



Greater
South East
Net Zero Hub

GSENZH REGION



Domestic Energy Efficiency Supply Chain Market Intelligence

Report Years: 2019/20 to 2021/22

October
2022



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kMatrix Data Services Ltd

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Greater South East Net Zero Hub

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Report Overview

This report forms part of the evidence-base produced within Lot 1 of the Greater South East Net Zero Hub (GSENZH) project: Domestic Retrofit Supply Chain Market Intelligence & Skills Assessment. Lot 1 of the project is specifically focussed on the Domestic Energy Efficiency Supply Chain Market Intelligence.

This report examines the market in the GSENZH region as a whole, with detail comparing the eleven Local Enterprise Partnerships (LEPs) within the region. Alongside this report are a further eleven reports, one for each LEP, which examines the market for the LEP and compares the Local Authorities within them.

The detail within these reports feed into the wider Lot 1 reporting, which includes the extensive stakeholder engagement and wider analysis.

Geography

The GSENZH is one of five local net zero hubs in England, funded by the Department for Business, Energy and Industrial Strategy. The overarching aims of the hubs are to bring investment into local energy projects and working together to share best practice across the regions.

The GSENZH is a collaboration of eleven Local Enterprise Partnerships (LEPs), who work together to increase the number, scale and quality of local energy projects being delivered across the greater south east region of England. These LEPs are:

Greater South East Net Zero Hub Map



Note: TVBLEP was re-named BerksLEP in 2022

The south east region has a population of approximately 9.2 million people, there are 13.9 million households in the greater south east area, with 1.4 million of those households in fuel poverty. The 2018 fuel poverty statistics suggest that 10.2% of households in the GSENZH are fuel poor, which is inline with the average for England of 10.3%. Three LEP areas have a higher proportion of fuel poor households than the rate for England and these are also the three LEPs with the highest numbers of households in GSENZH. Overall, 58.9% of the total number of households in fuel poverty in England are within the GSENZH area.

The Local Authorities and LEPs play a vital role in coordinating, facilitating and delivering the transformation of our energy system. This report provides data and analysis for the GSENZH and the 11 LEPs, with Local Authority detail available within each LEP-level report.

For clarity of geography, the local authorities and their associated LEPs are listed below, complete with both the full name and the shortened versions used within reporting for data visualization:

Local Authority name	Shortened Name	LEP
London Borough of Barking & Dagenham	Barking & Dagenham	GLA
London Borough of Barnet	Barnet	GLA
London Borough of Bexley	Bexley	GLA
London Borough of Brent	Brent	GLA
London Borough of Bromley	Bromley	GLA
London Borough of Camden	Camden	GLA
City of London	City of London	GLA
London Borough of Croydon	Croydon	GLA
London Borough of Ealing	Ealing	GLA
London Borough of Enfield	Enfield	GLA
London Borough of Hackney	Hackney	GLA
London Borough of Hammersmith & Fulham	Hammersmith & Fulham	GLA
London Borough of Haringey	Haringey	GLA
London Borough of Harrow	Harrow	GLA
London Borough of Havering	Havering	GLA
London Borough of Hillingdon	Hillingdon	GLA
London Borough of Hounslow	Hounslow	GLA
London Borough of Islington	Islington	GLA
Royal Borough of Kingston upon Thames	Kingston upon Thames	GLA
London Borough of Lambeth	Lambeth	GLA
London Borough of Lewisham	Lewisham	GLA
London Borough of Merton	Merton	GLA
London Borough of Newham	Newham	GLA
London Borough of Redbridge	Redbridge	GLA
London Borough of Richmond upon Thames	Richmond upon Thames	GLA
Royal Borough of Greenwich	Greenwich	GLA
Royal Borough of Kensington & Chelsea	Kensington & Chelsea	GLA
London Borough of Southwark	Southwark	GLA
London Borough of Sutton	Sutton	GLA
London Borough of Tower Hamlets	Tower Hamlets	GLA

London Borough of Waltham Forest	Waltham Forest	GLA
London Borough of Wandsworth	Wandsworth	GLA
Westminster City Council	Westminster	GLA
Kings Lynn & West Norfolk Borough Council	Kings Lynn & West Norfolk	NALEP
Breckland District	Breckland	NALEP
Broadland District	Broadland	NALEP
Great Yarmouth Borough Council	Great Yarmouth	NALEP
North Norfolk District Council	North Norfolk	NALEP
Norwich City Council	Norwich City	NALEP
South Norfolk District Council	South Norfolk	NALEP
Babergh District Council	Babergh	NALEP
East Suffolk Council	East Suffolk	NALEP
Ipswich Borough Council	Ipswich	NALEP
Mid Suffolk District Council	Mid Suffolk	NALEP
West Suffolk Council	West Suffolk	NALEP
Cambridge City Council	Cambridge City	CPCA
East Cambridgeshire District Council	East Cambridgeshire	CPCA
Fenland District Council	Fenland	CPCA
Huntingdonshire District Council	Huntingdonshire	CPCA
Peterborough City Council (U)	Peterborough City	CPCA
South Cambridgeshire District Council	South Cambridgeshire	CPCA
Borough of Broxbourne	Broxbourne	HertsLEP
Dacorum Borough Council	Dacorum	HertsLEP
East Hertfordshire District Council	East Herts	HertsLEP
Hertsmere Borough Council	Hertsmere	HertsLEP
North Hertfordshire District Council	North Hertfordshire	HertsLEP
St Albans City and District Council	St Albans City	HertsLEP
Stevenage Borough Council	Stevenage	HertsLEP
Three Rivers District Council	Three Rivers	HertsLEP
Watford Borough Council	Watford	HertsLEP
Welwyn Hatfield Borough Council	Welwyn Hatfield	HertsLEP
Basildon Borough Council	Basildon	SELEP
Braintree District Council	Braintree	SELEP
Brentwood Borough Council	Brentwood	SELEP
Castle Point Borough Council	Castle Point	SELEP
Chelmsford City Council	Chelmsford	SELEP
Colchester Borough Council	Colchester	SELEP
Epping Forest District Council	Epping Forest	SELEP
Harlow Council	Harlow	SELEP
Maldon District Council	Maldon	SELEP
Rochford District Council	Rochford	SELEP
Southend on Sea (U) City Council	Southend on Sea	SELEP
Tendring District Council	Tendring	SELEP
Thurrock (U) Council	Thurrock	SELEP

Uttlesford District Council	Uttlesford	SELEP
Ashford Borough Council	Ashford	SELEP
Canterbury City Council	Canterbury	SELEP
Dartford Borough Council	Dartford	SELEP
Dover District Council	Dover	SELEP
Folkestone & Hythe District Council	Folkestone & Hythe	SELEP
Gravesham Borough Council	Gravesham	SELEP
Maidstone Borough Council	Maidstone	SELEP
Medway Council (U)	MEDWAY	SELEP
Sevenoaks District Council	Sevenoaks	SELEP
Swale Borough Council	Swale	SELEP
Thanet District Council	Thanet	SELEP
Tonbridge & Malling Borough Council	Tonbridge & Malling	SELEP
Tunbridge Wells Borough Council	Tunbridge Wells	SELEP
Eastbourne Borough Council	Eastbourne	SELEP
Hastings Borough Council	Hastings	SELEP
Lewes District Council	Lewes	SELEP
Rother District Council	Rother	SELEP
Wealden District Council	Wealden	SELEP
Buckinghamshire County Council	Buckinghamshire	BucksLEP
Bracknell Forest Council	Bracknell Forest	BerksLEP
Reading Borough Council	Reading	BerksLEP
Slough Borough Council	Slough	BerksLEP
West Berkshire Council	West Berkshire	BerksLEP
Royal Borough of Windsor and Maidenhead	Windsor & Maidenhead	BerksLEP
Wokingham Borough Council	Wokingham	BerksLEP
Cherwell District Council	Cherwell	OxLEP
Oxford City Council	Oxford City	OxLEP
South Oxfordshire District Council	South Oxfordshire	OxLEP
Vale of White Horse District Council	Vale of White Horse	OxLEP
West Oxfordshire District Council	West Oxfordshire	OxLEP
Adur District Council	Adur	C2CLEP
Arun District Council	Arun	C2CLEP
Chichester District Council	Chichester	C2CLEP
Brighton & Hove City Council	Brighton & Hove	C2CLEP
Crawley Borough Council	Crawley	C2CLEP
Horsham District Council	Horsham	C2CLEP
Mid Sussex District Council	Mid Sussex	C2CLEP
Worthing Borough Council	Worthing	C2CLEP
Reigate and Banstead Borough Council	Reigate and Banstead	C2CLEP
Epsom and Ewell Borough Council	Epsom and Ewell	C2CLEP
Tandridge District Council	Tandridge	C2CLEP
Mole Valley District Council	Mole Valley	C2CLEP
Elmbridge Borough Council	Elmbridge	EM3

Guildford Borough Council	Guildford	EM3
Runnymede Borough Council	Runnymede	EM3
Spelthorne Borough Council	Spelthorne	EM3
Surrey Heath Borough Council	Surrey Heath	EM3
Waverley Borough Council	Waverley	EM3
Woking Borough Council	Woking	EM3
Basingstoke & Deane Borough Council	Basingstoke & Deane	EM3
East Hampshire District Council	East Hampshire	EM3
Hart District Council	Hart	EM3
Rushmoor Borough Council	Rushmoor	EM3
Test Valley Borough Council	Test Valley	EM3
Winchester City Council	Winchester City	EM3
West Northamptonshire Council (U)	West Northamptonshire	SEMLEP
North Northamptonshire Council (U)	North Northamptonshire	SEMLEP
Milton Keynes City Council (U)	Milton Keynes	SEMLEP
Bedford Borough Council (U)	Bedford	SEMLEP
Central Bedfordshire Council (U)	Central Bedfordshire	SEMLEP
Luton Borough Council (U)	Luton	SEMLEP

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Executive Summary

This executive summary provides key findings, drawn from the graphical representation of the data within the report. Sector definitions are provided in Appendix 1.

GSENZH's Domestic Energy Efficiency Supply Chain (DEESC) sector was worth £27.8bn to the GSENZH's economy in 2021/22, as indicated by the value of sales in the sector. These sales were generated by over 8,000 businesses that employed over 270,000 people in the sector in 2021/22.

Sales and growth

The Domestic Energy Efficiency Supply Chain sector in the GSENZH's region has grown year on year since 2019/20. Total sales in the sector were worth £22.8bn in 2019/20 and have now reached £27.8bn in 2021/22. This compares with the UK sales of £49.2bn in 2019/20 and £59.9bn in 2021/22.

The sector in the GSENZH region grew by 9.6% during the financial year 2019/20 to 2020/21 and 11.3% during 2020/21 to 2021/22. This compares with the UK average for the same period of 10.4% and 10.2% respectively.

Employment

Employment in GSENZH's Domestic Energy Efficiency Supply Chain sector in 2021/22 was 271,928, up from 222,901 in 2019/20. Annual growth rate in employment was 7.7% between 2019/20 and 2020/21 and 13.3% between 2020/21 and 2021/22. This compares with the UK average for the same period of 8.1% and 12.5% respectively.

Companies

The number of companies in GSENZH's Domestic Energy Efficiency Supply Chain sector in 2021/22 was 8,011, up from 6,778 in 2019/20. Annual growth rate in the number of companies was 6.2% between 2019/20 and 2020/21 and 11.3% between 2020/21 and 2021/22. This compares with the UK average for the same period of 20.6% and 10.4% respectively.

Activity

Activities within the sector, allocated through sales were split: Installation 51%, Manufacture 17%, Advisory 7%, Sales 7%, Maintenance 6%, Product Design 5%, R&D 5%, Professional Services 2%, with negligible Service and Information activity.

This compares with the UK average of Installation 52%, Manufacture 16%, Advisory 7%, Sales 7%, Maintenance 5%, Product Design 5%, R&D 4%, Professional Services 2%, with negligible Service and Information activity.

GSENZH's sub-sectors

In 2021/22 GSENZH's Domestic Energy Efficiency Supply Chain sector was made up by the following proportions: Energy Efficiency Measures 62%, Electricity and Heat 26% Making Good After Works 9% and Advisory and Related Services 2%.

GSENZH's sub-sector strengths

The five largest sub-sectors in the Domestic Energy Efficiency Supply Chain sector by sales account for 78% of the GSENZH's total sales and are made up of:

- Ventilation and Air-tightness (£15.3bn) – this sub-sector includes insulation and activities such as insulation manufacturers, agents and installers

- Walls & Ceilings (£2.2bn) - this includes those installing plasterboard, plasterers and painters and decorators, alongside companies manufacturing the plasterboard and paint and those providing advisory services
- Heat Pumps (£1.7bn) – this includes manufacturing of components, installation and maintenance
- Energy Management (£1.5bn) - this includes design, manufacture, supply, installation and maintenance activities
- Photovoltaic (£1.0bn) - this includes predominantly supply and installation, with some manufacture ancillary equipment

The next five largest sub-sectors by sales account for a further 11% of GSENZH's total sales and are made up of:

- Biogas (£787m) - this includes supply and installation, manufacture and maintenance
- Biomass (£750m) - this includes manufacturers, installers and consultancies
- Technical Services (£565m) - include construction project management
- Hot Water (£543m) – this includes manufacturers and installers
- Electric Vehicle Charge Points (£525mn) - this includes installers, manufacturers and consultancies

Key Energy Efficiency Measures Sub-sectors

The two largest Energy Efficiency Measures sub-sectors are Ventilation and Air-tightness (including insulation) and Energy Management. Within those sub-sectors, key markets include:

- Ventilation and Air-tightness (£15.3bn)
 - Roof/Loft Insulation (£5.8bn)
 - External Cavity Wall Insulation (£2.4bn)
 - Floor Insulation (£1.4bn)
 - Ventilation and Heat Recovery Systems (£1.0bn)
 - Heating System Insulation (£0.9bn)
 - Energy Efficiency Windows (£0.9bn)
- Energy Management (£1.5bn)
 - Home Energy Systems Integration (£0.4bn)
 - Home Automation (£0.4bn)
 - Energy Management Systems (£0.4bn)
 - Smart Heating Controls (£0.3bn)

Key Electricity and Heat Sub-sectors

The six largest Electricity and Heat sub-sectors are Heat Pumps, Photovoltaic, Biogas, Biomass, Hot Water and Electric Vehicle Charge Points. Within those sub-sectors, key markets include:

- Heat Pumps (£1.7bn)
 - Air Source Heat Pumps (£718m)
 - Ground Source Heat Pumps (£661m)
 - Water Source Heat Pumps (£275m)
- Photovoltaic (£1.0bn)
 - Photovoltaic PV (£550m)
 - Solar Thermal (£459m)
- Biogas (£0.8bn)
 - Biogas Plant (£228m)
 - Biogas Energy Systems (£204m)
 - Biogas Boilers and Related Systems (£187m)
 - Biogas Furnace Systems (£168m)

- Biomass (£0.7bn)
 - Biomass Boilers and Related Systems (£270m)
 - Biomass Furnace Systems (£254m)
 - Biomass Energy Systems (£226m)
- Hot Water (£0.5bn)
 - Hot Water Systems (£543m)
- Electric Vehicle Charge Point (£0.5bn)
 - On-road Solutions (£274m)
 - Off-road Solutions (£251m)

Key Advisory and Related Services Heat Sub-sectors

The largest Advisory and Related Services sub-sector is Technical Services and key markets include:

- Technical Services (£565m)
 - Project Planning (Strategy and Approach) (£242m)
 - Planning Application Services (£74m)
 - Buildings Surveys (£73m)
 - Monitoring and Evaluation (£66m)

Investment

Investment within GSENZH grew in all three categories of investment between 2019/20 and 2021/22:

- Private Equity Investment grew 25.2% from £1.78bn in 2019/20 to £2.23bn in 2021/22
- Venture capital Investment grew 24.5% from £1.76bn in 2019/20 to £2.19bn in 2021/22
- Other Investment grew 20.9% from £1.83bn in 2019/20 to £2.21bn in 2021/22

The pattern of Investment was similar to sales, with the exception of the Heat Pumps sub-sector, where the largest sub-sector in terms of sales was Air Source Heat Pumps, followed by Ground Source and Water Source Heat Pumps. Investment in Private Equity and Venture Capital were higher for Water Source Heat Pumps than for Air Source or Ground Source Heat Pumps. Other investment, which includes government, followed the same pattern as for sales.

Sub-sector growth

GSENZH's five largest sub-sectors by sales have all enjoyed high levels of growth in sales, number of employees and number of companies between 2019/20 and 2021/22:

- Ventilation and Air-tightness – sales have grown from £12.5bn to £15.3bn (21.9%), number of employees by 22.0% and number of companies by 15.4%
- Walls & Ceilings – sales have grown from £1.8bn to £2.2bn (21.9%), number of employees by 21.7% and number of companies by 22.6%
- Heat Pumps – sales have grown from £1.4bn to £1.7bn (22.1% increase), number of employees by 22.0% and number of companies by 21.9%
- Energy Management – sales have grown from £1.2bn to £1.5bn (22.2% increase), number of employees by 22.2% and number of companies by 21.8%
- Photovoltaic – sales have grown from £0.8bn to £1.0bn (22.2% increase), number of employees by 22.0% and number of companies by 23.2%

Sub-sectors which saw stronger growth than the UK average between 2019/20 and 2021/22 include:

- Battery Technologies with 22.2% (UK 19.9%)
- Biomass with 22.0% (UK 21.2%)
- Combination Systems with 21.7% (UK 20.5%)
- Heat Pumps with 22.1% (UK 21.5%)

- Wind with 21.3% (UK 18.1%)
- Ventilation and Air-tightness with 21.9% (UK 21.3%)
- Walls & Ceilings with 21.9% (UK 21.3%)

Sub-sectors which saw weaker growth than the UK average between 2019/20 and 2021/22 include:

- Sector Development with 21.6% (UK 24.7%)
- Electric Heating with 22.2% (UK 24.1%)
- Geothermal with 22.3% (UK 24.1%)
- Heat Networks with 21.7% (UK 24.8%)
- Hot Water with 22.7% (UK 24.6%)
- Energy Saving Lighting with 22.4% (UK 27.1%)
- Cleaning Services with 22.2% (UK 24.2%)
- Floors with 21.9% (UK 24.8%)

Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Wind has stronger growth than the UK and above average market size
- Battery Technologies has stronger growth than the UK and above average market size
- Biomass has slightly stronger growth than the UK and above average market size
- Heat Pumps has slightly stronger growth than the UK and above average market size
- Heat Networks has weaker growth than the UK, but above average market size
- Hydrogen has weaker growth than the UK, but above average market size
- Hot Water has weaker growth than the UK, but above average market size
- Walls and Ceilings have stronger growth than the UK, but below average market size

Sub-Sector weaknesses include:

- Floors has weaker growth than the UK and below average market size
- Sector Development has weaker growth than the UK and below average market size
- Geothermal has weaker growth than the UK and below average market size

Scalability of sub-sectors

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

- Information Dissemination with small GVA and high Scalability
- Hot Water with moderate GVA and high Scalability
- Photovoltaic with large GVA and high Scalability
- Energy Management with very high GVA and medium Scalability
- Walls and Ceilings with very high GVA and medium Scalability
- Ventilation and Air-tightness with the highest GVA and average scalability

Forecasts

5-year forecasts for sales include:

- No policy sales to increase year-on-year from 11.8% between 2021/22 and 2022/23 to 17.7% between 2025/26 and 2026/27
- Current Policy sales to include a large growth of 117.7% between 2021/22 and 2022/23 followed by 13.4% between 2022/23 and 2023/24 to 18.7% between 2025/26 and 2026/27

5-year forecasts for employment include:

- No policy sales to increase year-on-year from 9.1% between 2021/22 and 2022/23 to 11.4% between 2025/26 and 2026/27

- Current Policy sales to include a large growth of 70.9% between 2021/22 and 2022/23 followed by 9.9% between 2022/23 and 2023/24 to 14.6% between 2025/26 and 2026/27

Net Zero 2030 and 2050 forecasts for sales include:

- No policy sales are forecast to increase from £27.8bn in 2021/22 to £626bn (22.5x) to reach net zero by 2030 or £153bn (5.5x) to reach net zero by 2050
- Current Policy sales are forecast to increase from £27.8bn in 2021/22 to £832bn (29.9x) to reach net zero by 2030 or £207bn (7.4x) to reach net zero by 2050

Net Zero 2030 and 2050 forecasts for employment include:

- No policy employment is forecast to increase from 271,928 in 2021/22 to 4,527,038 (16.6x) to reach net zero by 2030 or 938,320 (3.5x) to reach net zero by 2050
- Current Policy employment is forecast to increase from 271,928 in 2021/22 to 7,423,105 (27.3x) to reach net zero by 2030 or 1,221,123 (4.5x) to reach net zero by 2050

A key point of the analysis is even without policy, the sector is forecast to see strong, double-digit growth throughout the forecast period and current policy has the potential to front-load that growth, resulting in a significantly larger market. To reach net zero by 2030 requires the largest proportional increase in both sales and employment, because there is a smaller timeframe to complete the retrofit of a finite number of properties.

GSENZH's Exports

The value of exports in GSENZH's Domestic Energy Efficiency Supply Chain sector in 2021/22 was £5.6bn, an increase from £4.6bn in 2019/20. This accounted for 59.0% of the UK's DEESC exports in 2021/22 and is higher than GSENZH's 46.4% share of the overall UK DEESC market.

GSENZH's DEESC exports grew by 10.3% and 10.8% over the last three years which was slower than the UK average of 14.9% and 14.6%.

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

- Ventilation and Air-tightness - £3.2bn
- Walls and Ceilings - £430m
- Energy Management - £302m
- Heat Pumps - £283m
- Photovoltaic - £207m
- Biomass - £152m
- Biogas - £146m

GSENZH's Imports

The value of imports was lower than exports, making the GSENZH a net exporter in the market. The value of Imports in GSENZH region's Domestic Energy Efficiency Supply Chain sector in 2021/22 was £4.0bn, an increase from £3.2bn in 2019/20. This accounted for 38.3% of the UK's DEESC imports in 2021/22, below the GSENZH regions 46.4% share of the overall UK DEESC market.

GSENZH region DEESC imports grew by 10.2% and 10.8% over the last three years which was slower than the UK average of approximately 14.9% and 14.6% respectively.

Introduction to the Domestic Energy Efficiency Supply Chain

The definition of Domestic Energy Efficiency Supply Chain used within this study is broadly defined as:

“Those activities required to deliver net zero across the domestic housing sector”

This includes obvious activities such as insulating the property, but also manufacturing of the insulation materials, the advice given to insulate the house and the behavioural scientists working to change behaviours. It does not include wider activities not directly attributable to the property, e.g., district heat networks are included, but only for those activities relating to the property, such as the infrastructure within the property boundary. Likewise Wind is included, but only small domestic wind turbines. As such, these sub-sectors are lower in significance within the domestic energy setting than the wider energy market.

Skills within this remit include equipment and materials installers, alongside domestic assessment, advice, maintenance and manufacture and extending into sales, communication and sector development activities and public procurement.

Hands-on activities involve the energy efficiency technologies such as the building envelope or fabric, separating the outside elements from the inside of the property, including energy efficient windows, doors, wall and loft insulation, but also home energy management systems, home automation and smart heating controls. Activities also involve energy generation and heating technologies such as photovoltaics, heat pumps, geothermal, heat networks and so on, but also the installation of electric vehicle charge points.

Ancillary activities include societal behaviour studies, societal engagement campaigns, sector development activities (such as business model development) and (technical services such as planning application services, architectural services and environmental consultancy).

Brief Methodology for data production

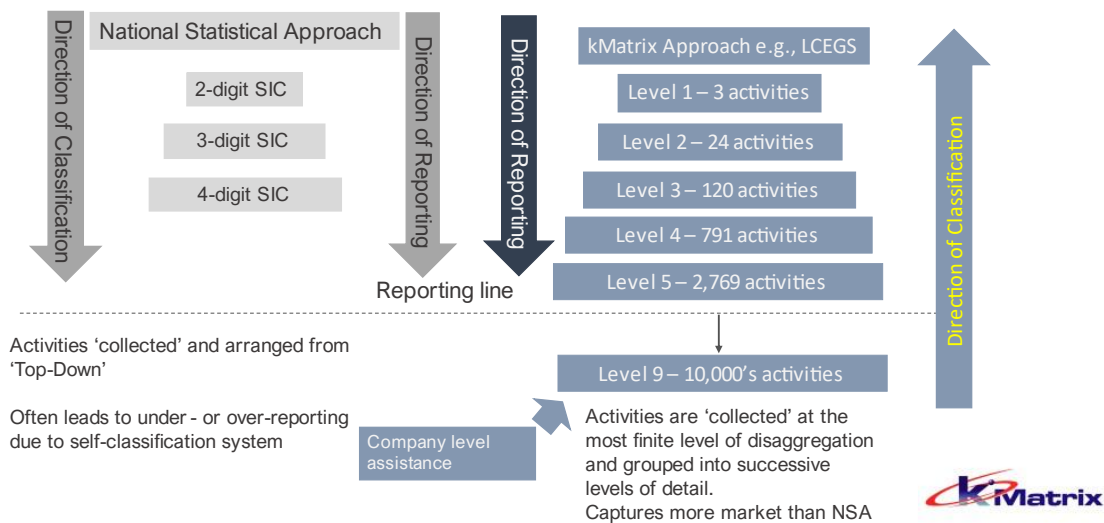
kMatrix uses a unique data triangulation methodology, developed as an international research programme with Professor R. Jaikumar of Harvard University over 35 years ago and subsequently developed in countries across Europe.

The core research processes within the methodology are used to track technology and market change and employs “big data,” analytical industrial data grids, business case studies and industry-level research to provide probabilistic and measurable evidence about how companies and economies adapt to and perform within changing market conditions. The process was originally developed to look at individual companies, providing evidenced data for development and has since mapped the market of single technologies through to whole countries. This is achieved outside of the Standard Industrial Classification system, enabling detailed market segmentation.

Because the process was originally developed to look at individual companies, providing evidenced data for development, sectors are classified from the ‘bottom up,’ collecting activities from the most finite level of granulation and grouping them into successive levels of detail. This diagram provides an example of the depth of detail possible, using the Low Carbon Environmental Goods and Services (LCEGS) sector as an example:

kMatrix Sector Classification System

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 as LCEGS or Domestic Energy Efficiency Supply chain. Here, the kMatrix system of data collection, which triangulates transactional data from many sources, over 11,200 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:

- Domestic Energy Retrofit in the North East <https://evidencehub.northeastlep.co.uk/domestic-retrofit-skills-needs-assessment>
- 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.sustainabilitywestmidlands.org.uk/resources/midlands-low-carbon-sector-study/>
- 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>
- Adaptation & Resilience to Climate Change: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)01787-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01787-6/fulltext)
- 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>

Impact of Policy on Sector Forecasts

An important element of this supply chain market intelligence report is the provision of forecasts for the size of the sector, in terms of the sales and employment for different forecasting periods and under different forecasting scenarios.

The baseline measurement for 2021/22, together with the historical trends of 2019/20 and 2020/21 were used to forecast the likely growth of the sectors and sub-sectors within the DEESC.

Forecasts are provided for:

- 5-year annual timeseries forecast with no policy overlay
- 5-year annual timeseries forecast applying current policies
- Forecasting size of industry needed to deliver net zero by 2030 with no policy overlay
- Forecasting size of industry needed to deliver net zero by 2030 applying current policies
- Forecasting size of industry needed to deliver net zero by 2050 with no policy overlay
- Forecasting size of industry needed to deliver net zero by 2050 applying current policies

The purpose of providing a distinction between 'No Policy' and 'Current Policy' is to provide detail to policy makers of the likely impact of current policy, but also to provide the likely baseline minimal growth of the sector if those policies were not in place.

The 'No Policy' forecast essentially provides a baseline growth, which represents an average of the forecasts from within the sector and provides:

- the likely trajectory of the sector without intervention for the 5-year forecasts
- the minimum size the sector would need to be to achieve net zero targets for 2030 or 2050

The 'Current Policy' forecast uses the policies and implications drawn from the Heat & Buildings Strategy (2021), Net Zero Strategy (2021), the Prime Minister's Ten Point Plan (2020), Industrial and Clean Growth Strategies (2016), Energy White Paper (2020), Energy Security Policy (2021) and Industrial Decarbonisation Strategy (2022). These have been overlaid on the baseline 'No Policy' forecasts, to provide insight into the impacts of those policies and provide:

- the impact of current policies on the likely trajectory of the sector for the 5-year forecasts
- the size the sector would need to be to achieve net zero targets for 2030 or 2050 under current policy

The impact of policy on the sector is both direct through funding, and indirect such as the increase in consumer awareness through increased reporting on polices, which drives an organic increase in demand for energy efficiency.

In addition to the more general boost to the sector through awareness and cultural movement, there are also specific policies which focus on social housing and assistance to those in fuel poverty which alter the supply chain needs of the sector, for example increase the need for painters and decorators.

The Domestic Energy Efficiency sector has been growing steadily for the last decade, however a significant effect of policy on the sector is to front-load the growth, with immediate policy interventions causing significant growth over the next couple of years as the sector rapidly increases capacity. This would then be followed by more usual sectoral growth, resulting in a larger market overall.

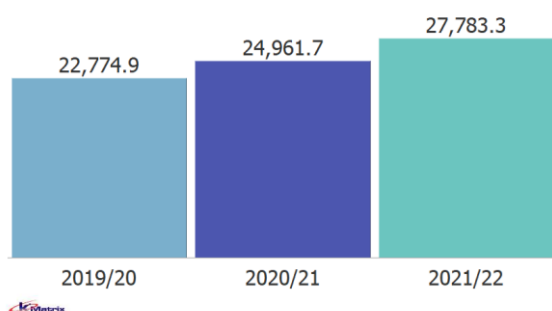
1. GSENZH Regional Domestic Energy Efficiency Supply Chain Analysis

This section of the report analyses the GSENZH Regional Domestic Energy Efficiency Supply Chain (DEESC) at Level 1 and Level 2 (see Appendix 1 for definitions). It also provides information at Level 3 to show the type of activities included in these sub-sectors.

1.1 GSENZH DEESC Compared by Year

In this section of the report, GSENZH Regional DEESC performance is compared for the last three years for the three key measures of Sales, Employment and Growth.

Figure 1: Sales 2019/20 to 2021/22 in £m

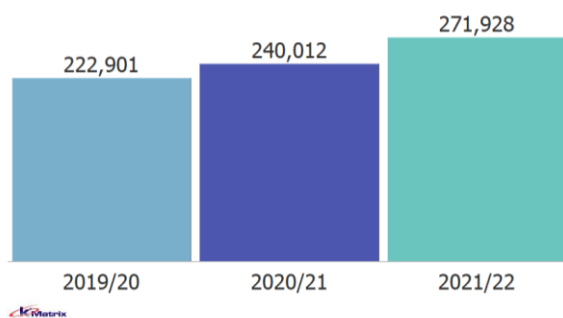


GSENZH Regional DEESC sales in 2021/22 were £27.8bn, up from £22.8bn in 2019/20.

