



Enterprise M3 Low Carbon Environmental Good and Services (LCEGS) Sector Highlights

November 2019





Disclaimer

kMatrix

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Enterprise M3 Local Enterprise Partnership

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Introduction

This is a companion report to the much longer “EM3’s Low Carbon Economy Market Snapshot for LCEGS 2015/16 to 2017/18”, produced for the Enterprise M3 Local Enterprise Partnership in November 2019.

The purpose of this report is to provide an insightful overview of the Low Carbon Environmental Goods and Services sector in the EM3 LEP, drawing from the evidence-based market intelligence data provided in the longer companion report. In contrast, the longer companion report offers the background data and evidence for conclusions drawn here.

The methodology used to produce the data is explained briefly in this report, with a longer methodology provided in the companion report.

This report will firstly give an overview of the methodology and what we are measuring, followed by key findings of the LCEGS market analysis and their relevance to the EM3 LEP. Finally we provide example companies which have commercial activities which cross several sectors.

Introduction to the Low Carbon and Environmental Goods and Services (LCEGS)

The three LCEGS datasets used to analyse the sector in the EM3 LEP were for the fiscal years 2015/16, 2016/17 and 2017/18, allowing 3-year trend analysis.

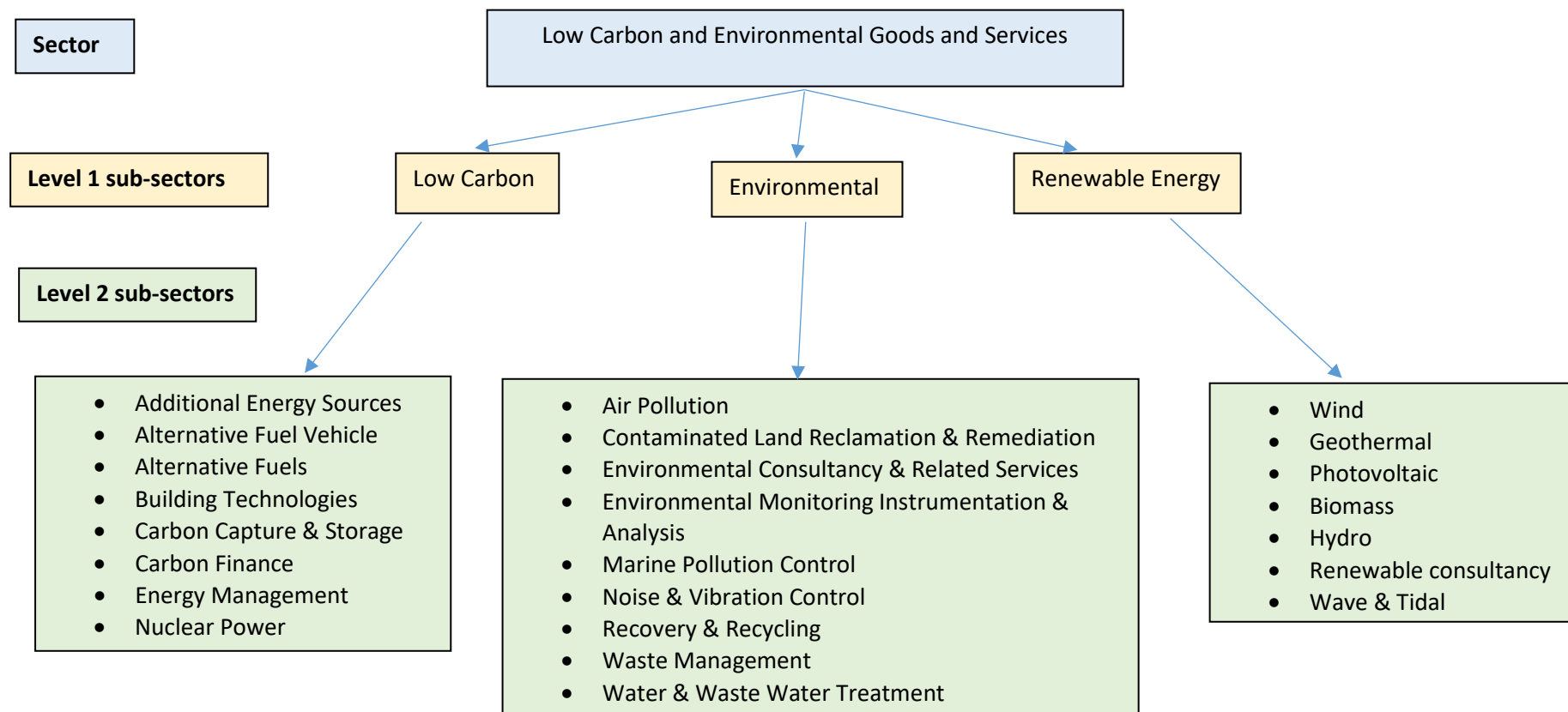
The data used in this study is based upon the work and methodology used by kMatrix to provide datasets on the UK’s LCEGS Sector for UK Government and that was reported annually by the Department for Business, Innovation and Skills (BIS) from 2008/09 to 2011/12. The sector has continued to be measured and reported by London providing data from 2007/08 to 2017/18, the latest dataset.

