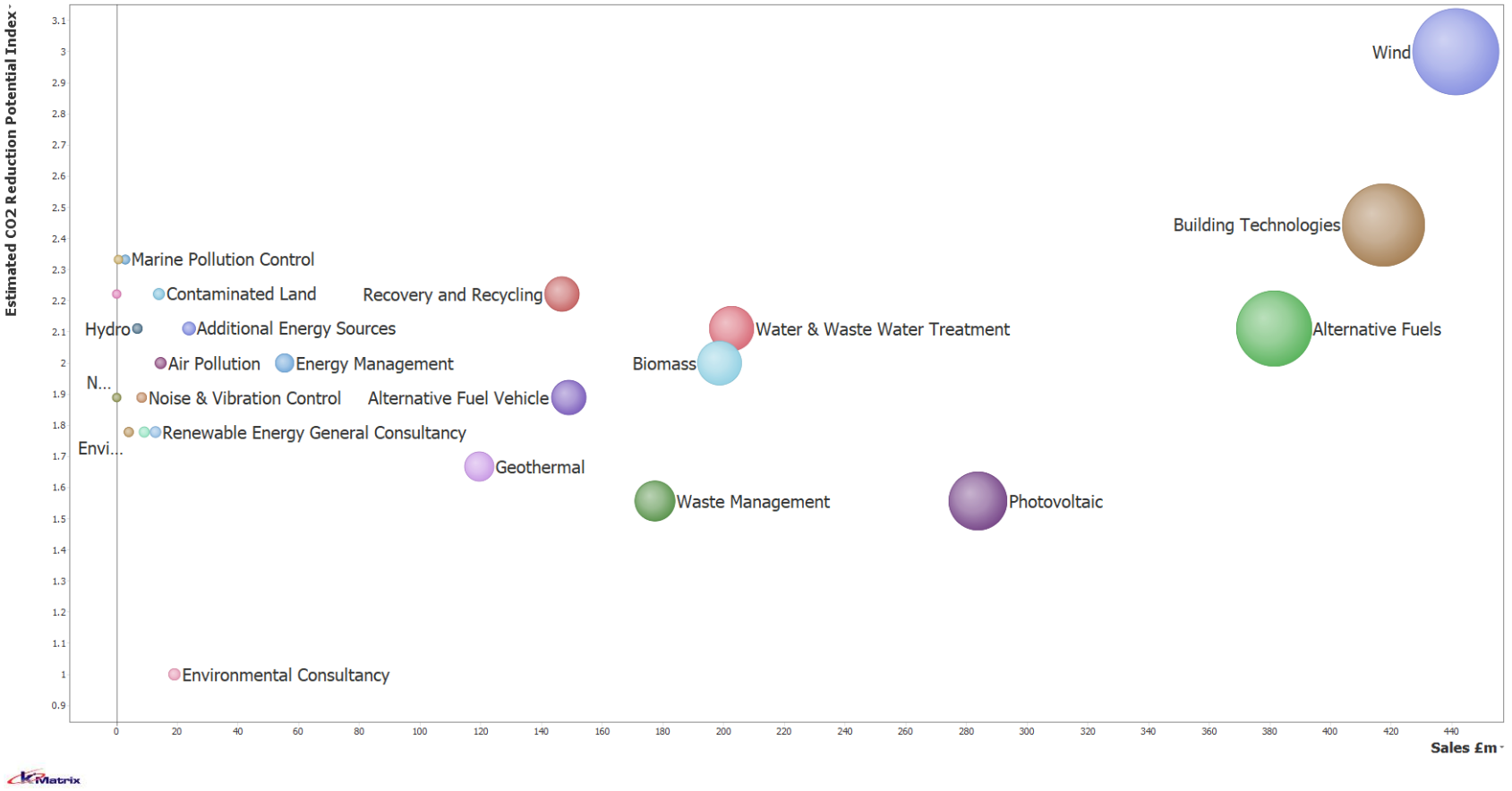
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

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 provide 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: Stoke and Staffordshire LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector



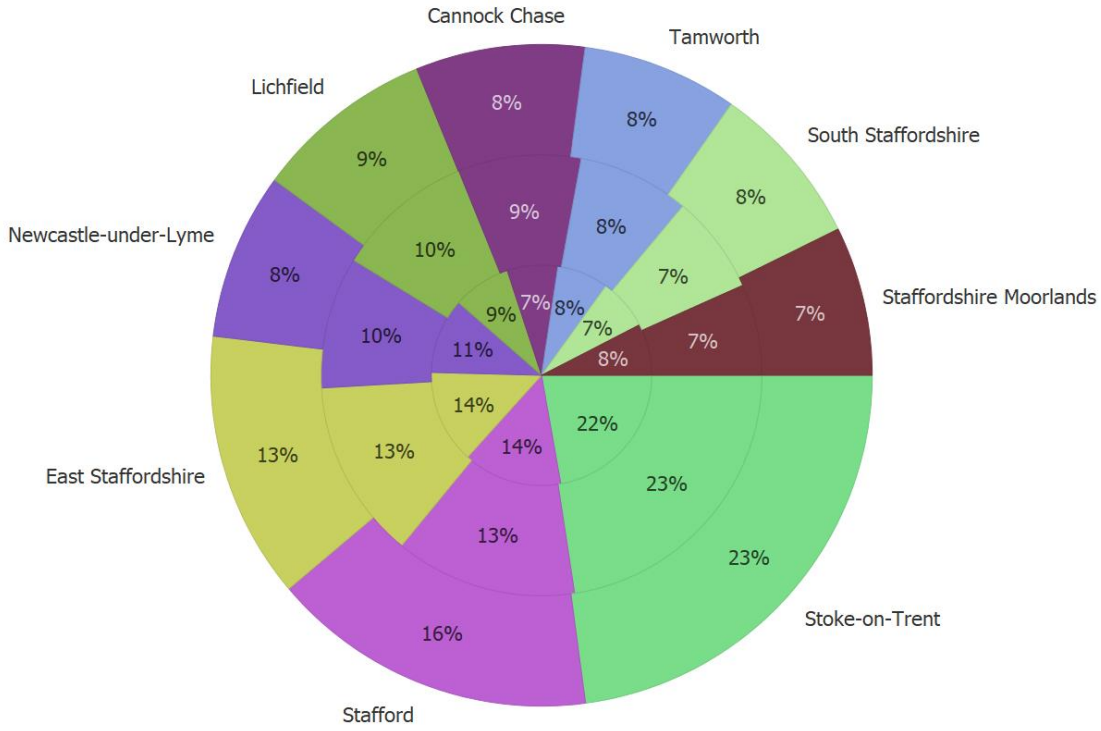
2. Stoke and Staffordshire LEP's LCEGS by Local Authority

2.1 LCEGS by Local Authority

This section of the report the analyses the Stoke and Staffordshire 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). Stoke-on-Trent accounts for 23% of Stoke and Staffordshire LEP's LCEGS sales, 23% of companies and 22% of employment. The top 3 Local Authorities are Stoke-on-Trent, Stafford and East Staffordshire. The smallest Local Authority is Staffordshire Moorlands with 7% of the market.

Figure 41: Stoke and Staffordshire 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 ., 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 is steady between years for the Local Authorities, less than 1.0% higher 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:

- Staffordshire Moorlands – 18.1%
- Tamworth – 14.8%
- Stafford – 11.9%

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

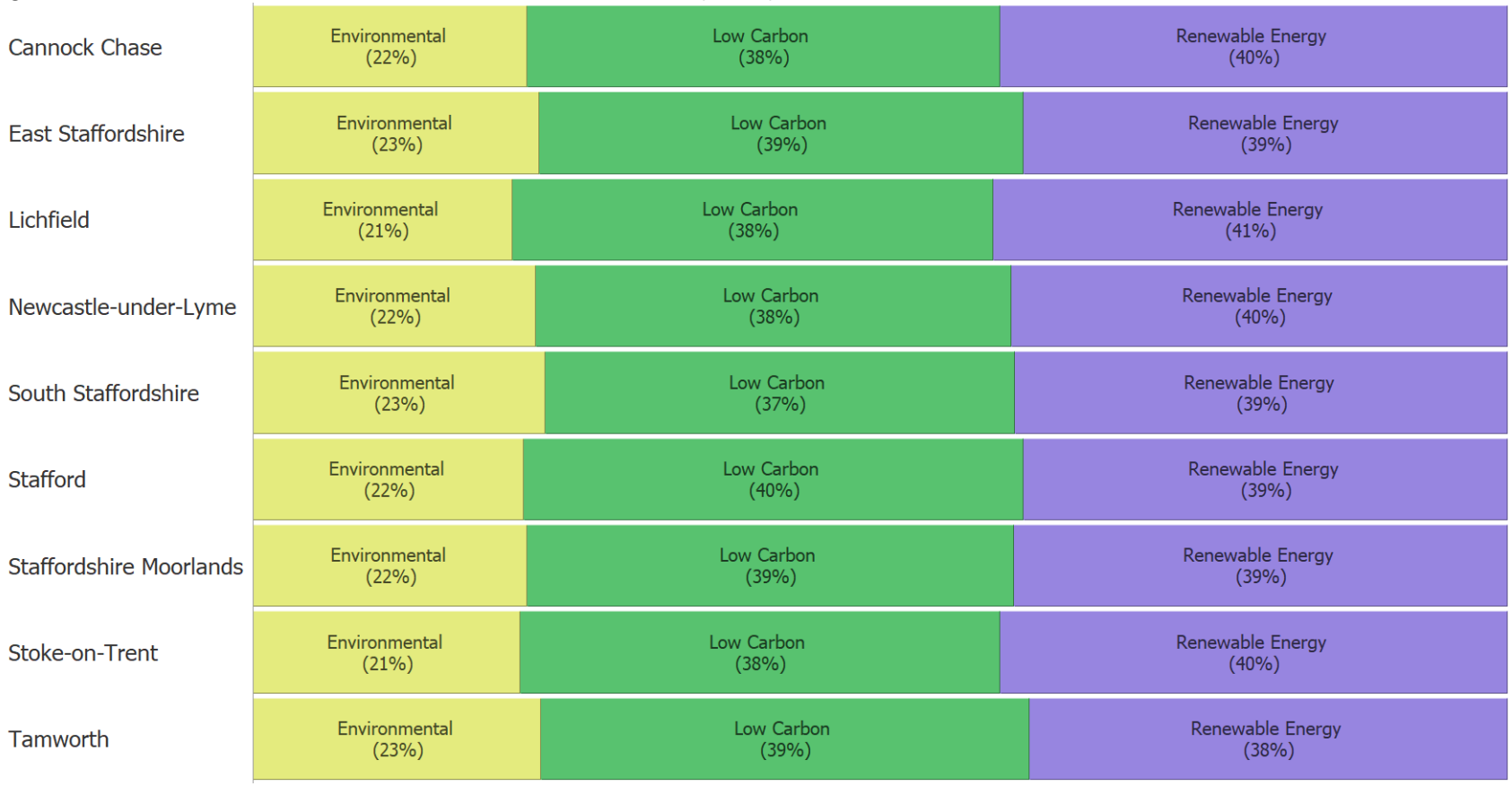
	Sales £m					Available Sales £m					GVA £m				
		Growth		Growth			Growth		Growth			Growth		Growth	
Local Authority	2017/18	%	2018/19	%	2019/20	2017/18	%	2018/19	%	2019/20	2017/18	%	2018/19	%	2019/20
Cannock Chase	217.5	1.0%	219.7	1.1%	222.2	132.5	1.1%	134.0	-1.1%	132.6	170.6	1.0%	172.3	1.1%	174.3
East Staffordshire	311.9	5.7%	329.8	6.4%	350.9	185.0	7.6%	199.1	6.0%	211.0	247.5	5.7%	261.7	6.4%	278.5
Lichfield	228.0	1.7%	231.8	2.0%	236.4	139.3	-0.4%	138.7	1.8%	141.2	179.6	1.7%	182.6	2.0%	186.2
Newcastle-under-Lyme	212.4	1.5%	215.5	1.7%	219.2	126.5	0.8%	127.5	2.0%	130.1	168.7	1.5%	171.2	1.7%	174.2
South Staffordshire	193.6	5.1%	203.5	5.5%	214.7	116.7	1.9%	118.9	7.8%	128.2	156.1	5.1%	164.1	5.5%	173.2
Stafford	345.2	11.1%	383.5	11.9%	429.1	208.8	9.8%	229.3	12.2%	257.3	273.9	11.1%	304.2	11.8%	340.3
Staffordshire Moorlands	140.3	18.1%	165.8	18.1%	195.9	84.4	16.0%	97.9	22.6%	120.0	111.1	18.1%	131.2	18.0%	154.8
Stoke-on-Trent	576.2	3.1%	594.0	3.5%	614.9	345.8	4.9%	362.8	3.8%	376.8	451.2	3.1%	465.1	3.5%	481.4
Tamworth	155.4	14.7%	178.3	14.8%	204.8	93.3	12.9%	105.4	16.5%	122.7	119.2	14.7%	136.8	14.8%	157.0
Total	**2,380.6**	**5.9%**	**2,521.9**	**6.6%**	**2,688.1**	**1,432.3**	**5.7%**	**1,513.7**	**7.0%**	**1,619.9**	**1,878.0**	**5.9%**	**1,989.3**	**6.6%**	**2,119.9**

	# Employees					# Companies				
		Growth		Growth			Growth		Growth	
Local Authority	2017/18	%	2018/19	%	2019/20	2017/18	%	2018/19	%	2019/20
Cannock Chase	1,531	-8.0%	1,409	-1.0%	1,395	79	6.0%	84	0.0%	84
East Staffordshire	2,441	-2.2%	2,387	7.7%	2,572	100	8.8%	109	12.7%	122
Lichfield	1,796	-5.3%	1,701	-6.3%	1,593	101	-6.3%	95	-0.3%	94
Newcastle-under-Lyme	2,040	8.5%	2,213	-6.5%	2,068	83	1.5%	85	6.5%	90
South Staffordshire	1,399	-3.9%	1,345	4.1%	1,400	59	10.1%	65	4.1%	67
Stafford	2,146	9.0%	2,339	16.1%	2,715	102	2.0%	104	20.0%	124
Staffordshire Moorlands	1,140	13.1%	1,290	10.1%	1,420	48	9.2%	53	18.2%	62
Stoke-on-Trent	3,880	1.1%	3,922	6.1%	4,161	196	7.1%	210	0.1%	211
Tamworth	1,086	17.7%	1,279	10.7%	1,416	53	14.7%	61	24.7%	76
Total	**17,460**	**2.4%**	**17,883**	**4.8%**	**18,740**	**822**	**5.2%**	**864**	**7.8%**	**932**

2.3 Local Authority Analysis by Year – Level 1

Figure 42 shows the different profiles of the Stoke and Staffordshire LEP's Local Authorities when sales is split at Level 1. The Local authorities show variation in Environmental of 23% for East Staffordshire, South Staffordshire and Tamworth, to 21% for Lichfield and Stoke-on-Trent; Low carbon from 40% for Stafford to 37% for South Staffordshire; and Renewable Energy from 41% for Lichfield to 38% for Tamworth. This highlights that Stoke and Staffordshire 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: Stoke and Staffordshire 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 Stoke and Staffordshire 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 Stoke and Staffordshire LEP's Local Authorities and these include Wind, Building Technologies, Alternative Fuels and Photovoltaic, they are represented in all of Stoke and Staffordshire LEP's Local Authorities and are consistent with the LEP's top four sub-sectors.