Annual sales growth in GSENZH Regional DEESC was 9.6% from 2019/20 to 2020/21 and 11.3% from 2020/21 to 2021/22.

In comparison UK sales growth in DEESC was 10.4% and 10.2% respectively.

Figure 2: Employment 2019/20 to 2021/22

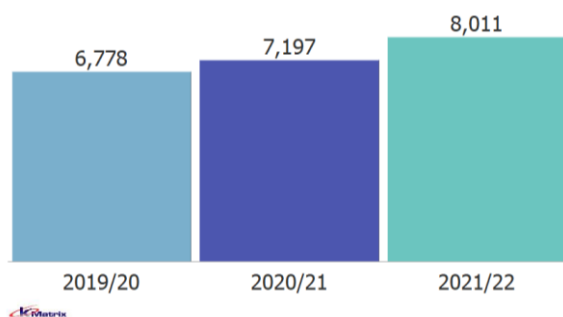


GSENZH Regional DEESC employment in 2021/22 was 271,928, up from 222,901 in 2019/20.

Annual employment growth in GSENZH Regional DEESC was 7.7% from 2019/20 to 2020/21 and 13.3% from 2020/21 to 2021/22.

In comparison UK employment growth in DEESC was 8.1% and 12.5% respectively.

Figure 3: Companies 2019/20 to 2021/22



GSENZH Regional DEESC company count in 2021/22 was 8,011, up from 6,778 in 2019/20.

Annual company growth in GSENZH Regional DEESC was 6.2% from 2019/20 to 2020/21 and 11.3% from 2020/21 to 2021/22.

In comparison UK company growth in LCEGS was 20.6% and 10.4% respectively.

Growth in all three measures in the GSENZH region was slower between 2019/20 and 2021/22, then stronger between 2020/21 and 2021/22 when compared with the UK as a whole.

1.2 GSENZH DEESC at Level 1

The analysis in this section of the report focuses on the Level 1 split of DEESC in the GSENZH for each of the last three years, along with the activities within those sub-sectors.

1.2.1 GSENZH DEESC (Level 1)

Figure 4: Sales 2019/20 to 2021/22 in £m (Level 1)

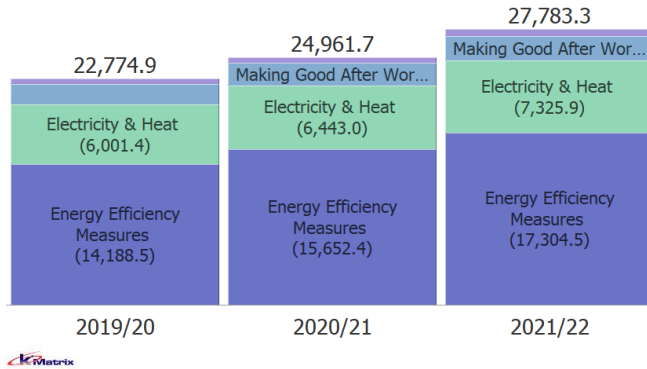


Figure 4 shows the three-year DEESC sales split by Level 1.

In 2021/22 the split was 62% Energy Efficiency Measures, 26% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services. The split has not changed since 2019/20.

Figure 5: Employment 2019/20 to 2021/22 (Level 1)

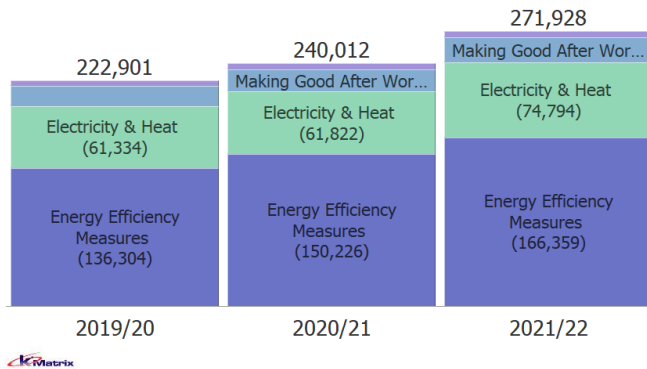


Figure 5 shows the three-year employment split by Level 1.

In 2021/22 the split was 62% Energy Efficiency Measures, 26% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services. The split has not changed since 2019/20.

Figure 6: Companies 2019/20 to 2021/22 (Level 1)

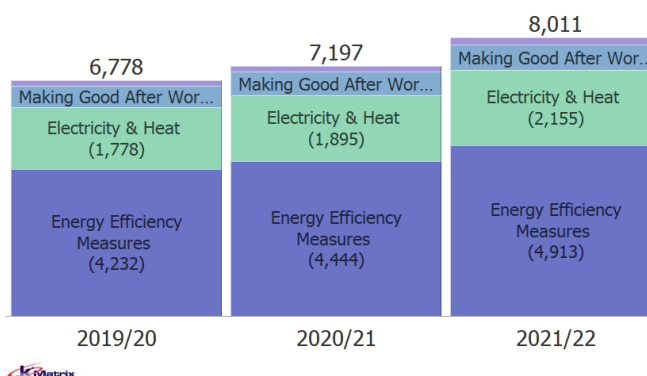


Figure 6 shows the three-year company split by Level 1.

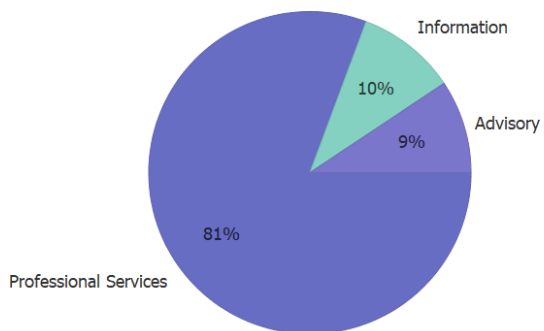
In 2021/22 the split was 62% Energy Efficiency Measures, 26% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services. The split has not changed since 2019/20.

In 2021/22 UK DEESC sales was split – 63% Energy Efficiency Measures, 24% Electricity & Heat, 10% Making Good After Works and 3% Advisory & Related Services.

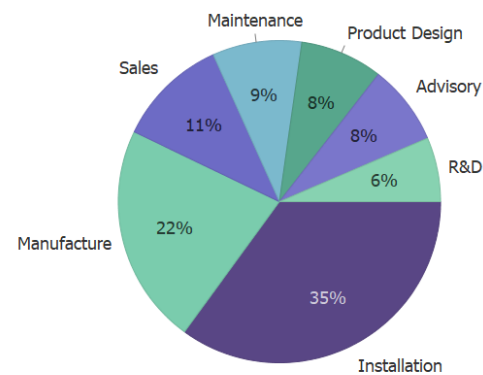
1.2.2 GSENZH DEESC Activity Codes

Figure 7: DEESC Sales Split by Activity Code 2021/22 (Level 1)

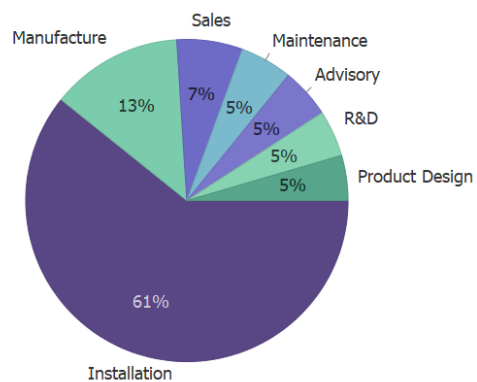
Advisory & Related Services



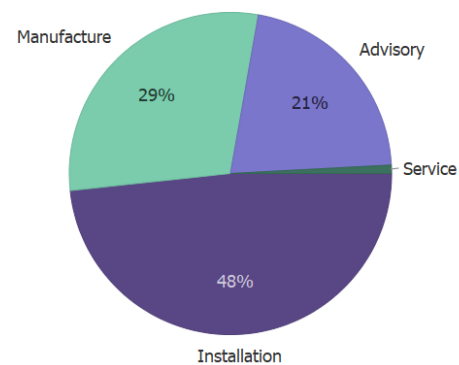
Electricity & Heat



Energy Efficiency Measures



Making Good After Works



Activities vary by Level 1 sub-sector (Figure 7), with the largest activity code being Installation for Energy Efficiency Measures 61%, Making Good After Works 48% and Electricity and Heat 35%, while Professional Services is the largest activity within Advisory and Related Services 81%.

1.3 GSENZH DEESC Level 1 – Energy Efficiency Measures

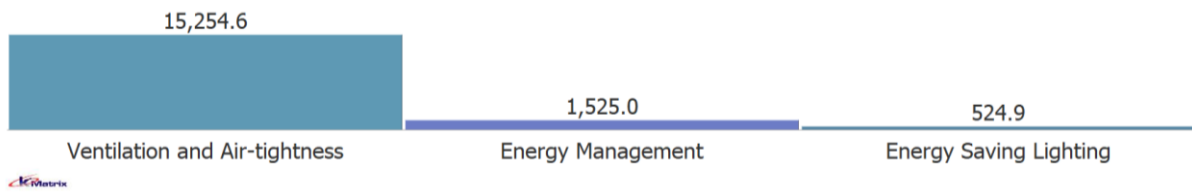
In this section we look at the Energy Efficiency Measures market in greater detail. Initially we split the market into three further sub-sectors (Level 2) and then look at the Level 2 sub-sectors in more detail, then by activity code and then the sub-sectors within Level 3. Sub-sectors within Energy Efficiency Measures are shown in Table 1.

Table 1: Level 2 and Level 3 sub-sectors within Energy Efficiency Measures

Level 2	Level 3
Energy Management	Energy Management Systems
	Home Automation
	Home Energy Systems Integration
	Smart Heating Controls
Energy Saving Lighting	Energy Saving Lighting Equipment
Ventilation & Air-tightness	Energy Efficient Windows
	External Cavity Wall Insulation
	External Wall Insulated Cladding
	Floor Insulation
	Heating System Insulation (ducting/pipework/cylinders)
	Insulated Doors
	Internal Wall Insulation
	Park Home Insulation
	Roof/Loft Insulation
	Roofing
Ventilation and Heat Recovery Systems	

1.3.1 Energy Efficiency Measures (Level 2)

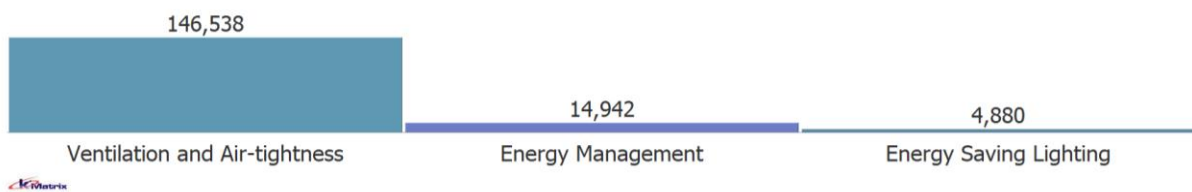
Figure 8: Sales 2021/22 in £m (Level 2)



Energy Efficiency Measures is further sub-divided into three sub-sectors, Ventilation and Air-tightness 88%, Energy Management 9% and Energy Saving Lighting 3% (Figure 8).

Each of these three sub-sectors grew between 2019/20 and 2021/22: Ventilation and Air-tightness from £12,511.8m to £15,254.6m; Energy Management from £1,247.9m to £1,525.0m and Energy Saving Lighting from £428.8m to £524.9m.

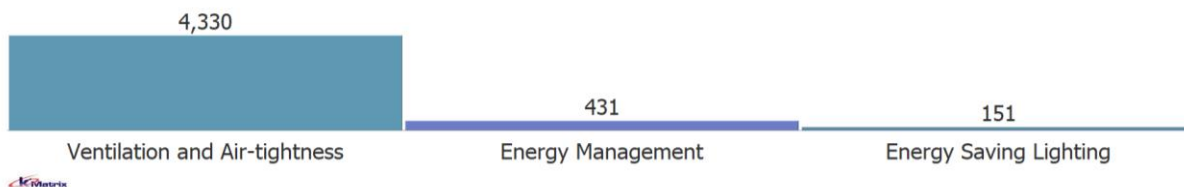
Figure 9: Employment 2021/22 (Level 2)



Employment within the three sub-sectors are: Ventilation and Air-tightness 88%, Energy Management 9% and Energy Saving Lighting 3% (Figure 9).

Each of these three sub-sectors grew between 2019/20 and 2021/22: Ventilation and Air-tightness from 120,109 to 146,538; Energy Management from 12,222 to 14,942 and Energy Saving Lighting from 3,973 to 4,880.

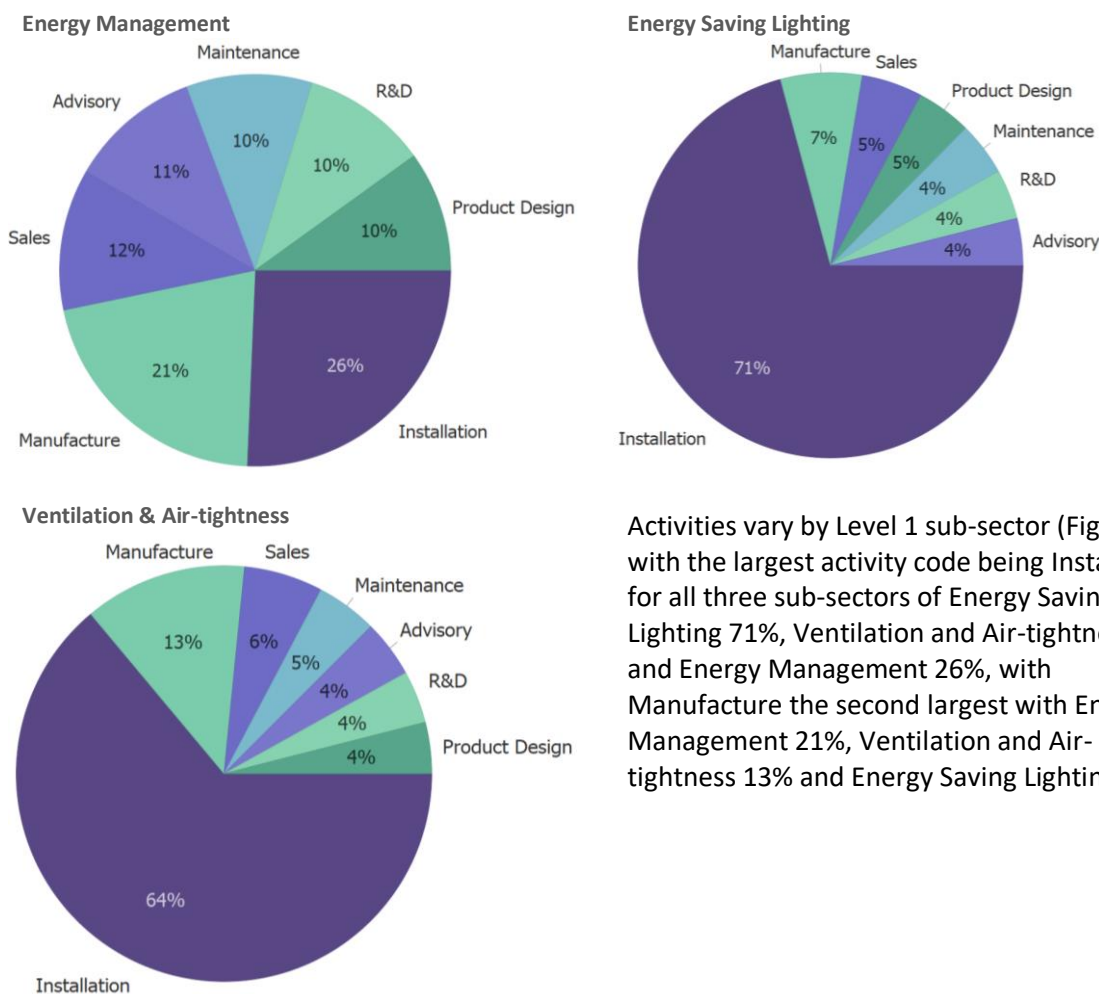
Figure 10: Companies 2021/22 (Level 2)



Employment within the three sub-sectors are: Ventilation and Air-tightness 88%, Energy Management 9% and Energy Saving Lighting 3%.

Each of these three sub-sectors grew between 2019/20 and 2021/22: Ventilation and Air-tightness from 3,751 to 4,330; Energy Management from 354 to 431 and Energy Saving Lighting from 127 to 151 (Figure 10).

Figure 11: Energy Efficiency Measures Sales Split by Activity Code 2021/22 (Level 1)



Activities vary by Level 1 sub-sector (Figure 11), with the largest activity code being Installation for all three sub-sectors of Energy Saving Lighting 71%, Ventilation and Air-tightness 64% and Energy Management 26%, with Manufacture the second largest with Energy Management 21%, Ventilation and Air-tightness 13% and Energy Saving Lighting 7%.

1.3.3 Energy Efficiency Measures Market at Level 3

Figure 12: Summary of metrics for 2021/22 for Energy Efficiency Measures, Level 2 sub-sectors at Level 3

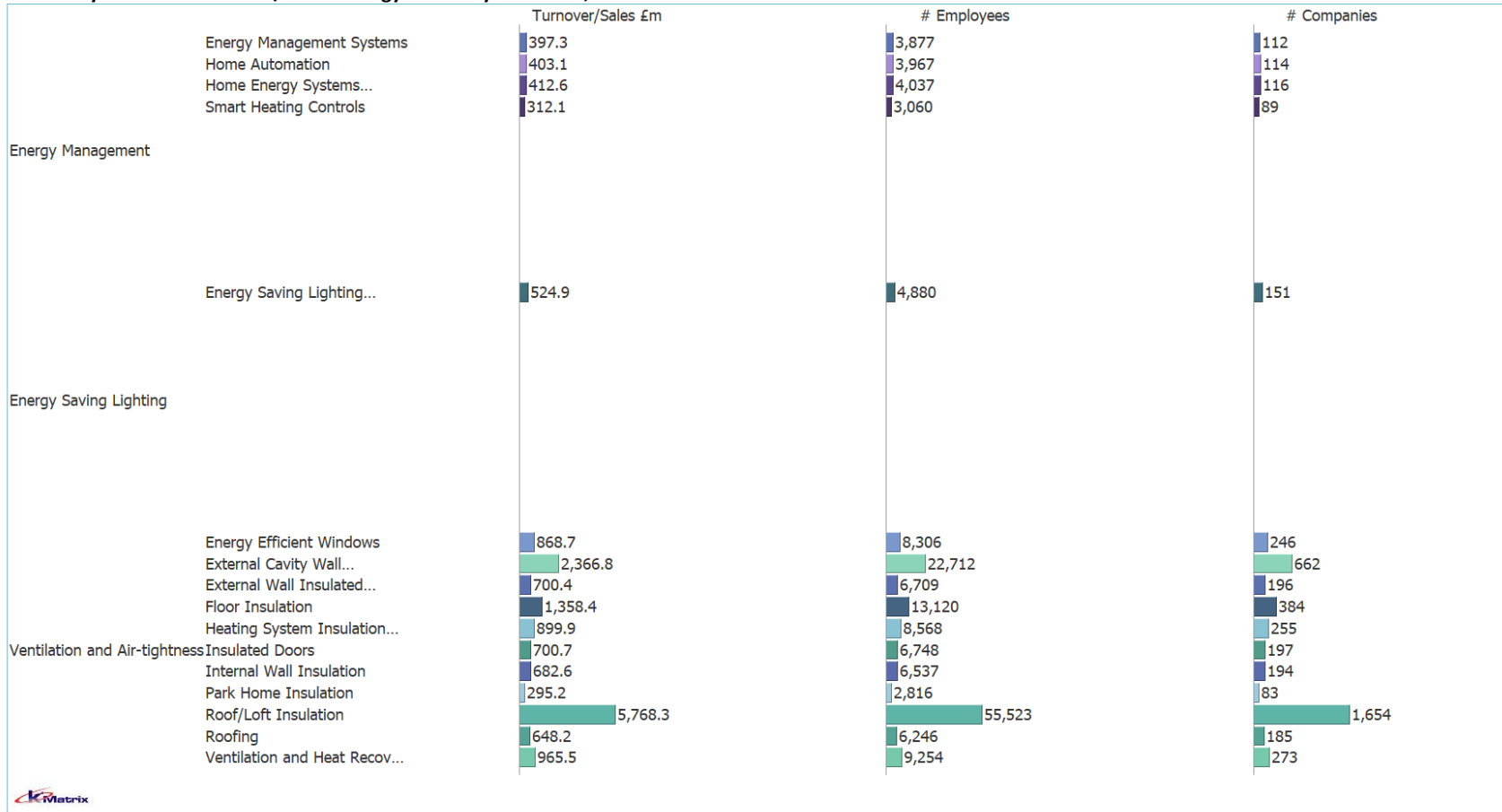


Figure 12 shows a summary of the Sales, Companies and Employees for these Level 2 sub-sectors, broken out into their Level 3 sub-sectors.

Ventilation and Air-tightness is the largest Level 2 sub-sector and Roof/Loft Insulation is the largest of the eleven Level 3 sub-sectors, making up 38% of the market. Example companies in this sub-sector would include insulation manufacturers, agents and installers.

Energy Management has four sub-sectors at level 3, with Home Energy Systems Integration holding 27% of the market share, Energy Management Systems and Home Automation both holding 26% of market share and Smart Heating Controls holding 20% of the market. Example companies in this sub-sector would include design, manufacture, supply, installation and maintenance activities.

Energy Saving Lighting only has one sub-sector, Energy Saving Lighting Equipment. Example companies in this sub-sector would include design, manufacture, agents and installers.

1.4 GSENZH’s DEESC Level 1 – Electricity and Heat

In this section we look at the Electricity and Heat market in greater detail. Initially we split the market into thirteen further sub-sectors (Level 2) and then look at the Level 2 sub-sectors in more detail, then by activity code and then the sub-sectors within Level 3.

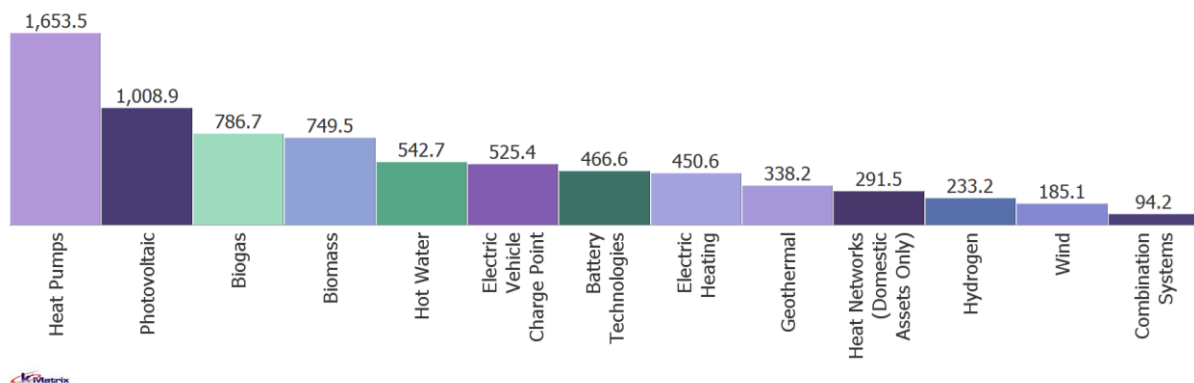
Sub-sectors within Electricity and Heat are shown in Table 2.

Table 2: Level 2 and Level 3 sub-sectors within Electricity and Heat

Level 2	Level 3
Battery Technologies	Electrical Batteries
	Thermal Batteries (Latent Heat Storage)
	Thermal Batteries (Thermochemical Heat Storage)
	Thermal Stores (Sensible Heat Storage)
Biogas	Biogas Boilers and Related systems
	Biogas Energy Systems
	Biogas Furnace Systems
	Biogas Plant (Domestic)
Biomass	Biomass Boilers and Related systems
	Biomass Energy Systems
	Biomass Furnace Systems
Combination Systems	Combination Systems Design
	Combination Systems Installation
Electric Heating	High Retention Storage Heaters
Electric Vehicle Charge Point	Off-road Solutions
	On-road Solutions
Geothermal	Horizontal Systems
	Vertical Systems
Heat Networks (Domestic Assets Only)	External Physical Assets
	Internal Physical Assets
Heat Pumps	Air Source Heat Pumps
	Ground Source Heat Pumps
	Water Source Heat Pumps
Hot Water	Hot Water Systems
Hydrogen	Hydrogen Boilers
	Hydrogen Cooking Appliances
	Hydrogen Fuel Cells
Photovoltaic	Photovoltaic PV
	Solar Thermal
Wind	Domestic Small Wind Turbines

1.4.1 Electricity and Heat Market at Level 2

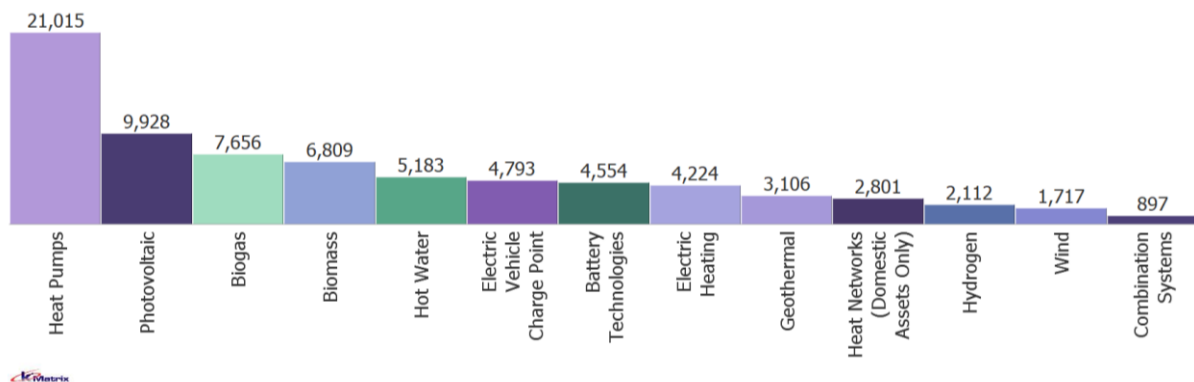
Figure 13: Sales 2021/22 in £m (Level 2)



Electricity and Heat is then split into thirteen sub-sectors, of which six account for 72% of sales (Figure 13). These six are made up of Heat Pumps 23%, Photovoltaic 14%, Biogas 11%, Biomass 10%, Hot Water 7% and Electric Vehicle Charge Point 7%.

Each of these six sub-sectors grew between 2019/20 and 2021/22: Heat Pumps from £1,353.7m to £1,653.5m; Photovoltaic from £825.6m to £1,008.9m, Biogas from £646.3m to £786.7m, Biomass from £614.2m to £749.5m, Hot Water from £442.5m to £542.7m and Electric Vehicle Charge Point From £431.0m to £525.4m.

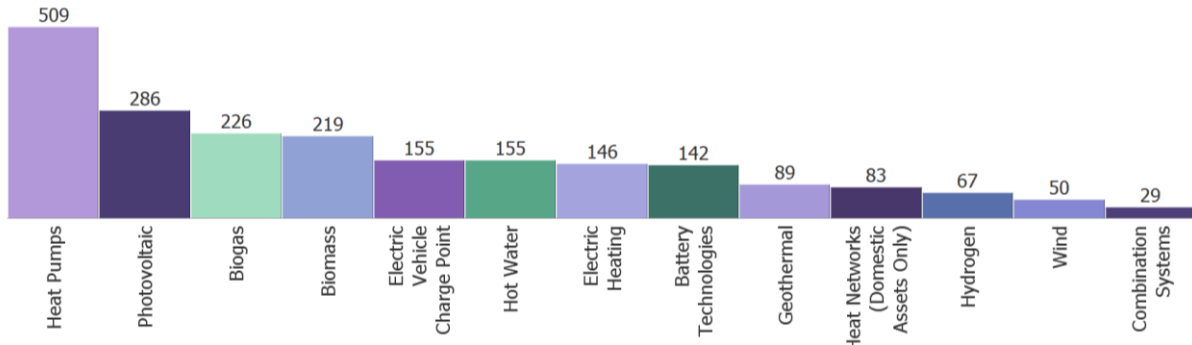
Figure 14: Employment 2021/22 (Level 2)



The same six sub-sectors account for 74% of employment (Figure 14). They are made up of Heat Pumps 28%, Photovoltaic 13%, Biogas 10%, Biomass 9%, Hot Water 7% and Electric Vehicle Charge Point 6%.

Employment in each of these six sub-sectors grew between 2019/20 and 2021/22: Heat Pumps from 17,232 to 21,015, Photovoltaic from 8,136 to 9,928, Biogas from 6,301 to 7,656, Biomass from 5,594 to 6,809, Hot Water from 4,231 to 5,183 and Electric Vehicle Charge Point From 3,933 to 4,793.

Figure 15: Companies 2021/22 (Level 2)



The same six sub-sectors also account for 72% of companies (Figure 15). They are made up of Heat Pumps 24%, Photovoltaic 13%, Biogas 10%, Biomass 10%, Hot Water 7% and Electric Vehicle Charge Point 7%.

Each of these six sub-sectors grew between 2019/20 and 2021/22: Heat Pumps from 418 to 509, Photovoltaic from 232 to 286, Biogas from 187 to 226, Biomass from 181 to 219, Electric Vehicle Charge Point From 128 to 155 and Hot Water from 135 to 155.