The LCEGS sector has been defined using 24 sub-sectors (or Level 2 markets). These are grouped into three broad categories - 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 evolve to address the environmental challenges that the world is facing.

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. Figure 1 is an illustration, the sector is LCEGS, which is then 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:



Figure 1: Flow diagram of the LCEGS taxonomy to Level 2



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).



What is actually measured?

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 through 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 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. For the purpose of this study, we interrogated the data to define what proportion of the market for the EM3 LEP are 'core' activities and what proportion are 'non-core' activities. This was done because the EM3 LEP is very strong in mid-chain activities, in multiple sectors (as discussed in more depth below), so analysis of the proportions of 'core' to 'non-core' activities in this LEP provides greater insight into the shape and nature of the sector.

The economic values which are 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 companion report includes 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.



Key Findings

LCEGS Sector

The Enterprise M3 LEP LCEGS sector had total sales in 2017/18 of £18.2bn, which includes all the core and non-core activities within the sector. The sector had over 7,100 companies and over 126,800 employees. At first glance these figures may appear to be high, however they include all activities and services which are relevant to the LCEGS sector and its chain of supply.

The value of sales for core activities within the sector was £4.6bn, only 25% of the total LCEGS sales. £13.7bn, or 75% of the total LCEGS sales were within non-core, midstream activities. These are illustrated in figure 2.

Figure 2: The split between core and non-core activities in LCEGS in the EM3 LEP

EM3 Core and Non-Core LCEGS Activities in 2017/18 (£m)

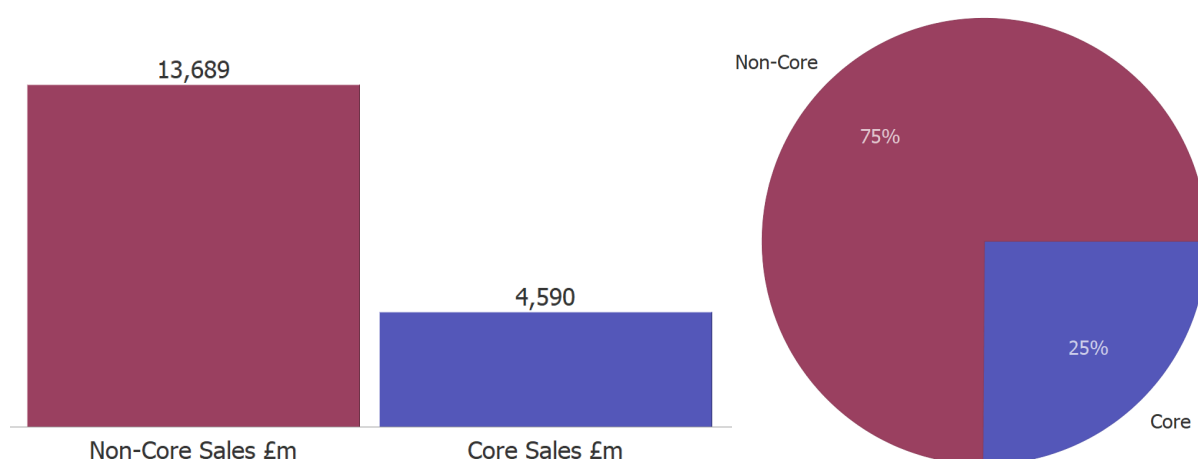


Figure 2 clearly illustrates that the LCEGS sector in the EM3 LEP is dominated by non-core activities. The vast majority of the activity in the LEP is involved in areas of the sector that are essential to the LCEGS sector but are not necessarily obvious. The split is 26% core and 74% non-core for both the number of companies and number of employees at the sector level.