Figure 43: Stoke and Staffordshire 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
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
Newcastle-under-Lyme	4	0.7%	4	7.9%	5	25	2.0%	25	5.7%	27	42	1.1%	42	6.9%	45
South Staffordshire	3	10.1%	3	4.2%	3	18	9.9%	19	4.1%	20	29	10.3%	32	4.1%	34
Stafford	5	2.7%	5	19.9%	6	31	0.9%	31	21.2%	37	51	2.6%	52	19.3%	62
Staffordshire Moorlands	2	9.6%	3	17.4%	3	14	10.6%	16	18.1%	19	24	8.3%	26	18.3%	31
Stoke-on-Trent	10	7.2%	11	0.3%	11	59	7.4%	63	0.0%	63	98	6.8%	105	0.3%	105
Tamworth	3	15.0%	3	24.4%	4	16	15.2%	18	24.2%	23	27	14.5%	31	24.8%	38
Total	**41**	**5.1%**	**43**	**8.1%**	**47**	**247**	**5.4%**	**260**	**7.8%**	**280**	**411**	**5.0%**	**432**	**7.8%**	**465**

	# 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
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
Newcastle-under-Lyme	8	2.0%	9	5.8%	9	4	1.9%	4	7.2%	5	83	1.5%	85	6.5%	90
South Staffordshire	6	10.5%	6	3.9%	7	3	9.4%	3	4.5%	3	59	10.1%	65	4.1%	67
Stafford	10	2.1%	10	20.1%	12	5	2.3%	5	20.7%	6	102	2.0%	104	20.0%	124
Staffordshire Moorlands	5	9.6%	5	17.7%	6	2	8.8%	3	18.9%	3	48	9.2%	53	18.2%	62
Stoke-on-Trent	20	7.1%	21	-0.2%	21	10	7.8%	11	-0.3%	11	196	7.1%	210	0.1%	211
Tamworth	5	14.8%	6	26.0%	8	3	14.0%	3	24.0%	4	53	14.7%	61	24.7%	76
Total	**82**	**5.4%**	**86**	**7.7%**	**93**	**41**	**5.7%**	**43**	**7.6%**	**47**	**822**	**5.2%**	**864**	**7.8%**	**932**

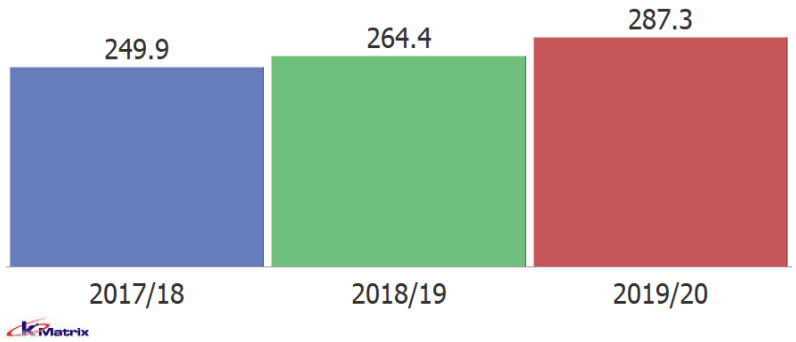
Company number fluctuations may represent companies in more than one sector (such as automotive), who trade sporadically within the LCEGS sector. Decreases in company numbers can therefore be a result of trading in other sectors, not that the company itself has ceased to trade.

3. Stoke and Staffordshire LEP's LCEGS and International Trade

3.1 Stoke and Staffordshire LEP's LCEGS Exports

This section of the report addresses Stoke and Staffordshire 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: Stoke and Staffordshire LEP's Exports (£m) 2015/16 to 2017/18

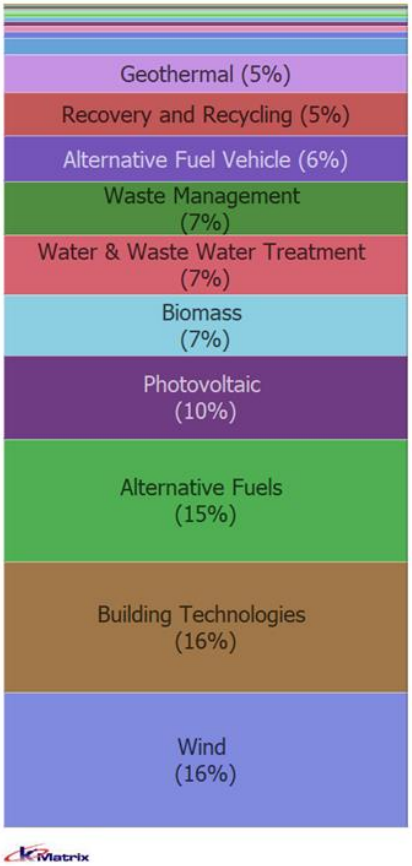


The value of Stoke and Staffordshire LEP's LCEGS Exports was £250m in 2017/18 and has grown to £287m in 2019/20.

Growth between 2017/18 and 2018/19 was 5.8% and growth between 2018/19 and 2019/20 was 8.7%.

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: Stoke and Staffordshire LEP's Exports (%) by Sub-Sector 2019/20

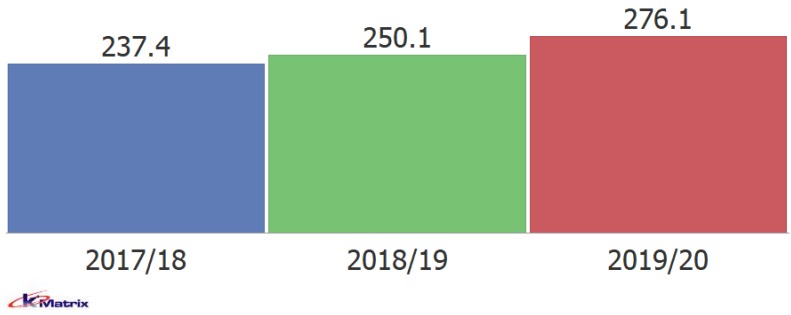


Stoke and Staffordshire LEP represented 9% of all MEH LCEGS exports in 2019/20. This is slightly lower than Stoke and Staffordshire LEP's 10% of overall MEH Sales.

Figure 45 shows the proportion of Stoke and Staffordshire LEP's LCEGS exports by Level 2 sub-sector, with Wind (16%), Building Technologies (16%), Alternative Fuels (15%), Photovoltaic (10%) and Biomass (8%) being the leading sub-sectors and accounting for 64% of all Stoke and Staffordshire 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: Stoke and Staffordshire LEP's Imports (£m) 2015/16 to 2017/18

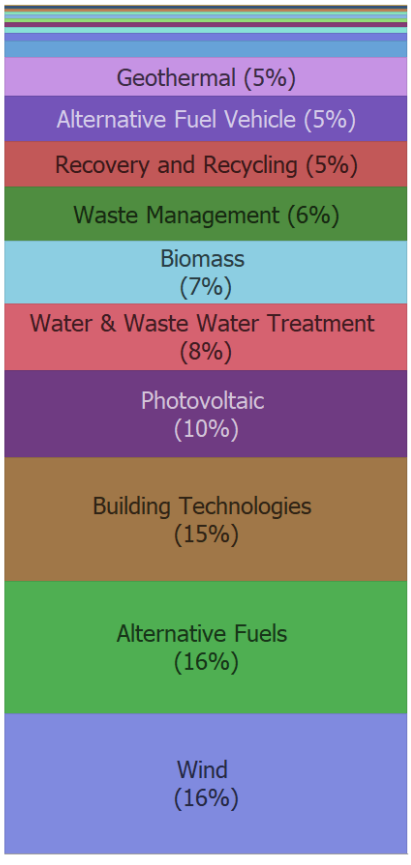


The value of Stoke and Staffordshire LEP's LCEGS Imports was £237m in 2017/18 and has grown to £276m in 2019/20.

Growth between 2017/18 and 2018/19 was 5.4% and growth between 2018/19 and 2019/20 was 10.4%.

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: Stoke and Staffordshire LEP's Imports (%) by Sub-Sector 2019/20



Stoke and Staffordshire LEP represented 10% of all MEH LCEGS imports in 2019/20. This is in line with Stoke and Staffordshire LEP's 10% of overall MEH Sales.

Figure 47 shows the proportion of Stoke and Staffordshire LEP's LCEGS imports by Level 2 sub-sector, with Wind (16%), Alternative Fuels (16%), Building Technologies (15%), Photovoltaic (10%) and Water & Waste Water Treatment (8%) being the leading sub-sectors and accounting for 65% of all Stoke and Staffordshire LEP's LCEGS imports.

In Table 14 Stoke and Staffordshire 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 10.7%, with less than 1.0 percentage point variation between sub-sectors, which is consistent across the three years, indicating a stable and established export market.

Table 14: Stoke and Staffordshire 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	12.8	1.4	10.6%	13.6	1.4	10.4%	14.5	1.5	10.5%
Environmental	Contaminated Land	12.4	1.2	10.0%	13.2	1.4	10.6%	14.0	1.4	10.2%
Environmental	Environmental Consultancy	16.8	1.8	10.4%	17.8	1.8	10.3%	19.0	2.0	10.6%
Environmental	Environmental Monitoring	3.5	0.4	10.7%	3.7	0.4	10.5%	4.0	0.4	10.6%
Environmental	Marine Pollution Control	2.4	0.2	10.3%	2.6	0.3	10.5%	2.8	0.3	10.3%
Environmental	Noise & Vibration Control	7.2	0.8	10.6%	7.7	0.8	10.3%	8.2	0.9	10.5%
Environmental	Recovery and Recycling	129.6	13.0	10.0%	137.5	14.9	10.8%	146.7	15.2	10.4%
Environmental	Waste Management	157.4	16.8	10.7%	166.6	17.3	10.4%	177.4	18.7	10.5%
Environmental	Water & Waste Water Treatment	179.1	18.5	10.4%	190.0	20.1	10.6%	202.7	20.9	10.3%
Low Carbon	Additional Energy Sources	21.0	2.2	10.3%	22.3	2.3	10.5%	23.7	2.4	10.2%
Low Carbon	Alternative Fuel Vehicle	132.0	13.6	10.3%	139.8	14.4	10.3%	148.9	16.0	10.8%
Low Carbon	Alternative Fuels	336.3	34.8	10.3%	357.0	38.6	10.8%	381.3	42.7	11.2%
Low Carbon	Building Technologies	369.6	39.1	10.6%	391.5	40.1	10.2%	417.3	45.4	10.9%
Low Carbon	Carbon Capture & Storage	8.0	0.9	10.7%	8.5	0.9	10.5%	9.0	0.9	10.2%
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	49.1	5.1	10.3%	52.0	5.4	10.4%	55.4	5.8	10.4%
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	176.3	18.9	10.7%	186.6	20.0	10.7%	198.7	21.2	10.7%
Renewable Energy	Geothermal	105.9	11.2	10.5%	112.1	11.6	10.4%	119.4	12.9	10.8%
Renewable Energy	Hydro	6.0	0.7	10.9%	6.3	0.7	10.5%	6.7	0.7	10.7%
Renewable Energy	Photovoltaic	252.2	26.9	10.7%	266.7	27.2	10.2%	283.8	29.5	10.4%
Renewable Energy	Renewable Consultancy	11.3	1.2	10.4%	12.0	1.3	10.4%	12.8	1.4	10.8%
Renewable Energy	Wave & Tidal	0.4	0.0	9.7%	0.4	0.0	10.3%	0.4	0.0	11.2%
Renewable Energy	Wind	391.1	41.5	10.6%	414.2	43.5	10.5%	441.3	47.1	10.7%
Total		**2,380.4**	**249.9**	**10.5%**	**2,522.1**	**264.4**	**10.5%**	**2,688.0**	**287.3**	**10.7%**

In Table 15 Stoke and Staffordshire 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 24.7%, with subtle variation between sub-sectors.

Table 15: Stoke and Staffordshire 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	1.4	0.3	24.4%	1.4	0.3	24.6%	1.5	0.4	24.3%
Environmental	Contaminated Land	1.2	0.3	24.4%	1.4	0.4	25.1%	1.4	0.4	24.7%
Environmental	Environmental Consultancy	1.8	0.4	25.5%	1.8	0.5	24.5%	2.0	0.5	24.3%
Environmental	Environmental Monitoring	0.4	0.1	23.9%	0.4	0.1	23.7%	0.4	0.1	24.9%
Environmental	Marine Pollution Control	0.2	0.1	25.4%	0.3	0.1	23.6%	0.3	0.1	24.5%
Environmental	Noise & Vibration Control	0.8	0.2	24.3%	0.8	0.2	24.7%	0.9	0.2	24.7%
Environmental	Recovery and Recycling	13.0	3.2	24.9%	14.9	3.6	23.9%	15.2	3.8	24.9%
Environmental	Waste Management	16.8	4.0	24.0%	17.3	4.2	24.4%	18.7	4.4	23.6%
Environmental	Water & Waste Water Treatment	18.5	4.5	24.3%	20.1	4.9	24.4%	20.9	5.1	24.6%
Low Carbon	Additional Energy Sources	2.2	0.5	25.1%	2.3	0.6	25.4%	2.4	0.6	24.4%
Low Carbon	Alternative Fuel Vehicle	13.6	3.3	24.2%	14.4	3.7	25.8%	16.0	3.9	24.1%
Low Carbon	Alternative Fuels	34.8	8.5	24.5%	38.6	9.6	24.8%	42.7	10.1	23.7%
Low Carbon	Building Technologies	39.1	9.0	23.1%	40.1	9.9	24.7%	45.4	11.4	25.2%
Low Carbon	Carbon Capture & Storage	0.9	0.2	24.9%	0.9	0.2	23.8%	0.9	0.2	24.9%
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	5.1	1.3	24.7%	5.4	1.3	24.0%	5.8	1.4	24.3%
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	18.9	4.7	24.9%	20.0	5.1	25.4%	21.2	5.4	25.4%
Renewable Energy	Geothermal	11.2	2.7	24.1%	11.6	2.9	24.6%	12.9	3.3	25.3%
Renewable Energy	Hydro	0.7	0.2	23.3%	0.7	0.2	23.8%	0.7	0.2	26.3%
Renewable Energy	Photovoltaic	26.9	6.8	25.5%	27.2	6.9	25.3%	29.5	7.4	25.3%
Renewable Energy	Renewable Consultancy	1.2	0.3	24.1%	1.3	0.3	25.6%	1.4	0.3	24.8%
Renewable Energy	Wave & Tidal	0.0	0.0	24.9%	0.0	0.0	26.1%	0.0	0.0	25.5%
Renewable Energy	Wind	41.5	10.4	25.2%	43.5	10.5	24.1%	47.1	11.7	24.8%
Total		**249.9**	**61.2**	**24.5%**	**264.4**	**65.3**	**24.7%**	**287.3**	**70.8**	**24.7%**

The sub-sectors with the highest available export to export ratio in 2019/20 are: Hydro 26.3%; Wave & Tidal 25.5%; Geothermal 25.3%; Photovoltaic 25.3%; Building Technologies 25.2%; Environmental Monitoring 24.9% and Carbon Capture & Storage 24.9%.

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 Stoke and Staffordshire 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 10.3%, with only 1.0 percentage point variation between sub-sectors, which is consistent across the three years, indicating a stable and established import market.