1.4.2 Electricity and Heat Market by Activity Code

Figure 16a: Electricity and Heat Sales Split by Activity Code 2021/22 (Level 1)

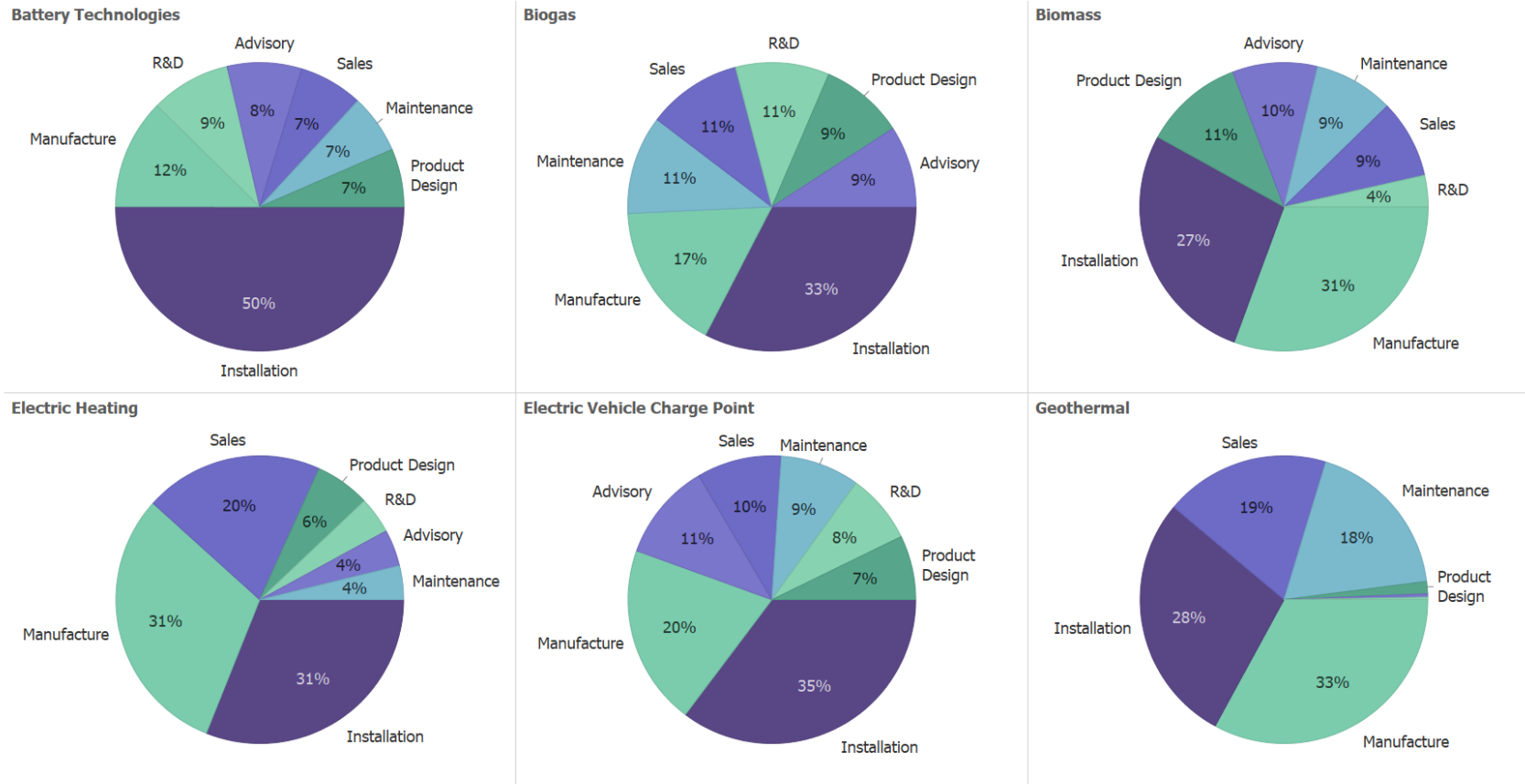
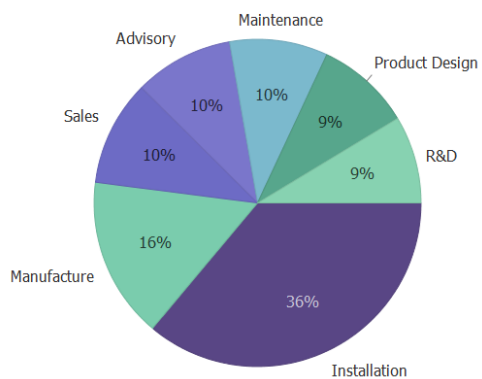
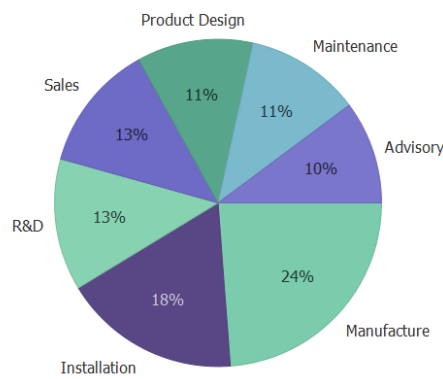


Figure 16b: Electricity and Heat Sales Split by Activity Code 2021/22 (Level 1)

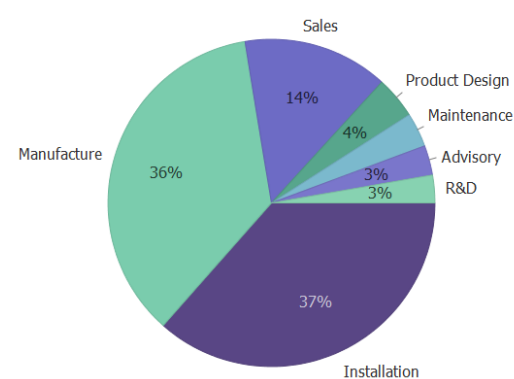
Heat Networks (Domestic Assets Only)



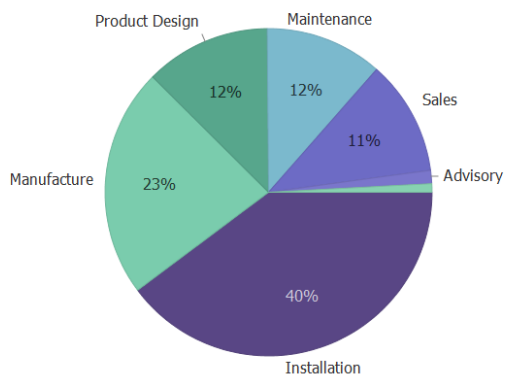
Heat Pumps



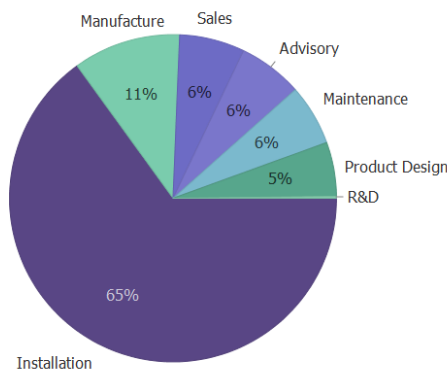
Hot Water



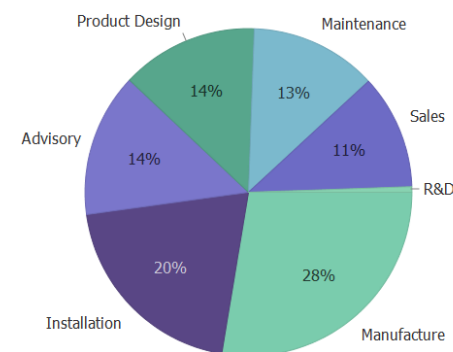
Hydrogen



Photovoltaic



Wind



Activities vary by Level 1 sub-sector (Figure 16), with the largest activity code being Installation for Battery Technologies 50%, Biogas 33%, Electric Heating 31%, Electric Vehicle Charge Point 35%, Heat Networks 36%, Hot Water 37%, Hydrogen 40% and Photovoltaic 65% and Manufacture for Biomass 31%, Geothermal 33%, Heat Pumps 24% and Wind 28%.

Combination Systems (where two or more of the above measures are combined) are not included in the Activity Code pie chart and is split Installation 75% and Advisory 24%.

1.4.3 Electricity and Heat Market at Level 3

Figure 17: Summary of selected metrics for 2021/22 for selected Electricity and Heat, Level 2 sub-sectors at Level 3



The top six Level 2 sub-sectors for Electricity and Heat are Heat Pumps, Photovoltaic, Biogas, Biomass, Hot Water and Electric Vehicle Charge Point, making up 72% of Sales in the Electricity and Heat market in the GSENZH region. Figure 17 shows a summary of the Sales, Companies and Employees for these Level 2 sub-sectors, broken out into their Level 3 sub-sectors.

Heat Pumps is the largest Level 2 sub-sector with 23% of sales and has three sub-sectors at Level 3, the largest being Air Source Heat Pumps which makes up 43% of sales in this market, followed by Ground Source Heat Pumps with 40% and Water Source with 17%. Example companies include manufacturing of components, installation and maintenance.

Photovoltaic has two sub-sectors at level 3, the largest being Photovoltaic PV with 54% of sales, with Solar Thermal holding 46% of sales in this market. Example companies include predominantly supply and installation, with some manufacture ancillary equipment.

Biogas has four sub-sectors at level 3, the largest being Biogas Plant (Domestic) which makes up 29% of the sales in this market, followed by Biogas Energy Systems with 26%, Biogas Boilers and Related Systems with 24% and Biogas Furnace Systems with 21%. Example companies include supply and installation, manufacture and maintenance.

Biomass has three sub-sectors at level 3, the largest being Biomass Boilers and Related Systems which makes up 36% of the sales in this market, followed by Biomass Furnace Systems with 34% and Biomass Energy Systems with 30% of the market. Example companies include manufacturers, installers and consultancies.

Hot Water has only one sub-sector at level 3, the Hot Water Systems, example companies include manufacturers and installers.

Electric Vehicle Charge Points has two sub-sectors at level 3, with On-road Solutions making up 52% of the sales in this market, and Off-road Solutions making up 48% of the market. Example companies include installers, manufacturers and consultancies.

1.5 GSENZH’s DEESC Level 1 – Making Good After Works

In this section we look at the Making Good After Works market in greater detail. Initially we split the market into thirteen further sub-sectors (Level 2) and then look at the Level 2 sub-sectors in more detail, then by activity code and then the sub-sectors within Level 3.

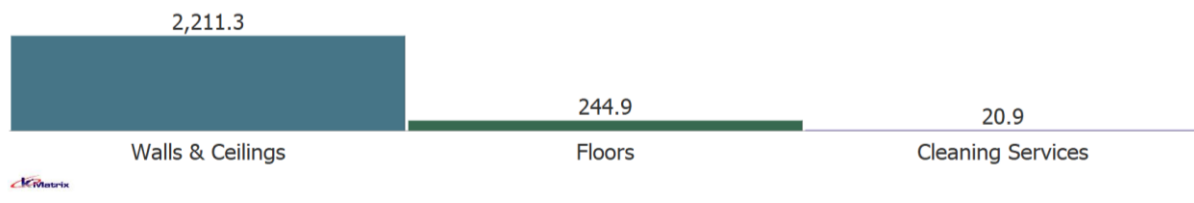
Sub-sectors within Making Good After Works are shown in Table 3.

Table 3: Level 2 and Level 3 sub-sectors within Making Good After Works

Level 2	Level 3
Cleaning Services	Contract Cleaning
Floors	Carpet Fitting
	Hard Flooring
Walls & Ceilings	Painting and Decorating
	Plastering & Plasterboarding

1.5.1 Making Good After Works Market at Level 2

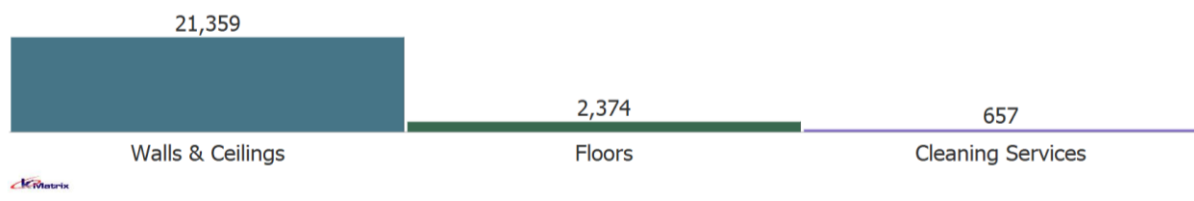
Figure 18: Sales 2021/22 in £m (Level 2)



Making Good After Works is then split into three sub-sectors (Figure 18), these are Walls & Ceilings 89%, Floors 10% and Cleaning Services 1%.

Each of these three sub-sectors grew between 2019/20 and 2021/22: Walls & Ceilings from £1,813.8m to £2,211.3m; Floors from £200.8m to £244.9m and Cleaning Services from £17.1m to £20.9m.

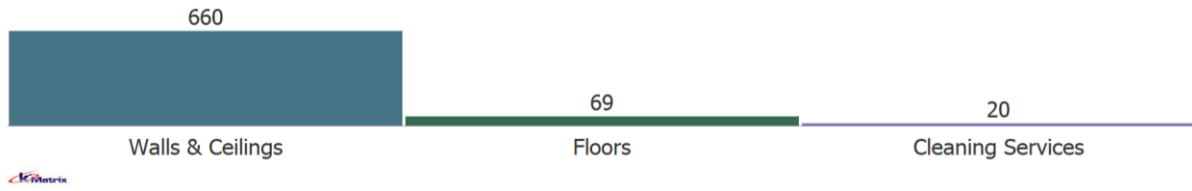
Figure 19: Employment 2021/22 (Level 2)



Employment within Making Good After Works are: Walls & Ceilings 88%, Floors 10% and Cleaning Services 3% (Figure 19).

Each of these three sub-sectors grew between 2019/20 and 2021/22: Walls & Ceilings from 17,548 to 21,359; Floors from 1,945 to 2,374 and Cleaning Services from 543 to 657.

Figure 20: Companies 2021/22 (Level 2)

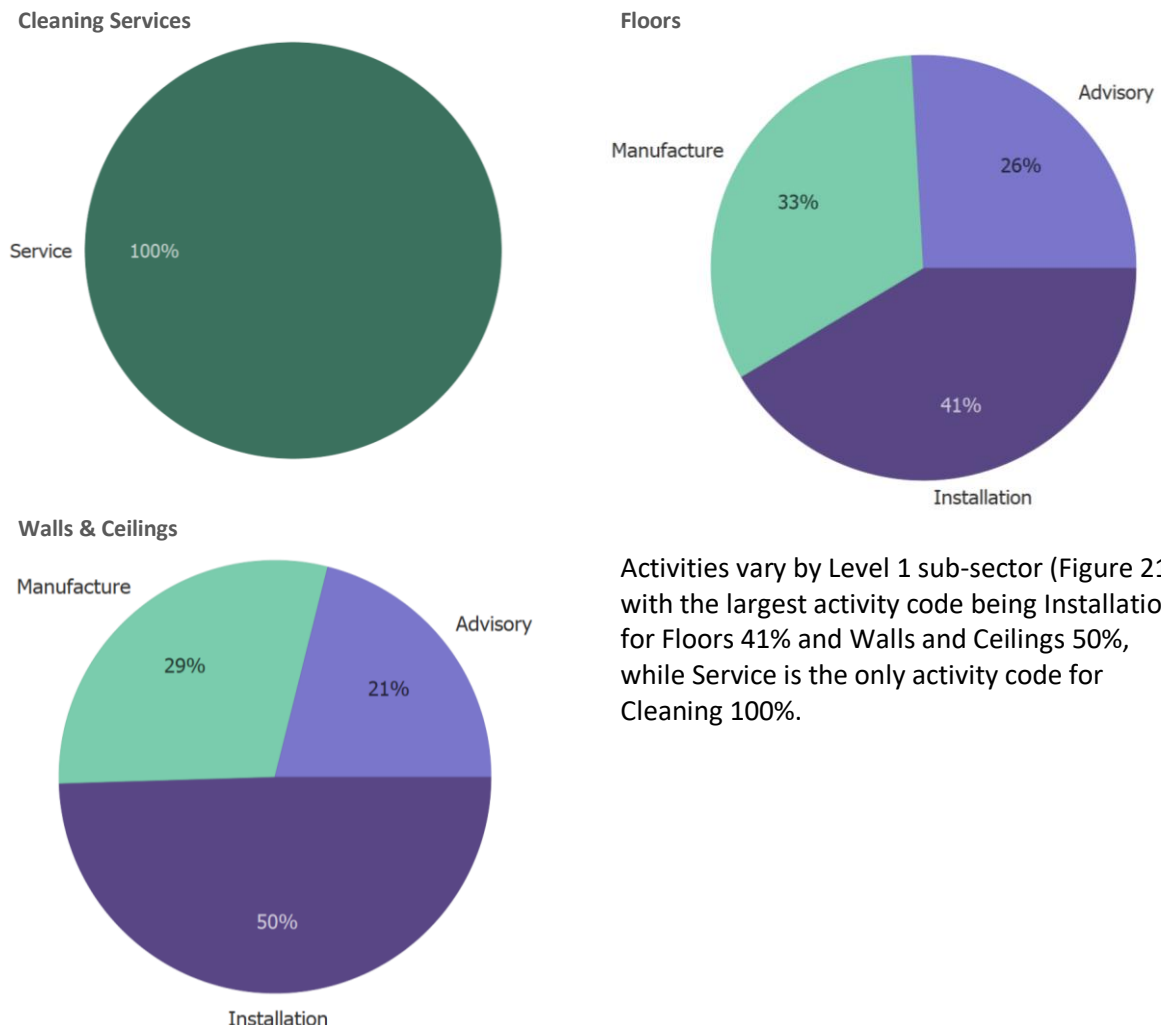


Companies within Making Good After Works are: Walls & Ceilings 89%, Floors 9% and Cleaning Services 3% (Figure 20).

Each of these three sub-sectors grew between 2019/20 and 2021/22: Walls & Ceilings from 538 to 660; Floors from 54 to 69 and Cleaning Services from 16 to 20.

1.5.2 Making Good After Works Market by Activity Code

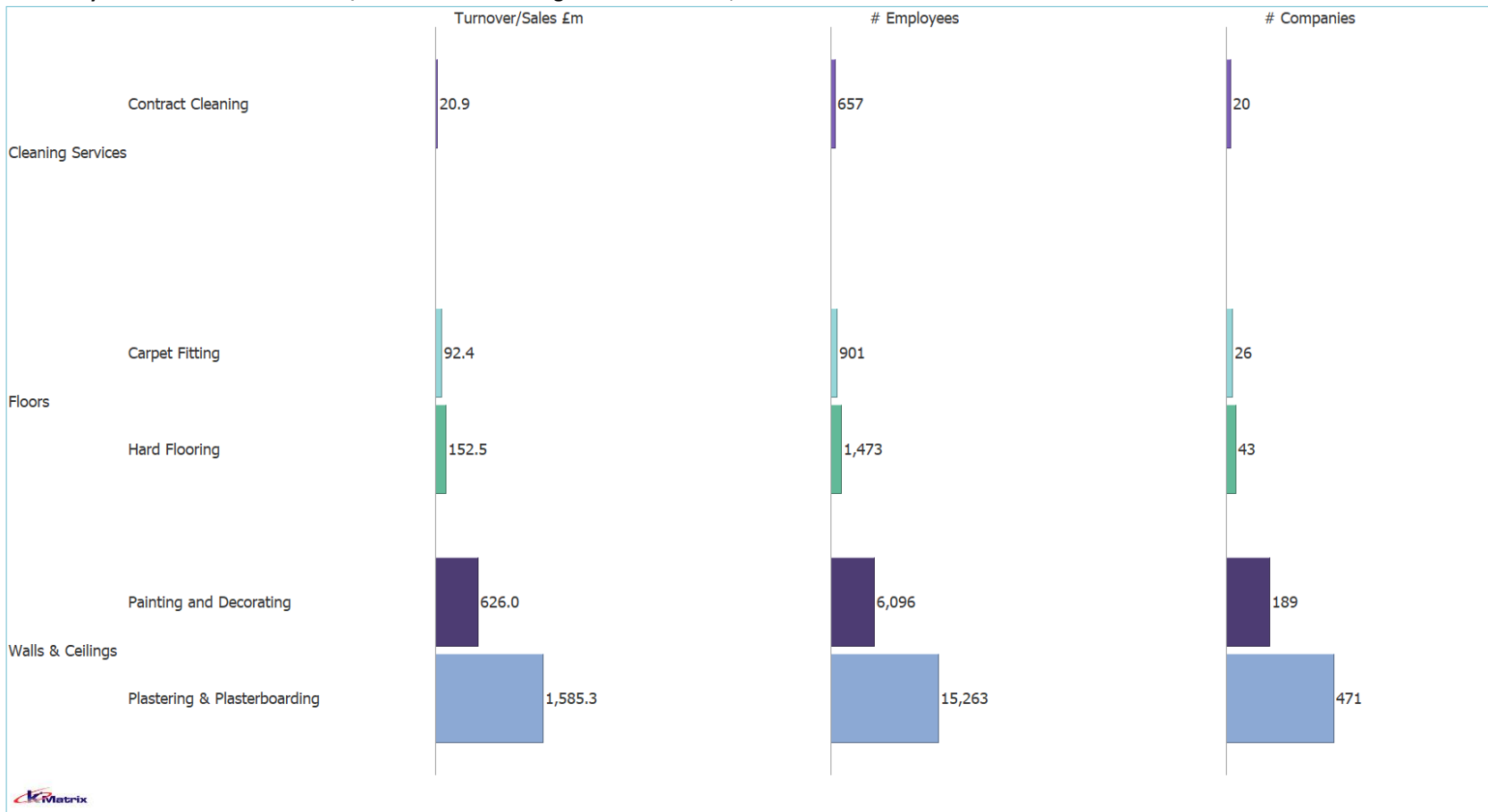
Figure 21: Making Good After Works Sales Split by Activity Code 2021/22 (Level 1)



Activities vary by Level 1 sub-sector (Figure 21), with the largest activity code being Installation for Floors 41% and Walls and Ceilings 50%, while Service is the only activity code for Cleaning 100%.

1.5.2 Making Good After Works Market at Level 3

Figure 22: Summary of selected metrics for 2021/22 for selected Making Good After Works, Level 2 sub-sectors at Level 3



Walls and Ceilings is the largest sub-sector with 89% of sales and has two sub-sectors at Level 3 (Figure 22), the largest being Plastering & Plasterboarding which makes up 72% of sales in this market, followed by Painting and Decorating with 28%. Example companies include those installing plasterboard, plasterers and painters and decorators, alongside companies manufacturing the plasterboard and paint and those providing advisory services.

Floors has two sub-sectors at level 3, the largest being Hard flooring with 62% of sales, with Carpet Fitting holding 38% of sales in this market. Example companies include those replacing flooring damaged during retrofit activities, alongside the proportion of companies manufacturing hard floors and carpets which are retrofitted.

Cleaning Services is comprised of a single sub-sector, Contract Cleaning with 100% of the sales in this market. Example companies are those contracted to clean during and after the retrofit process, often between final installation and before painting and decorating.

1.6 GSENZH’s DEESC Level 1 – Advisory and Related Services

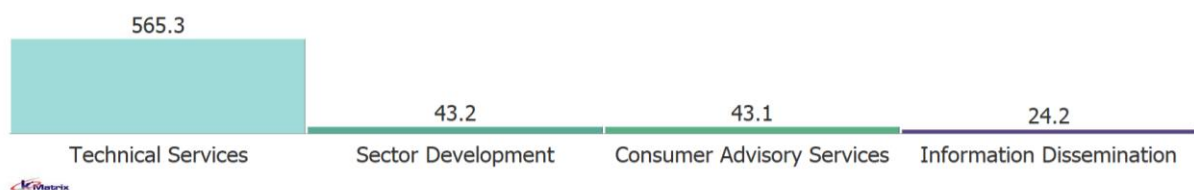
In this section we look at the Advisory and Related Services market in greater detail. Initially we split the market into four further sub-sectors (Level 2) and then look at the Level 2 sub-sectors in more detail, then by activity code and then the sub-sectors within Level 3. Sub-sectors within Advisory and Related Services are shown in Table 4.

Table 4: Level 2 and Level 3 sub-sectors within Advisory and Related Services

Level 2	Level 3
Consumer Advisory Services	After Sales Support
	Energy Tariff Advice
	Funding Advice
Information Dissemination	Industry-oriented Publications
	Newscasting (early stage project engagement activities)
	Societal Engagement Campaigns (e.g. info boards)
Sector Development	Business Model Development
	Business Support & Development
	Sales Strategy Training
	Societal Behaviour Studies
Technical Services	Architectural Services
	Building Surveys
	Environmental Consultancy
	Monitoring & Evaluation
	Planning Application Services (Listed buildings etc)
	Project Planning (Strategy/Approach)
	Retrofit Coordination
	Specification
Technical Advice	

1.6.1 Advisory and Related Services Market at Level 2

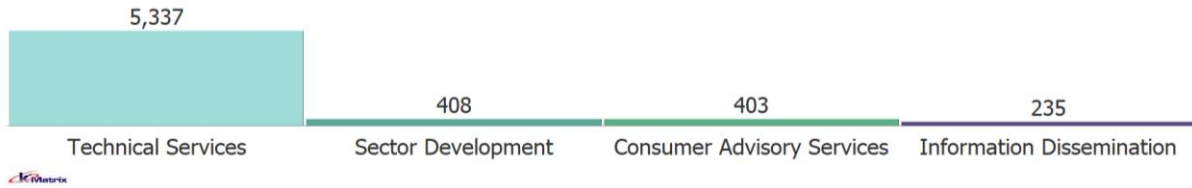
Figure 23: Sales 2021/22 in £m (Level 2)



Advisory and Related services is then split into four sub-sectors, of which, Technical Services accounts for 84% of sales (Figure 23). The other three sub-sectors are Sector Development 6%, Consumer and Advisory Services 6% and Information Dissemination 4%.

Each of these four sub-sectors grew between 2019/20 and 2021/22: Technical Services from £462.4m to £565.3m; Sector Development from £35.5m to £43.2m, Customer Advisory Services from £35.4m to £43.1m and Information Dissemination From £19.9m to £24.2m.

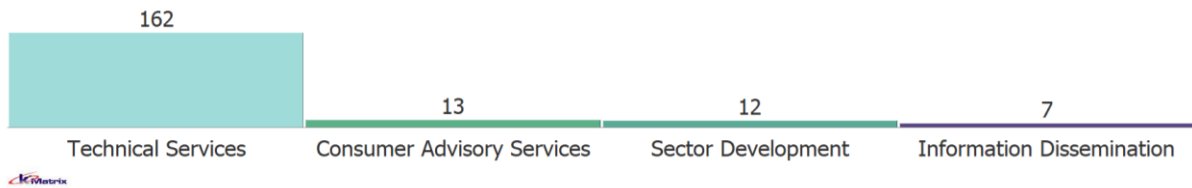
Figure 24: Employment 2021/22 (Level 2)



Technical Services accounts for 84% of employment (Figure 24). The other three sub-sectors are made up of Sector Development 6%, Consumer and Advisory Services 6% and Information Dissemination 4%.

Employment in each of these four sub-sectors grew between 2019/20 and 2021/22: Technical Services from 4,367 to 5,337, Sector Development from 335 to 408, Customer Advisory Services from 331 to 403, and Information Dissemination From 194 to 235.

Figure 25: Companies 2021/22 (Level 2)



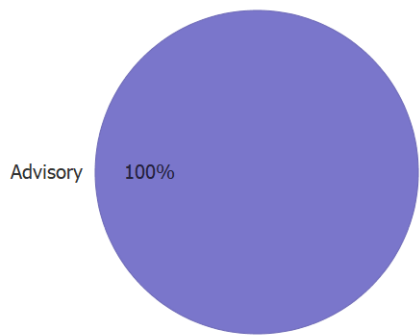
Technical Services accounts for 83% of companies (Figure 25). The other three sub-sectors are made up of Sector Development 7%, Consumer and Advisory Services 6% and Information Dissemination 4%.

Each of these four sub-sectors grew between 2019/20 and 2021/22: Technical Services from 132 to 162, Sector Development from 11 to 13, Customer Advisory Services from 10 to 12, and Information Dissemination From 6 to 7.

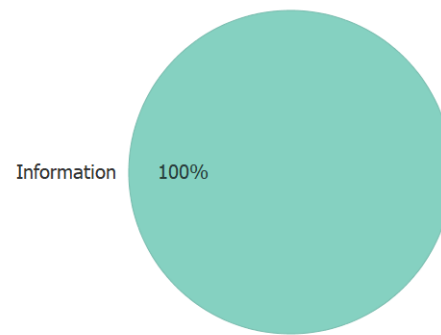
1.6.2 Advisory and Related Services Market by Activity Code

Figure 26: Advisory and Related Services Sales Split by Activity Code 2021/22 (Level 1)

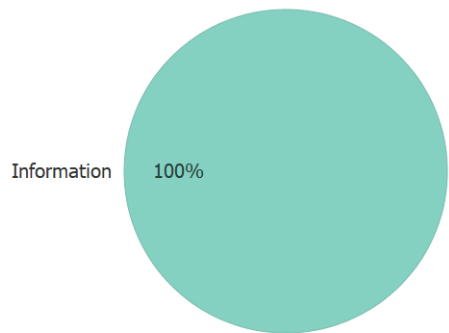
Consumer Advisory Services



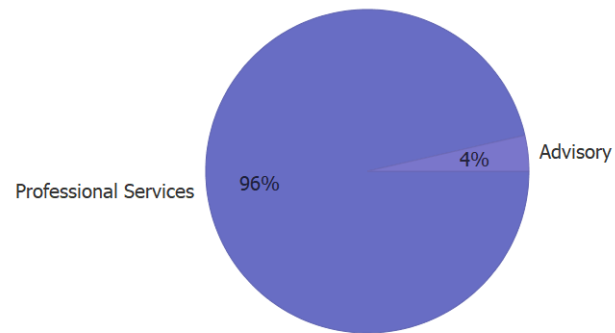
Information Dissemination



Sector Development



Technical Services

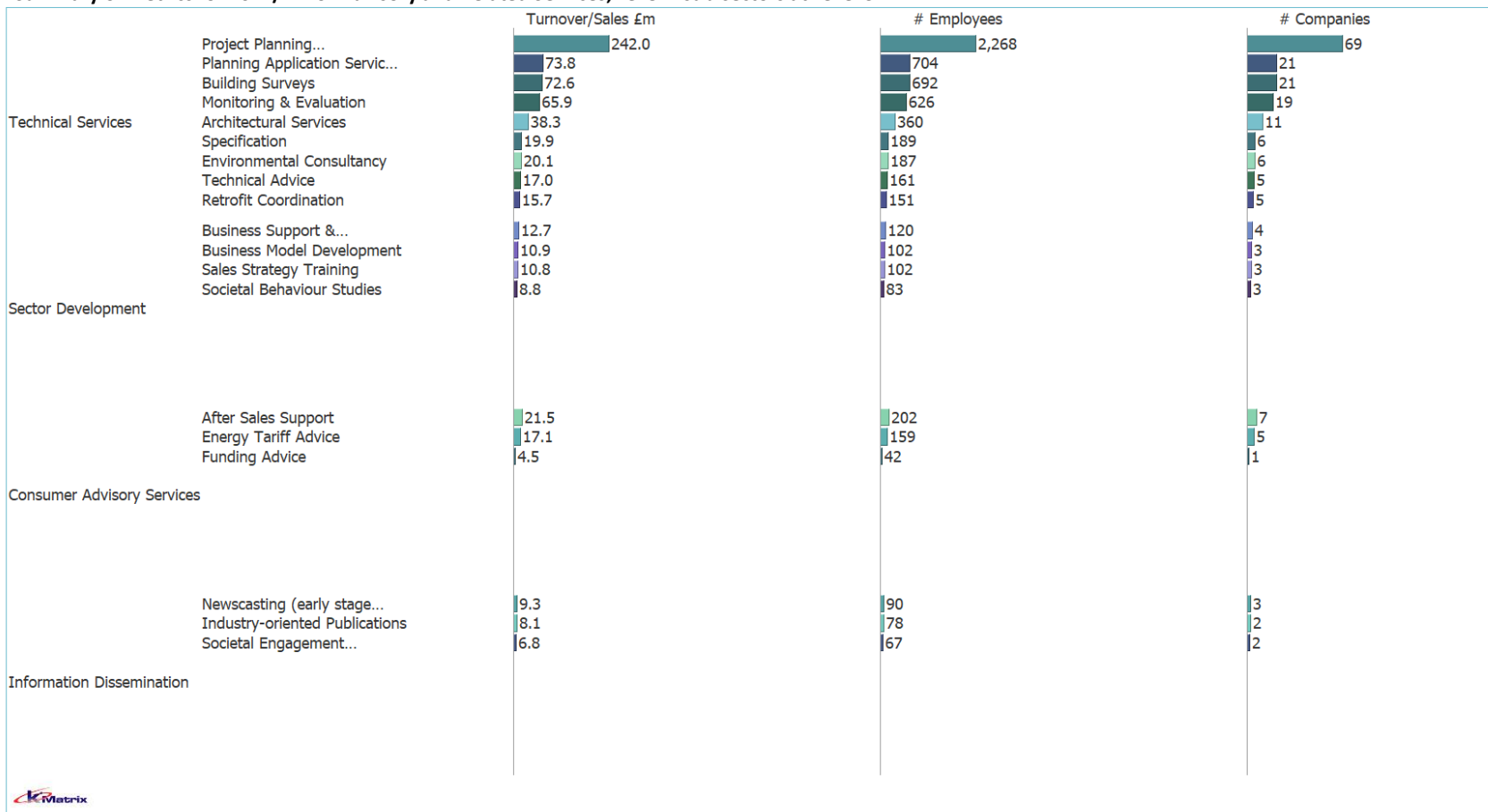


Activities vary by Level 1 sub-sector (Figure 26), with Advisory being the only activity within Consumer Advisory Services 100%, Information being the only activity within Information Dissemination 100% and Sector Development and Professional Services being the largest activity within Technical Services 96%.