The significance of this split is that it highlights how the LCEGS sector is embedded in other areas of the economy. In general LCEGS can be viewed in terms of the environmental benefit an activity can bring, alternatively the savings made through free power generation for example, here we also see the effect of the LCEGS sector in terms of direct sales across the wider economy of the EM3 LEP. These wider economy sales are present in the non-core section of the market and dominate the sector in this region.

The total EM3 economy is worth £54.3bn, making the LCEGS 33.5% of the economy. The whole LCEGS sector (core and non-core activities) in the EM3 LEP is proportionally larger than for other LEPs in the UK. This is because the EM3 LEP is exceptionally strong in mid-chain activities. In fact, the LCEGS sector as a proportion of the economy of the EM3 LEP is 17.2% higher than the UK average across LEPs (excluding London). The LCEGS sector core activities account for only 8.5% of the total EM3 economy.



LCEGS Level 1 Sub-sectors

The LCEGS sector consists of three Level 1 sub-sectors: Low Carbon, Renewable Energy and Environmental.

The Low Carbon sub-sector is by far the largest sub-sector, with sales of £8.8bn (48%). Renewable Energy had sales of £6.3bn (34%), with Environmental sales being £3.1bn (18%).

When we examine the split between the core and non-core activities at the first sub-sector level, we can see that the different sub-sectors have quite different compositions, as illustrated in figure 3.

Figure 3: The split between core and non-core activities for Level 1 sub-sectors

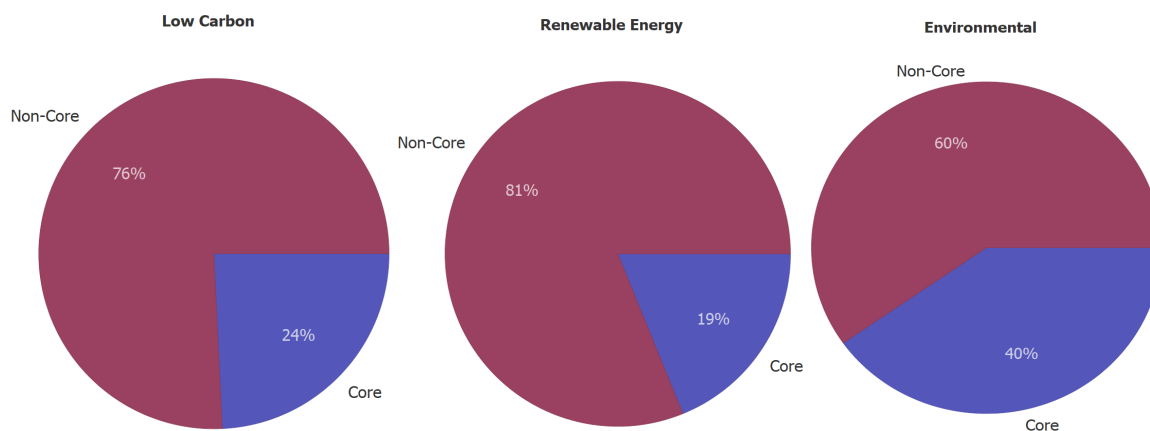


Figure 3 shows clearly that the split between core and non-core activities is very variable. The Low carbon sub-sector has a split similar to the sector as a whole, not surprising as the Low Carbon sub-sector accounts for 48% of LCEGS sector sales. By contrast the Renewable Energy sub-sector has a much smaller proportion of core activities (19%), with Environmental having a significantly larger proportion (40%). The proportions of core and non-core for number of companies and number of employees are within 1% of those for sales.