Table 16: Stoke and Staffordshire 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	12.8	1.3	9.9%	13.6	1.3	9.8%	14.5	1.5	10.2%
Environmental	Contaminated Land	12.4	1.2	9.5%	13.2	1.3	9.9%	14.0	1.4	10.2%
Environmental	Environmental Consultancy	16.8	1.7	10.3%	17.8	1.7	9.4%	19.0	1.9	10.2%
Environmental	Environmental Monitoring	3.5	0.3	9.9%	3.7	0.4	10.1%	4.0	0.4	10.2%
Environmental	Marine Pollution Control	2.4	0.3	10.5%	2.6	0.3	9.9%	2.8	0.3	10.1%
Environmental	Noise & Vibration Control	7.2	0.7	10.0%	7.7	0.8	10.3%	8.2	0.8	10.1%
Environmental	Recovery and Recycling	129.6	13.2	10.2%	137.5	13.3	9.7%	146.7	14.8	10.1%
Environmental	Waste Management	157.4	15.5	9.8%	166.6	16.8	10.1%	177.4	17.5	9.8%
Environmental	Water & Waste Water Treatment	179.1	18.3	10.2%	190.0	20.1	10.6%	202.7	21.6	10.7%
Low Carbon	Additional Energy Sources	21.0	2.1	9.9%	22.3	2.2	9.7%	23.7	2.3	9.7%
Low Carbon	Alternative Fuel Vehicle	132.0	13.1	9.9%	139.8	13.1	9.4%	148.9	14.7	9.9%
Low Carbon	Alternative Fuels	336.3	34.1	10.1%	357.0	33.1	9.3%	381.3	43.1	11.3%
Low Carbon	Building Technologies	369.6	37.4	10.1%	391.5	39.9	10.2%	417.3	40.1	9.6%
Low Carbon	Carbon Capture & Storage	8.0	0.8	10.0%	8.5	0.9	10.4%	9.0	0.9	10.2%
Low Carbon	Carbon Finance	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0
Low Carbon	Energy Management	49.1	4.9	9.9%	52.0	5.1	9.9%	55.4	5.6	10.1%
Low Carbon	Nuclear Power	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0
Renewable Energy	Biomass	176.3	17.0	9.6%	186.6	18.7	10.0%	198.7	20.6	10.4%
Renewable Energy	Geothermal	105.9	10.5	9.9%	112.1	10.9	9.7%	119.4	12.6	10.5%
Renewable Energy	Hydro	6.0	0.6	9.5%	6.3	0.6	9.2%	6.7	0.6	9.3%
Renewable Energy	Photovoltaic	252.2	26.0	10.3%	266.7	27.4	10.3%	283.8	28.5	10.1%
Renewable Energy	Renewable Consultancy	11.3	1.2	10.4%	12.0	1.3	10.6%	12.8	1.3	9.8%
Renewable Energy	Wave & Tidal	0.4	0.0	10.4%	0.4	0.0	9.3%	0.4	0.0	10.1%
Renewable Energy	Wind	391.1	37.2	9.5%	414.2	41.0	9.9%	441.3	45.5	10.3%
Total		**2,380.6**	**237.4**	**10.0%**	**2,521.9**	**250.1**	**9.9%**	**2,688.1**	**276.1**	**10.3%**

Figure 48 shows the Exports plotted against the Stoke and Staffordshire 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 sub-sector holds the most desirable position, being both the largest in terms of exports and strongest for growth. Markets that should be considered Export strengths include: Wind, Building Technologies, Alternative Fuels, Biomass Geothermal.

Figure 48: Stoke and Staffordshire LEP's LCEGS Exports vs Stoke and Staffordshire LEP's Level 2 Growth for 2019/20

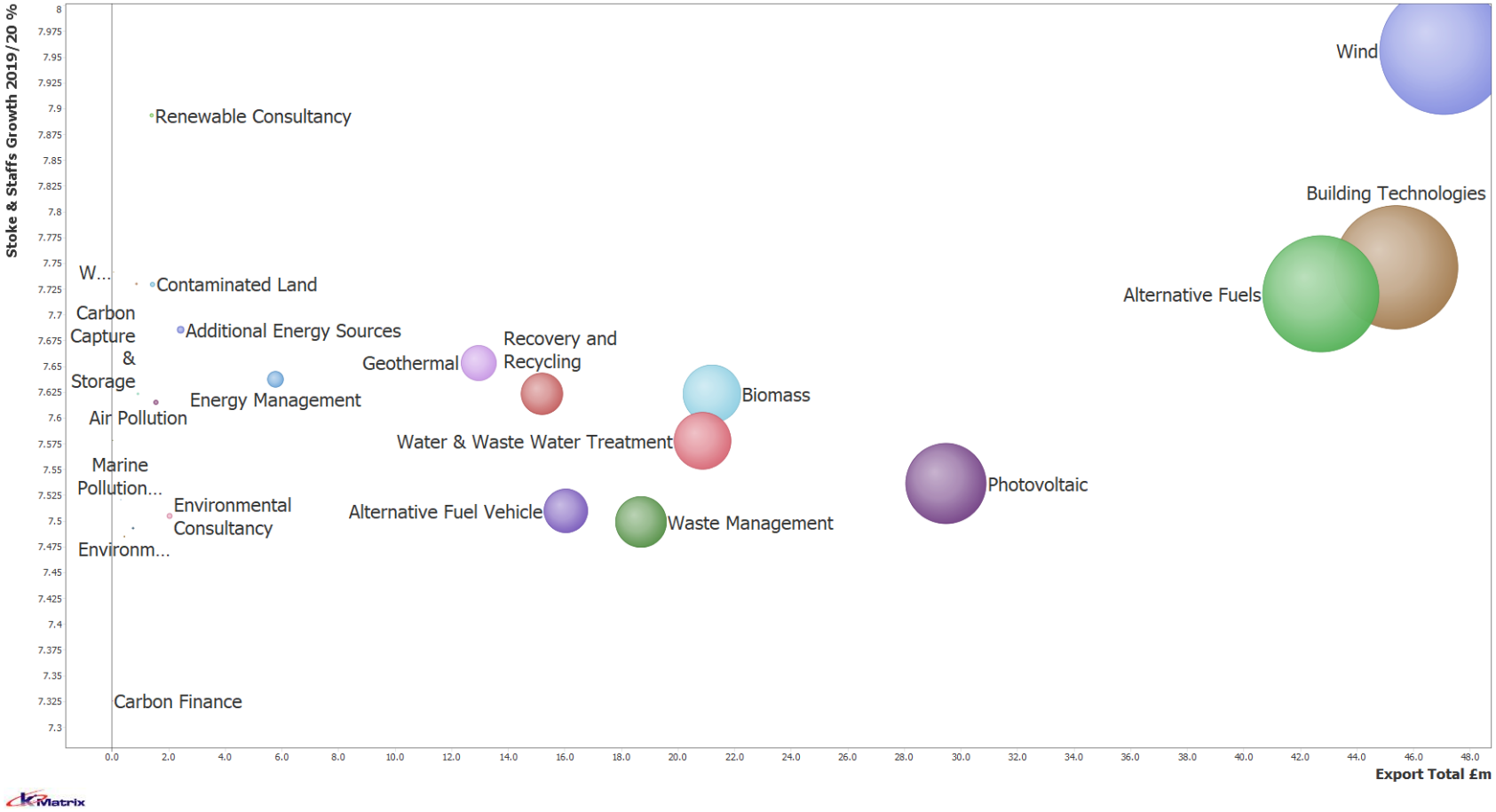
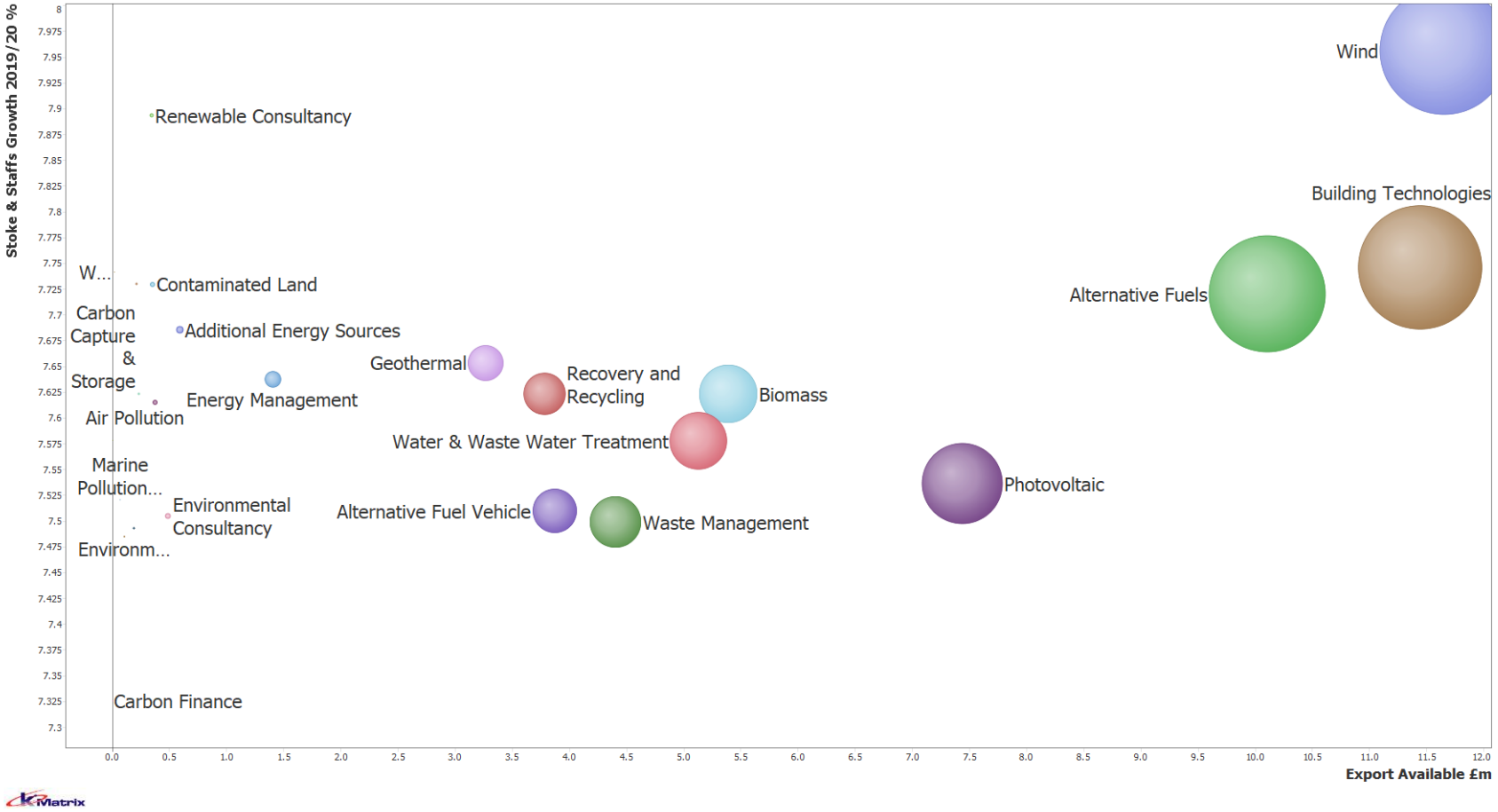


Figure 49 shows the Available Exports plotted against the Stoke and Staffordshire LEP's Growth from to 2018/19 to 2019/20 for all Level 2 sub-sectors, with the bubbles sized according to the size of the Exports. Here we can see that the pattern is slightly different from the Export graph in figure 48, Biomass has moved to the left as the Available market is less attractive, while Alternative Fuels has moved to the right as there is a strong Export Market Available.

Figure 49: Stoke and Staffordshire LEP's LCEGS Available Exports vs Stoke and Staffordshire LEP's Level 2 Growth for 2019/20

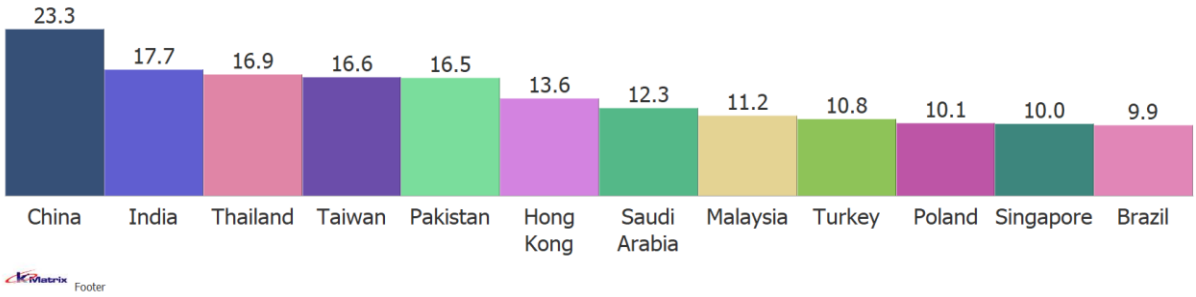


The Top 12 destinations for Stoke and Staffordshire LEP's LCEGS exports are shown in Figure 50. China is the top destination, followed by India, Thailand, Taiwan, Pakistan, Hong Kong, Saudi Arabia, Malaysia, Turkey, Poland, Singapore and Brazil.

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 Stoke and Staffordshire LEP's LCEGS Export Destinations 2019/20



3.2 Stoke and Staffordshire LEP's LCEGS Priority Markets

Table 17 combines analysis of Stoke and Staffordshire 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 11 (out of 24) sub-sectors.

Table 17: Stoke and Staffordshire 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	0.21	0.47	0.38	0.05	1.21	0.29	0.25	0.26	0.66	0.35	0.82	0.21	0.24	0.26	0.53	0.12
Environmental	Waste Management	0.28	0.59	0.46	0.06	1.46	0.32	0.29	0.30	0.78	0.45	1.04	0.26	0.31	0.31	0.65	0.16
Environmental	Water & Waste Water Treatment	0.31	0.73	0.55	0.08	1.55	0.43	0.37	0.44	0.97	0.55	1.29	0.32	0.35	0.42	0.81	0.20
Low Carbon	Alternative Fuel Vehicle	0.39	0.89	0.70	0.10	2.07	0.55	0.45	0.50	1.19	0.69	1.63	0.41	0.51	0.53	1.05	0.25
Low Carbon	Alternative Fuels	0.54	1.54	1.05	0.15	2.92	0.82	0.77	0.71	2.03	1.01	2.64	0.68	0.58	0.72	1.72	0.35
Low Carbon	Building Technologies	0.47	1.08	0.89	0.13	3.01	0.70	0.59	0.68	1.57	0.88	2.09	0.53	0.60	0.62	1.32	0.33
Low Carbon	Carbon Finance	0.15	0.36	0.32	0.04	0.84	0.20	0.17	0.23	0.48	0.28	0.49	0.14	0.19	0.15	0.45	0.10
Low Carbon	Energy Management	0.09	0.23	0.18	0.03	0.53	0.13	0.12	0.13	0.32	0.17	0.49	0.10	0.11	0.13	0.25	0.06
Renewable Energy	Biomass	0.25	0.55	0.45	0.06	1.42	0.32	0.31	0.32	0.88	0.45	0.94	0.26	0.27	0.28	0.65	0.14
Renewable Energy	Geothermal	0.56	1.20	0.94	0.15	3.05	0.72	0.58	0.69	1.73	0.92	2.16	0.54	0.56	0.65	1.34	0.34
Renewable Energy	Photovoltaic	0.30	0.61	0.52	0.07	1.53	0.34	0.32	0.34	0.87	0.53	1.27	0.30	0.33	0.36	0.70	0.17
Renewable Energy	Wind	0.45	1.01	0.83	0.11	2.38	0.55	0.44	0.55	1.36	0.76	1.72	0.44	0.48	0.54	1.07	0.27

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	0.33	0.83	0.50	0.21	0.31	0.25	0.63	0.53	0.25	0.25	0.16	0.84	0.85	0.52	0.44	0.17
Environmental	Waste Management	0.37	0.98	0.59	0.24	0.40	0.28	0.70	0.60	0.28	0.31	0.19	1.01	1.08	0.61	0.56	0.20
Environmental	Water & Waste Water Treatment	0.49	1.18	0.76	0.31	0.44	0.34	0.90	0.69	0.35	0.40	0.23	1.23	1.24	0.73	0.69	0.24
Low Carbon	Alternative Fuel Vehicle	0.66	1.68	0.84	0.43	0.61	0.50	1.14	0.98	0.41	0.53	0.34	1.27	1.34	0.98	0.92	0.33
Low Carbon	Alternative Fuels	0.88	2.24	1.49	0.54	0.97	0.61	1.77	1.28	0.83	0.88	0.52	2.17	2.53	1.59	1.37	0.48
Low Carbon	Building Technologies	0.79	1.85	1.16	0.58	0.74	0.62	1.54	1.23	0.61	0.64	0.38	1.95	1.87	1.31	1.11	0.41
Low Carbon	Carbon Finance	0.23	0.66	0.39	0.18	0.25	0.16	0.42	0.40	0.17	0.21	0.15	0.54	0.69	0.37	0.29	0.13
Low Carbon	Energy Management	0.14	0.43	0.24	0.11	0.15	0.12	0.29	0.24	0.11	0.13	0.08	0.42	0.40	0.25	0.22	0.08
Renewable Energy	Biomass	0.38	0.87	0.63	0.24	0.40	0.29	0.73	0.62	0.34	0.32	0.21	1.02	1.02	0.62	0.52	0.21
Renewable Energy	Geothermal	0.76	2.05	1.21	0.57	0.81	0.64	1.45	1.30	0.57	0.64	0.41	2.19	2.03	1.32	1.15	0.44
Renewable Energy	Photovoltaic	0.44	1.06	0.68	0.32	0.47	0.34	0.82	0.67	0.35	0.38	0.22	1.19	1.11	0.72	0.60	0.22
Renewable Energy	Wind	0.65	1.70	1.05	0.40	0.64	0.53	1.13	0.90	0.50	0.54	0.33	1.73	1.75	1.10	0.86	0.34