1.6.3 Advisory and Related Services at Level 3

Figure 27: Summary of metrics for 2021/22 for Advisory and Related Services, Level 2 sub-sectors at Level 3



Technical Services is the largest Level 2 sub-sector, making up 84% of the Advisory and Related Services market in the GSENZH region. Figure 27 shows a summary of the Sales, Companies and Employees for these Level 2 sub-sectors, broken out into their Level 3 sub-sectors.

Technical Services has nine sub-sectors at level 3, the largest being Project Planning (Strategy and Approach) which makes up 43% of sales in this market, example companies and activities include construction project management.

Sector Development has four sub-sectors at level 3, which are relatively evenly balanced, with Business Support & Development the largest with 29% of sales, Business Model Development holding 25% of sales, Sales Strategy Training 25% and Societal Behaviour Studies 2%. Example activities include business consulting companies, training providers and social science research.

Consumer Advisory Services has three sub-sectors at level 3, with After Sales Support holding 50% of the sales in this market, followed by Energy Tariff Advice with 40% and Funding Advice with 10%. Example activities include consumer support services after purchase of goods, advice for energy tariffs and financial advice relevant to DEESC activities.

Information Dissemination has three sub-sectors at level 3, which are evenly balanced with Newscasting (early-stage project engagement) making up 38% of the sales in this market, Industry-oriented Publications with 33% and Societal Engagement Campaigns (e.g., information boards) with 28% of the market. Example companies and activities include procurement companies, magazines and magazine websites, advertising and marketing.

1.7 GSENZH and the UK's DEESC compared

The GSENZH accounts for 46% of the UK's DEESC sector.

Figure 28: GSENZH Measures 2021/22 by Level 1

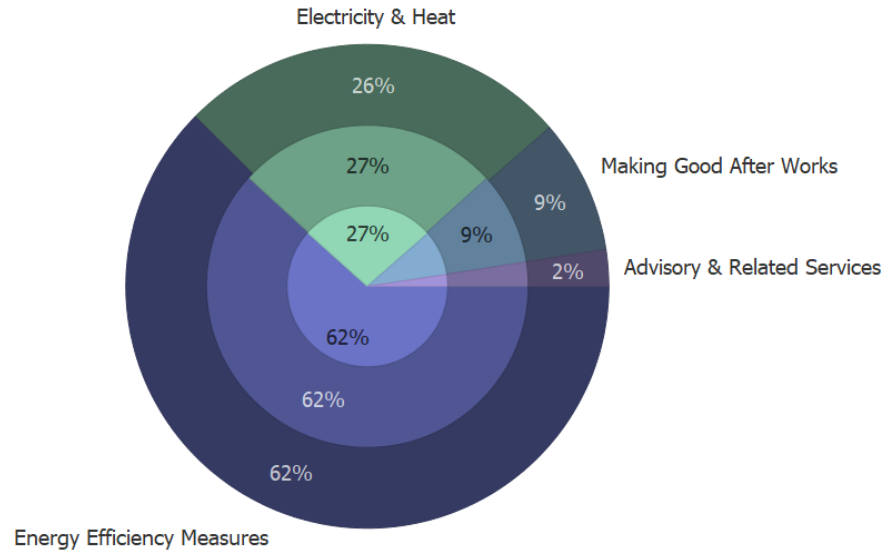
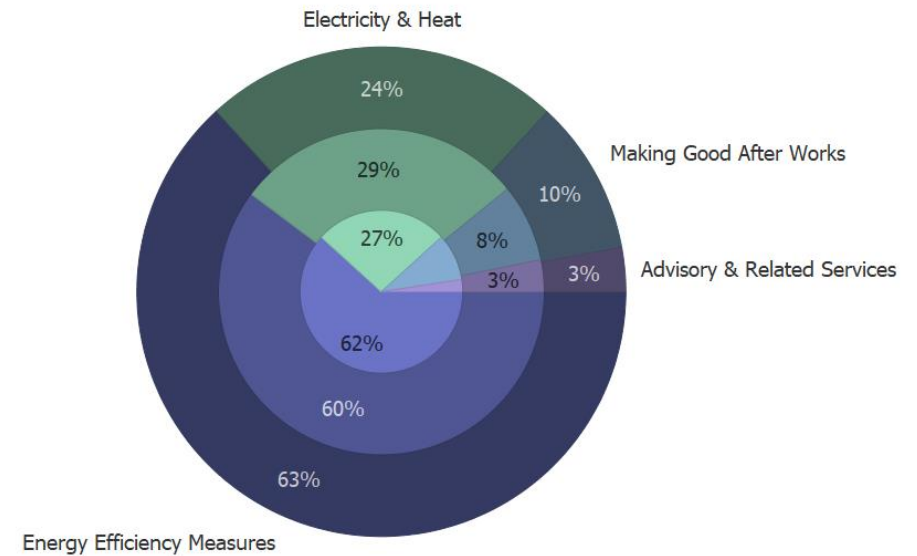


Figure 29: UK Measures 2021/22 by Level 1



Figures 28 and 29 compare the profile of the GSENZH and the UK's DEESC activities at Level 1 for sales (outer circle), companies (middle circle) and employment (inner circle). The GSENZH market is broadly in line with the UK DEESC market, with a slightly higher proportion within the Electricity and Heat sub-sector in terms of sales, slightly less market for Electricity and Heat for companies and slightly more market for Energy Efficiency Measures for companies than the national average.

Figure 30: GSENZH's DEESC sub-sectors for 2021/22 at Level 2

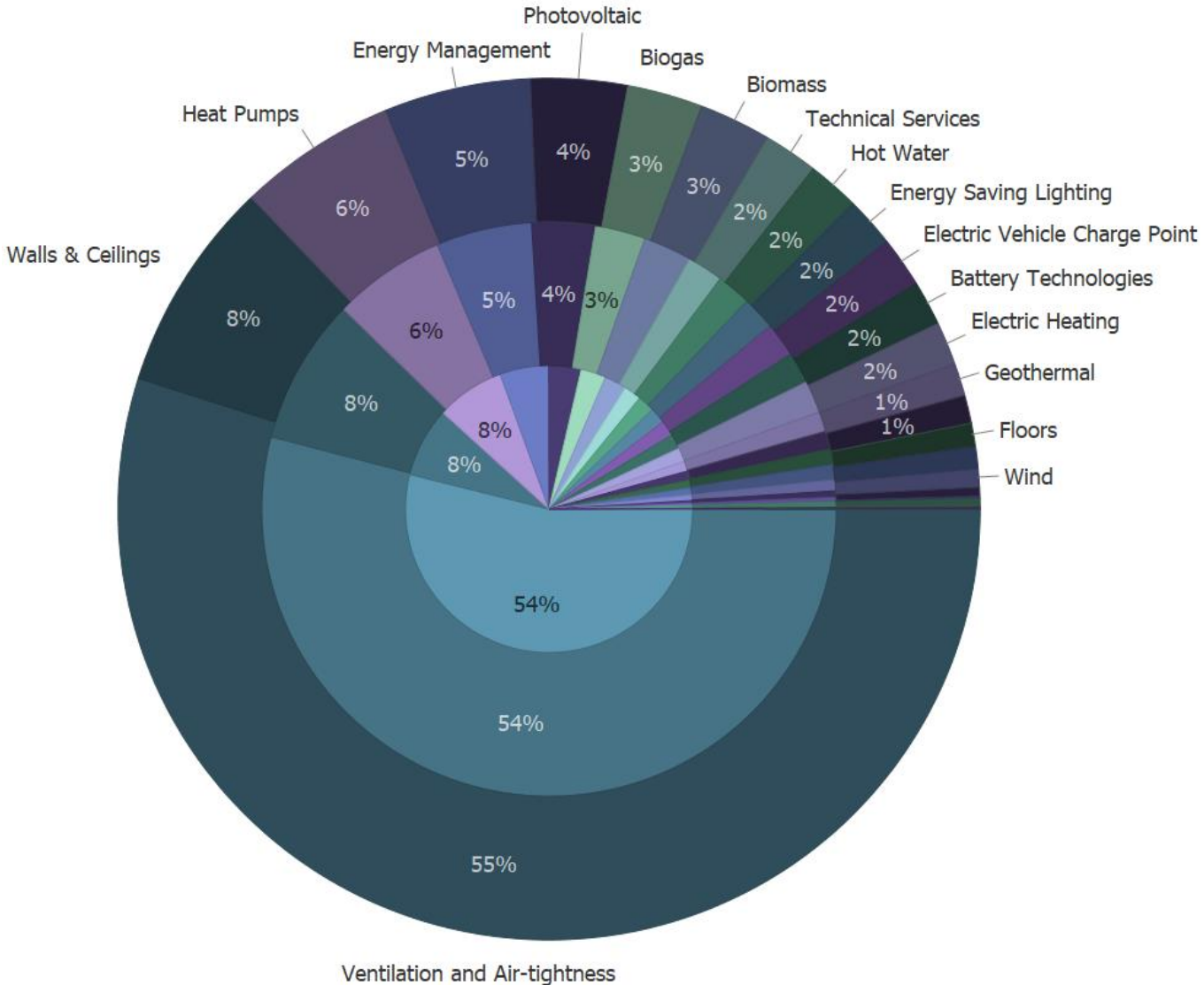
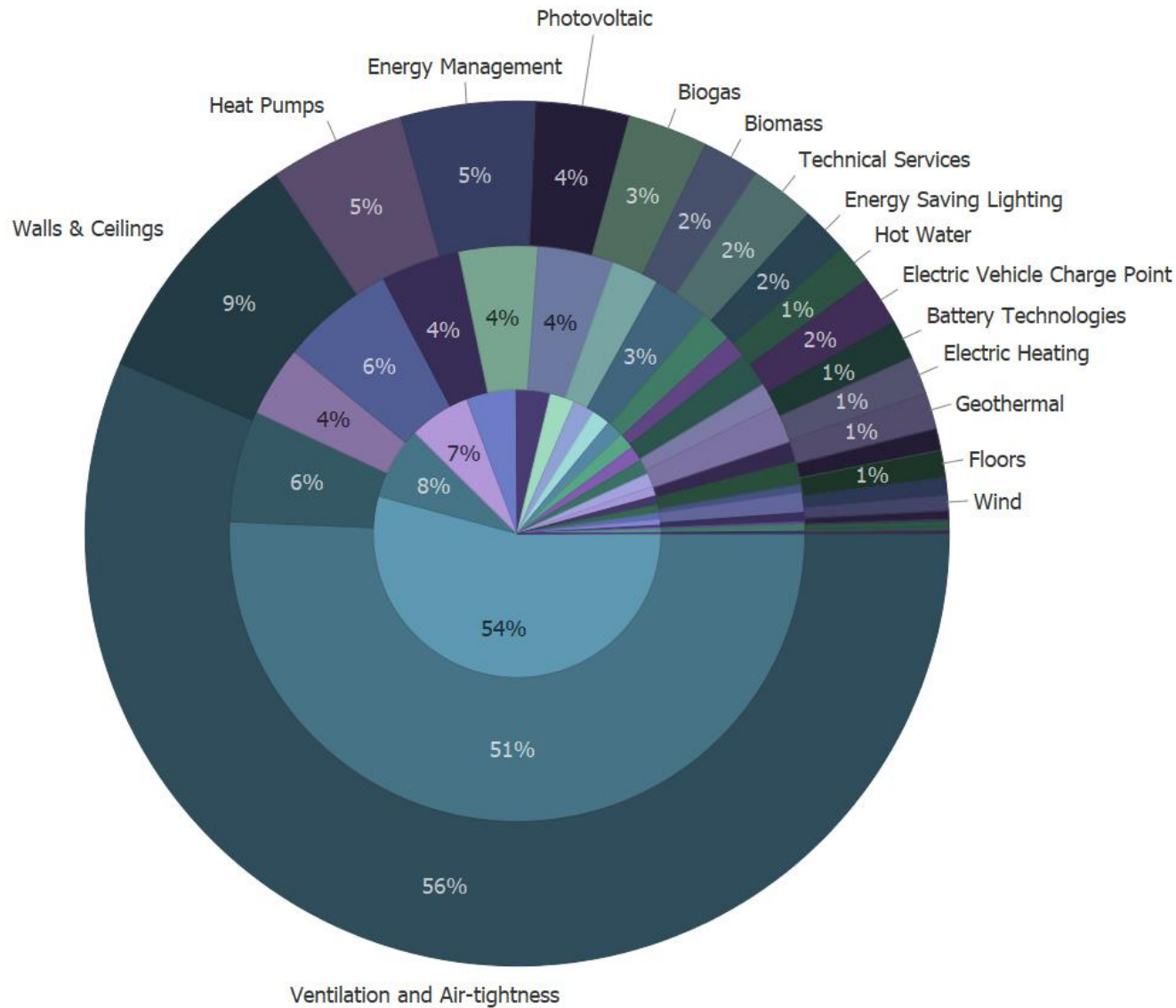


Figure 31: UK's DEESC sub-sectors for 2021/22 at Level 2



Figures 30 and 31 extends the analysis by comparing the profile of the GSENZH and UK's DEESC 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 Ventilation and Air-tightness companies in GSENZH than the national average.

In general, the GSENZH company split is more in line with sales than the national average, where the percentage of companies and sales is up to 3 percentage points different in some sub-sectors.

Note: Insulation accounts for between 79%-94% of the Ventilation and Air-tightness sub-sector, depending on definition (e.g., inclusion of insulated windows or doors).

1.8 GSENZH’s DEESC Investment in R&D

This section examines the investment profile of the GSENZH at the sector level and Level 1 for 2019/20, 2020/21 and 2021/22 and for Level 2 and the top Level 3 subsectors.

Figure 32: GSENZH’s DEESC Investment in R&D by Fiscal Year

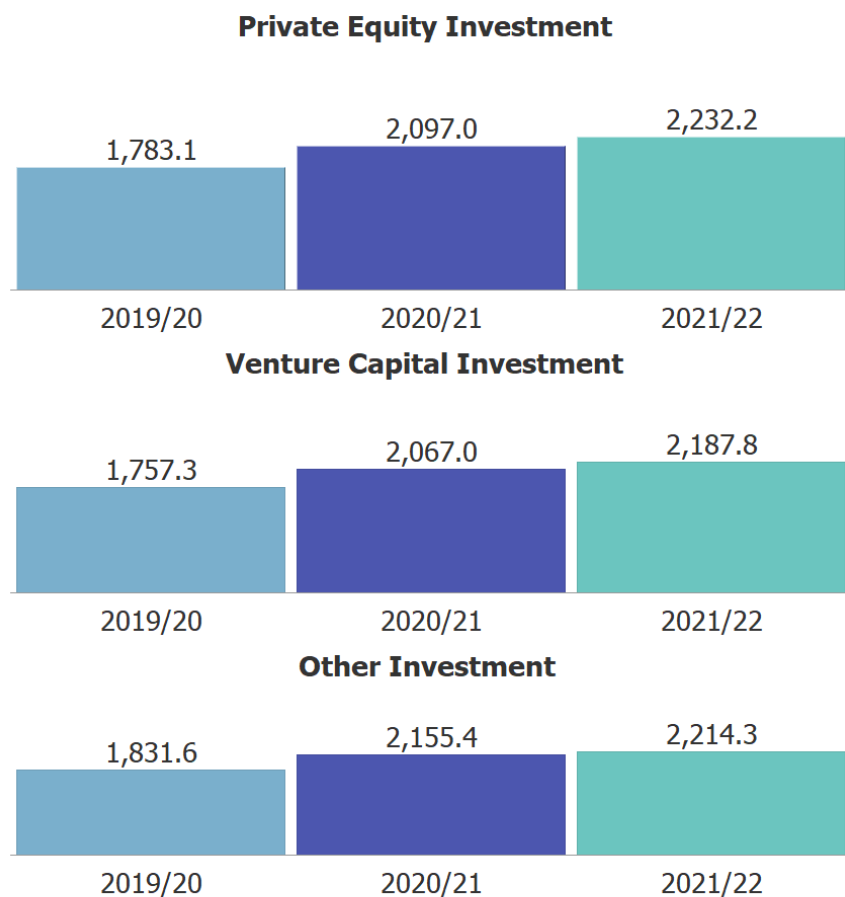


Figure 32 shows the investment for the three financial years of the sector study, made into the whole DEESC sector.

Private Equity Investment has grown from £1,783.1m in 2019/20 to £2,232.2m in 2021/22, representing 17.6% growth between 2019/20 and 2020/21 and 6.4% growth between 2020/21 and 2021/22.

By comparison, the UK’s growth rates were 18.3% and 11.3%.

Venture Capital Investment has grown from £1,757.3m in 2019/20 to £2,187.8m in 2021/22, representing 17.6% growth between 2019/20 and 2020/21 and 5.8% growth between 2020/21 and 2021/22.

By comparison, the UK’s growth rates were 18.6% and 16.3%.

Other Investment has grown from £1,831.6m in 2019/20 to £2,214.3m in 2021/22, representing 17.7% growth between 2019/20 and 2020/21 and 2.7% growth between 2020/21 and 2021/22.

By comparison, the UK’s growth rates were 18.6% and 14.1%.

Figure 33: GSENZH's DEESC Investment in R&D by Fiscal Year – Level 1

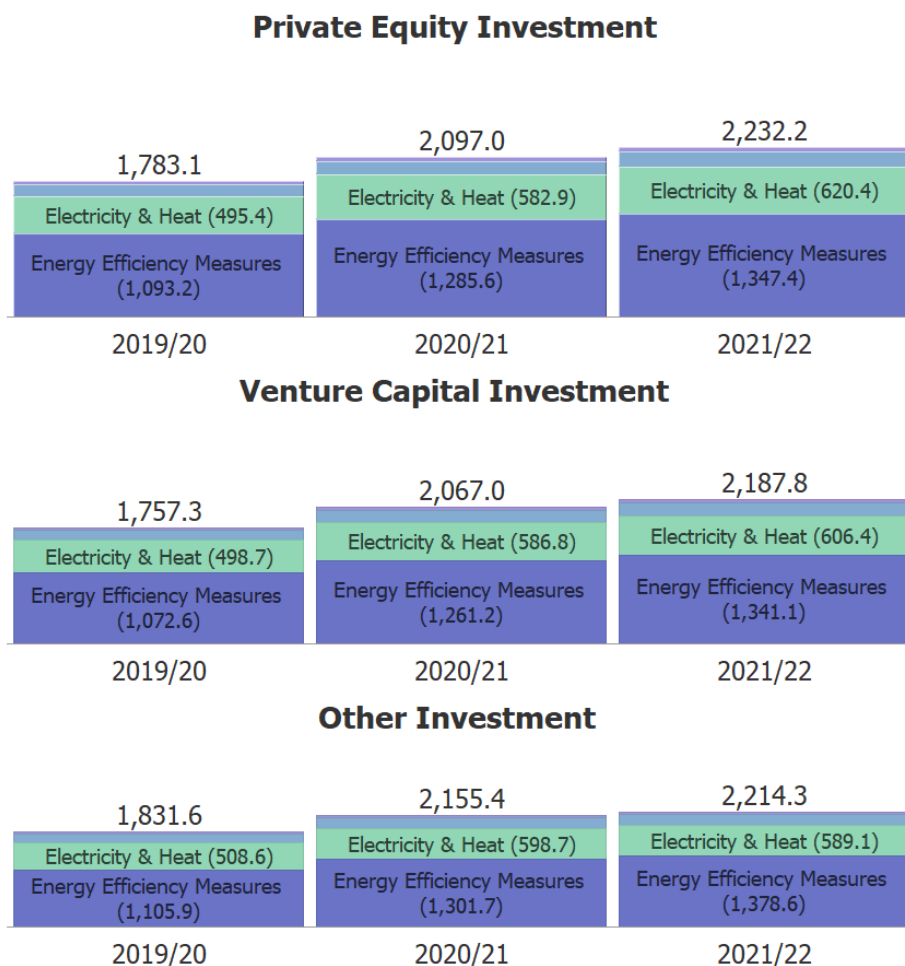


Figure 33 shows the investment for the three financial years of the sector study, made into the DEESC sector, split into Level 1.

Private Equity Investment in 2021/22 was split 60% Energy Efficiency Measures, 28% Electricity & Heat, 10% Making Good After Works and 2% Advisory & Related Services.

This is slightly different to the sales split of 62% Energy Efficiency Measures, 26% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services, suggesting slightly more investment in Energy Efficiency Measures and Electricity and Heat than the market share.

Venture Capital Investment in 2021/22 was split 61% Energy Efficiency Measures, 28% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services.

This is slightly different to the sales split of 62% Energy Efficiency Measures, 26% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services, suggesting slightly more investment in Electricity and Heat than the market share.

Other Investment in 2021/22 was split 62% Energy Efficiency Measures, 27% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services.

This is broadly in line with the sales split of 62% Energy Efficiency Measures, 26% Electricity & Heat, 9% Making Good After Works and 2% Advisory & Related Services



Figure 34: GSENZH's DEESC Investment in R&D 2021/22 – Level 2 Energy Efficiency Measures

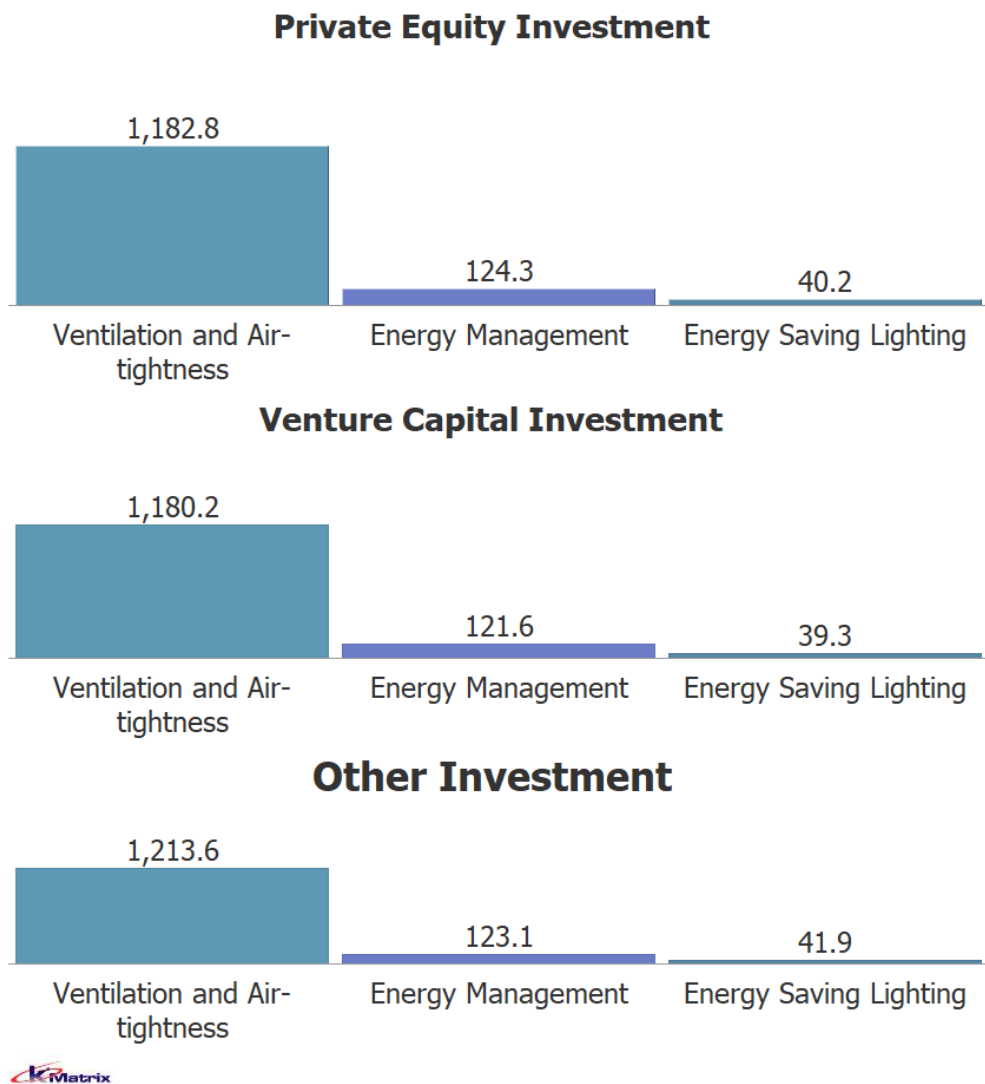


Figure 34 shows the investment in 2021/22 made into the Level 2 sub-sectors of Energy Efficiency Measures.

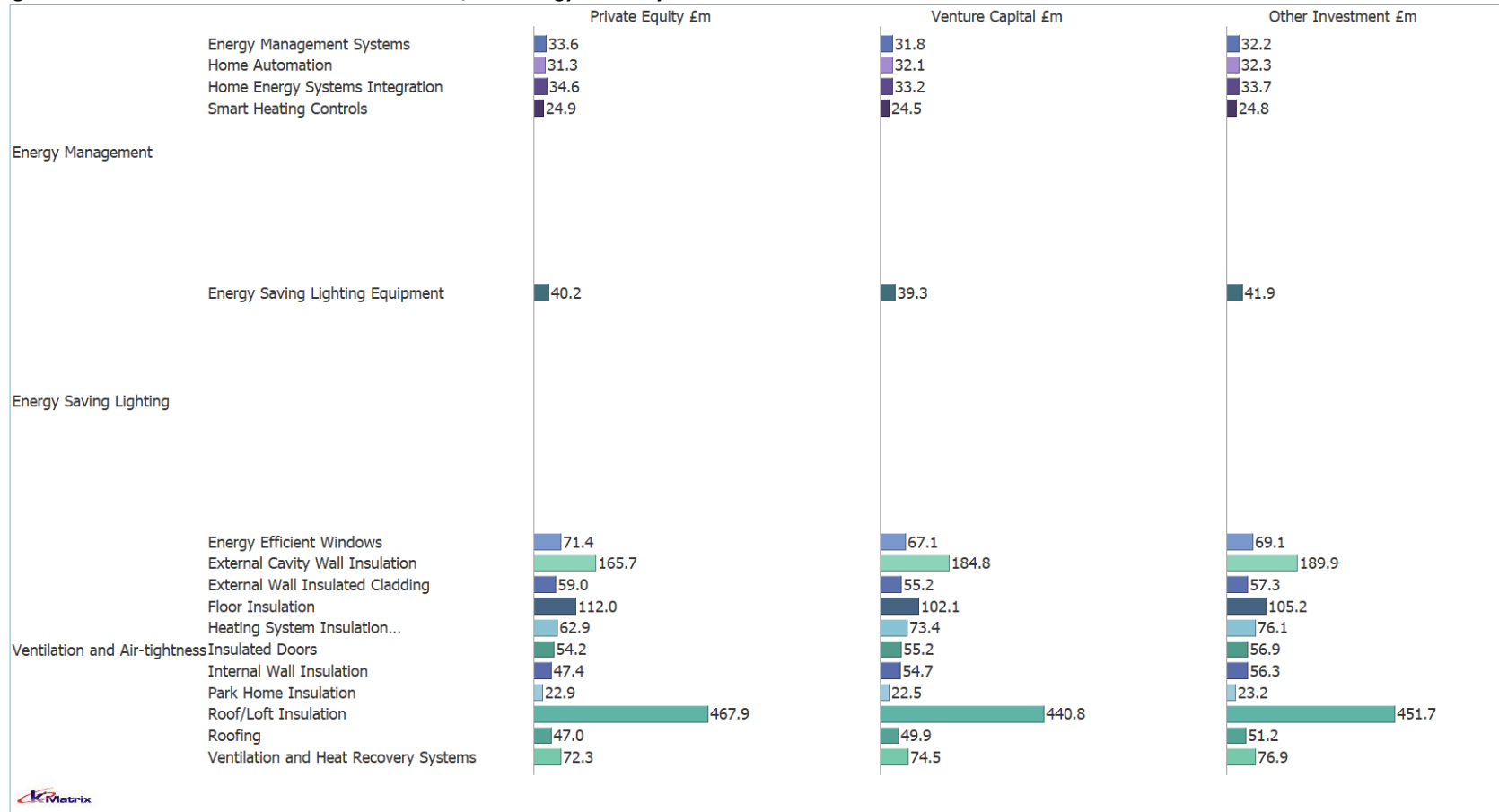
Investment for each of the three Energy Efficiency Measures sub-sectors grew between 2019/20 and 2021/22:

Ventilation and Air-tightness grew from £960.4m to £1,182.8m for Private Equity, from £937.7m to £1,180.2m for Venture Capital and grew from £971.1m to £1,213.6m for Other Investment

Energy Management grew from £100.2m to £124.3m for Private Equity, £98.8m to £121.6m for Venture Capital and £101.7m to £123.1m for Other Investment

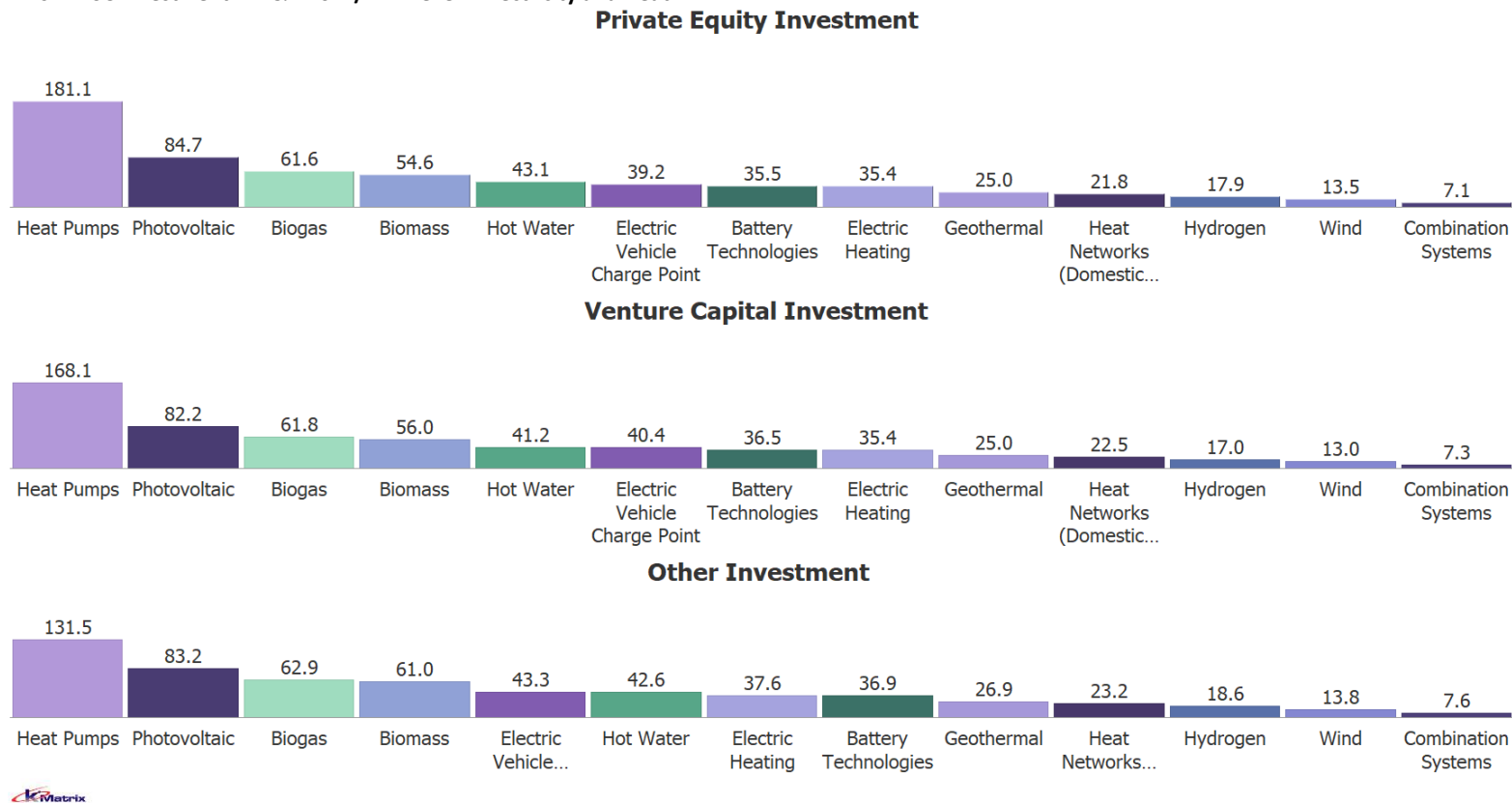
Energy Saving Lighting grew from £32.7m to £40.2m for Private Equity, £36.1m to £39.3m for Venture Capital and £33.0m to £41.9m for Other Investment

Figure 35: GSENZH's DEESC Investment in R&D 2021/22 – Energy Efficiency Measures Level 3 sub-sectors



Investment for the Level 3 sub-sectors of within Energy Efficiency Measures have grown between 2019/20 and 2021/22. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 1.3.3.