The EM3 LEP has a core specialty in high-end engineering, which includes mechanical, electrical and electronic engineering and the associated design, computing and software, particularly at the machine control level, which are all especially relevant in the mid-supply chain in many sectors. There is a strong engineering centre that can and does apply itself to many sectors, which helps explain the strong mid-stream LCEGS capabilities. We see companies within the EM3 area who provide products and services to multiple sectors including LCEGS, Motorsport, Automotive, Marine (especially motor yachts), Aerospace, Industrial, Defence etc. For example, there are engineering companies who will provide components which are used in several different sectors. This is because the machinery they have dictates the work they do. The machinery and skills that produce small fittings for wind turbines capable of tolerating extreme stress for leverage, can also produce high reliability components for extreme performance in motorsport.



LCEGS Level 2 Sub-sectors

The three Level 1 sub-sectors are split into level 2 sub-sectors (see figure 1). We can move down through the levels allowing us to explore areas of the sector in a 'deep dive'.

Within the Low Carbon Level 1 sub-sector, there are eight level 2 sub-sectors, with the largest being Alternative Fuels, Building Technologies and Alternative Fuel Vehicles. The largest of the seven sub-sectors within Renewable Energy are Wind, Geothermal, Biomass and Photovoltaic. The largest of the nine Environmental sub-sectors are Water & Waste Water Treatment, Recovery & Recycling and Waste Management.

London accounts for 20% of the UK total sales for LCEGS and has different characteristics to the rest of the UK, for example 98% of the Level 2 Carbon Finance sub-sector is based there. When London is removed from the UK analysis, we have a clearer comparison between the EM3 LEP and the rest of the UK. Generally the difference in percentage of market share in the EM3 LEP is within 1% of the UK average, however there are some subtle differences, for example, the EM3 LEP is:

- Stronger in Building Technologies, with 14.3% of sales vs 12.8% in the UK
- Stronger in Biomass, with 6.2% of sales vs 4.9% in the UK
- Stronger in Energy Management, with 4.2% of sales vs 2.3% in the UK
- Weaker in Alternative Fuels, with 15.9% of sales vs 17.5% in the UK
- Weaker in Nuclear Power, with 1.6% of sales vs 2.9% in the UK

With regards to Building Technologies, there appears to be some virtual clustering of companies. The Building Technologies sub-sector is long established in the EM3 LEP, with specializations including architecture and design which can be virtual, with companies designing the product within the LEP and selling it outside. This kind of specialization helps to explain why the Building Technologies sub-sector has a strong core to non-core ratio of 43% to 57%. Interestingly, the strength of the Building Technologies sub-sector is spread across the whole of its constituent activities, both core and non-core.

Strength in Energy Management is unsurprising due to specialisms in power firming, power factor control and synchronization.

Although Alternative Fuels is technically weaker than the rest of the UK, it is still the largest sub-sector in the EM3 LEP. It is not weak in as much as there are several other areas of market which are slightly stronger than the UK average, which combine to reduce the total market share of the Alternative Fuels sub-sector.

When we look at the core vs non-core split at this level of detail, we can clearly see different patterns within the different areas of the sector. Figures 4, 5 and 6 shows the split for Low Carbon, Renewable Energy and Environmental respectively.



Figure 4: The split between core and non-core activities for Low Carbon Level 2 sub-sectors