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 Stoke and Staffordshire 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: Stoke and Staffordshire 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	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01
Recovery and Recycling	Glass Stock Processing	0.03	0.07	0.05	0.01	0.18	0.04	0.03	0.03	0.08	0.04	0.12
Recovery and Recycling	Technologies, Research & Development	0.01	0.01	0.01	0.00	0.03	0.01	0.01	0.01	0.02	0.01	0.02
Recovery and Recycling	Waste Collection	0.09	0.19	0.16	0.02	0.51	0.13	0.11	0.12	0.29	0.16	0.34
Waste Management	Construction & Operation of Waste Treatment Facilities	0.08	0.19	0.14	0.02	0.41	0.10	0.11	0.10	0.28	0.13	0.29
Waste Management	Consultancy, Training and Education	0.03	0.08	0.07	0.01	0.19	0.04	0.04	0.04	0.08	0.05	0.16
Waste Management	Equipment For Waste Treatment	0.11	0.23	0.18	0.02	0.55	0.12	0.09	0.10	0.30	0.18	0.38
Waste Management	Technologies, Research & Development	0.06	0.10	0.08	0.01	0.31	0.06	0.05	0.06	0.12	0.09	0.22
Water & Waste Water Treatment	Engineering	0.07	0.13	0.11	0.01	0.33	0.10	0.09	0.09	0.22	0.11	0.25
Water & Waste Water Treatment	Water Treatment and Distribution	0.24	0.59	0.43	0.06	1.19	0.32	0.28	0.34	0.74	0.43	1.02
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	0.28	0.65	0.54	0.07	1.55	0.43	0.33	0.37	0.86	0.53	1.20
Alternative Fuel Vehicle	Other Fuels and Vehicles	0.11	0.24	0.16	0.03	0.52	0.12	0.12	0.13	0.34	0.16	0.43
Alternative Fuels	Main Stream Bio Fuels	0.09	0.25	0.22	0.03	0.51	0.13	0.12	0.13	0.33	0.22	0.42
Alternative Fuels	Other Bio Fuels	0.37	1.08	0.70	0.10	1.86	0.61	0.57	0.47	1.41	0.67	1.88
Alternative Fuels	Other Fuels	0.04	0.13	0.08	0.01	0.37	0.04	0.04	0.06	0.19	0.06	0.21
Building Technologies	Doors	0.11	0.28	0.24	0.04	0.83	0.22	0.14	0.20	0.45	0.22	0.59
Building Technologies	Insulation and Heat Retention Materials	0.09	0.18	0.16	0.02	0.47	0.11	0.09	0.12	0.24	0.14	0.34
Building Technologies	Monitoring and Control Systems	0.08	0.18	0.12	0.02	0.40	0.11	0.08	0.09	0.26	0.14	0.32
Building Technologies	Windows	0.19	0.44	0.37	0.05	1.31	0.26	0.28	0.26	0.62	0.38	0.84
Energy Management	Technologies, Research & Development	0.01	0.02	0.01	0.00	0.04	0.01	0.01	0.01	0.03	0.01	0.03
Biomass	Biomass Energy Systems	0.10	0.25	0.18	0.03	0.65	0.14	0.14	0.15	0.43	0.20	0.41
Biomass	Biomass Furnace Systems	0.03	0.05	0.04	0.01	0.12	0.03	0.03	0.03	0.07	0.04	0.09
Biomass	Boilers and related Systems	0.08	0.18	0.15	0.02	0.48	0.11	0.10	0.10	0.27	0.15	0.33
Biomass	Manufacturing Of Boilers and Related Systems	0.04	0.08	0.08	0.01	0.16	0.04	0.04	0.04	0.10	0.06	0.12
Geothermal	Manufacture and Supply of Specialist Equipment	0.16	0.36	0.24	0.04	0.86	0.22	0.17	0.18	0.45	0.25	0.53
Geothermal	Suppliers of Systems	0.14	0.30	0.22	0.04	0.81	0.18	0.17	0.17	0.47	0.21	0.60
Geothermal	Whole Systems Manufacture	0.16	0.34	0.31	0.04	0.87	0.19	0.12	0.20	0.52	0.27	0.58
Photovoltaic	Other Related Equipment and Chemicals	0.07	0.13	0.10	0.02	0.35	0.08	0.07	0.09	0.21	0.11	0.28
Photovoltaic	Photovoltaic Cells	0.08	0.12	0.14	0.01	0.30	0.07	0.07	0.08	0.17	0.11	0.26
Photovoltaic	Systems & Equipment	0.15	0.34	0.25	0.04	0.80	0.18	0.18	0.16	0.45	0.29	0.69
Wind	Large Wind Turbine	0.19	0.46	0.31	0.04	0.97	0.23	0.15	0.20	0.59	0.34	0.68
Wind	Small Wind Turbine	0.11	0.24	0.24	0.03	0.59	0.16	0.14	0.16	0.39	0.22	0.51
Wind	Wind Farm Systems	0.16	0.31	0.27	0.03	0.81	0.16	0.15	0.18	0.38	0.20	0.53

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: Stoke and Staffordshire 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	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Recovery and Recycling	Glass Stock Processing	0.03	0.03	0.04	0.06	0.01	0.04	0.13	0.07	0.02	0.04	0.03
Recovery and Recycling	Technologies, Research & Development	0.01	0.01	0.01	0.02	0.00	0.01	0.02	0.01	0.01	0.01	0.01
Recovery and Recycling	Waste Collection	0.09	0.10	0.11	0.22	0.06	0.14	0.35	0.21	0.10	0.13	0.11
Waste Management	Construction & Operation of Waste Treatment Facilities	0.07	0.10	0.09	0.21	0.05	0.13	0.32	0.18	0.08	0.13	0.08
Waste Management	Consultancy, Training and Education	0.04	0.04	0.03	0.09	0.02	0.05	0.13	0.07	0.03	0.05	0.04
Waste Management	Equipment For Waste Treatment	0.10	0.12	0.12	0.24	0.06	0.14	0.35	0.24	0.09	0.16	0.11
Waste Management	Technologies, Research & Development	0.04	0.05	0.06	0.12	0.03	0.05	0.18	0.11	0.04	0.06	0.05
Water & Waste Water Treatment	Engineering	0.07	0.07	0.09	0.16	0.04	0.09	0.27	0.14	0.06	0.09	0.06
Water & Waste Water Treatment	Water Treatment and Distribution	0.25	0.28	0.33	0.65	0.15	0.39	0.90	0.60	0.25	0.34	0.28
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	0.30	0.41	0.41	0.82	0.19	0.51	1.30	0.64	0.31	0.46	0.37
Alternative Fuel Vehicle	Other Fuels and Vehicles	0.11	0.10	0.13	0.23	0.06	0.15	0.38	0.20	0.11	0.15	0.12
Alternative Fuels	Main Stream Bio Fuels	0.10	0.13	0.14	0.27	0.07	0.15	0.43	0.27	0.11	0.15	0.09
Alternative Fuels	Other Bio Fuels	0.49	0.37	0.48	1.25	0.22	0.62	1.52	1.01	0.35	0.73	0.43
Alternative Fuels	Other Fuels	0.07	0.04	0.06	0.12	0.03	0.07	0.17	0.13	0.05	0.05	0.06
Building Technologies	Doors	0.12	0.14	0.15	0.31	0.09	0.20	0.52	0.31	0.15	0.22	0.17
Building Technologies	Insulation and Heat Retention Materials	0.09	0.09	0.10	0.21	0.05	0.12	0.31	0.20	0.09	0.13	0.10
Building Technologies	Monitoring and Control Systems	0.07	0.10	0.09	0.19	0.05	0.12	0.32	0.18	0.08	0.10	0.08
Building Technologies	Windows	0.24	0.27	0.27	0.62	0.14	0.34	0.70	0.47	0.26	0.30	0.27
Energy Management	Technologies, Research & Development	0.01	0.01	0.01	0.02	0.00	0.01	0.04	0.02	0.01	0.01	0.01
Biomass	Biomass Energy Systems	0.12	0.12	0.12	0.29	0.07	0.17	0.38	0.25	0.11	0.17	0.12
Biomass	Biomass Furnace Systems	0.02	0.03	0.03	0.07	0.01	0.04	0.07	0.05	0.02	0.04	0.02
Biomass	Boilers and related Systems	0.09	0.09	0.10	0.21	0.05	0.12	0.30	0.22	0.08	0.14	0.11
Biomass	Manufacturing Of Boilers and Related Systems	0.04	0.04	0.04	0.08	0.02	0.06	0.11	0.10	0.03	0.06	0.04
Geothermal	Manufacture and Supply of Specialist Equipment	0.16	0.14	0.18	0.36	0.10	0.21	0.49	0.30	0.16	0.20	0.15
Geothermal	Suppliers of Systems	0.14	0.14	0.17	0.37	0.08	0.18	0.57	0.35	0.15	0.21	0.16
Geothermal	Whole Systems Manufacture	0.14	0.16	0.18	0.36	0.10	0.21	0.56	0.33	0.16	0.25	0.19
Photovoltaic	Other Related Equipment and Chemicals	0.06	0.08	0.08	0.14	0.04	0.10	0.25	0.16	0.07	0.10	0.08
Photovoltaic	Photovoltaic Cells	0.07	0.06	0.08	0.17	0.05	0.11	0.21	0.16	0.08	0.13	0.08
Photovoltaic	Systems & Equipment	0.16	0.18	0.19	0.36	0.08	0.22	0.56	0.34	0.16	0.23	0.17
Wind	Large Wind Turbine	0.18	0.19	0.21	0.44	0.12	0.26	0.72	0.41	0.16	0.25	0.22
Wind	Small Wind Turbine	0.11	0.13	0.14	0.31	0.07	0.18	0.44	0.28	0.12	0.17	0.13
Wind	Wind Farm Systems	0.14	0.16	0.18	0.32	0.08	0.21	0.54	0.36	0.12	0.21	0.17

Table 18c: Stoke and Staffordshire 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	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Recovery and Recycling	Glass Stock Processing	0.09	0.07	0.03	0.03	0.02	0.13	0.11	0.09	0.05	0.02
Recovery and Recycling	Technologies, Research & Development	0.02	0.02	0.01	0.01	0.00	0.03	0.02	0.01	0.01	0.00
Recovery and Recycling	Waste Collection	0.28	0.24	0.11	0.12	0.07	0.37	0.36	0.21	0.20	0.08
Waste Management	Construction & Operation of Waste Treatment Facilities	0.24	0.19	0.09	0.10	0.06	0.30	0.35	0.20	0.17	0.06
Waste Management	Consultancy, Training and Education	0.09	0.07	0.04	0.03	0.02	0.12	0.13	0.07	0.08	0.03
Waste Management	Equipment For Waste Treatment	0.26	0.21	0.11	0.12	0.07	0.40	0.39	0.20	0.23	0.08
Waste Management	Technologies, Research & Development	0.12	0.12	0.05	0.06	0.03	0.19	0.21	0.13	0.08	0.03
Water & Waste Water Treatment	Engineering	0.19	0.14	0.08	0.09	0.05	0.26	0.28	0.14	0.14	0.04
Water & Waste Water Treatment	Water Treatment and Distribution	0.70	0.54	0.27	0.31	0.18	0.96	0.95	0.58	0.53	0.19
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	0.88	0.77	0.30	0.42	0.27	0.89	0.96	0.77	0.71	0.25
Alternative Fuel Vehicle	Other Fuels and Vehicles	0.26	0.22	0.11	0.11	0.07	0.38	0.37	0.22	0.21	0.08
Alternative Fuels	Main Stream Bio Fuels	0.28	0.23	0.14	0.11	0.09	0.38	0.41	0.22	0.23	0.08
Alternative Fuels	Other Bio Fuels	1.28	0.86	0.59	0.67	0.37	1.53	1.81	1.14	0.95	0.33
Alternative Fuels	Other Fuels	0.13	0.12	0.07	0.06	0.04	0.14	0.18	0.15	0.11	0.05
Building Technologies	Doors	0.47	0.31	0.15	0.17	0.11	0.55	0.52	0.36	0.27	0.10
Building Technologies	Insulation and Heat Retention Materials	0.22	0.18	0.10	0.11	0.06	0.33	0.26	0.22	0.20	0.07
Building Technologies	Monitoring and Control Systems	0.22	0.20	0.10	0.10	0.06	0.29	0.30	0.18	0.14	0.07
Building Technologies	Windows	0.64	0.54	0.26	0.26	0.14	0.78	0.79	0.55	0.50	0.17
Energy Management	Technologies, Research & Development	0.02	0.02	0.01	0.01	0.01	0.03	0.03	0.02	0.02	0.01
Biomass	Biomass Energy Systems	0.35	0.27	0.16	0.14	0.10	0.47	0.49	0.23	0.23	0.09
Biomass	Biomass Furnace Systems	0.06	0.05	0.03	0.03	0.02	0.10	0.09	0.05	0.06	0.02
Biomass	Boilers and related Systems	0.23	0.22	0.10	0.10	0.06	0.33	0.33	0.23	0.16	0.07
Biomass	Manufacturing Of Boilers and Related Systems	0.09	0.09	0.04	0.05	0.03	0.13	0.11	0.10	0.07	0.03
Geothermal	Manufacture and Supply of Specialist Equipment	0.46	0.37	0.17	0.17	0.10	0.54	0.63	0.34	0.26	0.13
Geothermal	Suppliers of Systems	0.37	0.35	0.17	0.18	0.11	0.53	0.55	0.31	0.30	0.12
Geothermal	Whole Systems Manufacture	0.32	0.35	0.13	0.17	0.12	0.68	0.45	0.40	0.36	0.11
Photovoltaic	Other Related Equipment and Chemicals	0.18	0.15	0.07	0.08	0.05	0.25	0.25	0.17	0.14	0.05
Photovoltaic	Photovoltaic Cells	0.17	0.16	0.09	0.08	0.05	0.29	0.22	0.14	0.12	0.05
Photovoltaic	Systems & Equipment	0.44	0.33	0.17	0.20	0.11	0.61	0.60	0.38	0.31	0.12
Wind	Large Wind Turbine	0.48	0.34	0.22	0.20	0.13	0.70	0.71	0.44	0.36	0.15
Wind	Small Wind Turbine	0.31	0.25	0.13	0.16	0.09	0.49	0.52	0.31	0.25	0.09
Wind	Wind Farm Systems	0.34	0.31	0.15	0.18	0.11	0.54	0.53	0.35	0.25	0.10

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.