Figure 36: GSENZH's DEESC Investment in R&D 2021/22 – Level 2 Electricity and Heat



Investment for most of the top six Electricity and Heat sub-sectors grew between 2019/20 and 2021/22:

Heat Pumps grew from £138.9m to £181.1m for Private Equity, £142.9m to £168.1m for Venture Capital fell from £148.6m to £131.5m for Other Investment

Photovoltaic grew from £63.8m to £84.7m for Private Equity, from £68.3m to £82.2m for Venture Capital and from £69.3m to £83.2m for Other Investment

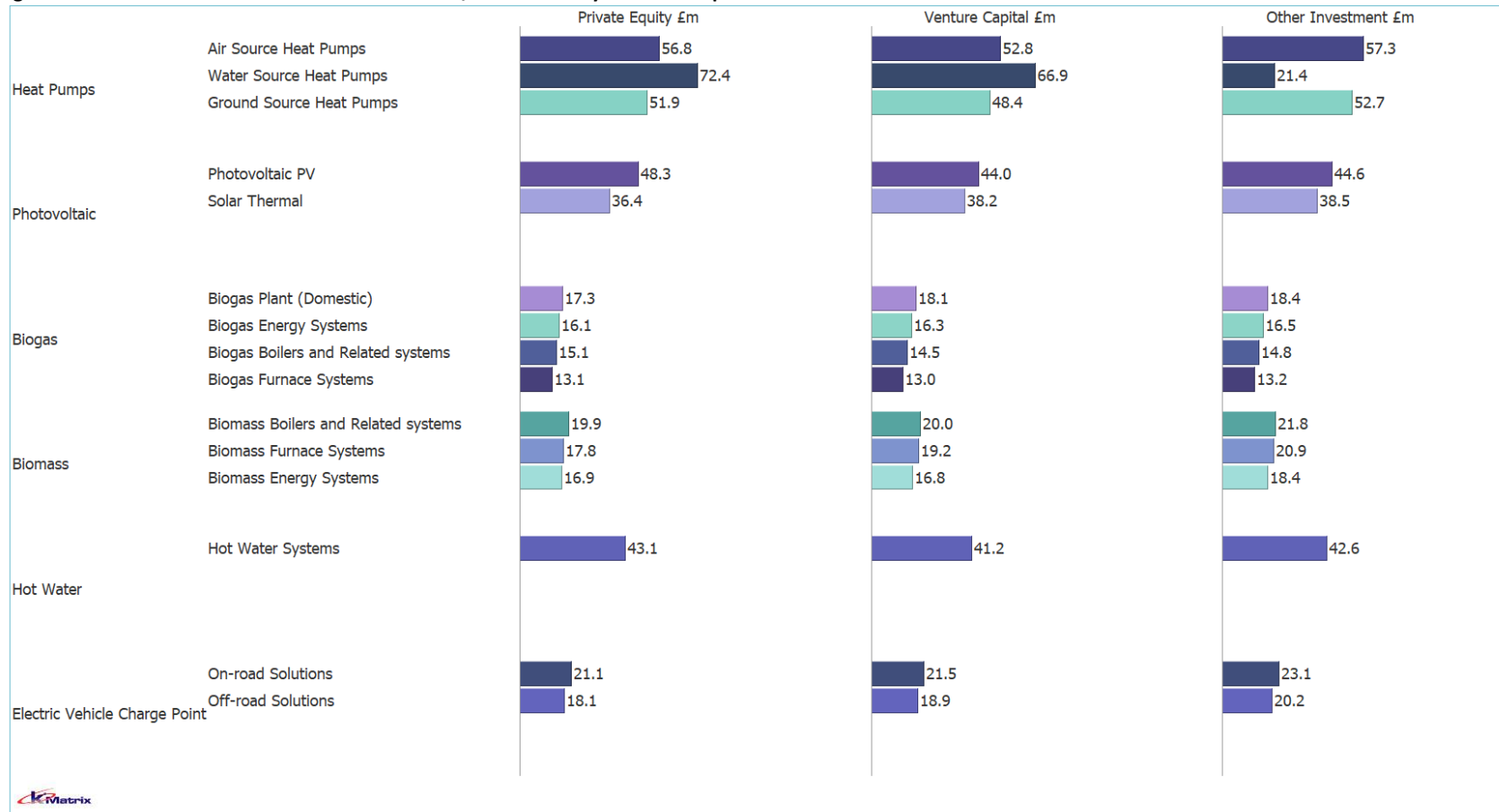
Biogas grew from £51.3m to £61.6m for Private Equity, £51.3m to £61.8m for Venture Capital and £50.7m to £62.9m for Other Investment

Biomass grew from £46.5m to £54.6m for Private Equity, £43.3m to £56.0m for Venture Capital and £44.6m to £61.0m for Other Investment

Hot Water grew from £33.7m to £43.1m for Private Equity, £34.4m to £41.2m for Venture Capital and £35.4m to £42.6m for Other Investment

Electric Vehicle Charge Points grew from £31.5m to £39.2m for Private Equity, £31.2m to £40.4m for Venture Capital and £32.2m to £43.3m for Other Investment

Figure 37: GSENZH's DEESC Investment in R&D 2021/22 – Electricity and Heat top Level 3 sub-sectors



Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Electricity and Heat have grown between 2019/20 and 2021/22. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 1.4.3. for most sub-sectors, with the exception of Heat Pumps, where Water Source Heat Pumps hold the smallest proportion of Sales, but significant Private Equity and Venture Capital investment, this differs slightly to the UK average, where Venture Capital investment is slightly higher for Air Source Heat Pumps than Water Source. Ground Source Heat Pumps have the lowest Private Equity and Venture Capital of the three sub-sectors for the GSENZH and UK.

Figure 38: GSENZH's DEESC Investment in R&D 2021/22 – Level 2 Making Good After Works

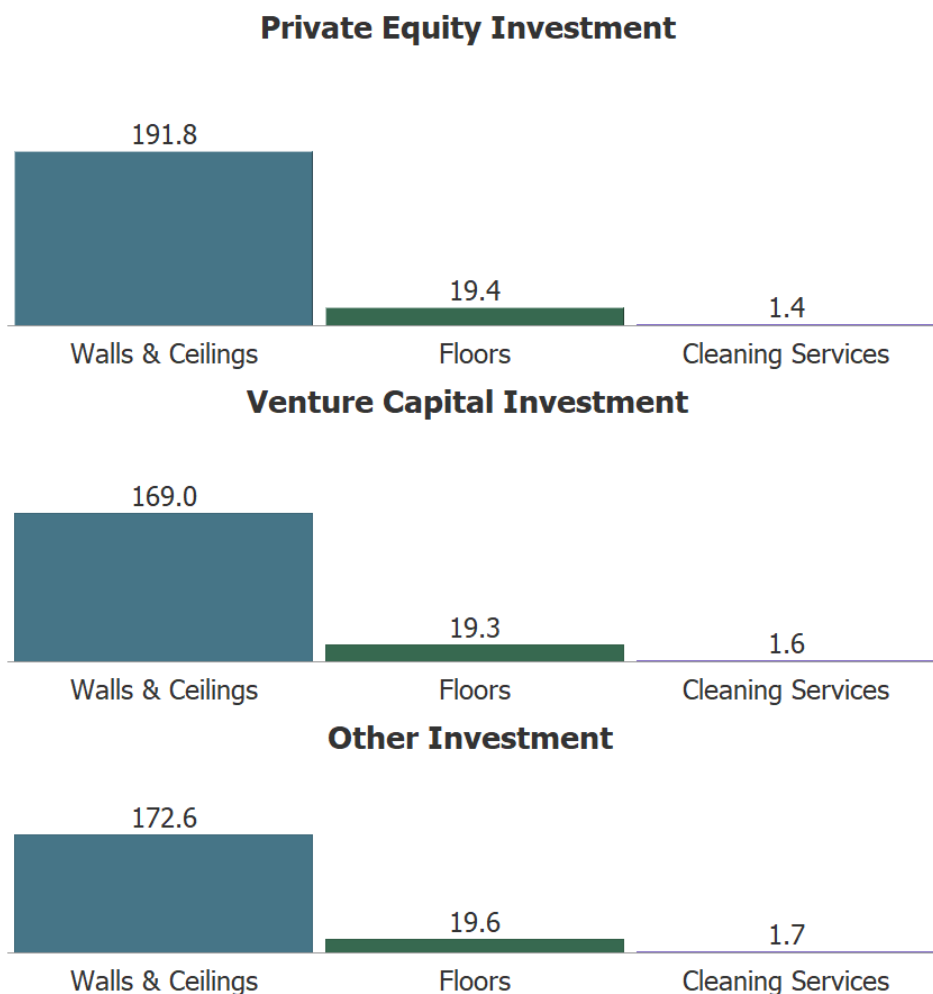


Figure 38 shows the investment in 2021/22 made into the Level 2 sub-sectors of Making Good After Works.

Investment for each of the three Making Good after Works sub-sectors grew between 2019/20 and 2020/21:

Walls and Ceilings from £138.4m to £191.8m for Private Equity, £128.9m to £169.0m for Venture Capital and £157.6m to £172.6m for Other Investment

Floors grew at from £14.7m to £19.4m for Private Equity, £15.3m to £19.3m for Venture Capital and £15.8m to £19.6m for Other Investment

Contract Cleaning was steady at £1.4m for Private Equity and grew from £1.3m to £1.6m for Venture Capital and £1.2m to £1.7m for Other Investment

Figure 39: GSENZH's DEESC Investment in R&D 2021/22 – Making Good After Works Level 3 sub-sectors



Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Making Good After Works have grown between 2019/20 and 2021/22. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 1.5.3.

Figure 40: GSENZH's DEESC Investment in R&D 2021/22 – Level 2 Advisory and Related Services

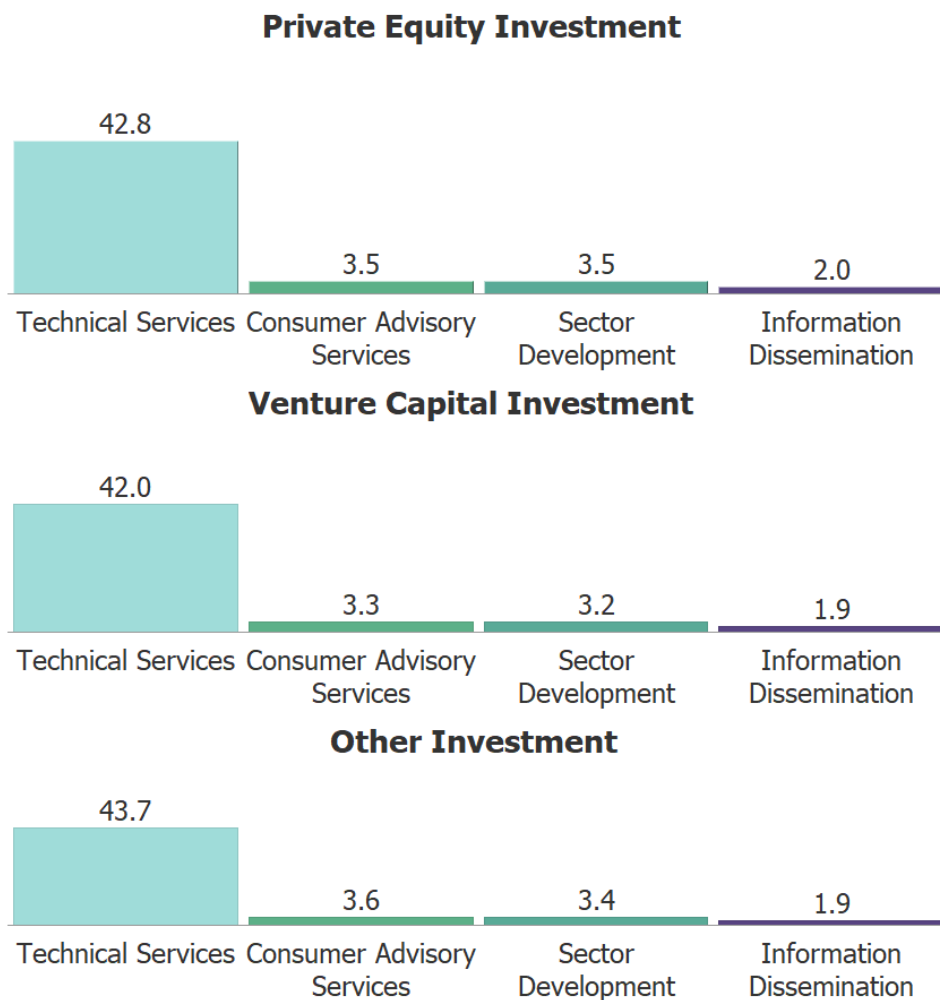


Figure 40 shows the investment in 2021/22 made into the Level 2 sub-sectors of Advisory and Related Services.

Investment for each of the four Advisory & Related Services sub-sectors grew between 2019/20 and 2020/21:

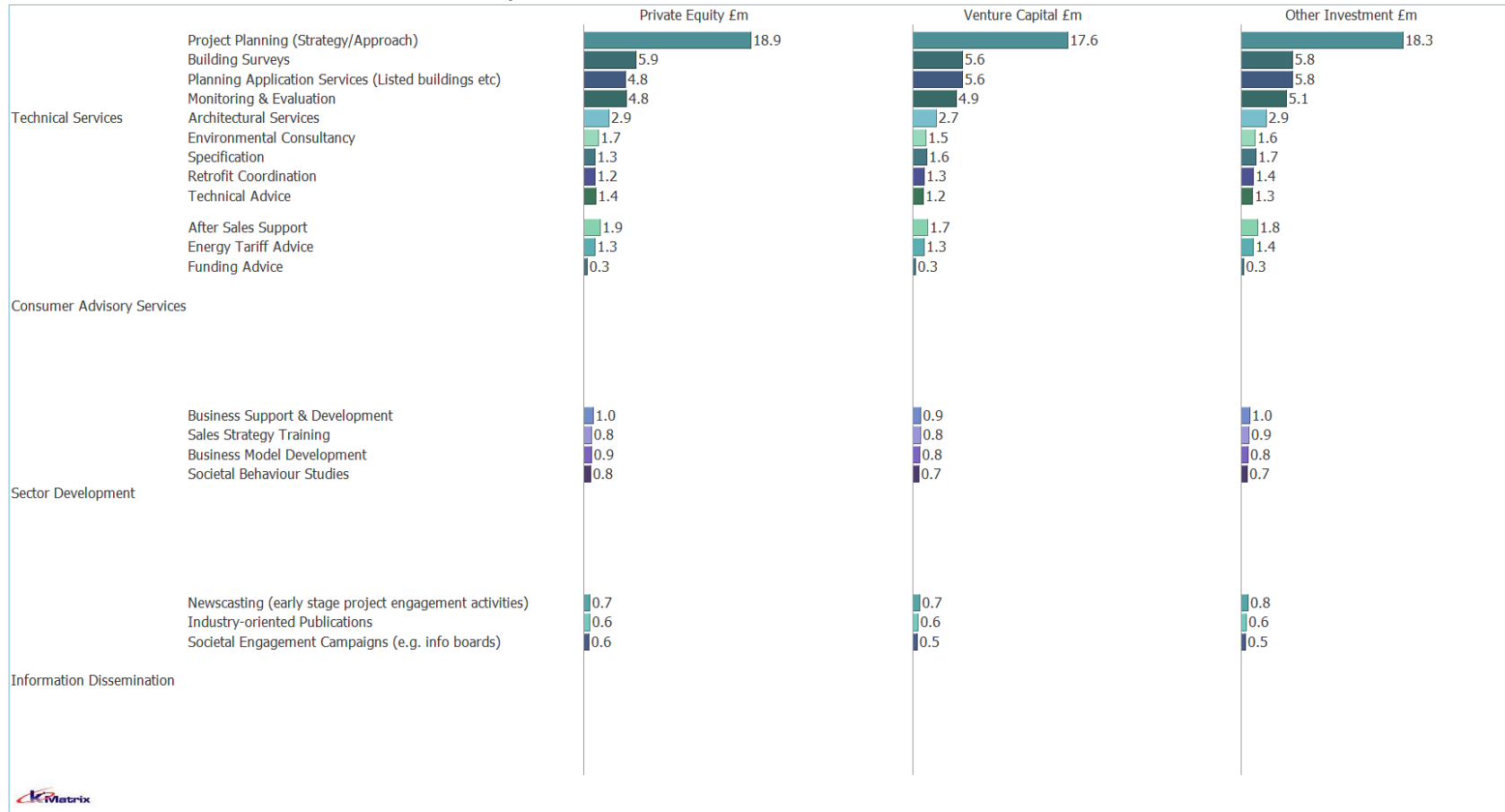
Technical Services from £32.8m to £42.8m for Private Equity, £33.6m to £42.0m for Venture Capital and £35.2m to £43.7m for Other Investment

Consumer Advisory Services from £2.7m to £3.5m for Private Equity, £2.7m to £3.3m for Venture Capital and £2.9m to £3.6m for Other Investment

Sector Development grew from £2.9m to £3.5m for Private Equity, £2.6m to £3.2m for Venture Capital and £2.9m to £3.4m for Other Investment

Information Dissemination grew from £1.7m to £2.0m for Private Equity, £1.6m to £1.9m for Venture Capital and £1.6m to £1.9m for Other Investment

Figure 41: GSENZH's DEESC Investment in R&D 2021/22 – Advisory and Related Services Level 3 sub-sectors



Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Advisory and Related Services have grown between 2019/20 and 2021/22. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 1.6.3.

1.9 GSENZH’s DEESC Company Size and Employment

In this section we look at the number of companies within the GSENZH area in 2021/22, split by size of company, using the standard classification of company size. Company size classifications:

- Start-up = any company formed during the previous 12 months, for 2021/22 that would include companies formed during 2020/21
- Micro = companies with 1-9 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

Start-up companies are a discrete category, not dependent on number of employees and are not double counted in the other categories.

Figure 42: Companies 2021/22 split by size and Employment in 2021/22 split by Company Size

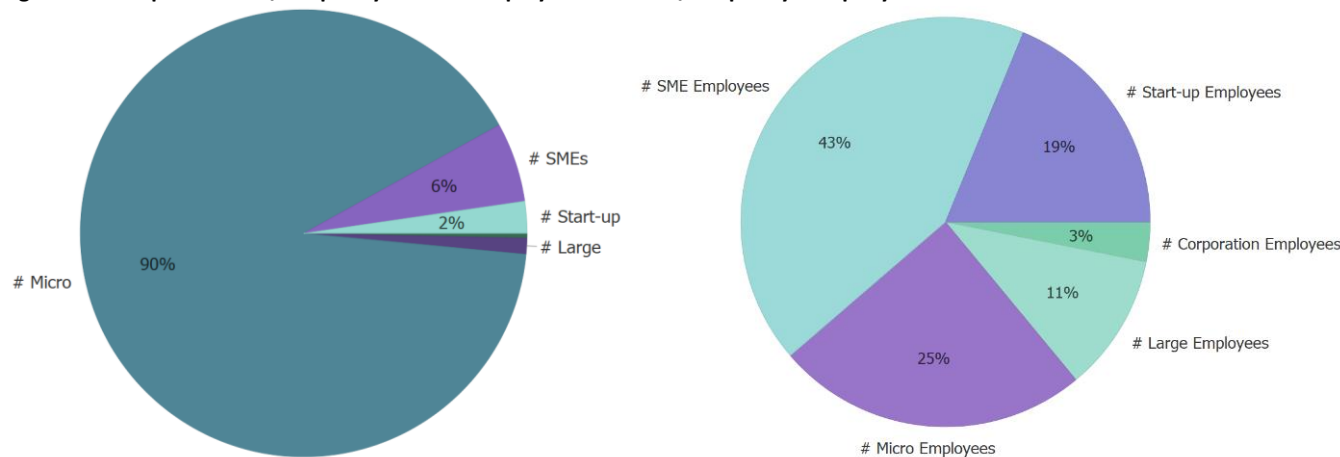
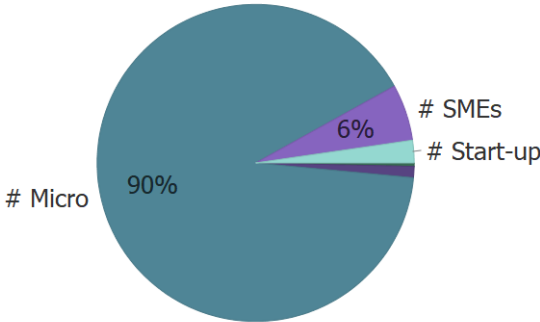


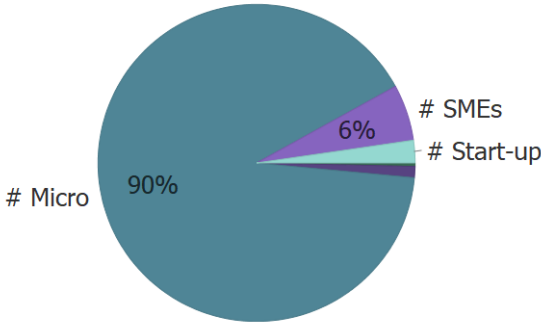
Figure 42 splits the 7,942 DEESC sector companies in 2021/22 by company size and employment by the size of company. The DEESC sector in GSENZH is characterized by:

- Micro: 90% of companies, but 25% of employment
- SME’s: 6% of companies, but 43% of employment
- Start-up, 2% of companies, but 19% of employment
- Large companies, 1% of companies, but 11% of employment
- Corporations, 1% of companies, but 3% of employment

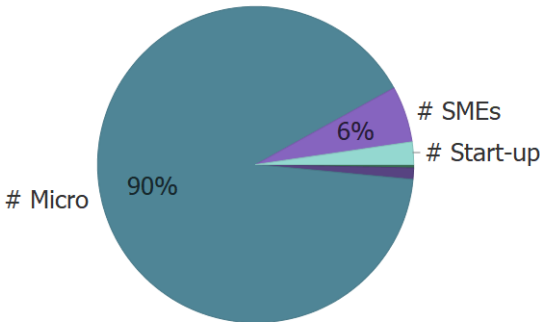
Figure 43: Companies 2021/22 split by size and Level 1
Advisory & Related Services



Electricity & Heat



Energy Efficiency Measures



Making Good After Works

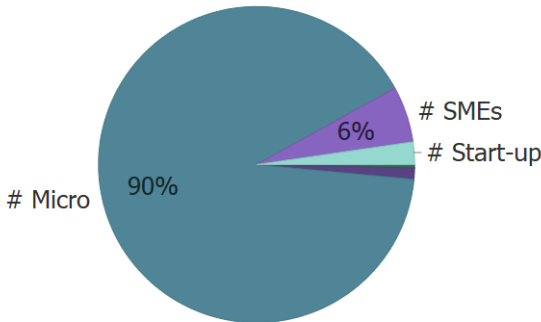
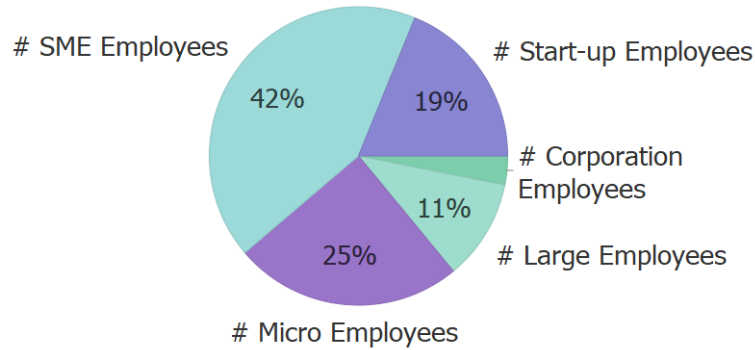


Figure 43 splits the DEESC companies in 2021/22 by company size and by Level 1. The DEESC sector in GSENZH at Level 1 and Level 2 is relatively uniform, as would be expected with a market which is being serviced by an established sector.

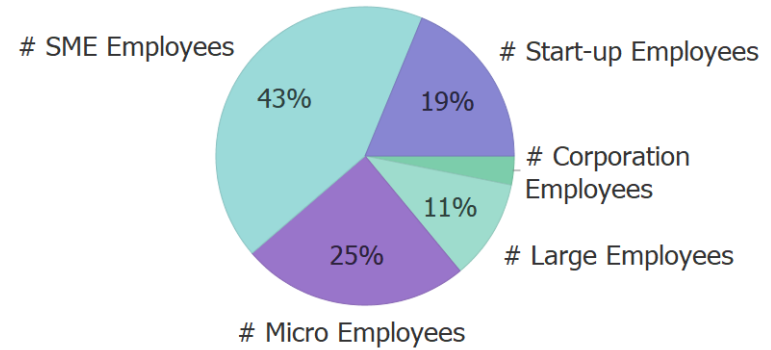


Figure 44: Employment 2021/22 split by Company Size and Level 1

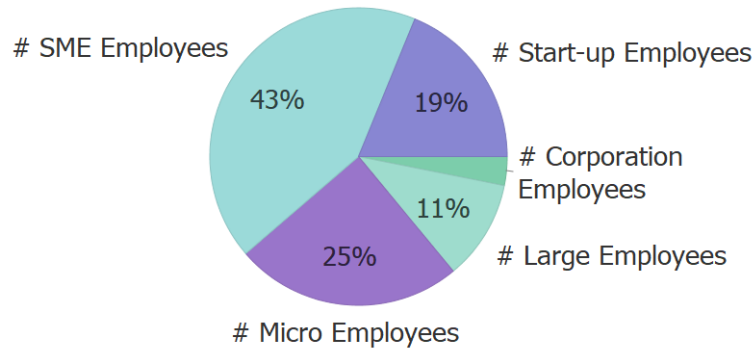
Advisory & Related Services



Electricity & Heat



Energy Efficiency Measures



Making Good After Works

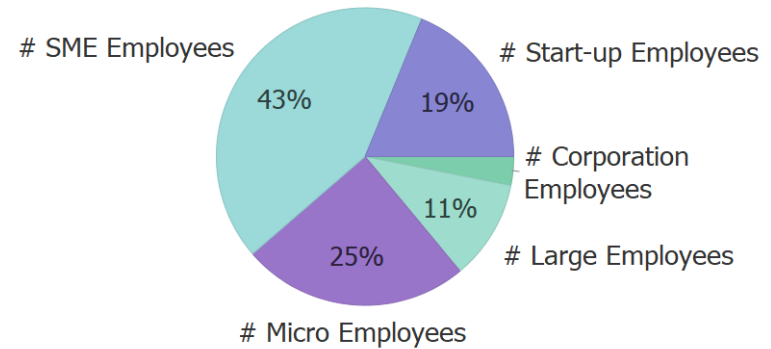


Figure 44 splits the DEESC employment in 2021/22 by company size and by Level 1. As for Figure 44, the DEESC sector in GSENZH at Level 1 and Level 2 is relatively uniform, as would be expected with a market which is being serviced by an established sector.

1.10 GSENZH's DEESC Historic Growth

In Section 1.1 annual growth in GSENZH's DEESC sales, companies and employment was compared with growth in the UK's DEESC sector as a whole for 2019/20 to 2021/22. Table 5 shows the GSENZH'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.

GSENZH covers 46% of the UK's total DEESC sector in terms of sales. The growth rates for GSENZH were slower than the UK average for all three measures between 2019/20, followed by stronger growth than the UK average between 2020/21 and 2021/22.

While annual growth in the DEESC sector as a whole has varied between 6.2% and 13.3% for each of the three parameters, Table 5 shows that the sector has experienced varied growth in terms of sales across the Level 2 sub-sectors.