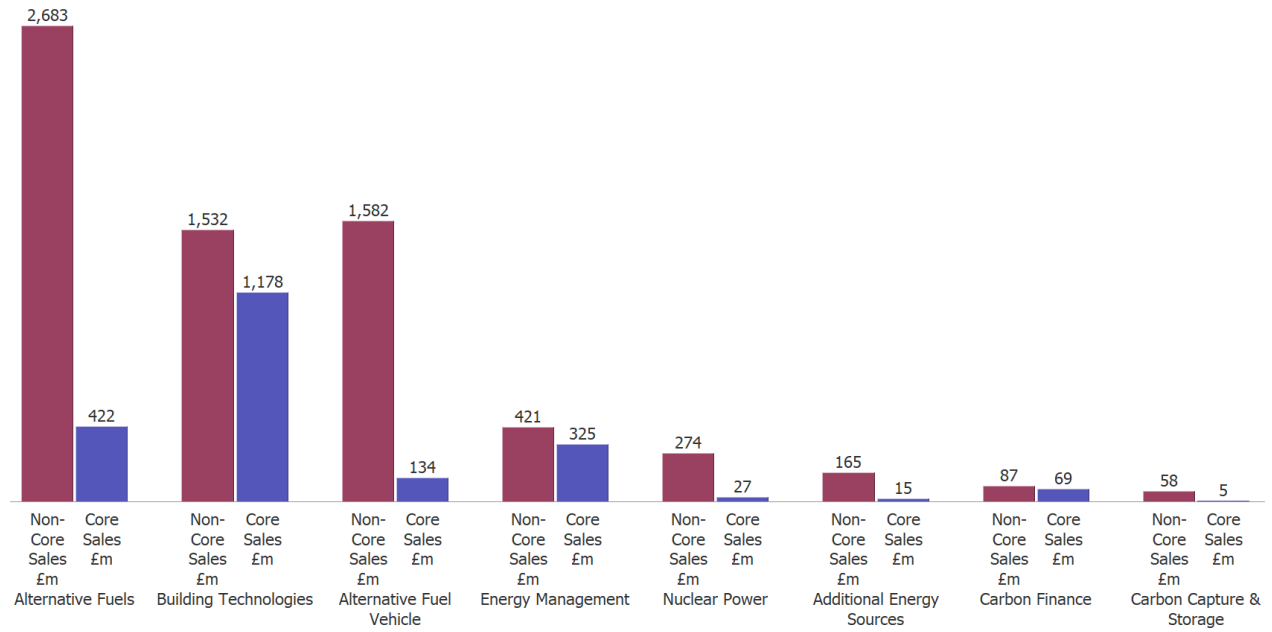


Figure 5: The split between core and non-core activities for Renewable Energy Level 2 sub-sectors

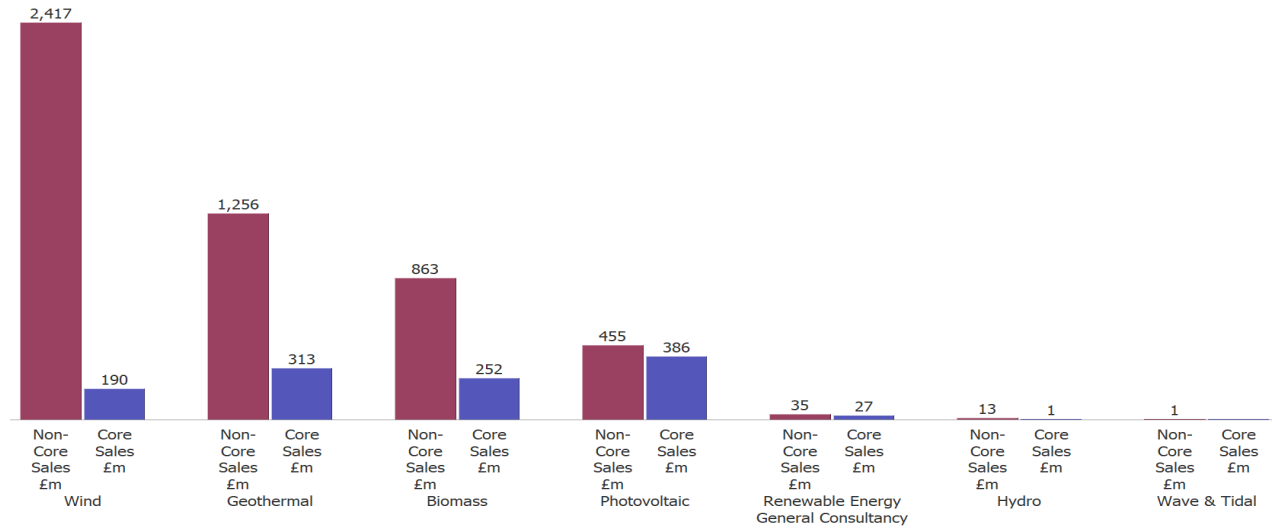
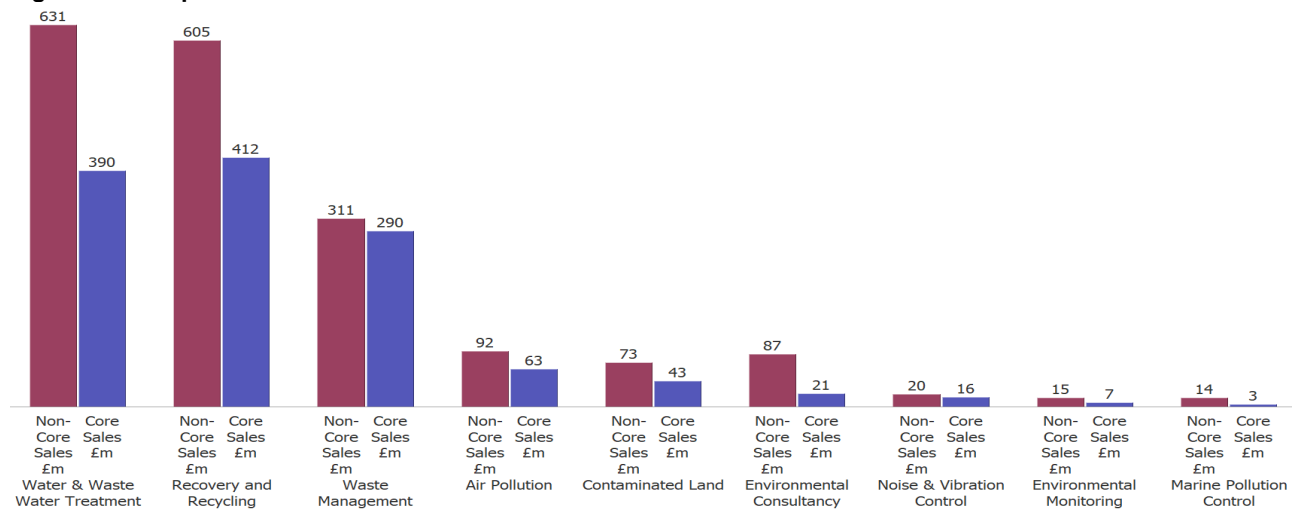