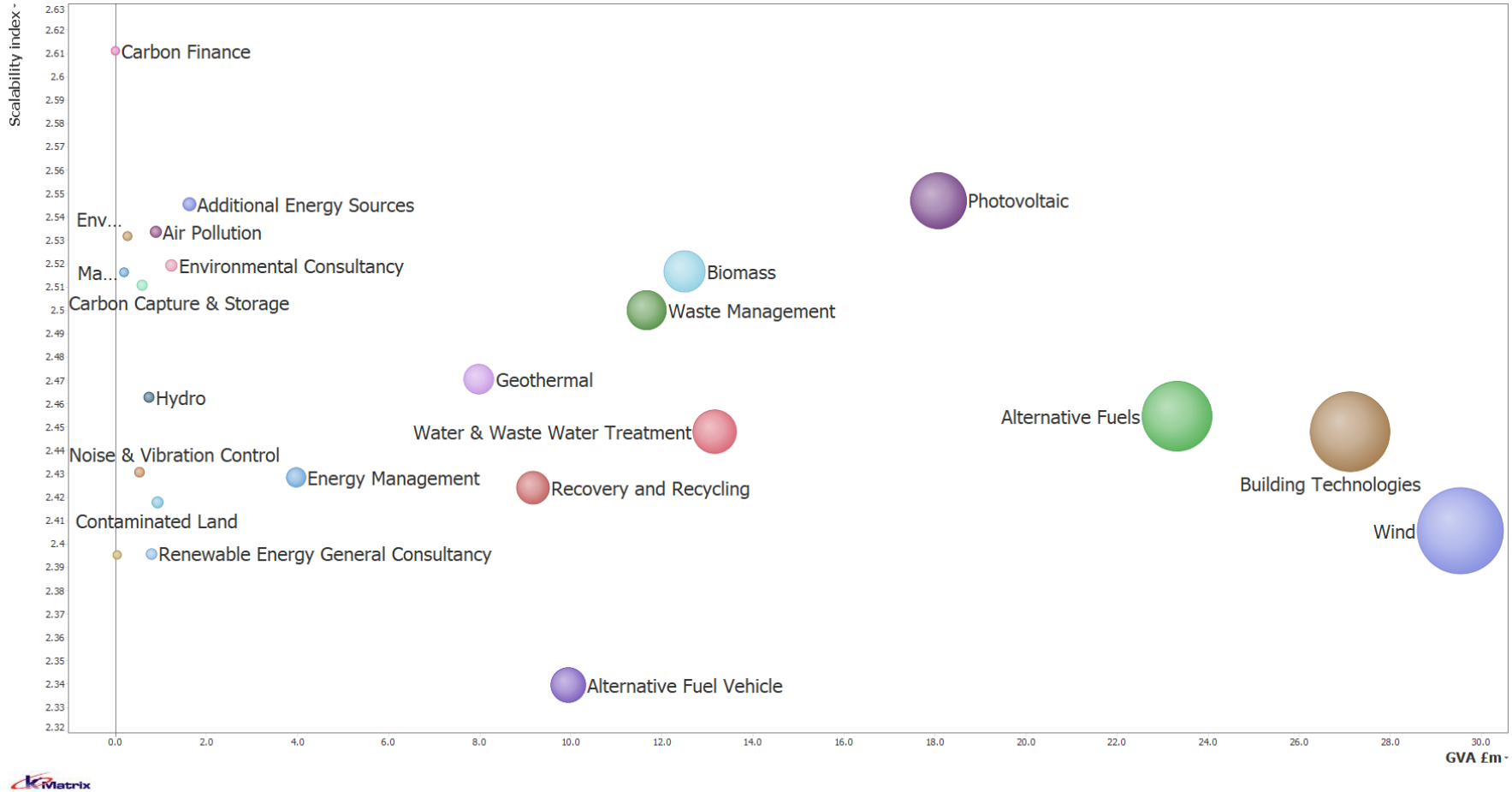
Table 2: kMatrix and ONS – EGSS Comparison Summary Table

	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: https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2010to2015		

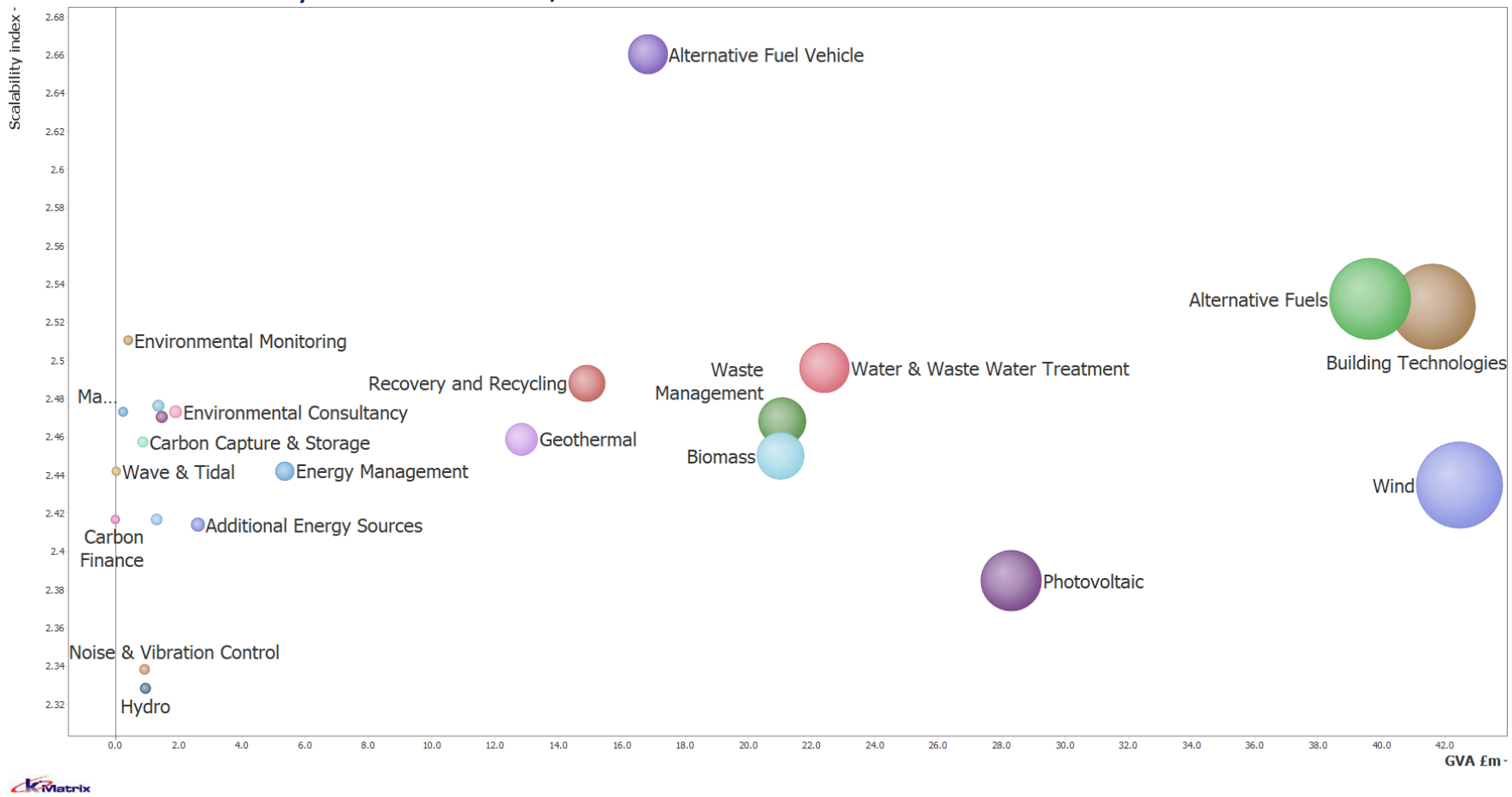
Appendix 4

LCEGS Scalability vs. GVA by Local Authority for Level 2

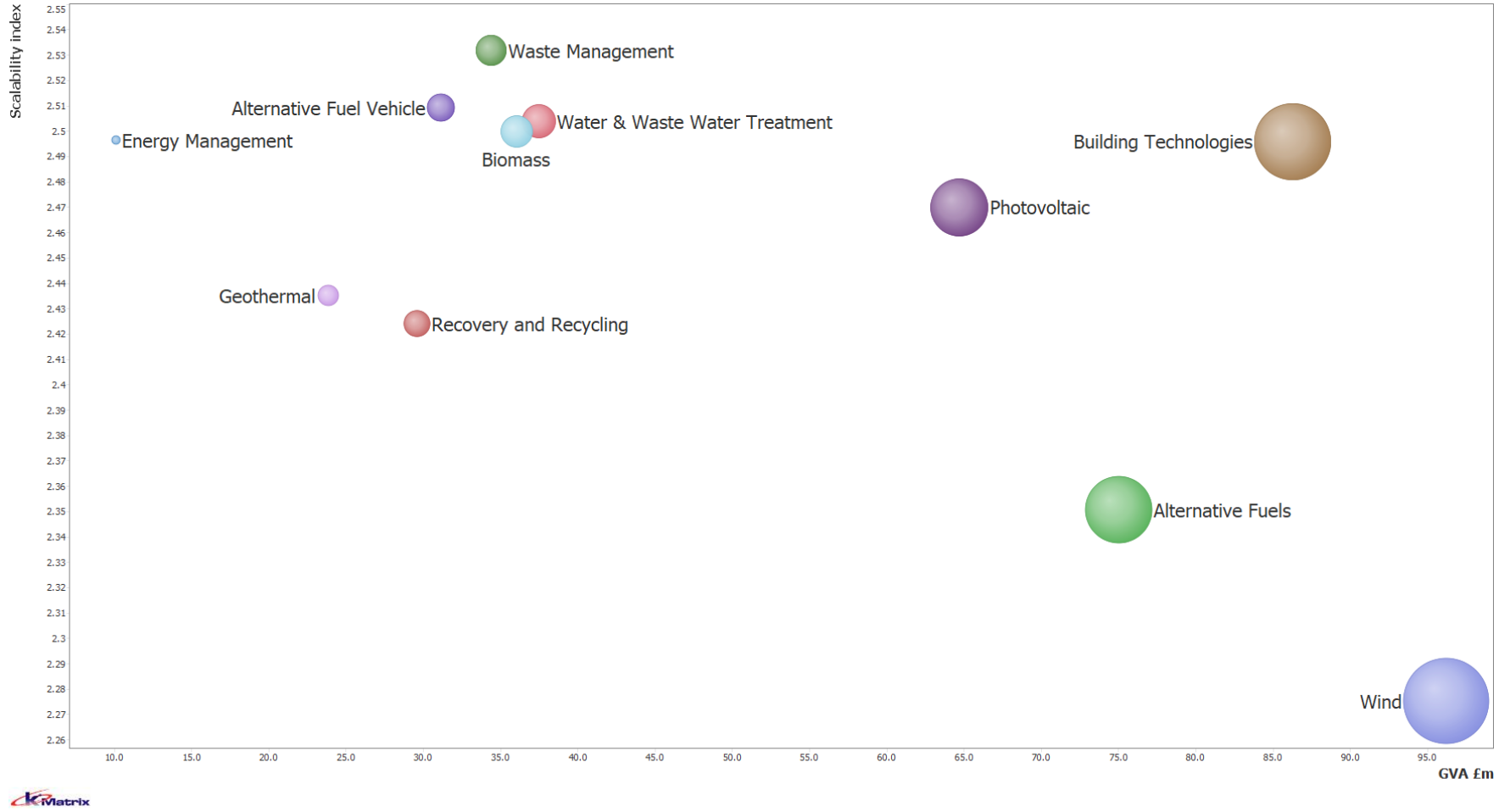
Cannock Chase – Scalability Index vs. GVA for 2019/20



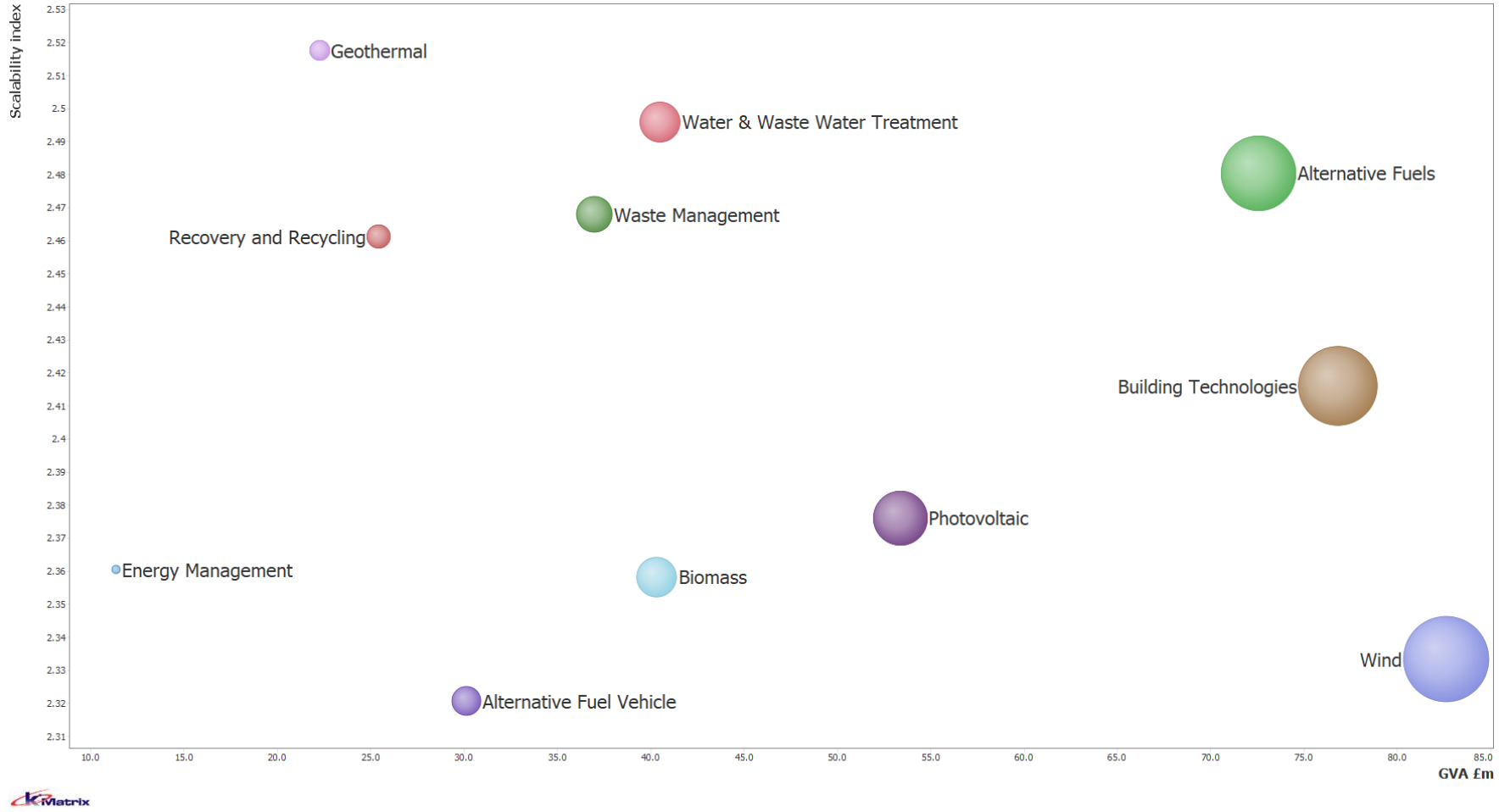
East Staffordshire – Scalability Index vs. GVA for 2019/20



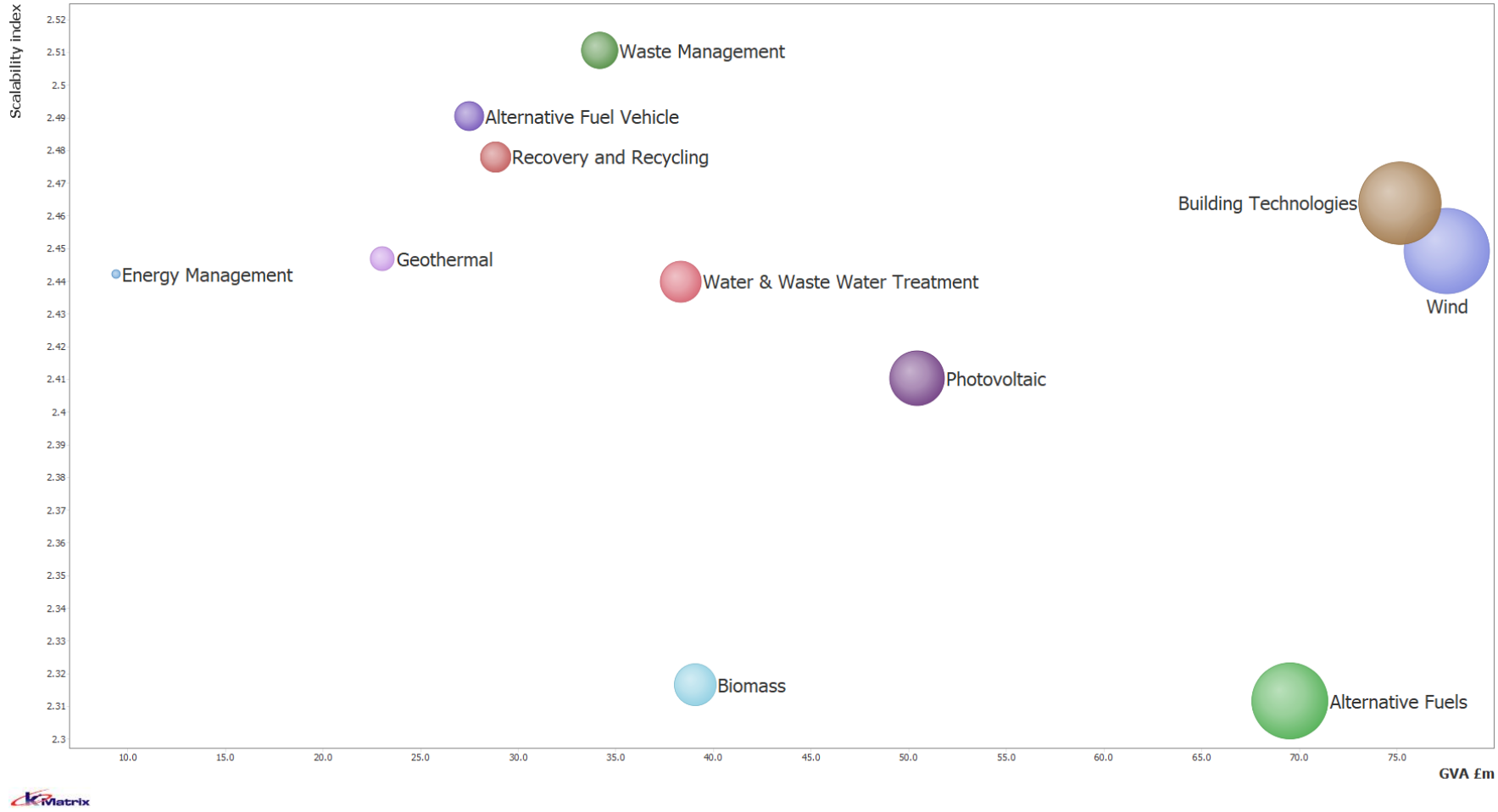
Lichfield – Scalability Index vs. GVA for 2019/20