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

Battery Technologies, where the GSENZH growth rates were 11.0% between 2019/20 and 2020/21 and 10.0% between 2020/21 and 2021/22 and the UK growth rates were 8.8% between 2019/20 and 2020/21 and 10.3% between 2020/21 and 2021/22

Biomass, where the GSENZH growth rates were 10.4% between 2019/20 and 2020/21 and 10.5% between 2020/21 and 2021/22 and the UK growth rates were 6.7% between 2019/20 and 2020/21 and 13.6% between 2020/21 and 2021/22

Combination Systems, where the GSENZH growth rates were 10.1% between 2019/20 and 2020/21 and 10.5% between 2020/21 and 2021/22 and the UK growth rates were 11.9% between 2019/20 and 2020/21 and 7.7% between 2020/21 and 2021/22

Heat Pumps, where the GSENZH growth rates were -3.8% between 2019/20 and 2020/21 and 27.0% between 2020/21 and 2021/22 and the UK growth rates were -2.7% between 2019/20 and 2020/21 and 24.9% between 2020/21 and 2021/22

Wind, where the GSENZH growth rates were 9.1% between 2019/20 and 2020/21 and 11.2% between 2020/21 and 2021/22 and the UK growth rates were 6.7% between 2019/20 and 2020/21 and 10.7% between 2020/21 and 2021/22

Ventilation and Air-tightness, where the GSENZH growth rates were 10.3% between 2019/20 and 2020/21 and 10.6% between 2020/21 and 2021/22 and the UK growth rates were 10.2% between 2019/20 and 2020/21 and 10.6% between 2020/21 and 2021/22

Walls & Ceilings, where the GSENZH growth rates were 10.8% between 2019/20 and 2020/21 and 10.1% between 2020/21 and 2021/22 and the UK growth rates were 8.5% between 2019/20 and 2020/21 and 9.3% between 2020/21 and 2021/22

Table 5: GSENZH’s DEESC Sales (£m), Company and Employment Growth 2019/20 to 2021/22

Level 1	Level 2	Turnover/ Sales £m					# Employees					# Companies				
		2019/20	Growth	2020/21	Growth	2021/22	2019/20	Growth	2020/21	Growth	2021/22	2019/20	Growth	2020/21	Growth	2021/22
Advisory & Rel. Ser.	Consumer Advisory Services	35.4	10.3%	39.1	10.3%	43.1	331	10.8%	367	9.9%	403	11	14.7%	12	10.4%	13
Advisory & Rel. Ser.	Information Dissemination	19.9	9.7%	21.9	10.9%	24.2	194	9.9%	214	10.3%	235	6	6.8%	6	11.1%	7
Advisory & Rel. Ser.	Sector Development	35.5	9.5%	38.9	11.1%	43.2	335	9.6%	367	11.2%	408	10	8.8%	11	10.5%	12
Advisory & Rel. Ser.	Technical Services	462.4	11.6%	516.1	9.5%	565.3	4,367	11.2%	4,858	9.9%	5,337	132	12.0%	148	9.3%	162
Electricity & Heat	Battery Technologies	382.0	11.0%	424.0	10.0%	466.6	3,723	10.7%	4,123	10.4%	4,554	115	11.7%	129	10.1%	142
Electricity & Heat	Biogas	646.3	11.0%	717.1	9.7%	786.7	6,301	10.8%	6,981	9.7%	7,656	187	10.3%	206	9.4%	226
Electricity & Heat	Biomass	614.2	10.4%	678.0	10.5%	749.5	5,594	10.3%	6,171	10.3%	6,809	181	9.1%	197	10.7%	219
Electricity & Heat	Combination Systems	77.4	10.1%	85.2	10.5%	94.2	737	9.2%	804	11.6%	897	23	9.7%	26	11.2%	29
Electricity & Heat	Electric Heating	368.7	9.5%	403.8	11.6%	450.6	3,452	10.0%	3,797	11.2%	4,224	110	18.6%	131	11.5%	146
Electricity & Heat	Electric Vehicle Charge Point	431.0	10.8%	477.7	10.0%	525.4	3,933	10.9%	4,360	9.9%	4,793	128	10.1%	141	10.1%	155
Electricity & Heat	Geothermal	276.6	12.1%	310.2	9.0%	338.2	2,543	12.2%	2,854	8.8%	3,106	75	9.6%	82	9.1%	89
Electricity & Heat	Heat Networks	239.4	10.1%	263.6	10.6%	291.5	2,303	10.2%	2,537	10.4%	2,801	74	2.1%	75	10.1%	83
Electricity & Heat	Heat Pumps	1,353.7	-3.8%	1,302.2	27.0%	1,653.5	17,232	-24.4%	13,021	61.4%	21,015	418	-3.8%	402	26.7%	509
Electricity & Heat	Hot Water	442.5	10.5%	488.8	11.0%	542.7	4,231	11.0%	4,698	10.3%	5,183	135	3.8%	140	10.5%	155
Electricity & Heat	Hydrogen	191.6	10.5%	211.7	10.1%	233.2	1,734	10.2%	1,912	10.5%	2,112	55	10.2%	61	10.0%	67
Electricity & Heat	Photovoltaic	825.6	10.7%	914.0	10.4%	1,008.9	8,136	10.8%	9,015	10.1%	9,928	232	11.8%	260	10.2%	286
Electricity & Heat	Wind	152.6	9.1%	166.5	11.2%	185.1	1,414	9.5%	1,548	10.9%	1,717	44	2.4%	45	10.7%	50
Energy Efficiency Meas.	Energy Management	1,247.9	10.9%	1,383.7	10.2%	1,525.0	12,222	10.9%	13,560	10.2%	14,942	354	10.3%	390	10.5%	431
Energy Efficiency Meas.	Energy Saving Lighting	428.8	11.2%	476.9	10.1%	524.9	3,973	11.1%	4,413	10.6%	4,880	127	8.0%	137	10.1%	151
Energy Efficiency Meas.	Ventilation and Air-tightness	12,511.8	10.2%	13,791.9	10.6%	15,254.6	120,109	10.1%	132,253	10.8%	146,538	3,751	4.4%	3,916	10.6%	4,330
Making Good After Works	Cleaning Services	17.1	10.3%	18.9	10.7%	20.9	543	11.2%	604	8.7%	657	16	11.6%	18	9.9%	20
Making Good After Works	Floors	200.8	10.6%	222.2	10.2%	244.9	1,945	11.0%	2,158	10.0%	2,374	54	15.4%	63	9.6%	69
Making Good After Works	Walls & Ceilings	1,813.8	10.8%	2,009.3	10.1%	2,211.3	17,548	10.5%	19,396	10.1%	21,359	538	11.5%	600	10.0%	660
Total		22,774.9	9.6%	24,961.7	11.3%	27,783.3	222,900	7.7%	240,012	13.3%	271,928	6,778	6.2%	7,197	11.3%	8,011

Some sub-sectors have shown stronger growth across the 3-year study period 2019/20 to 2021/22 than the UK average and should be considered strengths of the region and include:

Battery Technologies with 22.2% (UK 19.9%)

Biomass with 22.0% (UK 21.2%)

Combination Systems with 21.7% (UK 20.5%)

Heat Pumps with 22.1% (UK 21.5%)

Wind with 21.3% (UK 18.1%)

Ventilation and Air-tightness with 21.9% (UK 21.3%)

Walls & Ceilings with 21.9% (UK 18.5%)

Some sub-sectors have shown weaker growth across the 3-year study period 2019/20 to 2021/22 than the UK average and include:

Sector Development with 21.6% (UK 24.7%)

Electric Heating with 22.2% (UK 24.1%)

Geothermal with 22.3% (UK 24.1%)

Heat Networks with 21.7% (UK 24.8%)

Hot Water with 22.7% (UK 24.6%)

Energy Saving Lighting with 22.4% (UK 27.1%)

Cleaning Services with 22.2% (UK 24.2%)

Floors with 21.9% (UK 24.8%)

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 6 shows how the GSENZH compares with the UK as a whole for the 23 Level 2 sub-sectors.

The GSENZH as a % of UK Sales has been converted to a Proportionality Factor, where 1.0 equals the sector value (46.4%), 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 GSENZ/UK Growth Factor indicates where growth is stronger than the UK (above 1.0) or weaker than the UK (below 1.0)

Table 6: UK and GSENZH DEESC Sales (£m) and 3-Year Growth Comparison

Level 1	Level 2	UK		GSENZH				
		UK Sales £m 2021/22	UK 3- Year Growth %	GSENZH Sales £m 2021/22	GSENZH 3-Year Growth %	GSENZH as % of UK	GSENZH/ UK Sales Proportio nality Factor	GSENZH/ UK Growth Factor
Advisory & Rel. Ser.	Consumer Advisory Services	109.0	22.8%	43.1	21.7%	39.5%	0.9	1.0
Advisory & Rel. Ser.	Information Dissemination	59.5	21.2%	24.2	21.6%	40.8%	0.9	1.0
Advisory & Rel. Ser.	Sector Development	102.0	24.7%	43.2	21.6%	42.3%	0.9	0.9
Advisory & Rel. Ser.	Technical Services	1,480.9	22.8%	565.3	22.3%	38.2%	0.8	1.0
Electricity & Heat	Battery Technologies	866.8	19.9%	466.6	22.2%	53.8%	1.2	1.1
Electricity & Heat	Biogas	1,798.5	22.6%	786.7	21.7%	43.7%	0.9	1.0
Electricity & Heat	Biomass	1,285.5	21.2%	749.5	22.0%	58.3%	1.3	1.0
Electricity & Heat	Combination Systems	195.2	20.5%	94.2	21.7%	48.2%	1.0	1.1
Electricity & Heat	Electric Heating	865.5	24.1%	450.6	22.2%	52.1%	1.1	0.9
Electricity & Heat	Electric Vehicle Charge Point	1,128.6	23.3%	525.4	21.9%	46.6%	1.0	0.9
Electricity & Heat	Geothermal	809.5	24.1%	338.2	22.3%	41.8%	0.9	0.9
Electricity & Heat	Heat Networks	493.4	24.8%	291.5	21.7%	59.1%	1.3	0.9
Electricity & Heat	Heat Pumps	3,162.3	21.5%	1,653.5	22.1%	52.3%	1.1	1.0
Electricity & Heat	Hot Water	893.2	24.6%	542.7	22.7%	60.8%	1.3	0.9
Electricity & Heat	Hydrogen	387.7	22.5%	233.2	21.7%	60.1%	1.3	1.0
Electricity & Heat	Photovoltaic	2,098.2	23.8%	1,008.9	22.2%	48.1%	1.0	0.9
Electricity & Heat	Wind	336.6	18.1%	185.1	21.3%	55.0%	1.2	1.2
Energy Efficiency Meas.	Energy Management	2,977.2	23.4%	1,525.0	22.2%	51.2%	1.1	0.9
Energy Efficiency Meas.	Energy Saving Lighting	1,076.9	27.1%	524.9	22.4%	48.7%	1.1	0.8
Energy Efficiency Meas.	Ventilation and Air-tightness	33,681.7	21.3%	15,254.6	21.9%	45.3%	1.0	1.0
Making Good After Works	Cleaning Services	42.7	24.2%	20.9	22.2%	48.8%	1.1	0.9
Making Good After Works	Floors	622.9	24.8%	244.9	21.9%	39.3%	0.8	0.9
Making Good After Works	Walls & Ceilings	5,421.0	18.5%	2,211.3	21.9%	40.8%	0.9	1.2
Total		59,894.8	21.6%	27,783.3	22.0%	46.4%		

Figure 45 shows how the GSENZH compares with the UK for the 23 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2019/20 to 2021/22.

The x-axis represents the GSENZH/UK sales proportionality factor, which was calculated for each sub-sector by dividing the GSENZH sales a percentage of the UK, by 46.4%. This proportionality factor demonstrates where the GSENZH holds a larger or smaller share of the UK market than would be expected, where:

1 = 46.4% of the UK market

>1 = larger than 46.4% share

<1 = smaller than 46.4% share

The y-axis represents the growth rate of the GSENZH'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 one 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 23 Level 2 sub-sectors and are sized by the GSENZH 2021/22 sales £m, illustrating the relative sizes of each sub-sector.

Figure 45: GSENZH/UK Sales proportionality factor vs. GSENZH/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m

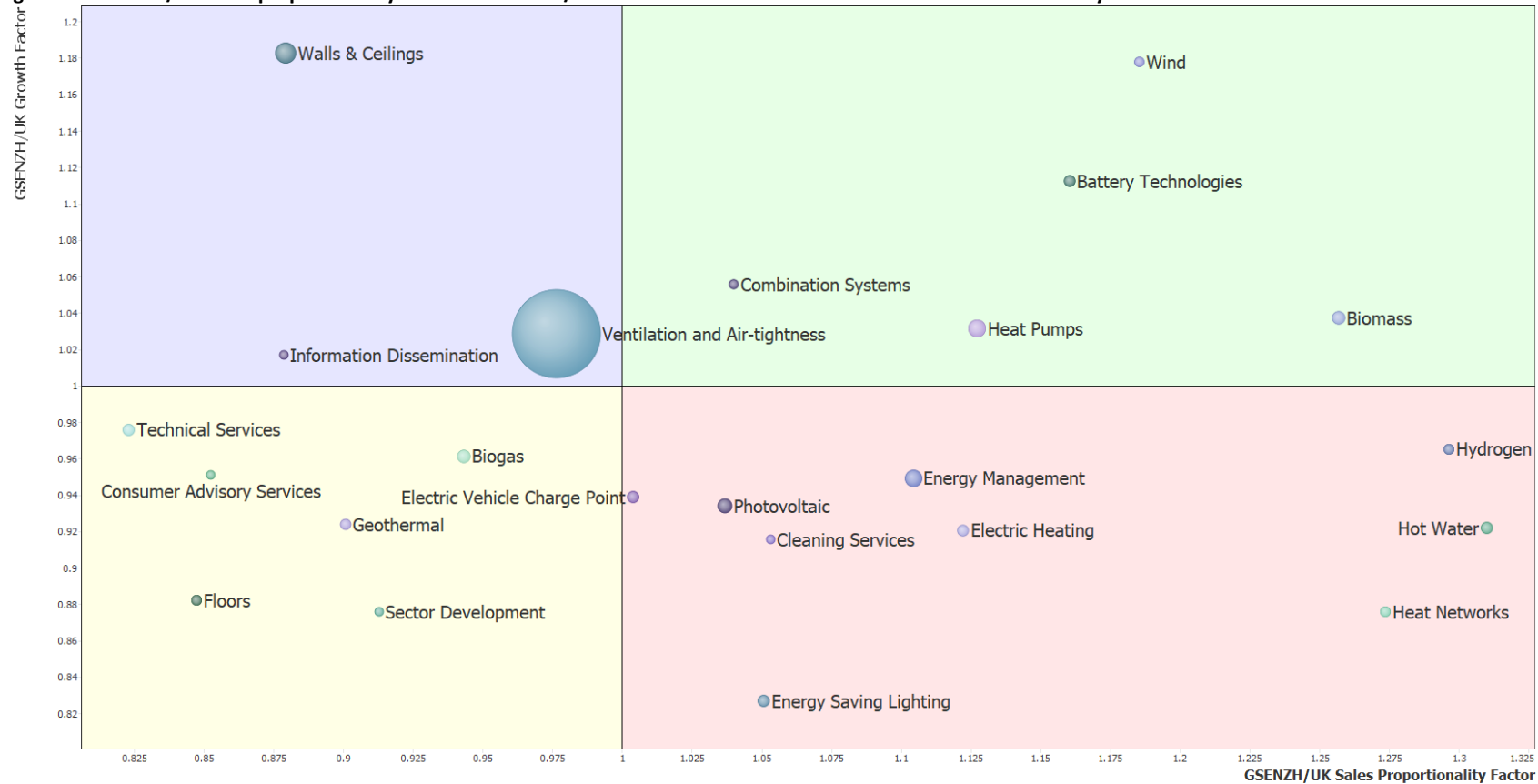


Figure 45 clearly illustrates the strong growth of many of the Level 2 sub-sectors within Electricity and Heat, including Wind, Battery Technologies and Biomass with stronger growth than the UK average and larger market share than expected. Hydrogen, Hot Water and Heat Networks all hold a larger share of the market than would be expected, but experienced slower growth than the UK average. Heat Pumps, Energy Management and Electric Heating experienced similar growth than the UK average but hold a larger proportion of the UK market than would be expected. Walls and Ceilings hold a smaller share of market but is fast growing and sub-sectors with slower growth and a smaller proportion of the market include Floors, Sector Development and Geothermal, with Technical Services and Consumer Advisory Services holding a smaller proportion of the UK market than would be expected.



1.11 GSENZH's DEESC 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 twenty-one products and services within the Level 2 sub-sector of Heat Pumps, within Electricity and Heat. For each Local Authority (using Westminster as an example), each product and service was allocated a scalability factor:

- 9 products and services listed as 'High' with a score of 3
- 12 products and services listed as 'Medium' with a score of 2
- 0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(9 \times 3) + (12 \times 2) + (0 \times 1)}{21} = 2.43$$

The scalability index has been calculated for the 340 products and services, for the Activity Codes of Level 3 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 46: GSENZH’s Scalability vs. GVA of Level 2 Sub-sectors 2021/22 – Bubbles Sized by GVA



Figure 46 shows the GVA plotted against the scalability index of the 23 Level 2 sub-sectors for the GSENZH, with each bubble sized by the GVA of that sub-sector in 2021/22. 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 Ventilation and Air-tightness dominates the graph, with medium scalability and very high GVA compared with the other sub-sectors. Figure 47 removed Ventilation and Air-tightness to enable the scalability of other sub-sectors to become more clear. Scalability graphs for each LEP can be found in Appendix 4.

Figure 47: GSENZH's Scalability vs. GVA of Level 2 Sub-sectors 2021/22 – Bubbles Sized by GVA – Ventilation and Air-tightness removed

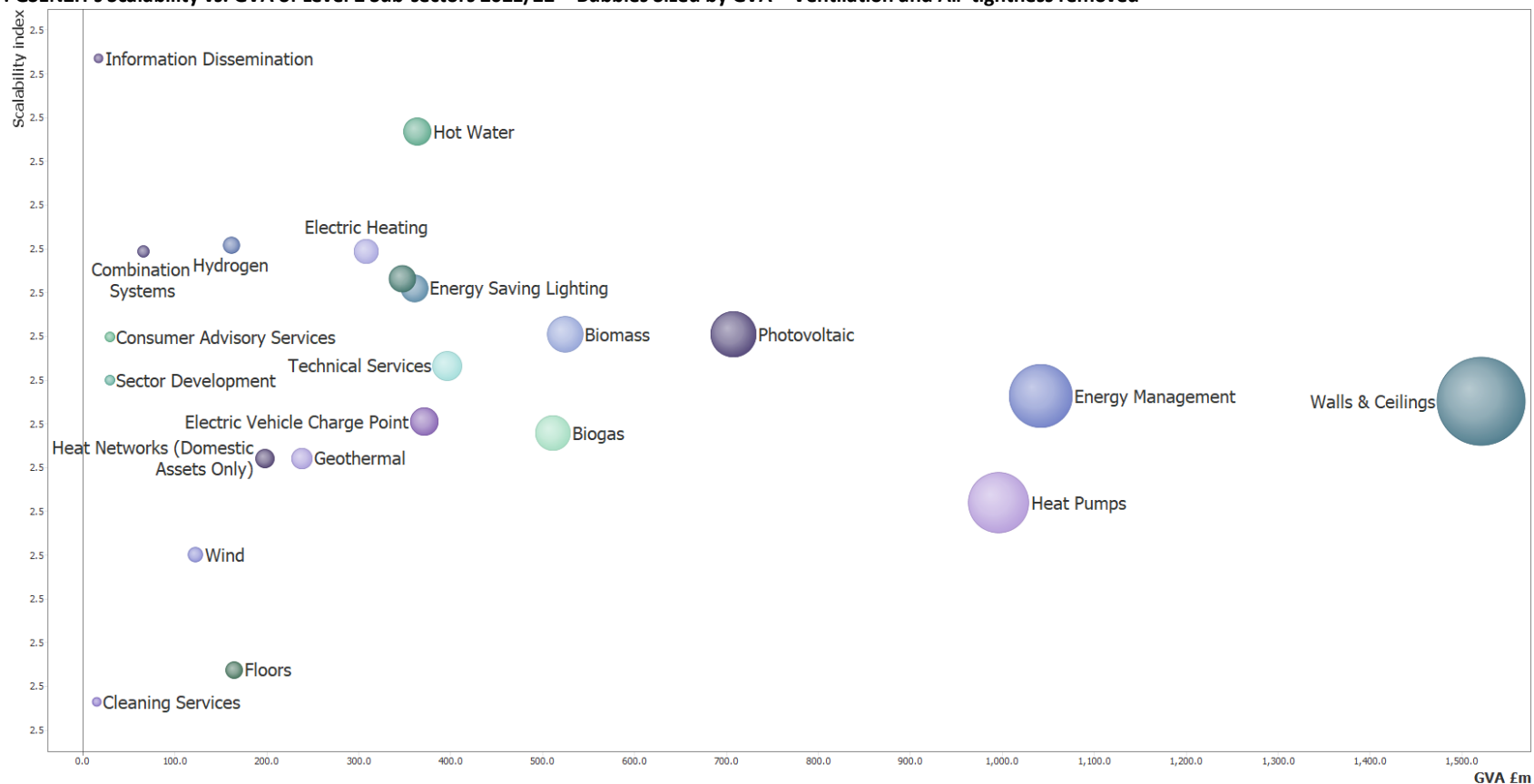


Figure 47 shows the same data as Figure 46, with Ventilation and Air-tightness removed. The largest sub-sectors with regards to GVA have average or above scalability, with Heat Pumps slightly lower than the comparable sized Energy Management. Information Dissemination is the most scalable sub-sector, albeit with a small GVA. Hot Water is reasonably large in terms of GVA and has good scalability compared with similar-sized sub-sectors such as Energy Saving Lighting and Technical Services.

Figure 48: GSENZH's 2020/21 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA



Figure 48 shows the same principle as Figures 46 and 47, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2020/21. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Heat Pumps sub-sector dominates the graph in terms of growth, but in terms of scalability (Figure 47), 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 Heat Pumps, scalability is currently impacted by production capability being impeded by high development of technology. For this reason, scalability is a more useful measure than previous growth when looking at opportunities. Figure 49 removes Heat Pumps and Ventilation and Air-tightness to look at growth within the other sub-sectors.

Figure 49: GSENZH's 2020/21 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA – Heat Pumps and Ventilation and Air-tightness removed

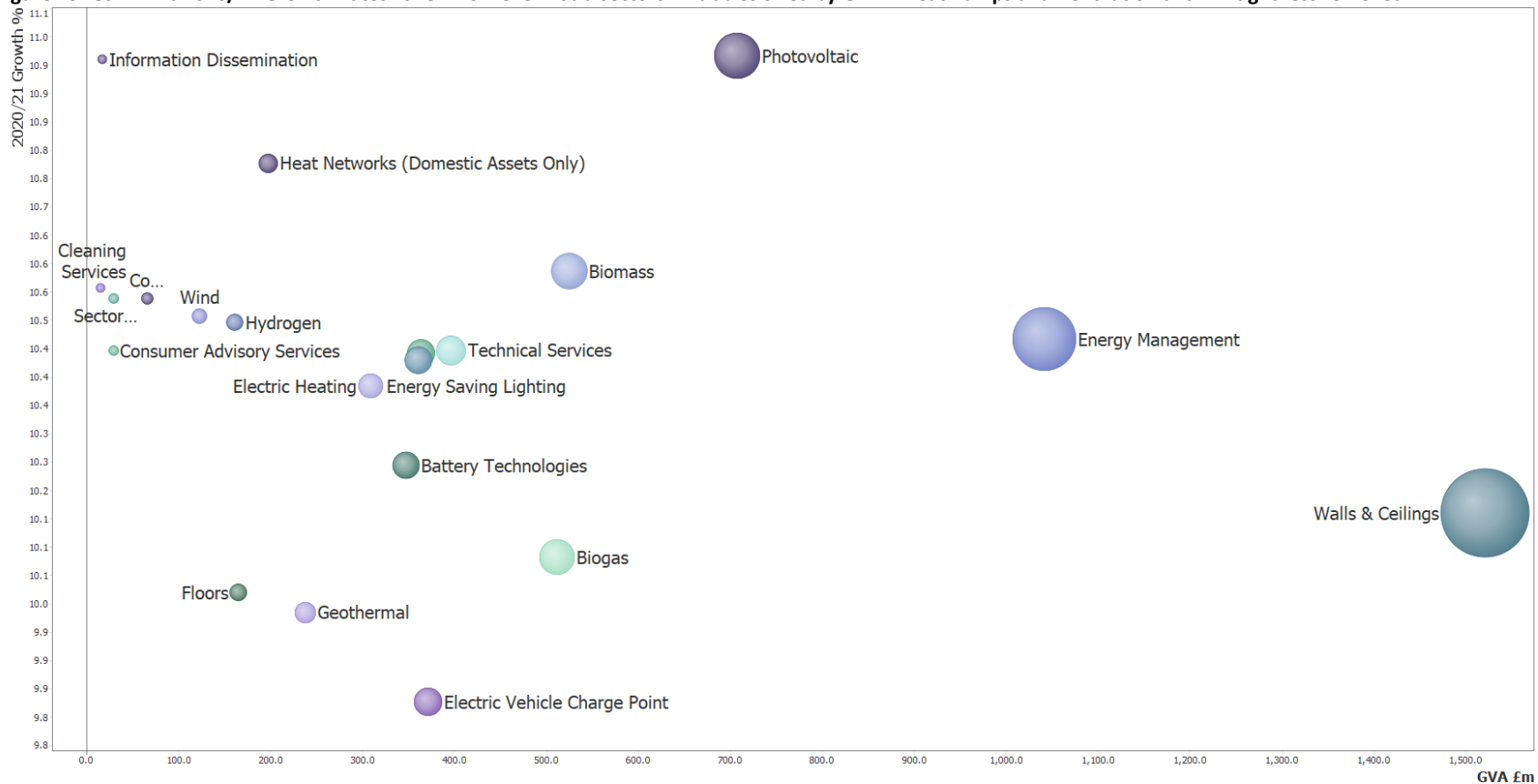


Figure 49 shows the same data as Figure 48, but with Heat Pumps and Ventilation and Air-tightness removed. When compared with Figure 46, Photovoltaics and Heat Networks saw some of the strongest growth in 2020/21, however their scalability is more average. Conversely, Hot Water is strong in terms of scalability but saw growth in line with the less scalable Technical Services. Similarly, Electric Vehicle Charge Points saw slow growth, but are more average in terms of scalability.

1.12 GSENZH’s DEESC Sector Barriers to Entry

In this section we look at the barriers to entry for the market, in the context of Financial Barriers to Entry, Operational Barriers to Entry, Technical Risk of Substitution, Customer Power and Market Risk of Substitution, where a grading of 1 represents a low barrier to entry and 3 represents a high barrier.

Figure 50: GSENZH’s 2020/21 Barriers to Entry, split by Level 2 Sub-sectors



Figure 50 shows barriers to entry are generally high, between 2.3 and 3.0, which is associated with length of time associated with both training and accreditation. They do vary between sub-sectors, but are similar for similar types of activity, for example, Market Risk of Substitution is more of a barrier within the advisory services such as Customer Advisory Services, Information and Dissemination, Sector Development and Technical Services.



1.13 GSENZH’s DEESC Sector Forecasts

In this section we look at forecasts for the sector, Level 1 and Level 2, initially as a 5-year forecast, followed by growth requirements to reach Net Zero 2030 and Net Zero 2050. Forecasting for each has been performed on a ‘No Policy’ basis, as a baseline forecast and a ‘Current Policy’ forecast, which includes the Heat & Buildings Strategy (2021), Net Zero Strategy (2021), the Prime Minister’s Ten Point Plan (2020), Industrial and Clean Growth Strategies (2016), Energy White Paper (2020), Energy Security Policy (2021) and Industrial Decarbonisation Strategy (2022).

1.13.1 GSENZH’s DEESC 5-Year Forecast

Figure 51: GSENZH DEESC 5-Year Forecast for Sales and Employment, No Policy and with Current Policy



Figure 51 shows the 5-year forecasts for sales and employment, without policy and with current policy. No policy forecasts for sales and employment predict a more gradual growth for both measures, with year-on-year growth for sales starting at 11.8% and increasing to 17.7% and employment starting at 9.1% and increasing to 11.4% through the forecasting period. This compares with a large annual growth with current policy, which forecasts growth between 2021/22 and 2022/23 of 117.7% for sales and 70.9% for employment followed by annual growth more in-line with the no policy forecasts, with the growth between 2022/23 and 2023/24 of 13.4% for sales and 9.9% for employment, increasing to 18.7% and 14.6% respectively.

Figure 52: GSENZH DEESC 5-Year Forecast for Sales and Employment, stacked by Level 1, No Policy and with Current Policy

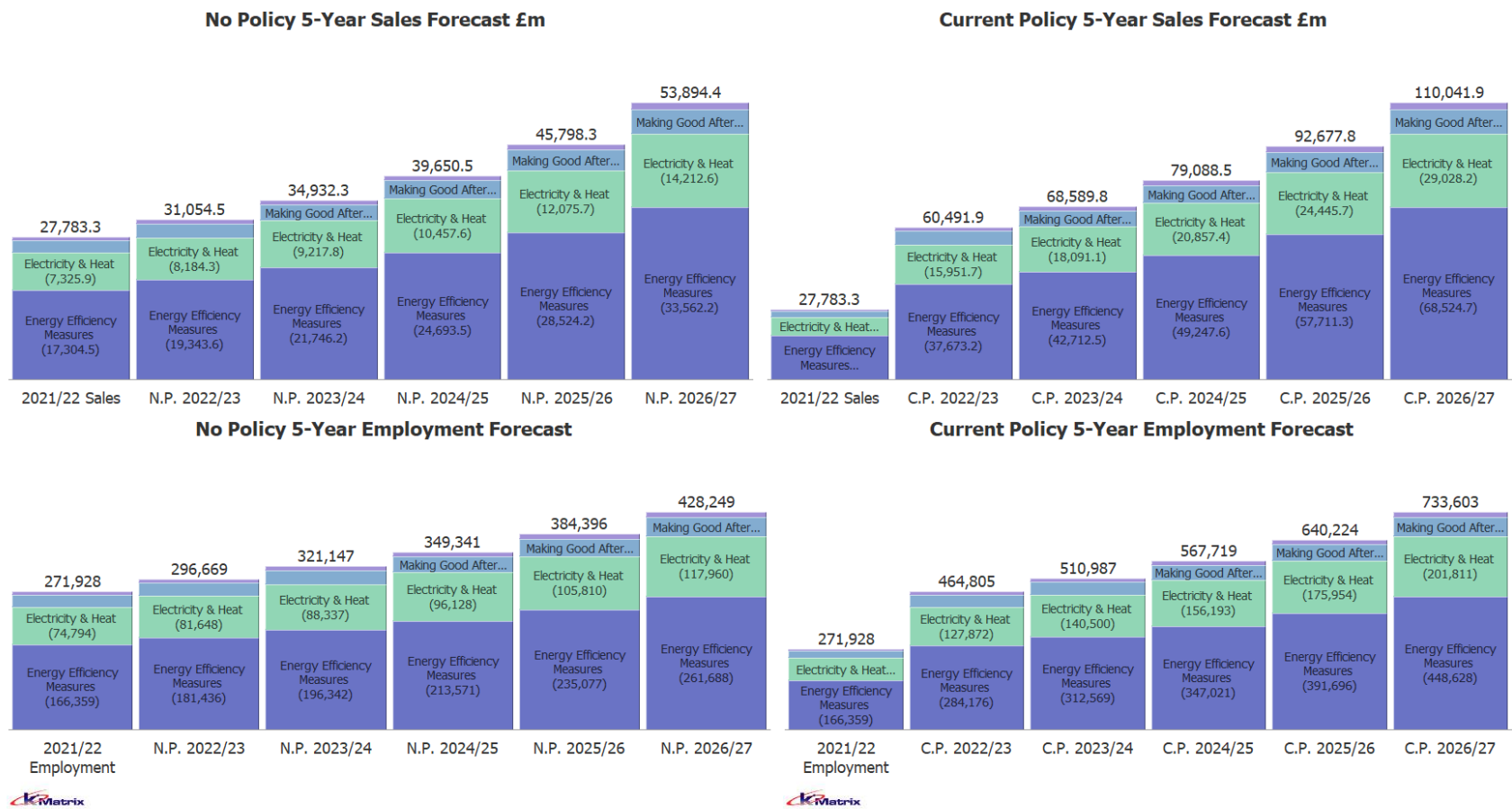


Figure 52 shows the same data as Figure 51, with the bars stacked by Level 1 sub-sectors and shows the same pattern of large growth in the first year under the current policy, with growth rates within the sub-sectors forecast to be in-line with those of the sector as a whole. A key point of the analysis is even without policy, the sector is forecast to see strong, double-digit growth throughout the forecast period and current policy has the potential to front-load that growth, resulting in a significantly larger market.