Figure 6: The split between core and non-core activities for Environmental Level 2 sub-sectors





Figures 4, 5 and 6 clearly show that some sub-sectors at this level have more core activities than others, for example core activities account for 48% of Waste Management (Environmental), but only 7% of Wind (Renewable Energy).

This fundamental split between core and non-core activities within the LCEGS and other sectors is why the EM3 LEP is not generally identified as a major contributor in some sectors and sub-sectors within the economy. For example, the EM3 LEP is not generally considered to be particularly strong in the Wind sub-sector, which is true if only the core activities within LCEGS are considered. This changes dramatically when we include the non-core activities, without which the Wind sub-sector could not function in not only this LEP but also in others. This is a pattern that is repeated in other sectors including Motorsport and Marine, which is usually considered to be concentrated North of London, but in fact encircles the arc around the West side of London and the South East, including the EM3 LEP, when the full supply chain is considered. It is true that the core activities for Motorsport are generally outside of the EM3 LEP, but without the mid-chain activities which occur within the LEP, the sector would struggle to function. The EM3 LEP is therefore arguably vital for many sectors and sub-sectors due to its mid-chain strengths.

EM3 LCEGS Compared with the UK

London accounts for 20% of the UK's LCEGS sector sales, but also has a very different LCEGS landscape to the rest of the UK. It was removed from part of the analysis looking at the proportionality of sub-sectors in order to give a more accurate view of what was happening in the rest of the UK.

Removing London from the UK figures showed that EM3 is more in line with the rest of the UK, when London is excluded from the analysis. Only the top four sub-sectors show variation between EM3 and the UK, with Building Technologies having more prominence and Wind slightly less.

EM3 LCEGS Compared with Other LEPs

The EM3 LEP has close ties with Coast to Capital LEP and South East LEP. For the purposes of this study, we have compared the LCEGS market in all three LEP's at a high level of analysis.