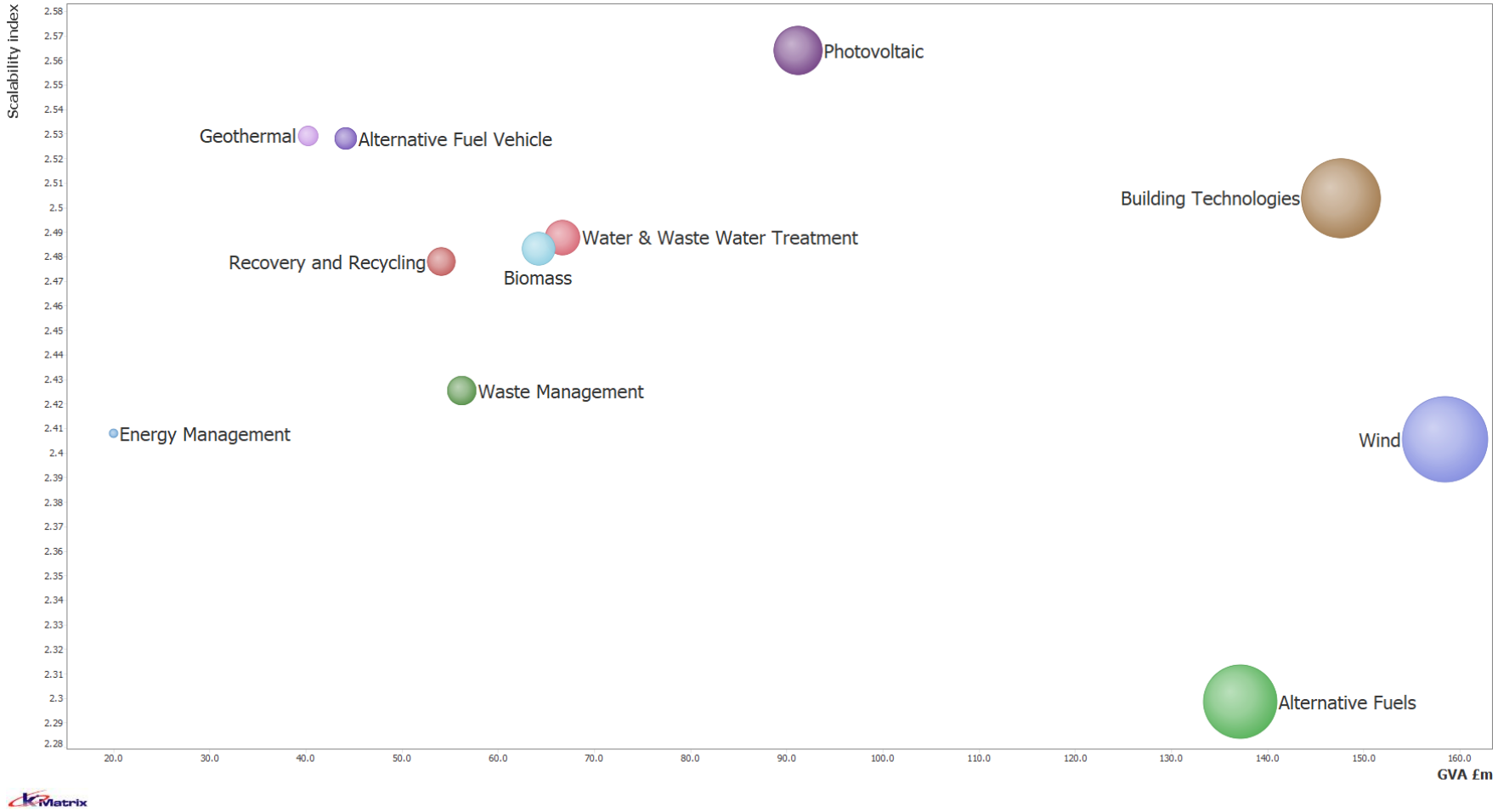
Newcastle- under-Lyme – Scalability Index vs. GVA for 2019/20



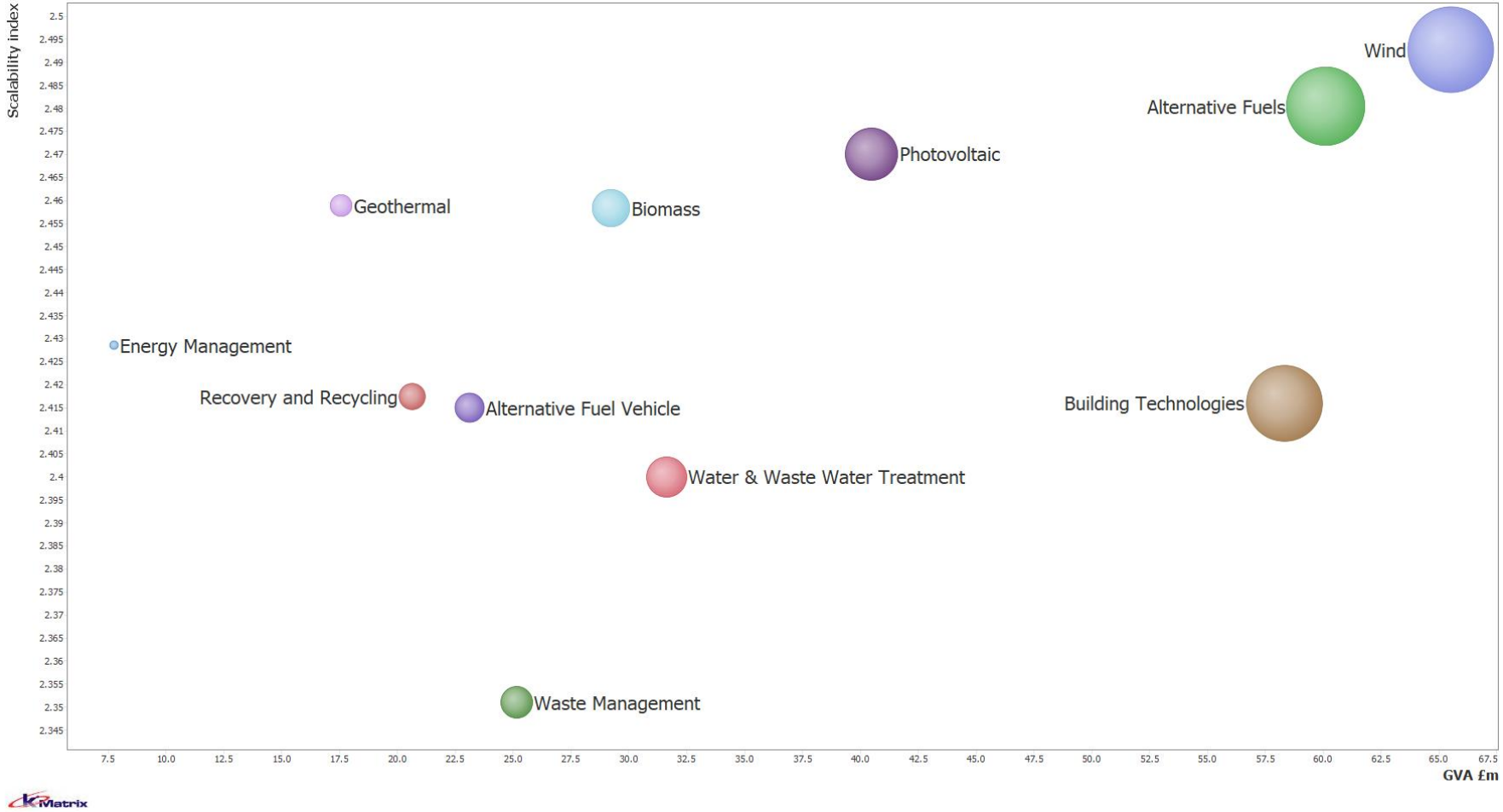
South Staffordshire – Scalability Index vs. GVA for 2019/20



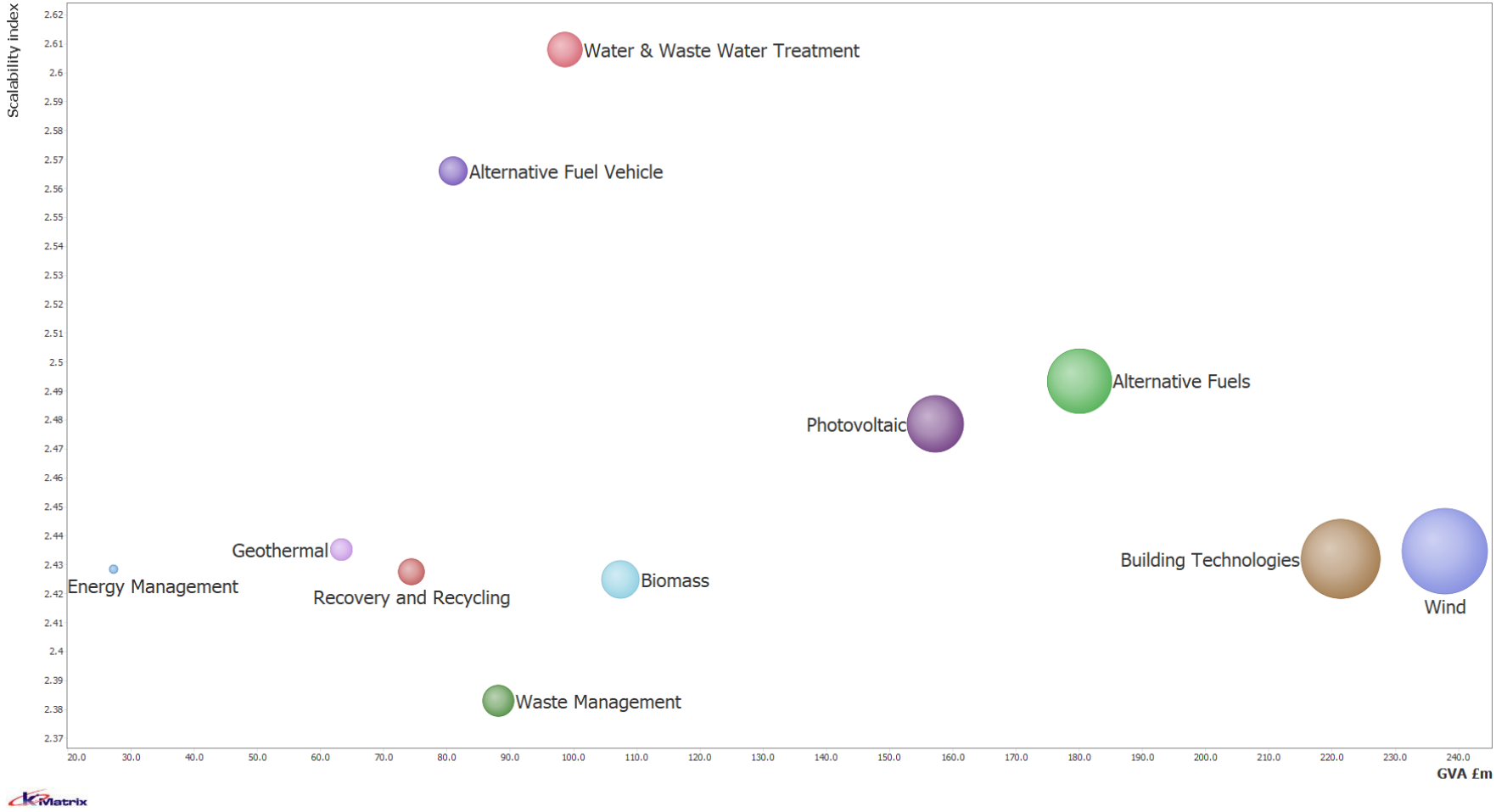
Stafford – Scalability Index vs. GVA for 2019/20



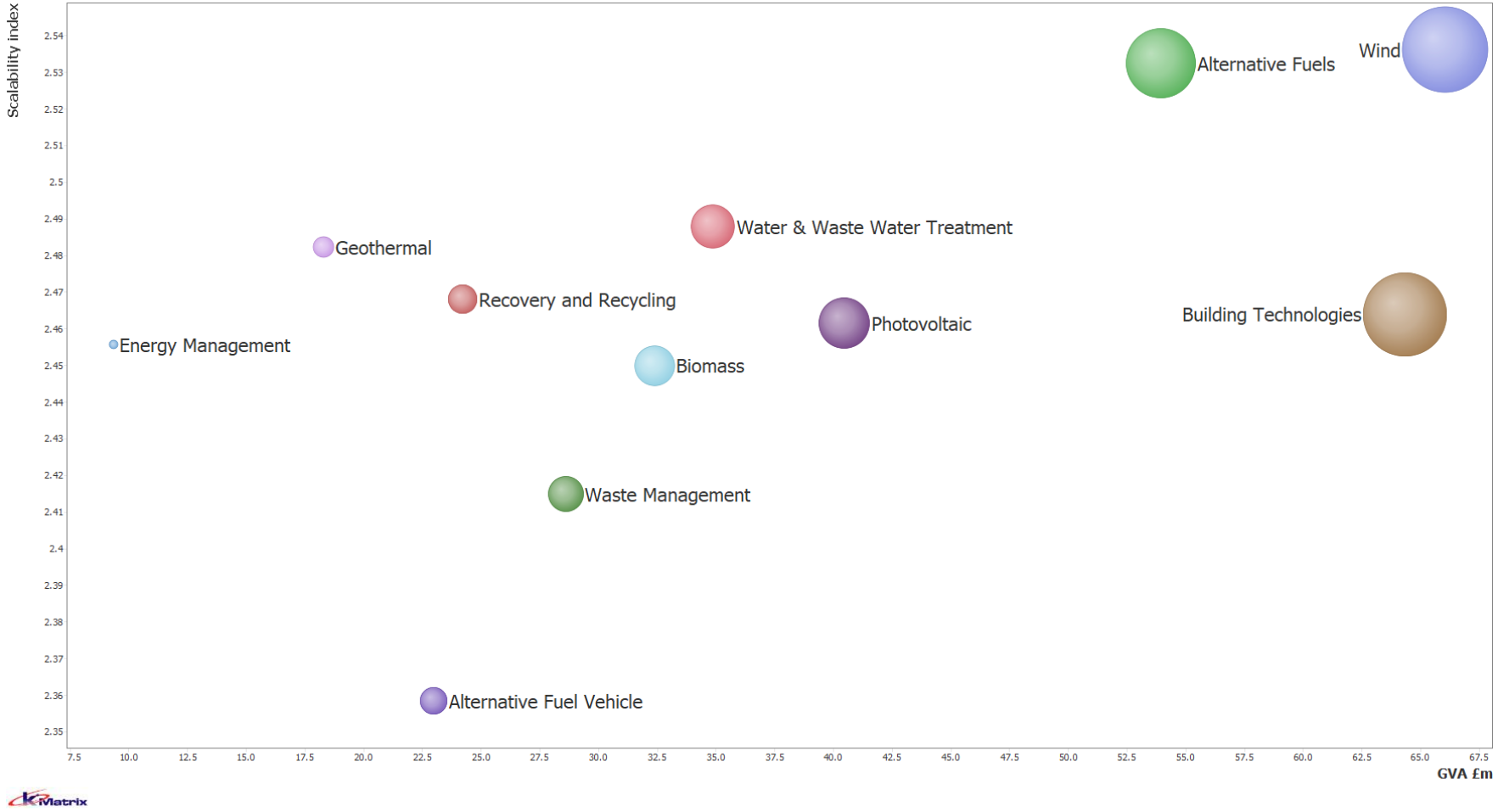
Staffordshire Moorlands – Scalability Index vs. GVA for 2019/20