Figure 53: GSENZH DEESC Sales and Employment Forecasts for Net Zero Scenarios, No Policy and with Current Policy
Sales Forecasts for Net Zero Scenarios

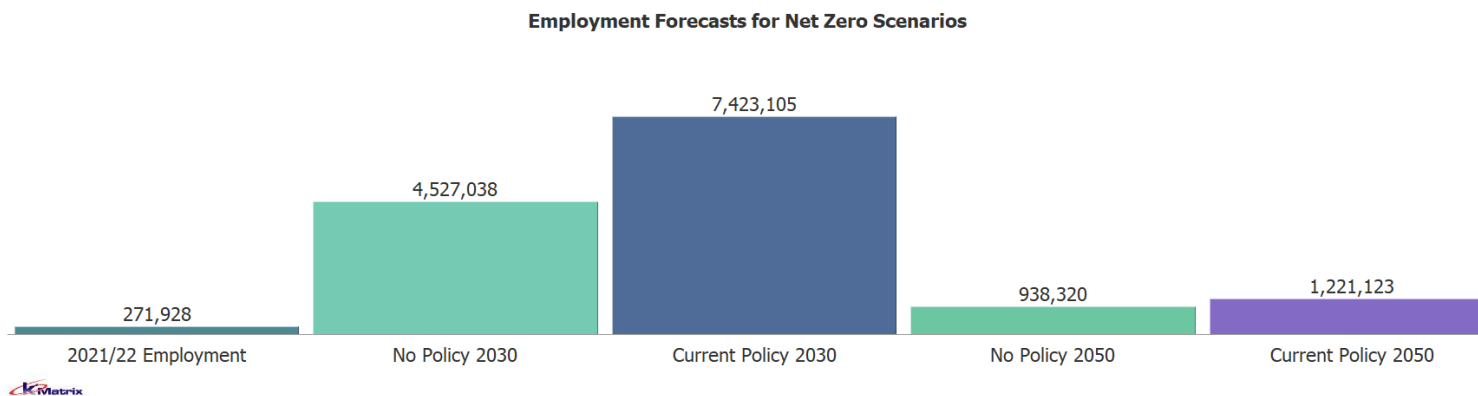
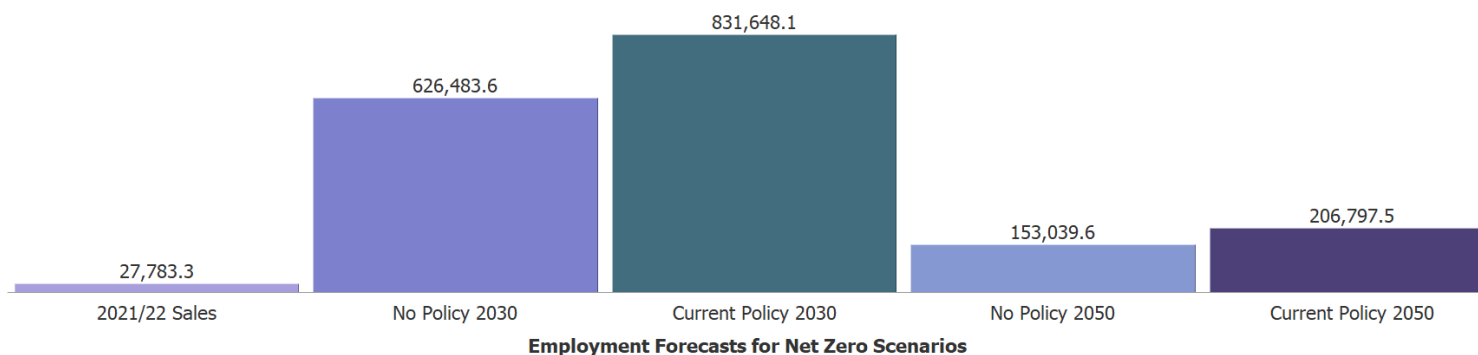


Figure 53 shows forecasts to reach net zero scenarios in 2030 and 2050, no policy and with current policy for sector sales and employment. To reach net zero by 2030 requires the largest proportional increase in both sales and employment, because there is a smaller timeframe to complete the retrofit of a finite number of properties. Under a no scenario policy, net zero 2030 would require a 22.5x increase in sales and a 16.6x increase in employment, and this increases with current policy to 29.9x in sales and 27.3x in employment. In comparison, net zero 2050 without policy intervention is expected to require 5.5x the sales and 3.5x the employment, which is forecast to increase to 7.4x the sales and 4.5x the employment with policy intervention.

Figure 54: GSENZH DEESC Sales and Employment Forecasts for Net Zero Scenarios, No Policy and with Current Policy – Level 1

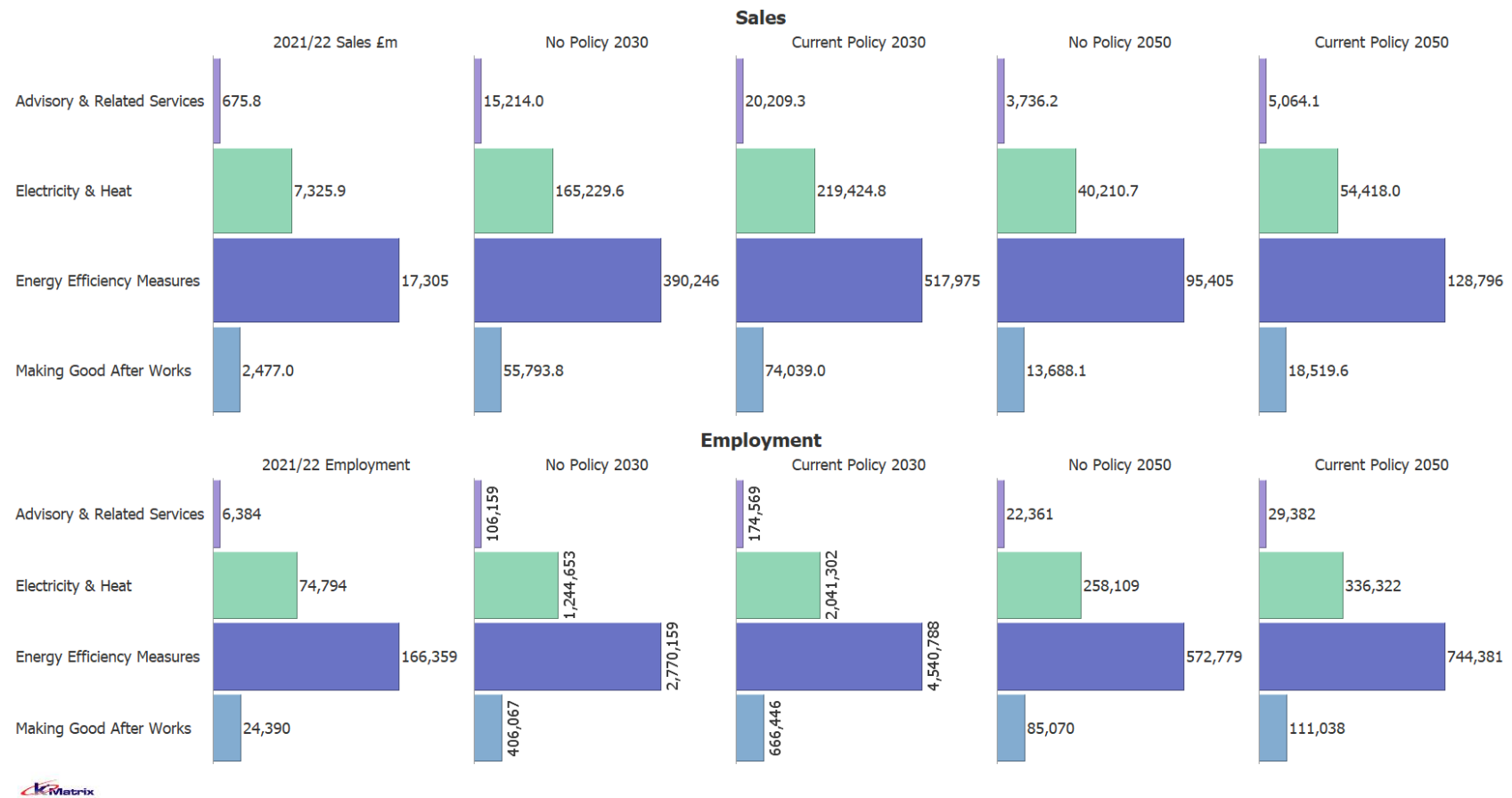


Figure 54 shows the same data as Figure 53, split by Level 1, which illustrates the whole market is forecast to require similar increases in order to fulfil net zero targets. For example, Energy Efficiency Measures under a no scenario policy, net zero 2030 would require a 22.6x increase in sales and a 16.7x increase in employment, and this increases with current policy to 29.9x in sales and 27.3x in employment. In comparison, net zero 2050 without policy intervention is expected to require 5.5x the sales and 3.3x the employment, which is forecast to increase to 7.4x the sales and 4.5x the employment with policy intervention.

Figure 55: GSENZH DEESC Sales Forecasts for Net Zero Scenarios, No Policy and with Current Policy – Level 2

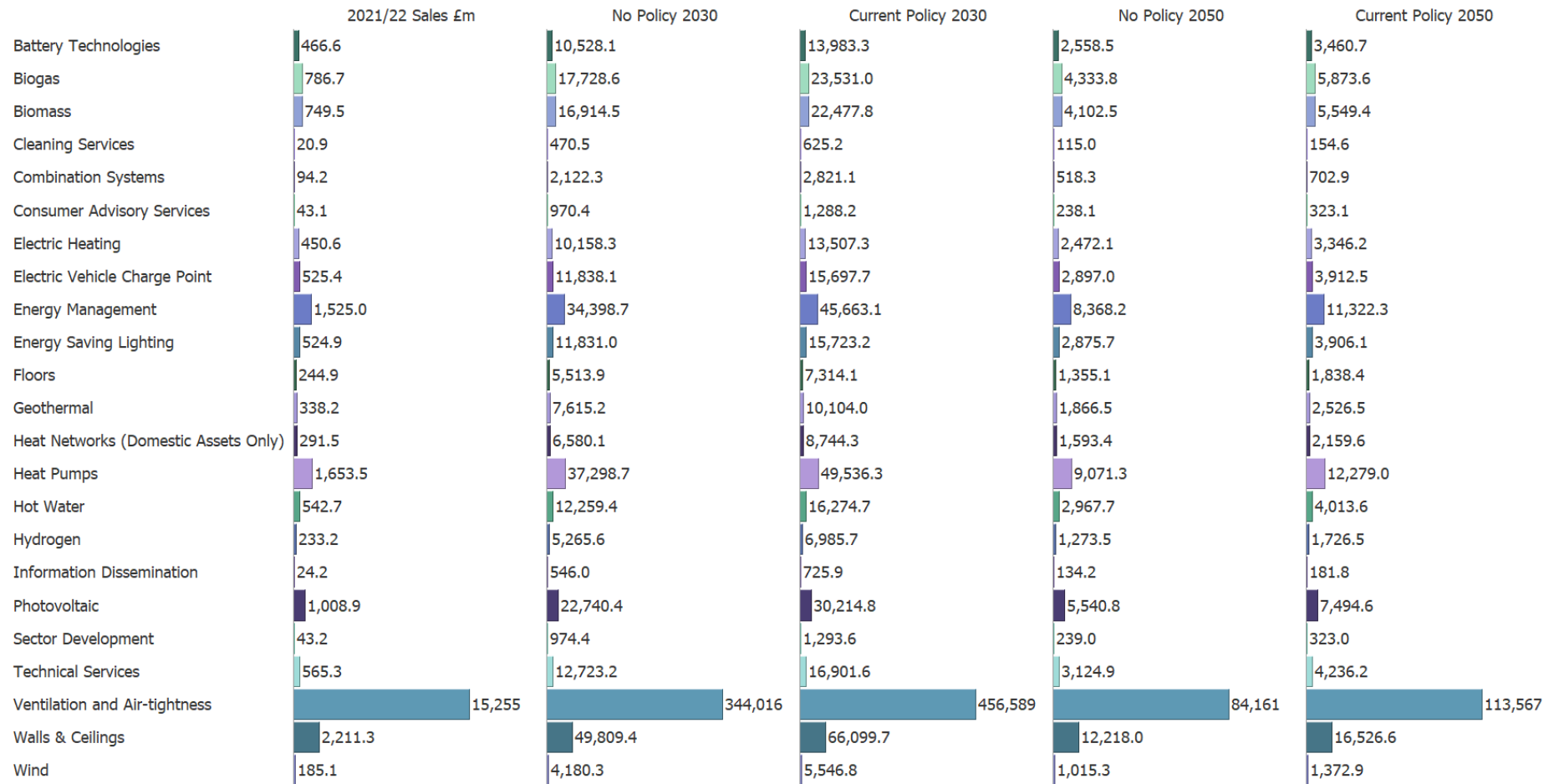


Figure 55 shows the sales data in Figure 54, split by Level 2, which illustrates the pattern of impact on growth of policy vs. no policy and timeframe to implement targets is similar across the sector with regards to sales.

Figure 56: GSENZH DEESC Employment Forecasts for Net Zero Scenarios, No Policy and with Current Policy – Level 2

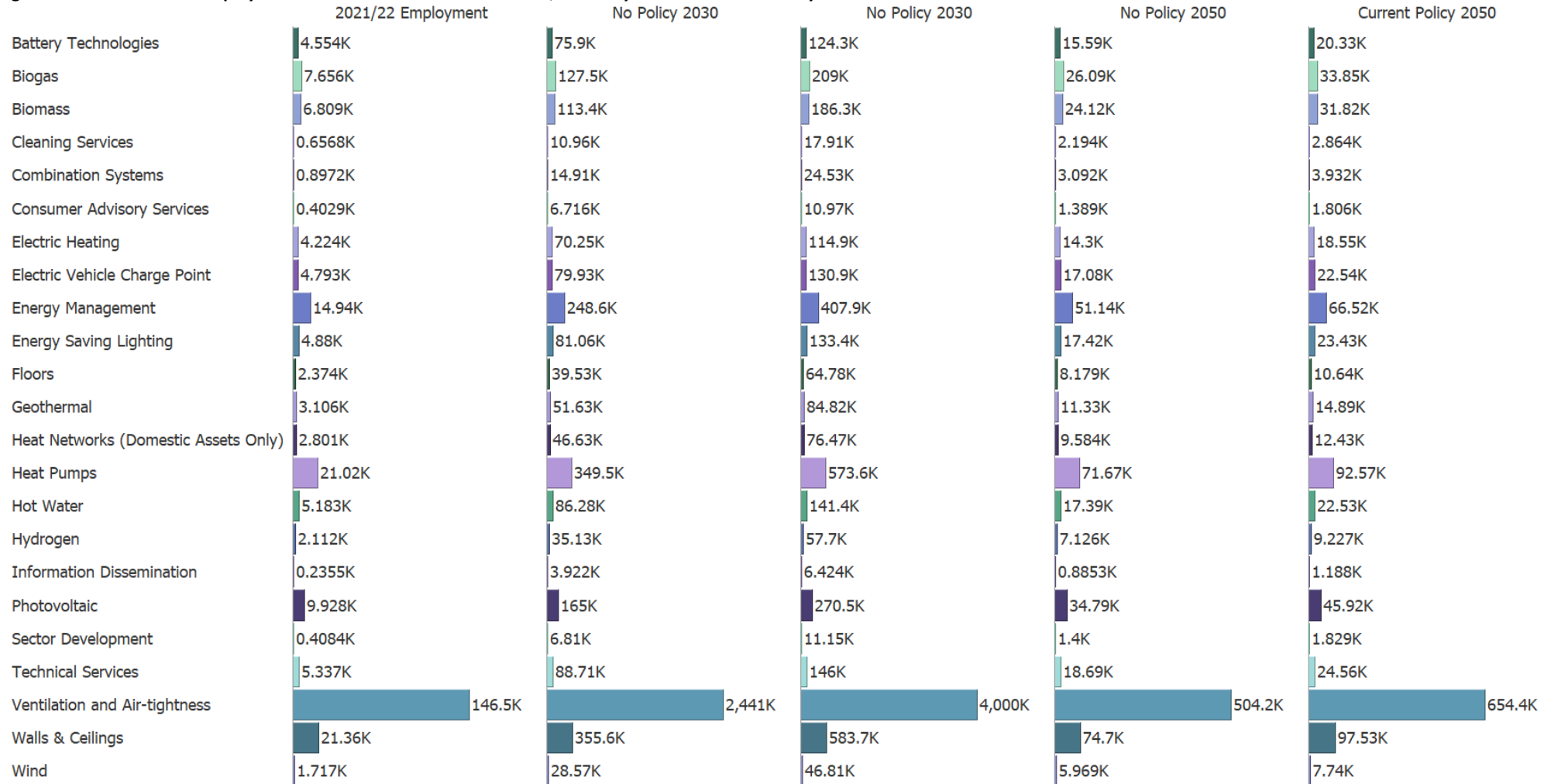


Figure 56 shows the employment data in Figure 54, split by Level 2, which illustrates the pattern of impact on growth of policy vs. no policy and timeframe to implement targets is also similar across the sector with regards to employment.



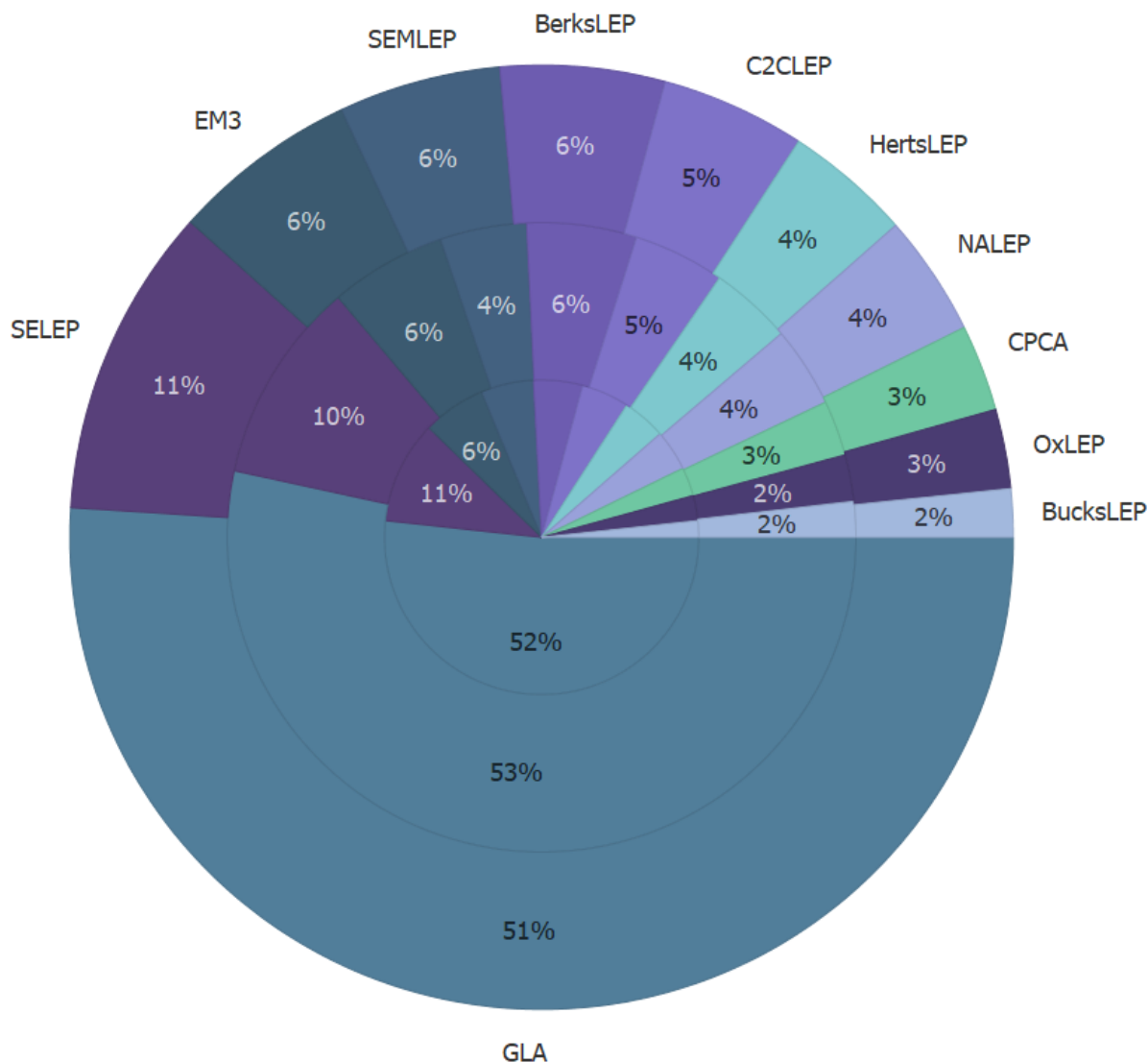
2. GSENZH’s DEESC by Local Enterprise Partnership

2.1 DEESC by Local Enterprise Partnership

This section of the report the analyses the GSENZH’s 11 LEPs.

Figure 57 shows DEESC for 2021/22 split by LEP for sales (outer circle), companies (middle circle) and employment (inner circle). GLA accounts for 51% of GSENZH’s DEESC sales, 53% of companies and 52% of employment. This is followed by SELEP with 11% of Sales, EM3 with 6% of Sales and SEMLEP with 6% of Sales, with the smallest being BucksLEP 2% of the market.

Figure 57: GSENZH’s DEESC 2021/22 by Local Authority for Sales, Companies and Employment



LEPs are analysed in more detail, by year, by economic measure and by DEESC activity in the following section.

2.2 LEP Analysis by Year and Sector

Table 7 shows the key metrics of Sales, Available Sales, GVA, Number of Companies and Number of Employees for each LEP at the Sector Level for three years with growth rates.

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

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

GVA tracks sales, with differences in growth rates between the two being within 1%.

The fluctuation between company and employee numbers are not entirely independent, but they do not 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 variable between LEPS and between years, with strongest growth in BucksLEP of 13.7% between 2019/20 and 2020/21 and the slowest growth in CPCA of 8.2% between 2019/20 and 2020/21.

Growth was generally stronger between 2020/21 and 2021/22 than the previous year, with the exception of HertsLEP and OxLEP and BucksLEP, who all saw slower growth during the second year.

Table 7: LEP Sales, Available Sales, GVA, Number of Employees and Number of Companies 2019/20 to 2021/22

LEP	Turnover/ Sales £m					Available Sales £m					GVA £m				
	2019/20	Growth	2020/21	Growth	2021/22	2019/20	Growth	2020/21	Growth	2021/22	2019/20	Growth	2020/21	Growth	2021/22
GLA	11,611.4	9.6%	12,729.0	11.3%	14,169.8	6,947.4	10.0%	7,645.4	11.4%	8,515.3	8,355.1	10.2%	9,211.4	10.7%	10,194.2
SELEP	2,421.3	9.3%	2,646.1	11.7%	2,955.1	1,485.1	10.1%	1,635.0	11.3%	1,819.7	1,739.3	9.6%	1,906.8	11.3%	2,122.3
EM3	1,452.9	10.1%	1,599.0	10.9%	1,772.9	826.8	10.6%	914.1	10.4%	1,009.1	970.1	11.0%	1,076.4	10.2%	1,185.9
BerksLEP	1,279.5	9.7%	1,404.0	11.4%	1,564.5	780.7	10.6%	863.5	11.0%	958.8	917.6	10.7%	1,015.9	10.4%	1,121.8
SEMLEP	1,273.7	8.3%	1,379.8	12.2%	1,547.7	729.4	8.5%	791.1	12.3%	888.3	869.6	8.4%	942.5	11.8%	1,053.5
HertsLEP	989.2	10.7%	1,095.1	10.2%	1,206.9	608.2	10.9%	674.2	9.8%	740.5	698.5	10.6%	772.3	10.4%	852.3
NALEP	950.7	9.1%	1,037.4	11.2%	1,154.1	579.2	9.5%	634.3	10.6%	701.6	692.5	9.1%	755.4	10.4%	834.1
C2CLEP	1,131.4	8.9%	1,231.7	11.7%	1,375.7	639.0	10.5%	705.8	9.8%	775.3	743.7	9.6%	814.9	10.7%	901.8
CPCA	676.3	8.2%	731.7	12.5%	823.4	397.7	8.3%	430.7	12.5%	484.7	445.9	8.6%	484.4	12.0%	542.5
OxLEP	616.9	11.2%	685.9	10.3%	756.2	373.5	11.8%	417.5	10.0%	459.3	444.7	10.6%	492.0	10.5%	543.6
BucksLEP	371.4	13.7%	422.1	8.3%	457.1	234.9	13.2%	265.9	7.3%	285.4	284.1	16.2%	330.2	7.5%	355.0
Total	22,774.9	9.6%	24,961.7	11.3%	27,783.3	13,601.8	10.1%	14,977.5	11.1%	16,638.2	16,161.0	10.2%	17,802.3	10.7%	19,706.9

LEP	# Employees					# Companies				
	2019/20	Growth	2020/21	Growth	2021/22	2019/20	Growth	2020/21	Growth	2021/22
GLA	115,104	7.7%	124,016	13.3%	140,530	3,650	5.2%	3,839	11.4%	4,277
SELEP	23,570	7.3%	25,296	13.8%	28,785	717	4.2%	748	11.5%	834
EM3	14,450	8.1%	15,617	13.0%	17,653	391	10.9%	434	10.6%	480
BerksLEP	11,209	8.2%	12,129	13.2%	13,727	360	13.9%	410	10.2%	452
SEMLEP	12,143	6.4%	12,915	14.0%	14,724	325	-2.1%	318	12.1%	357
HertsLEP	9,953	8.4%	10,787	12.5%	12,135	279	9.0%	304	11.0%	338
NALEP	9,422	7.0%	10,078	13.3%	11,420	286	4.0%	297	11.6%	332
C2CLEP	11,026	7.3%	11,831	12.7%	13,329	314	7.2%	337	11.6%	376
CPCA	6,602	6.1%	7,003	14.6%	8,029	186	8.1%	201	13.2%	228
OxLEP	5,723	8.8%	6,226	12.8%	7,022	164	5.9%	174	10.4%	192
BucksLEP	3,697	11.3%	4,113	11.2%	4,573	104	28.8%	134	9.1%	146
Total	222,900.5	7.7%	240,011.8	13.3%	271,928.0	6,777.6	6.2%	7,197.2	11.3%	8,011.1

2.3 LEP Analysis by Year – Level 1

Figure 58: GSENZH’s LEPs DEESC Sales 2021/22 (Level 1)

SELEP	Energy Efficiency Measures (63%)	Electricity & Heat (25%)	Making Good After Works (9%)	Advisory &...
EM3	Energy Efficiency Measures (63%)	Electricity & Heat (26%)	Making Good After Works (9%)	Advisory &...
SEMLEP	Energy Efficiency Measures (63%)	Electricity & Heat (25%)	Making Good After Works (10%)	Advisory &...
HertsLEP	Energy Efficiency Measures (64%)	Electricity & Heat (25%)	Making Good After Works (8%)	Advisory & Re...
NALEP	Energy Efficiency Measures (64%)	Electricity & Heat (25%)	Making Good After Works (9%)	Advisory & Re...
C2CLEP	Energy Efficiency Measures (62%)	Electricity & Heat (26%)	Making Good After Works (9%)	Advisory &...
CPCA	Energy Efficiency Measures (65%)	Electricity & Heat (24%)	Making Good After Works (9%)	Advisory &...
OxLEP	Energy Efficiency Measures (66%)	Electricity & Heat (23%)	Making Good After Works (8%)	Advisory &...
BucksLEP	Energy Efficiency Measures (64%)	Electricity & Heat (26%)	Making Good After Works...	Advisory & Relat...
GLA	Energy Efficiency Measures (64%)	Electricity & Heat (25%)	Making Good After Works (9%)	Advisory &...
BerksLEP	Energy Efficiency Measures (64%)	Electricity & Heat (25%)	Making Good After Works (9%)	Advisory & Re...



Figure 58 shows the different profiles of the GSENZH’s LEPs when sales is split at Level 1. The LEPs show little variation between the Level 1 sub-sectors, with Energy Efficiency Measures being between 62% and 66%; Electricity and Heat between 23% and 26%; Making Good After Works between 6% and 10% and Advisory and Related Services between 2% and 4%, showing subtle regional variations in activity within the ESSC sector. This is further confirmed by Figure 59 below.