While the South East holds 47% of the LCEGS sales for the three combined LEP's and holds the largest market share for 19 of 24 level 2 sub-sectors, EM3 holds the largest share in 4 level 2 sub-sectors: Energy Management (42%), Geothermal (40%), Air Pollution (39%) and Noise and Vibration Control (35%).

The larger the percentage share of a sub-sector in a region, the higher the degree of supply chain localization in that sub-sector within that region. Highly localized supply chains offer a stronger opportunity for the development of the sub-sector along with closer partnerships and regional cooperation.

Exports

The value of exports in EM3's Low Carbon and Environmental Goods and Services sector in 2017/18 was £1.3bn, an increase from £1.1bn in 2015/16. This accounted for 9.8% of the UK's LCEGS exports in 2017/18 and is in line with EM3's 9.8% share of the overall UK LCEGS market.



EM3's LCEGS exports grew by 10.9% and 5.7% over the last three years which was significantly higher than the UK average of 6.0% for the first year and slightly slower than the UK average of 6.8% for the second year.

The percentage of EM3's exports which were available for penetration under usual cost of sales were 16.5% in 2017/18, which is an increase from 15.1% in 2015/16 and 13.8 in 2016/17. Two sub-sectors have a combination of large export value and high available exports as a percentage of exports in 2017/18: Building Technologies with 19.4% available exports and Geothermal 18.4% available exports.

Example Companies

When assessing the business strengths and/or weaknesses across sectors of a region, it is vital that all companies within those sectors are accounted for. The easiest and most common method is to perform company counts on the basis of their specific SIC codes. However, SIC codes sometimes mask a company's true capabilities, the products that they produce and all of the markets that they serve. It is quite simple for a company to simply assign itself to the SIC code relating to their largest markets and ignore smaller offerings. It is also easy for a company to fall into the SIC code that largely covers the notion of the business that they perform without zeroing in on the actual thing that is produced. A company may be assigned as a general engineering company when in fact they produce a variety of highly specialised tooling equipment to various industries such as defence, motorsport, aerospace and renewable energy. All of which require a variety of closely related parts, products and services. In such a case, when performing an assessment of a region, all of the various sectors that they supply are technically undercounting the total number of companies involved.

Below are two examples of such companies within the EM3 LEP who are both largely portrayed as motorsports companies but both also actually produce parts for wind turbines. Due to the nature of their product offerings both are very relevant to the wind turbine markets (offering prototyping and production of lighter and stronger alternatives to existing parts from newer materials). Neither are classed as wind turbine manufacturers as neither manufacture complete solutions, however conversely wind turbines cannot be efficiently designed, produced and maintained without these companies within the chain of supply. Both also do the same in the motorsports industry, as well as other closely related industries and as such may be allocated to those sectors or to the Engineering sector overall.

The examples indicate the number of sectors that they serve as well as the offerings to those sectors. Then in more detail, the offerings in relation to motorsport in particular and then their renewable energy wind specific offerings.

All information is taken directly from their websites and is not based on assumptions made by us.



Example 1

FORMAPLEX

Formaplex Locations:

INJECTION MOULD TOOLING & COMPONENT MACHINING

Dakota Business Park
Downley Road,
Havant
Hampshire
PO9 2NJ
+44 (0) 2392 499276

INJECTION MOULD TOOLING & COMPONENT MOULDING

Access Point
Northarbour Road,
Cosham
Portsmouth
PO6 3TE
+44 (0) 2392 313100

COMPONENT MOULDING, FINISHING & ASSEMBLY

Unit 1, Voyager Park South
Portfield Road,
Portsmouth
Hampshire
PO3 5GF
+44 (0) 2392 313100

COMPOSITE TOOLING & COMPONENTS. JIGS & FIXTURES. SPECIALIST ENGINEERING

Hazleton Interchange
Lakesmere Road,
Horndean
Hampshire
PO8 9JU
+44 (0) 2392 590440

Sectors supplied:

- Aerospace
- Automotive
- Defence
- Marine
- Medical
- Motorsport
- Renewables (Tidal Turbines, Wind Turbines)
- Space

“We help the motorsport industry add lightness and strength to give them the competitive advantage they need to win.”

“If you are looking to set new world records, we are the partner that can meet your most demanding technical challenges to quickly produce carbon fibre, composite and polymer components customised to your needs”.