Stoke-on-Trent – Scalability Index vs. GVA for 2019/20



Tamworth – 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	8	4	45.4%	12	11	-9.6%	14	16.8%	17	39.9%	40	227.1%
Snr Management SME	14	3	23.3%	18	18	3.0%	24	37.9%	29	62.5%	69	292.5%
Supervisory	18	4	21.9%	22	23	6.5%	30	39.7%	35	63.6%	85	293.1%
Middle / Junior Management	18	4	22.6%	22	23	7.4%	30	38.9%	35	63.7%	85	291.3%
Designer / Developer	2	1	44.1%	3	3	-8.2%	3	19.3%	4	41.3%	10	232.2%
Clerical	11	0	0.5%	11	14	29.7%	19	70.8%	22	100.7%	53	381.0%
Self Employed	10	2	22.1%	12	13	7.5%	17	38.3%	20	64.9%	49	292.3%
Advisor or Agent	17	4	22.0%	21	22	6.1%	29	39.0%	35	66.8%	83	292.9%
Educator	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Specialist or Consultant	2	0	7.4%	2	2	23.1%	3	60.5%	4	86.8%	8	337.9%
Editor	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Industrial Researchers	31	3	11.2%	35	41	17.3%	54	55.1%	63	82.0%	150	334.7%
Scientist	3	1	44.8%	5	4	-9.7%	6	18.5%	7	40.6%	16	234.2%
Maintenance Engineer	24	3	12.6%	28	32	16.1%	42	52.8%	49	79.3%	118	326.9%
Civil Engineer	4	2	41.7%	5	5	-7.6%	6	21.6%	8	43.9%	18	235.6%
Production Engineer	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Power distribution Engineer	4	2	64.3%	6	5	-21.5%	6	4.1%	8	24.9%	18	193.9%
Construction Engineer	4	1	33.0%	5	5	-1.0%	7	29.6%	8	52.2%	19	260.6%
Sales Exec	22	5	21.7%	27	29	7.9%	38	43.6%	44	63.9%	105	293.4%
Marketing Personnel	22	5	21.1%	26	29	9.2%	37	42.2%	44	68.8%	102	289.6%
General Semi Skilled Worker	18	1	4.3%	19	24	24.8%	31	63.1%	37	93.4%	89	366.6%
General Labour	31	0	0.0%	31	41	31.4%	53	72.3%	62	100.5%	148	377.6%
Other Employees	22	2	11.0%	25	29	17.4%	39	55.5%	45	80.3%	107	331.0%
Administrative workers	14	1	4.4%	15	19	25.6%	25	64.0%	29	96.3%	69	362.3%
Total	**300**	**49**	**16.2%**	**349**	**392**	**12.4%**	**515**	**47.7%**	**605**	**73.6%**	**1,440**	**313.0%**

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	62	22	35.3%	84	82	-2.0%	105	25.9%	126	50.2%	291	247.6%
Snr Management SME	50	9	17.9%	59	66	11.4%	85	44.5%	100	69.7%	242	309.7%
Supervisory	61	11	17.5%	71	79	11.5%	105	47.0%	122	71.6%	290	307.0%
Middle / Junior Management	62	11	18.5%	74	81	10.3%	107	45.4%	126	71.7%	302	310.8%
Designer / Developer	11	4	30.9%	15	15	-1.9%	19	30.0%	23	54.9%	55	266.8%
Clerical	31	0	0.4%	31	41	31.6%	53	73.6%	62	101.0%	147	377.2%
Self Employed	15	3	19.9%	18	20	8.4%	26	41.8%	31	69.2%	74	302.7%
Advisor or Agent	1	0	19.1%	2	2	11.8%	2	41.6%	3	70.3%	6	301.0%
Educator	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Specialist or Consultant	45	2	5.2%	47	59	26.2%	75	60.8%	90	93.2%	208	345.1%
Editor	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Industrial Researchers	24	2	8.8%	26	31	19.4%	42	62.2%	48	85.2%	112	337.5%
Scientist	45	17	37.8%	61	58	-5.8%	77	25.6%	87	41.2%	211	243.9%
Maintenance Engineer	75	8	10.7%	83	100	20.3%	128	53.6%	151	81.4%	364	336.3%
Civil Engineer	0	0	35.2%	0	0	-2.1%	1	28.4%	1	51.2%	1	253.2%
Production Engineer	43	23	54.0%	66	56	-15.8%	75	12.5%	87	31.1%	203	206.6%
Power distribution Engineer	14	8	55.1%	21	18	-17.4%	23	8.9%	28	31.7%	67	210.7%
Construction Engineer	0	0	26.2%	0	0	3.7%	1	35.3%	1	59.2%	1	282.3%
Sales Exec	66	12	18.3%	78	87	11.2%	114	45.9%	133	69.8%	322	311.5%
Marketing Personnel	63	12	18.8%	74	83	10.9%	108	45.0%	127	70.3%	302	305.7%
General Semi Skilled Worker	84	3	3.5%	87	110	26.3%	144	66.0%	171	96.9%	400	360.5%
General Labour	121	0	0.0%	121	161	33.1%	210	73.0%	244	100.9%	584	381.8%
Other Employees	69	7	9.7%	76	90	18.9%	118	55.3%	138	81.9%	335	340.2%
Administrative workers	41	1	3.6%	43	54	28.0%	70	65.2%	83	95.2%	195	359.7%
Total	**983**	**155**	**15.8%**	**1,139**	**1,293**	**13.6%**	**1,689**	**48.4%**	**1,982**	**74.0%**	**4,715**	**314.1%**

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	35	8	23.0%	43	46	6.6%	60	39.1%	72	65.0%	169	289.5%
Snr Management SME	142	17	11.9%	159	189	19.0%	244	53.4%	289	81.7%	679	327.8%
Supervisory	138	15	10.9%	153	182	18.7%	235	53.4%	278	81.7%	667	335.0%
Middle / Junior Management	138	15	11.0%	154	180	17.3%	237	54.4%	285	85.8%	670	335.8%
Designer / Developer	16	4	23.0%	20	21	5.4%	28	38.6%	33	63.8%	78	287.3%
Clerical	71	0	0.2%	71	94	31.6%	123	72.4%	147	106.4%	341	379.3%
Self Employed	7	1	10.5%	7	9	19.9%	11	52.9%	13	84.8%	31	326.4%
Advisor or Agent	2	0	11.1%	2	3	17.5%	4	55.3%	4	82.2%	10	330.9%
Educator	0	0	10.8%	0	0	17.1%	0	59.7%	0	91.1%	0	333.5%
Specialist or Consultant	71	2	3.4%	73	93	26.6%	122	65.9%	144	96.0%	344	369.9%
Editor	2	0	2.2%	2	3	26.8%	4	65.4%	4	97.6%	10	367.0%
Industrial Researchers	3	0	5.6%	3	4	23.3%	5	60.4%	6	95.0%	14	356.1%
Scientist	5	1	22.0%	6	6	8.2%	8	42.8%	9	65.9%	22	293.6%
Maintenance Engineer	135	10	7.0%	145	179	23.5%	232	60.1%	271	87.0%	647	347.0%
Civil Engineer	2	1	22.8%	3	3	5.8%	4	39.7%	5	65.7%	11	288.6%
Production Engineer	22	7	33.4%	29	28	-1.8%	37	29.7%	44	51.0%	105	262.5%
Power distribution Engineer	65	22	34.2%	88	85	-3.6%	113	28.4%	133	51.7%	315	258.6%
Construction Engineer	2	0	17.1%	3	3	11.6%	4	46.9%	4	71.7%	10	311.0%
Sales Exec	72	8	11.6%	80	94	16.9%	124	53.6%	144	79.4%	343	326.8%
Marketing Personnel	70	8	11.5%	78	92	18.6%	119	53.3%	140	80.1%	330	324.5%
General Semi Skilled Worker	141	3	2.3%	144	183	27.1%	241	67.2%	284	97.4%	682	373.3%
General Labour	157	0	0.0%	157	206	31.2%	270	72.0%	315	100.2%	765	386.7%
Other Employees	204	12	6.0%	216	262	21.0%	348	61.0%	417	92.9%	971	349.4%
Administrative workers	68	2	2.2%	70	89	26.7%	118	68.6%	138	97.0%	332	374.8%
Total	**1,569**	**137**	**8.8%**	**1,706**	**2,052**	**20.3%**	**2,689**	**57.6%**	**3,179**	**86.3%**	**7,546**	**342.3%**

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	69	9	13.1%	78	90	14.9%	119	52.1%	140	78.1%	332	323.3%
Snr Management SME	168	12	6.9%	179	218	21.6%	287	60.1%	341	90.1%	796	343.9%
Supervisory	161	11	6.9%	172	207	20.7%	276	60.6%	325	89.0%	771	348.9%
Middle / Junior Management	164	11	6.9%	176	215	22.4%	281	60.2%	330	88.0%	795	353.0%
Designer / Developer	20	3	13.3%	22	26	15.1%	34	52.2%	40	78.3%	95	325.2%
Clerical	85	0	0.1%	85	112	31.1%	146	70.8%	172	100.9%	410	380.5%
Self Employed	18	1	7.0%	19	23	21.1%	30	60.3%	36	90.7%	85	351.5%
Advisor or Agent	21	1	6.6%	22	27	23.6%	35	60.2%	43	92.7%	99	347.7%
Educator	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Specialist or Consultant	79	2	2.1%	81	103	26.6%	137	69.4%	161	98.3%	379	367.7%
Editor	1	0	1.4%	1	1	27.0%	1	68.6%	1	99.6%	4	377.0%
Industrial Researchers	43	1	3.3%	45	57	27.2%	75	66.8%	88	97.3%	206	360.9%
Scientist	6	1	13.6%	7	8	15.0%	11	52.4%	12	76.8%	29	325.5%
Maintenance Engineer	162	7	4.1%	169	211	25.0%	277	63.9%	328	94.4%	777	360.5%
Civil Engineer	10	1	13.3%	11	13	16.6%	17	51.3%	20	77.9%	48	320.3%
Production Engineer	21	4	19.9%	26	28	8.9%	37	44.7%	43	68.7%	103	301.0%
Power distribution Engineer	83	17	20.5%	100	108	8.6%	143	43.5%	166	66.8%	398	298.8%
Construction Engineer	17	2	9.8%	18	22	19.6%	29	57.8%	34	82.5%	80	338.0%
Sales Exec	82	6	6.8%	87	106	21.7%	140	60.6%	166	89.9%	396	354.3%
Marketing Personnel	79	5	6.9%	85	104	22.7%	134	58.1%	162	91.1%	381	350.0%
General Semi Skilled Worker	179	2	1.4%	181	230	27.2%	309	70.5%	359	98.2%	857	373.3%
General Labour	345	0	0.0%	345	447	29.7%	591	71.3%	696	101.9%	1,658	380.6%
Other Employees	234	8	3.3%	242	310	28.3%	407	68.1%	469	93.9%	1,125	365.2%
Administrative workers	93	1	1.3%	95	122	29.2%	161	70.1%	189	99.2%	450	375.3%
Total	**2,140**	**106**	**4.9%**	**2,246**	**2,789**	**24.2%**	**3,677**	**63.7%**	**4,320**	**92.4%**	**10,275**	**357.6%**

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	11	5	45.6%	15	14	-10.2%	18	18.1%	22	39.7%	51	232.1%
Snr Management SME	19	4	22.9%	24	25	5.9%	33	39.2%	39	64.0%	95	296.2%
Supervisory	20	5	23.4%	25	26	4.7%	34	38.3%	41	64.2%	95	285.2%
Middle / Junior Management	20	5	22.7%	25	26	6.8%	35	40.6%	41	66.0%	98	296.0%
Designer / Developer	5	2	44.4%	8	7	-9.7%	9	19.1%	11	39.6%	26	231.7%
Clerical	10	0	0.5%	10	14	30.1%	18	70.8%	21	101.3%	51	383.7%
Self Employed	5	1	22.0%	6	6	5.4%	8	42.3%	9	65.9%	22	294.7%
Advisor or Agent	4	1	22.2%	5	5	7.9%	7	40.2%	8	64.0%	19	291.0%
Educator	0	0	22.9%	0	0	4.3%	0	41.8%	0	66.2%	1	292.0%
Specialist or Consultant	11	1	6.6%	11	14	23.0%	18	60.1%	22	90.9%	52	352.4%
Editor	2	0	4.3%	2	3	24.6%	3	63.2%	4	94.7%	10	364.0%
Industrial Researchers	4	0	11.6%	5	5	17.9%	7	53.0%	8	80.0%	19	330.7%
Scientist	2	1	41.5%	3	3	-6.9%	4	21.3%	4	39.5%	11	237.4%
Maintenance Engineer	24	3	13.9%	28	32	15.3%	41	49.3%	49	77.4%	116	322.5%
Civil Engineer	4	2	42.5%	5	5	-9.7%	6	21.0%	8	41.0%	18	232.0%
Production Engineer	5	3	66.1%	8	6	-20.7%	8	3.3%	9	21.3%	22	190.0%
Power distribution Engineer	11	7	65.4%	18	15	-21.1%	19	3.3%	22	21.5%	53	186.5%
Construction Engineer	4	1	34.4%	6	6	-2.6%	7	28.8%	9	50.0%	21	255.9%
Sales Exec	13	3	22.4%	16	17	5.6%	22	41.4%	26	65.9%	61	291.0%
Marketing Personnel	12	3	22.6%	14	15	6.9%	20	41.2%	23	63.8%	55	289.5%
General Semi Skilled Worker	24	1	4.6%	25	31	24.5%	41	64.4%	48	92.9%	113	355.3%
General Labour	39	0	0.0%	39	50	30.5%	67	72.1%	78	101.9%	185	378.8%
Other Employees	30	3	11.4%	34	40	17.0%	52	54.1%	62	81.8%	146	328.9%
Administrative workers	12	1	4.7%	13	16	23.9%	21	64.8%	25	93.0%	59	358.8%
Total	**291**	**53**	**18.0%**	**344**	**380**	**10.5%**	**500**	**45.5%**	**589**	**71.2%**	**1,397**	**306.5%**