Formaplex provides a comprehensive range of world-class manufacturing solutions for the motorsport industry. Customers include some of the world's leading motorsport names, including a large number of F1 racing teams.

Products/services include:

- Wind Tunnel Models
- Full-sized Components
- Gloss Polished Moulds and Assemblies
- Press Tooling
- Tools for use with Composites
- Component Machining

Renewables

We develop carbon fibre, composite and polymer components to help improve the efficiency of your turbines, casings and other key parts.

We provide dedicated manufacturing processes to service the challenging needs of customers within oil, gas and renewable energy sectors, for both prototype design development programmes and full production. Our quality managements systems comply with ISO 9001, TS16949 and AS9100 Rev.C.

Formaplex has been involved with composites since its foundation in 2001. Our wealth of experience with tooling design enables us to provide assistance to the oil, gas and renewable energy sectors as it strives for "light-weighting". We provide a complete composite tooling and component design and manufacture service, including in-autoclave and out-of-autoclave tooling solutions, wet layup, infusion and prepreg laminates.

We are experienced in providing fast aluminium compression mould tooling solutions for the manufacture of composite tooling and components, supplying CNC machined complex part geometries in aluminium and composites. We have the capabilities to undertake a wide variety of design projects, such as machining tidal turbine blades within a time critical delivery schedule.

Within our specialist engineering division, we can design and manufacture complex fabrication requirements in small to medium batch production, including prototype designs. Bespoke structures can range from small assemblies, to large fabrications up to 2 tonnes in weight, supplied as individual components or complete assemblies, finished and painted.



We have the capacity and capability to machine complex components. Whether its a single metal or plastic component, a package of aluminium and composite tooling, master pattern, or machined composite component, we can provide the machining solution.

Experienced operators prepare, finish, polish and inspect machined surfaces within a fully certified quality assurance system, ensuring components meet the highest standards.

Example 2

LEGGERO FORTE

20 Westbury Close
Fleet
Hampshire
GU51 3HR
T: 01252 217 156

Increasingly over recent years, the use of composite materials in our daily lives has become more prevalent and widely used in engineering projects across a multitude of industries. If your structure requires materials that are stiffness and weight are a driving factor then composites could offer a realistic solution.

Like all materials composites is not the solution to every problem. Carbon Fibre has become a buzz word, and its glossy look is probably used more for styling than its mechanical properties in many cases.

At Leggero Forte we have a true understanding of the materials having been involved with all stages, from the PAN manufacture of the fiber through to testing and beyond. We currently work in, but are not limited to the following fields:

- Automotive
- Aerospace
- Civil engineering
- Cycling
- Defence
- Motorsport / Sport
- Renewable Energy



Composites is a young industry and developments in fibers, matrixes', and processing happen at a more prevalent rate than many other industries. These technological advancements have in many cases increased the usage of the materials less high end applications but we believe a fundamental understanding is still key to getting the most from your material, which is why industries call upon the services of experienced engineers such as Leggero Forte to ensure the best results.

WHAT WE DELIVER

- Composite Design
- Autoclave-based Prepregs and Tooling
- Resin Infusion and RTM Component and Tooling Design
- Pattern and Tooling Design
- Melt / Wash Out Cores
- Intensifiers
- Component Machining
- Jigs and Fixtures
- Machining
- Assembly
- Bonding
- Inspection
- Testing

Prepreg composites are a popular option in projects where the quantity of components is limited and/or weight and repeat-ability is very important. The raw material is a higher cost than other forms of composite, Industries such as aerospace, defense, sports products, renewable energy and motorsport including Formula 1, all of whom have adopted prepreg materials for various uses. Our experience in these fields, coupled to our expertise in tooling design and manufacture enables us to deliver autoclave-based prepreg designs and produced to meet the specifications of the task.

Summary of Example Companies

Neither of these two companies would claim that renewable energy and in particular wind turbine manufacturing is their primary SIC code activity. However, in reality, both companies are involved in the supply chain for the Wind sub-sector and in turn LCEGS itself. It is with the inclusion of these and other similar companies, that a clearer picture of the real size and contribution of the EM3 LEP to the LCEGS sector can be demonstrated.