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	18	8	47.2%	26	23	-11.5%	30	16.8%	36	37.1%	85	227.8%
Snr Management SME	68	16	23.7%	84	89	6.8%	116	39.2%	136	62.9%	322	285.1%
Supervisory	63	15	23.0%	78	83	6.5%	109	40.2%	127	63.1%	300	284.8%
Middle / Junior Management	66	16	23.9%	82	87	6.1%	114	37.9%	136	64.8%	320	289.0%
Designer / Developer	8	4	46.4%	11	10	-11.7%	13	17.4%	15	37.8%	37	229.6%
Clerical	33	0	0.5%	33	44	30.4%	57	71.4%	67	100.8%	160	378.7%
Self Employed	4	1	23.2%	4	5	5.3%	6	39.1%	7	63.4%	17	289.7%
Advisor or Agent	3	1	22.2%	4	4	7.6%	6	40.1%	7	64.6%	16	293.6%
Educator	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Specialist or Consultant	32	2	7.0%	34	42	22.1%	54	59.2%	64	87.5%	155	353.5%
Editor	2	0	4.8%	2	2	24.0%	3	63.5%	4	93.3%	9	359.0%
Industrial Researchers	3	0	11.4%	3	3	16.7%	4	54.1%	5	81.8%	13	335.8%
Scientist	2	1	46.6%	3	3	-11.9%	4	17.5%	4	37.7%	10	226.6%
Maintenance Engineer	67	9	14.2%	76	87	13.6%	116	51.5%	135	76.7%	320	319.1%
Civil Engineer	3	2	47.8%	5	4	-12.8%	6	14.5%	7	38.0%	16	226.4%
Production Engineer	12	8	69.9%	20	15	-22.9%	20	0.5%	23	19.3%	55	178.5%
Power distribution Engineer	32	23	71.1%	55	42	-23.8%	54	-0.3%	64	17.6%	152	177.9%
Construction Engineer	3	1	33.5%	4	4	-2.3%	5	29.4%	6	51.0%	14	261.2%
Sales Exec	37	9	23.6%	46	49	6.3%	63	38.0%	75	63.7%	179	291.4%
Marketing Personnel	35	8	22.7%	43	46	6.7%	60	40.2%	70	64.3%	167	290.9%
General Semi Skilled Worker	70	3	4.7%	73	91	24.5%	121	64.3%	141	91.4%	339	361.8%
General Labour	111	0	0.0%	111	145	30.9%	191	72.8%	224	101.8%	534	381.9%
Other Employees	97	11	11.0%	108	128	18.6%	167	54.7%	197	82.4%	469	334.6%
Administrative workers	34	2	4.6%	35	44	24.9%	58	64.2%	69	93.7%	162	357.1%
Total	**802**	**139**	**17.3%**	**940**	**1,050**	**11.6%**	**1,378**	**46.5%**	**1,618**	**72.1%**	**3,850**	**309.4%**

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	58	5	9.0%	63	75	19.5%	99	56.4%	117	85.0%	278	342.0%
Snr Management SME	169	8	4.7%	177	221	24.3%	287	61.6%	338	90.5%	810	356.4%
Supervisory	161	7	4.5%	168	212	26.1%	275	63.5%	324	92.7%	771	359.0%
Middle / Junior Management	164	7	4.4%	172	214	24.8%	281	63.5%	329	91.9%	786	357.6%
Designer / Developer	12	1	9.0%	13	16	20.1%	21	58.5%	25	88.0%	59	342.0%
Clerical	84	0	0.1%	84	109	29.6%	144	71.6%	172	105.2%	399	375.8%
Self Employed	8	0	4.7%	9	11	24.0%	14	63.5%	17	92.5%	40	363.3%
Advisor or Agent	1	0	5.0%	1	1	27.2%	2	62.0%	2	98.0%	5	356.1%
Educator	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Specialist or Consultant	72	1	1.4%	73	94	28.8%	123	69.1%	145	99.2%	343	371.6%
Editor	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Industrial Researchers	6	0	2.3%	6	8	27.4%	10	66.9%	12	97.4%	29	370.3%
Scientist	0	0	9.6%	0	0	18.5%	0	58.7%	0	84.2%	1	326.4%
Maintenance Engineer	163	4	2.7%	167	215	28.4%	281	68.2%	326	94.9%	778	365.0%
Civil Engineer	4	0	9.6%	5	6	19.5%	8	56.0%	9	84.2%	21	333.1%
Production Engineer	23	3	13.3%	26	30	15.8%	39	51.6%	46	78.7%	110	323.3%
Power distribution Engineer	80	11	13.8%	91	105	15.3%	136	49.5%	163	78.7%	384	320.5%
Construction Engineer	9	1	7.3%	10	12	23.8%	16	59.8%	19	91.4%	44	346.8%
Sales Exec	85	4	4.2%	89	113	26.7%	149	67.3%	172	93.1%	408	358.5%
Marketing Personnel	82	4	4.5%	86	108	26.1%	141	64.2%	169	96.1%	398	362.9%
General Semi Skilled Worker	179	2	0.9%	180	234	29.7%	309	71.4%	360	99.6%	857	375.1%
General Labour	245	0	0.0%	245	319	29.9%	421	71.7%	496	102.3%	1,174	378.6%
Other Employees	237	5	2.1%	242	311	28.9%	398	64.8%	480	98.5%	1,144	373.4%
Administrative workers	86	1	0.9%	86	113	30.6%	146	69.3%	172	99.1%	412	376.6%
Total	**1,929**	**65**	**3.4%**	**1,994**	**2,527**	**26.7%**	**3,301**	**65.5%**	**3,893**	**95.2%**	**9,251**	**363.9%**

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	40	15	36.7%	55	53	-4.5%	69	25.3%	82	48.0%	194	252.3%
Snr Management SME	46	8	17.2%	54	61	13.3%	78	46.3%	92	72.1%	221	312.5%
Supervisory	47	8	17.8%	55	62	11.8%	80	45.0%	94	71.0%	225	307.7%
Middle / Junior Management	47	9	17.9%	56	62	10.7%	81	45.1%	96	70.8%	229	309.9%
Designer / Developer	34	12	36.5%	46	44	-3.9%	58	25.4%	68	47.9%	162	251.6%
Clerical	24	0	0.4%	24	31	30.0%	41	70.7%	49	103.4%	114	374.5%
Self Employed	11	2	18.2%	12	14	10.6%	18	44.1%	21	70.3%	51	307.5%
Advisor or Agent	4	1	18.4%	4	5	9.9%	7	46.2%	8	70.4%	18	301.7%
Educator	0	0	19.6%	0	0	11.5%	0	41.7%	0	68.8%	1	308.6%
Specialist or Consultant	36	2	5.5%	38	48	23.7%	62	61.2%	74	91.1%	176	358.0%
Editor	2	0	3.4%	2	3	26.5%	3	65.0%	4	95.4%	9	367.1%
Industrial Researchers	10	1	9.4%	11	14	20.1%	18	57.2%	21	84.1%	49	338.4%
Scientist	9	3	36.0%	13	12	-3.5%	16	25.9%	19	48.5%	45	253.1%
Maintenance Engineer	58	6	10.5%	64	76	19.3%	99	54.8%	118	83.5%	279	335.3%
Civil Engineer	17	6	37.3%	23	22	-5.5%	29	25.8%	34	46.9%	82	249.9%
Production Engineer	21	11	54.9%	32	27	-15.9%	36	9.8%	42	30.8%	101	211.4%
Power distribution Engineer	31	16	53.3%	47	40	-14.7%	53	12.4%	62	33.1%	146	212.8%
Construction Engineer	18	5	27.5%	23	24	2.9%	31	34.7%	37	57.9%	88	276.4%
Sales Exec	41	7	17.9%	48	54	10.9%	71	46.2%	83	71.2%	198	308.3%
Marketing Personnel	32	6	17.6%	37	42	11.9%	55	46.6%	64	71.4%	151	304.6%
General Semi Skilled Worker	80	3	3.6%	83	106	27.1%	138	66.0%	161	93.9%	383	361.7%
General Labour	84	0	0.0%	84	110	30.0%	145	72.2%	171	102.8%	407	382.3%
Other Employees	64	6	9.0%	69	82	18.1%	109	57.4%	129	85.9%	306	341.1%
Administrative workers	32	1	3.5%	33	42	26.4%	54	63.9%	65	96.0%	154	366.7%
Total	**788**	**129**	**16.4%**	**917**	**1,031**	**12.5%**	**1,351**	**47.4%**	**1,593**	**73.7%**	**3,790**	**313.3%**

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	34	5	13.9%	39	45	14.5%	58	50.0%	69	77.2%	163	318.8%
Snr Management SME	59	4	7.1%	63	77	22.5%	101	60.2%	119	88.6%	287	354.3%
Supervisory	64	4	6.9%	68	82	21.0%	109	60.5%	129	88.6%	309	354.2%
Middle / Junior Management	65	4	6.7%	69	85	23.2%	111	60.0%	130	88.0%	312	349.6%
Designer / Developer	14	2	13.9%	16	18	13.9%	24	50.8%	28	78.0%	67	319.4%
Clerical	35	0	0.1%	35	46	31.0%	60	72.4%	70	100.8%	169	381.3%
Self Employed	16	1	6.9%	17	21	21.6%	27	59.4%	33	90.0%	78	352.0%
Advisor or Agent	21	1	6.7%	23	28	23.1%	36	60.5%	43	88.2%	102	349.4%
Educator	1	0	5.9%	2	2	19.4%	3	63.4%	3	88.1%	7	354.0%
Specialist or Consultant	32	1	2.2%	32	41	26.6%	55	69.0%	65	99.1%	153	371.5%
Editor	4	0	1.3%	4	5	31.1%	7	71.2%	8	99.5%	18	374.0%
Industrial Researchers	32	1	3.3%	33	42	26.3%	55	65.5%	65	94.1%	157	369.5%
Scientist	6	1	13.7%	7	8	15.9%	11	49.7%	12	75.4%	30	327.3%
Maintenance Engineer	79	3	4.1%	82	102	24.6%	136	66.3%	158	93.4%	380	364.4%
Civil Engineer	12	2	13.1%	14	16	15.7%	21	51.7%	25	78.7%	59	321.9%
Production Engineer	14	3	21.3%	17	19	8.1%	24	41.1%	28	64.7%	68	295.6%
Power distribution Engineer	38	8	20.9%	46	50	8.4%	65	41.6%	76	66.9%	180	293.8%
Construction Engineer	17	2	10.2%	18	22	17.6%	29	55.5%	34	83.6%	80	337.9%
Sales Exec	34	2	6.6%	37	45	24.2%	59	62.5%	70	91.2%	165	352.0%
Marketing Personnel	31	2	6.8%	34	41	22.0%	54	61.4%	64	89.8%	151	347.9%
General Semi Skilled Worker	75	1	1.4%	76	98	29.1%	128	68.6%	152	99.9%	363	376.3%
General Labour	49	0	0.0%	49	64	31.8%	84	71.7%	99	103.3%	236	382.7%
Other Employees	107	4	3.5%	110	140	27.0%	183	66.2%	213	93.5%	510	362.8%
Administrative workers	42	1	1.4%	43	55	28.5%	73	69.3%	86	99.7%	202	371.5%
Total	**882**	**52**	**5.9%**	**934**	**1,153**	**23.4%**	**1,515**	**62.1%**	**1,779**	**90.5%**	**4,246**	**354.5%**

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	50	5	9.1%	55	66	19.6%	86	56.5%	102	85.9%	240	338.5%
Snr Management SME	80	4	4.5%	84	105	26.1%	137	64.4%	160	91.5%	383	358.3%
Supervisory	81	4	4.5%	84	105	24.9%	139	64.5%	163	93.3%	386	358.0%
Middle / Junior Management	82	4	4.3%	85	107	25.4%	141	65.4%	164	92.1%	393	361.5%
Designer / Developer	20	2	9.4%	21	26	20.5%	33	54.8%	40	85.3%	94	338.9%
Clerical	41	0	0.1%	41	54	29.5%	71	71.7%	82	98.9%	198	378.3%
Self Employed	20	1	4.6%	21	27	25.2%	35	62.9%	41	93.7%	98	358.1%
Advisor or Agent	3	0	4.5%	3	4	25.6%	5	64.8%	6	94.6%	13	358.8%
Educator	0	0	4.4%	0	0	24.1%	0	62.4%	0	91.8%	0	354.3%
Specialist or Consultant	43	1	1.3%	44	56	28.7%	75	69.9%	88	101.2%	210	377.9%
Editor	1	0	1.0%	2	2	28.0%	3	69.1%	3	99.9%	7	378.8%
Industrial Researchers	4	0	2.4%	4	5	27.8%	6	67.9%	8	98.1%	18	370.0%
Scientist	2	0	9.4%	2	2	18.9%	3	57.2%	3	82.7%	8	340.3%
Maintenance Engineer	107	3	2.7%	110	140	27.1%	184	66.5%	216	96.3%	512	364.6%
Civil Engineer	14	1	9.4%	15	18	19.1%	23	56.5%	27	85.1%	65	337.6%
Production Engineer	25	3	13.5%	28	33	14.6%	43	50.4%	50	76.9%	121	325.1%
Power distribution Engineer	50	7	13.5%	57	66	15.2%	86	50.7%	102	78.2%	244	325.2%
Construction Engineer	20	1	7.1%	22	26	22.0%	35	59.9%	41	87.9%	97	349.4%
Sales Exec	38	2	4.7%	40	50	24.2%	66	64.6%	77	92.8%	183	358.1%
Marketing Personnel	36	2	4.6%	38	47	23.3%	62	64.8%	73	93.4%	174	359.8%
General Semi Skilled Worker	99	1	0.9%	100	128	28.1%	169	69.4%	196	97.0%	476	377.7%
General Labour	54	0	0.0%	54	70	30.4%	92	72.0%	108	100.3%	259	381.6%
Other Employees	132	3	2.3%	135	174	29.2%	226	67.4%	265	96.4%	632	368.4%
Administrative workers	49	0	0.9%	50	64	29.4%	84	70.1%	99	99.5%	238	380.4%
Total	**1,051**	**43**	**4.1%**	**1,094**	**1,373**	**25.5%**	**1,803**	**64.8%**	**2,115**	**93.3%**	**5,049**	**361.5%**

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	87	12	13.6%	98	113	15.2%	148	50.5%	175	77.6%	411	318.3%
Snr Management SME	255	17	6.7%	272	335	23.2%	438	61.0%	516	89.9%	1,222	349.2%
Supervisory	249	17	6.8%	266	328	23.2%	428	61.2%	503	89.3%	1,186	346.2%
Middle / Junior Management	258	18	6.9%	276	339	22.8%	444	60.9%	520	88.4%	1,237	348.3%
Designer / Developer	13	2	15.0%	15	17	13.8%	22	50.1%	26	77.0%	61	320.7%
Clerical	129	0	0.1%	129	169	30.7%	222	71.2%	261	102.0%	625	382.8%
Self Employed	18	1	7.1%	19	24	23.6%	30	59.3%	36	90.2%	86	351.6%
Advisor or Agent	2	0	6.8%	2	3	19.6%	3	63.3%	4	90.5%	10	351.5%
Educator	0	0	0.0%	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Specialist or Consultant	110	2	2.2%	112	143	27.9%	189	68.5%	224	100.2%	526	369.3%
Editor	0	0	1.4%	0	0	25.3%	1	68.4%	1	96.7%	2	382.7%
Industrial Researchers	3	0	3.1%	3	4	22.5%	5	68.3%	6	99.2%	14	357.2%
Scientist	1	0	13.7%	1	1	18.2%	1	48.1%	1	80.8%	3	329.5%
Maintenance Engineer	286	12	4.3%	299	380	27.3%	488	63.6%	577	93.3%	1,379	361.9%
Civil Engineer	10	1	13.7%	11	13	15.7%	17	51.0%	20	78.4%	47	324.5%
Production Engineer	45	10	21.5%	54	59	8.5%	77	42.5%	90	65.2%	214	294.8%
Power distribution Engineer	127	28	22.0%	155	168	8.2%	218	40.3%	257	65.0%	611	293.0%
Construction Engineer	29	3	10.1%	32	38	19.9%	50	56.3%	59	83.5%	140	336.6%
Sales Exec	124	9	7.5%	133	163	22.2%	212	59.3%	252	89.0%	588	341.2%
Marketing Personnel	120	9	7.3%	128	156	21.6%	206	60.4%	242	88.6%	576	348.1%
General Semi Skilled Worker	271	4	1.4%	274	356	29.9%	459	67.5%	550	100.6%	1,299	373.9%
General Labour	333	0	0.0%	333	440	32.3%	571	71.5%	673	102.4%	1,593	378.6%
Other Employees	404	15	3.7%	419	525	25.3%	698	66.6%	812	93.9%	1,922	358.9%
Administrative workers	137	2	1.4%	138	177	28.1%	232	67.5%	273	97.4%	656	373.6%
Total	**3,008**	**163**	**5.4%**	**3,171**	**3,951**	**24.6%**	**5,160**	**62.7%**	**6,079**	**91.7%**	**14,407**	**354.4%**