2.4 LEP Analysis by Year – Level 2

Figure 59: GSENZH’s LEPs DEESC Sales 2021/22 (Level 2)

SELEP	Ventilation and Air-tightness (56%)	Walls & Ceilings (8%)	Energy Management (7%)	Heat Pumps (5%)	Photovoltaic (3%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (10%)
EM3	Ventilation and Air-tightness (54%)	Walls & Ceilings (8%)	Energy Management (7%)	Heat Pumps (5%)	Photovoltaic (4%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (11%)
SEMLEP	Ventilation and Air-tightness (56%)	Walls & Ceilings (9%)	Energy Management (6%)	Heat Pumps (4%)	Photovoltaic (4%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (10%)
HertsLEP	Ventilation and Air-tightness (56%)	Walls & Ceilings (7%)	Energy Management (6%)	Heat Pumps (5%)	Photovoltaic (4%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (10%)
NALEP	Ventilation and Air-tightness (55%)	Walls & Ceilings (8%)	Energy Management (6%)	Heat Pumps (5%)	Photovoltaic (4%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (10%)
C2CLEP	Ventilation and Air-tightness (55%)	Walls & Ceilings (8%)	Energy Management (6%)	Heat Pumps (5%)	Photovoltaic (4%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (11%)
CPCA	Ventilation and Air-tightness (57%)	Walls & Ceilings (8%)	Energy Management (6%)	Heat Pumps (4%)	Photovoltaic (3%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (10%)
OxLEP	Ventilation and Air-tightness (59%)	Walls & Ceilings (8%)	Energy Management (6%)	Heat Pumps (5%)	Photovoltaic (4%)	Biogas (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (9%)
BucksLEP	Ventilation and Air-tightness (57%)	Energy Management (5%)	Walls & Ceilings (5%)	Heat Pumps (4%)	Biogas (3%)	Technical Services (3%)	Biomass (3%)	Photovoltaic (3%)	Batteries (3%)	Electricity (3%)	Hot Water (3%)	13 others (11%)
GLA	Ventilation and Air-tightness (57%)	Walls & Ceilings (8%)	Heat Pumps (5%)	Energy Management (4%)	Photovoltaic (4%)	Biomass (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (11%)
BerksLEP	Ventilation and Air-tightness (57%)	Walls & Ceilings (8%)	Heat Pumps (5%)	Energy Management (4%)	Photovoltaic (3%)	Biomass (3%)	Biomass (3%)	Hot Water (3%)	Electricity (3%)	Tech (3%)	Energy (3%)	13 others (10%)



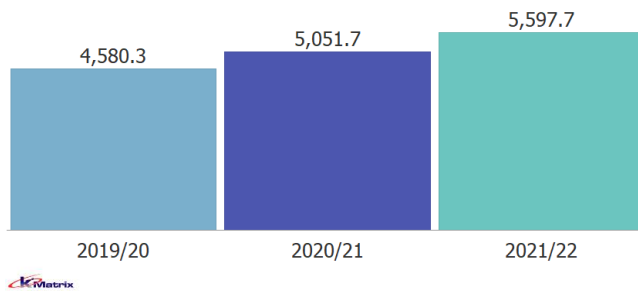
Figure 59 extends the analysis to include the Top 10 sub-sectors for each LEP. Typically, ten sub-sectors account for 90% of the total value, but the sub-sectors and their rankings do differ subtly across the LEPs. There are consistent sub-sectors running through the LEPs and these include Ventilation and Air-tightness, Walls and Ceilings, Energy Management and Heat Pumps, they are represented in all of the LEPs and are consistently in the top four sub-sectors.

3. GSENZH’s DEESC and International Trade

3.1 GSENZH’s DEESC Exports and Imports

This section of the report addresses GSENZH’s DEESC Exports over the past three years when compared with UK totals and then identifies leading DEESC export products and services and their destination markets.

Figure 60: GSENZH’s Exports (£m) 2019/20 to 2021/22

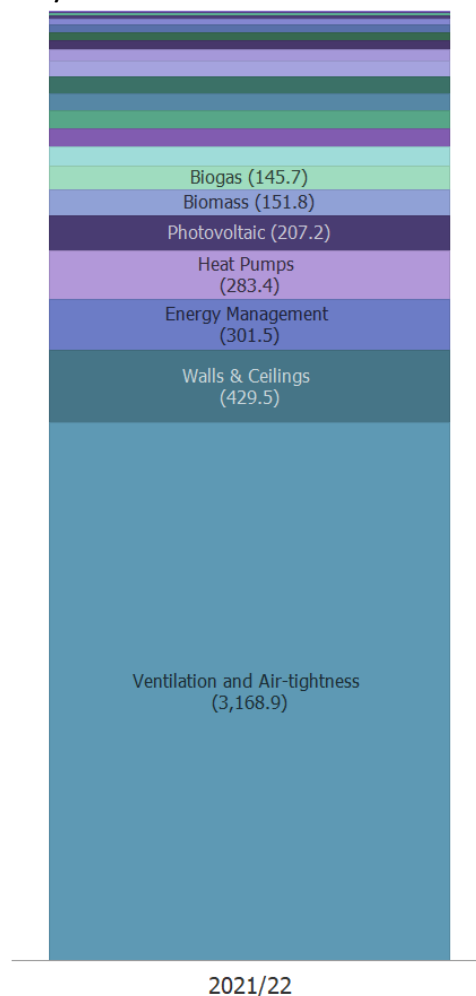


The value of GSENZH’s DEESC Exports was £4,580.3m in 2019/20 and despite the Covid-19 pandemic has grown to £5,597.7m in 2021/22.

Growth between 2019/20 and 2020/21 was 10.3% and growth between 2020/21 and 2021/22 was 10.8%.

This is compared with UK growth of 12.0% and 18.7%.

Figure 61: GSENZH’s Exports (%) by Sub-Sector 2021/22

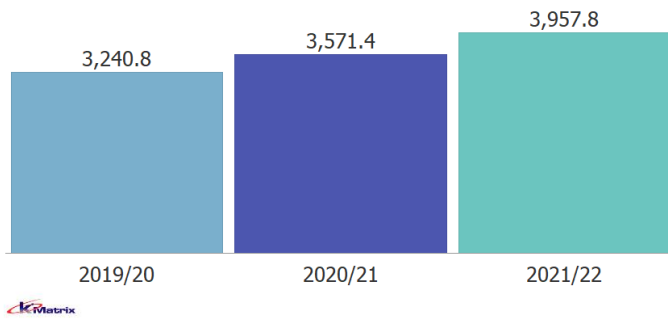


GSENZH represented 59.0% of all UK DEESC exports in 2021/22. This is higher than GSENZH’s 46.4% of overall UK Sales. This means that the GSENZH has a larger share of the export market than the UK domestic market.

Figure 61 shows the proportion of GSENZH DEESC exports by Level 2 sub-sector, with Ventilation and Air-tightness (57%), Walls & Ceilings (8%), Energy Management (5%), Heat Pumps (5%) and Photovoltaic (4%) being the leading sub-sectors and accounting for 78% of all GSENZH’s DEESC exports.

This compares with UK proportions of Ventilation and Air-tightness (48%), Walls & Ceilings (11%), Heat Pumps (6%), Energy Management (4%) and Photovoltaic (4%) being the leading sub-sectors and accounting for 74% of exports.

Figure 62: GSENZH's Imports (£m) 2019/20 to 2021/22

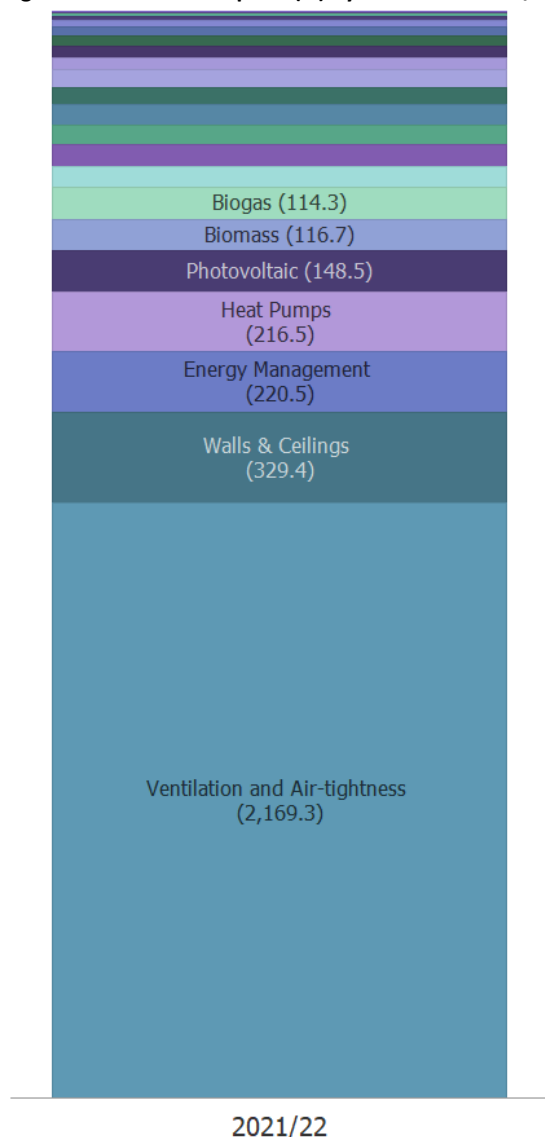


The value of GSENZH's DEESC Imports was £3,240.8m in 2019/20 and despite the Covid-19 pandemic has grown to has grown to £3,957.8m in 2021/22.

Growth between 2019/20 and 2020/21 was 10.2% and growth between 2020/21 and 2021/22 was 10.8%.

This is compared with UK growth of approximately 14.9% and 14.6%.

Figure 63: GSENZH's Imports (%) by Sub-Sector 2021/22



GSENZH represented 38.3% of all UK DEESC imports in 2021/22. This is lower than GSENZH's 46.4% of overall UK Sales. This means that the GSENZH has a smaller share of the import market than the UK domestic market.

Figure 63 shows the proportion of GSENZH DEESC imports by Level 2 sub-sector, with Ventilation and Air-tightness (55%), Walls & Ceilings (8%), Energy Management (6%), Heat Pumps (6%) and Photovoltaic (4%) being the leading sub-sectors and accounting for 78% of all GSENZH's DEESC imports.

This compares with UK proportions of Ventilation and Air-tightness (64%), Walls & Ceilings (9%), Energy Management (5%), Photovoltaic (4%) and Heat Pumps (3%) being the leading sub-sectors and accounting for 85% of imports.

The Covid 19 pandemic impacted imports and exports in many sectors, however the DEESC market still experienced healthy international trade despite restrictions, with minimal disruption.

Table 8: GSENZH’s DEESC Exports as a % of Sales 2019/20 to 2021/22

Level 1	Level 2	2019/20			2020/21			2021/22		
		Sales £m	Exports £m	Exports as % of Sales	Sales £m	Exports £m	Exports as % of Sales	Sales £m	Exports £m	Exports as % of Sales
Advisory & Rel. Ser.	Consumer Advisory Services	35.4	7.1	20.2%	39.1	8.0	20.4%	43.1	8.7	20.2%
Advisory & Rel. Ser.	Information Dissemination	19.9	4.1	20.5%	21.9	4.5	20.4%	24.2	5.0	20.4%
Advisory & Rel. Ser.	Sector Development	35.5	6.8	19.1%	38.9	7.4	19.1%	43.2	8.2	19.0%
Advisory & Rel. Ser.	Technical Services	462.4	90.0	19.5%	516.1	99.9	19.4%	565.3	109.2	19.3%
Electricity & Heat	Battery Technologies	382.0	80.0	20.9%	424.0	88.7	20.9%	466.6	97.8	21.0%
Electricity & Heat	Biogas	646.3	119.8	18.5%	717.1	132.6	18.5%	786.7	145.7	18.5%
Electricity & Heat	Biomass	614.2	124.8	20.3%	678.0	137.9	20.3%	749.5	151.8	20.3%
Electricity & Heat	Combination Systems	77.4	15.5	20.1%	85.2	16.9	19.8%	94.2	18.8	20.0%
Electricity & Heat	Electric Heating	368.7	75.1	20.4%	403.8	82.4	20.4%	450.6	91.8	20.4%
Electricity & Heat	Electric Vehicle Charge Point	431.0	89.6	20.8%	477.7	98.9	20.7%	525.4	108.9	20.7%
Electricity & Heat	Geothermal	276.6	55.4	20.0%	310.2	62.4	20.1%	338.2	67.9	20.1%
Electricity & Heat	Heat Networks	239.4	46.2	19.3%	263.6	51.1	19.4%	291.5	56.4	19.3%
Electricity & Heat	Heat Pumps	1,353.7	231.3	17.1%	1,302.2	248.3	19.1%	1,653.5	283.4	17.1%
Electricity & Heat	Hot Water	442.5	84.9	19.2%	488.8	94.0	19.2%	542.7	104.0	19.2%
Electricity & Heat	Hydrogen	191.6	37.9	19.8%	211.7	41.7	19.7%	233.2	46.1	19.8%
Electricity & Heat	Photovoltaic	825.6	169.6	20.5%	914.0	187.3	20.5%	1,008.9	207.2	20.5%
Electricity & Heat	Wind	152.6	26.9	17.6%	166.5	29.6	17.8%	185.1	32.7	17.7%
Energy Efficiency Meas.	Energy Management	1,247.9	246.2	19.7%	1,383.7	273.4	19.8%	1,525.0	301.5	19.8%
Energy Efficiency Meas.	Energy Saving Lighting	428.8	83.8	19.5%	476.9	93.6	19.6%	524.9	102.8	19.6%
Energy Efficiency Meas.	Ventilation and Air-tightness	12,511.8	2,592.4	20.7%	13,791.9	2,857.2	20.7%	15,254.6	3,168.9	20.8%
Making Good After Works	Cleaning Services	17.1	3.6	20.9%	18.9	3.9	20.9%	20.9	4.4	20.9%
Making Good After Works	Floors	200.8	38.9	19.4%	222.2	43.1	19.4%	244.9	47.2	19.3%
Making Good After Works	Walls & Ceilings	1,813.8	350.7	19.3%	2,009.3	388.8	19.4%	2,211.3	429.5	19.4%
Total		22,774.9	4,580.3	20.1%	24,961.7	5,051.7	20.2%	27,783.3	5,597.7	20.1%

In Table 8 GSENZH’s DEESC 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 2021/22 is 20.1%, with variation between sub-sectors from 17.7% for Heat Pumps through to 21.0% for Battery Technologies.

Table 9: GSENZH’s DEESC Available Exports and Available Exports as a % of Exports 2019/20 to 2021/22

Level 1	Level 2	2019/20			2020/21			2021/22		
		Exports £m	Available Exports £m	Avail. as % of Exports	Exports £m	Available Exports £m	Avail. as % of Exports	Exports £m	Available Exports £m	Avail. as % of Exports
Advisory & Rel. Ser.	Consumer Advisory Services	7.1	4.5	62.4%	8.0	4.9	62.0%	8.7	5.4	62.6%
Advisory & Rel. Ser.	Information Dissemination	4.1	2.4	58.3%	4.5	2.6	58.2%	5.0	2.9	58.1%
Advisory & Rel. Ser.	Sector Development	6.8	4.3	63.2%	7.4	4.7	63.5%	8.2	5.2	63.3%
Advisory & Rel. Ser.	Technical Services	90.0	53.1	59.0%	99.9	59.3	59.3%	109.2	64.9	59.4%
Electricity & Heat	Battery Technologies	80.0	45.0	56.3%	88.7	49.8	56.2%	97.8	54.8	56.0%
Electricity & Heat	Biogas	119.8	78.8	65.8%	132.6	87.3	65.9%	145.7	95.8	65.7%
Electricity & Heat	Biomass	124.8	73.1	58.6%	137.9	81.0	58.7%	151.8	89.1	58.7%
Electricity & Heat	Combination Systems	15.5	9.7	62.8%	16.9	10.7	63.5%	18.8	12.0	63.8%
Electricity & Heat	Electric Heating	75.1	46.7	62.2%	82.4	50.7	61.5%	91.8	56.5	61.6%
Electricity & Heat	Electric Vehicle Charge Point	89.6	51.8	57.8%	98.9	57.6	58.2%	108.9	63.1	58.0%
Electricity & Heat	Geothermal	55.4	32.0	57.6%	62.4	35.8	57.3%	67.9	39.1	57.5%
Electricity & Heat	Heat Networks	46.2	28.9	62.5%	51.1	32.0	62.6%	56.4	35.1	62.3%
Electricity & Heat	Heat Pumps	231.3	140.0	60.5%	248.3	150.2	60.5%	283.4	171.0	60.3%
Electricity & Heat	Hot Water	84.9	50.6	59.6%	94.0	56.0	59.5%	104.0	61.9	59.5%
Electricity & Heat	Hydrogen	37.9	22.8	60.3%	41.7	25.2	60.3%	46.1	27.7	60.1%
Electricity & Heat	Photovoltaic	169.6	97.9	57.7%	187.3	108.1	57.7%	207.2	119.8	57.8%
Electricity & Heat	Wind	26.9	17.2	63.9%	29.6	18.8	63.3%	32.7	20.9	63.8%
Energy Efficiency Meas.	Energy Management	246.2	151.0	61.3%	273.4	167.7	61.3%	301.5	184.4	61.2%
Energy Efficiency Meas.	Energy Saving Lighting	83.8	47.6	56.8%	93.6	53.0	56.7%	102.8	58.6	57.0%
Energy Efficiency Meas.	Ventilation and Air-tightness	2,592.4	1,473.8	56.8%	2,857.2	1,619.3	56.7%	3,168.9	1,795.2	56.7%
Making Good After Works	Cleaning Services	3.6	2.1	59.8%	3.9	2.3	59.2%	4.4	2.6	58.9%
Making Good After Works	Floors	38.9	24.0	61.7%	43.1	26.7	62.0%	47.2	29.2	61.8%
Making Good After Works	Walls & Ceilings	350.7	207.7	59.2%	388.8	229.5	59.0%	429.5	252.4	58.8%
Total		4,580.3	2,664.8	58.2%	5,051.7	2,933.2	58.1%	5,597.7	3,247.6	58.0%

In Table 9 GSENZH’s DEESC 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 2021/22 is 58.0%, with variation between sub-sectors.

The sub-sectors with above average available export to export ratio in 2021/22 and at least double-digit exports are: Biogas 65.7%; Combination Systems 63.8%; Wind 63.8%; Heat Networks 62.3%; Floors 61.8%; Electric Heating 61.6%; Energy Management 61.2%; Heat Pumps 60.3%; Hydrogen 60.1%; Hot Water 59.5%; Technical Services 59.4%; Walls and Ceilings 58.8% and Biomass 58.7%.

Table 10: GSENZH’s DEESC Imports as a % of Sales 2019/20 to 2021/22

Level 1	Level 2	2019/20			2020/21			2021/22		
		Sales £m	Imports £m	Imports as % of Sales	Sales £m	Imports £m	Imports as % of Sales	Sales £m	Imports £m	Imports as % of Sales
Advisory & Rel. Ser.	Consumer Advisory Services	35.4	5.2	14.8%	39.1	5.8	14.9%	43.1	6.4	14.8%
Advisory & Rel. Ser.	Information Dissemination	19.9	2.8	14.1%	21.9	3.1	14.2%	24.2	3.4	14.1%
Advisory & Rel. Ser.	Sector Development	35.5	5.4	15.1%	38.9	5.9	15.2%	43.2	6.5	15.1%
Advisory & Rel. Ser.	Technical Services	462.4	64.3	13.9%	516.1	71.6	13.9%	565.3	78.9	13.9%
Electricity & Heat	Battery Technologies	382.0	51.9	13.6%	424.0	57.7	13.6%	466.6	63.3	13.6%
Electricity & Heat	Biogas	646.3	93.7	14.5%	717.1	104.2	14.5%	786.7	114.3	14.5%
Electricity & Heat	Biomass	614.2	95.5	15.6%	678.0	105.3	15.5%	749.5	116.7	15.6%
Electricity & Heat	Combination Systems	77.4	10.5	13.6%	85.2	11.5	13.5%	94.2	12.7	13.5%
Electricity & Heat	Electric Heating	368.7	50.5	13.7%	403.8	55.8	13.8%	450.6	62.2	13.8%
Electricity & Heat	Electric Vehicle Charge Point	431.0	63.7	14.8%	477.7	70.5	14.8%	525.4	77.3	14.7%
Electricity & Heat	Geothermal	276.6	37.3	13.5%	310.2	41.8	13.5%	338.2	45.7	13.5%
Electricity & Heat	Heat Networks	239.4	33.5	14.0%	263.6	36.9	14.0%	291.5	40.7	14.0%
Electricity & Heat	Heat Pumps	1,353.7	176.7	13.1%	1,302.2	190.9	14.7%	1,653.5	216.5	13.1%
Electricity & Heat	Hot Water	442.5	59.9	13.5%	488.8	66.5	13.6%	542.7	73.4	13.5%
Electricity & Heat	Hydrogen	191.6	27.2	14.2%	211.7	29.9	14.1%	233.2	33.1	14.2%
Electricity & Heat	Photovoltaic	825.6	120.9	14.6%	914.0	135.1	14.8%	1,008.9	148.5	14.7%
Electricity & Heat	Wind	152.6	21.6	14.1%	166.5	23.5	14.1%	185.1	26.2	14.1%
Energy Efficiency Meas.	Energy Management	1,247.9	180.7	14.5%	1,383.7	200.1	14.5%	1,525.0	220.5	14.5%
Energy Efficiency Meas.	Energy Saving Lighting	428.8	60.2	14.0%	476.9	66.8	14.0%	524.9	73.3	14.0%
Energy Efficiency Meas.	Ventilation and Air-tightness	12,511.8	1,777.3	14.2%	13,791.9	1,952.5	14.2%	15,254.6	2,169.3	14.2%
Making Good After Works	Cleaning Services	17.1	2.6	15.4%	18.9	2.9	15.6%	20.9	3.3	15.6%
Making Good After Works	Floors	200.8	29.6	14.8%	222.2	32.9	14.8%	244.9	36.3	14.8%
Making Good After Works	Walls & Ceilings	1,813.8	269.8	14.9%	2,009.3	300.2	14.9%	2,211.3	329.4	14.9%
Total		22,774.9	3,240.8	14.2%	24,961.7	3,571.4	14.3%	27,783.3	3,957.8	14.2%

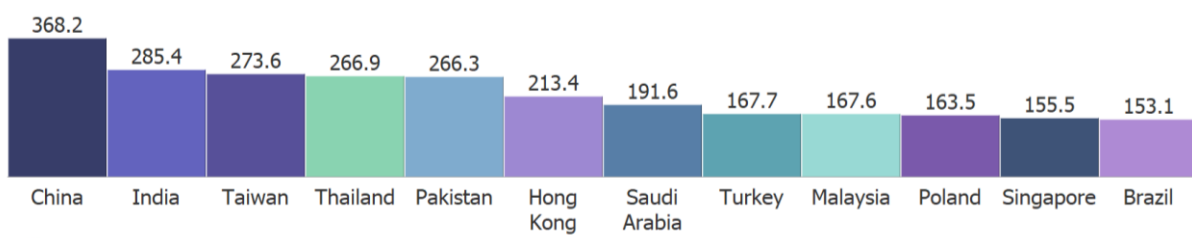
Table 10 shows GSENZH’s DEESC imports sub-sector for each of the three years of the report and have been expressed as a percentage of that sub-sector’s overall sales. The overall average for 2021/22 is 14.2%, with variation across the sub-sector from 13.1% for Heat Pumps to 15.6% for Biomass and Cleaning Services.

The Top 12 destinations for GSENZH’s DEESC exports are shown in Figure 64. China is the top destination, followed by India, Taiwan, Thailand, Pakistan, Hong Kong, Saudi Arabia, Turkey, Malaysia, 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 DEESC. This follows the same trend as the trading pattern for the wider Low Carbon Environmental Goods and Services (LCEGS) sector, which has been a feature of international trade in LCEGS since 2007/08 when the analysis first began.

The DEESC and wider 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 64: Top 12 GSENZH’s DEESC Export Destinations 2021/22



3.2 GSENZH’s DEESC Priority Markets

Tables 11 and 12 combine analysis of GSENZH’s DEESC product and service exports with destination countries using heat maps. The tables show the value of exports in £m and then colour codes the values – dark green for higher values and white for lower values. The tables have been simplified by excluding the lowest value destination countries, showing the top thirty-two export destinations for all Level 2 sub-sectors. The two largest Level 1 sub-sectors, for both Sales and Exports are Energy Efficiency Measures and Electricity and Heat, with Ventilation and Air-tightness in particular dominating any heat map. For this reason, the Level sub-sectors Energy Efficiency Measures, Making Good After Works and Advisory Related services are displayed in Table 11 and Electricity and Heat in Table 12, so the heat mapping of Electricity and Heat are more easily viewed. Note: Russia was number 22 for exports in 2021/22 and has been included for completeness, and for reference, the 33rd top export country in 2021/22 was Iran.

Table 11: GSENZH’s Level 2 Exports by Country for 2021/22 in £m – Energy Efficiency Measures, Making Good After Works and Advisory and Related Services

Level 1	Level 2	Australia	Brazil	Canada	Chile	China	Denmark	France	Germany	Hong Kong	Hungary	India	Indonesia	Italy	Japan	Malaysia	Mexico
A.&.R.S.	Consumer Advisory	0.1	0.3	0.2	0.0	0.6	0.1	0.1	0.1	0.3	0.2	0.5	0.1	0.1	0.1	0.3	0.1
A.&.R.S.	Info. Dissemination	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.2	0.0
A.&.R.S.	Sector Development	0.1	0.2	0.2	0.0	0.6	0.1	0.1	0.1	0.3	0.2	0.4	0.1	0.1	0.1	0.3	0.1
A.&.R.S.	Technical Services	1.4	3.1	2.5	0.4	7.7	1.9	1.6	1.8	4.2	2.4	5.8	1.4	1.6	1.8	3.5	0.9
E.E.M	Energy Management	3.9	8.4	6.8	1.0	20.5	4.8	4.2	4.8	12.0	6.4	15.6	3.8	4.2	4.7	9.5	2.3
E.E.M	Energy Saving Lighting	1.3	2.8	2.3	0.3	7.1	1.7	1.4	1.6	4.2	2.2	5.7	1.3	1.4	1.6	3.1	0.8
E.E.M	Ventil. & Air-tightness	38.1	83.4	67.1	9.8	201.8	48.9	42.6	48.0	116.8	65.2	156.9	38.1	41.4	47.2	90.0	23.2
M.G.A.W.	Cleaning Services	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.1	0.1	0.1	0.0
M.G.A.W.	Floors	0.6	1.4	1.1	0.2	3.2	0.8	0.7	0.8	1.9	1.0	2.6	0.6	0.6	0.8	1.5	0.4
M.G.A.W.	Walls & Ceilings	5.6	12.2	10.0	1.4	28.7	6.9	6.4	7.0	17.2	9.3	22.2	5.6	6.1	6.7	13.5	3.3

Level 1	Level 2	Netherlands	Pakistan	Poland	Portugal	Romania	Russia	Saudi Arabia	Singapore	South Africa	South Korea	Sweden	Taiwan	Thailand	Turkey	UAE	US
A.&.R.S.	Consumer Advisory	0.2	0.4	0.3	0.1	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.4	0.4	0.3	0.2	0.1
A.&.R.S.	Info. Dissemination	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.0
A.&.R.S.	Sector Development	0.2	0.4	0.3	0.1	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.4	0.4	0.3	0.2	0.1
A.&.R.S.	Technical Services	2.1	5.2	3.3	1.4	2.1	1.6	4.0	3.2	1.6	1.7	1.1	5.5	5.5	3.5	3.0	1.1
E.E.M	Energy Management	5.5	14.4	8.9	3.8	5.7	4.3	10.8	8.7	4.3	4.7	2.9	14.9	14.8	9.2	8.2	3.1
E.E.M	Energy Saving Lighting	2.1	5.0	3.0	1.3	1.8	1.5	3.7	3.0	1.5	1.6	1.0	5.0	4.8	3.1	2.7	1.1
E.E.M	Ventil. & Air-tightness	56.7	148.7	89.9	38.8	56.2	44.5	104.3	84.7	42.7	46.0	28.7	152.1	145.1	91.9	80.6	30.5
M.G.A.W.	Cleaning Services	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.0
M.G.A.W.	Floors	0.9	2.3	1.5	0.6	0.9	0.7	1.7	1.4	0.7	0.7	0.5	2.3	2.4	1.5	1.3	0.5
M.G.A.W.	Walls & Ceilings	8.0	20.4	13.2	5.3	8.1	6.2	15.3	12.3	6.1	7.0	4.4	21.5	22.0	13.5	11.7	4.5

Table 11 can be read horizontally to identify the strongest exporting sub-sectors i.e., Ventilation and Air-tightness, vertically to identify the strongest trading partners i.e., China, and using both vertical and horizontal you can identify strong niches like Energy Management to Hong Kong.

Table 12: GSENZH’s Level 2 Exports by Country for 2021/22 in £m – Electricity and Heat

Level 1	Level 2	Australia	Brazil	Canada	Chile	China	Denmark	France	Germany	Hong Kong	Hungary	India	Indonesia	Italy	Japan	Malaysia	Mexico
E. & H.	Battery Technologies	1.2	2.7	2.1	0.3	6.2	1.5	1.4	1.5	3.6	1.9	4.8	1.2	1.3	1.4	2.9	0.7
E. & H.	Biogas	2.0	4.4	3.5	0.5	10.6	2.5	2.2	2.5	6.1	3.4	8.2	1.9	2.1	2.4	4.9	1.2
E. & H.	Biomass	1.9	4.2	3.3	0.5	10.0	2.4	2.1	2.4	5.7	3.3	7.7	1.9	2.1	2.3	4.7	1.1
E. & H.	Combination Systems	0.2	0.5	0.4	0.1	1.3	0.3	0.3	0.3	0.7	0.4	1.0	0.2	0.3	0.3	0.6	0.1
E. & H.	Electric Heating	1.1	2.5	2.0	0.3	6.2	1.4	1.3	1.4	3.4	1.9	4.7	1.1	1.2	1.3	2.9	0.7
E. & H.	E. V. Charge Point	1.3	2.9	2.4	0.3	7.2	1.7	1.5	1.7	4.0	2.3	5.5	1.3	1.4	1.6	3.3	0.8
E. & H.	Geothermal	0.8	1.9	1.5	0.2	4.4	1.1	0.9	1.1	2.6	1.5	3.5	0.9	0.9	1.1	2.1	0.5
E. & H.	Heat Networks	0.7	1.6	1.3	0.2	3.9	0.9	0.8	0.9	2.2	1.2	3.0	0.7	0.8	0.9	1.8	0.4
E. & H.	Heat Pumps	4.2	9.3	7.1	1.0	21.8	5.2	4.5	5.1	12.6	7.1	17.4	4.0	4.5	5.2	10.4	2.5
E. & H.	Hot Water	1.3	3.0	2.5	0.3	7.1	1.7	1.6	1.7	4.0	2.3	5.4	1.3	1.5	1.7	3.3	0.8
E. & H.	Hydrogen	0.6	1.3	1.0	0.2	3.1	0.7	0.6	0.7	1.8	1.0	2.4	0.6	0.6	0.7	1.5	0.3
E. & H.	Photovoltaic	2.5	5.8	4.5	0.6	13.3	3.3	2.8	3.1	7.8	4.3	10.1	2.5	2.7	3.2	6.3	1.5
E. & H.	Wind	0.5	1.0	0.9	0.1	2.5	0.6	0.5	0.6	1.4	0.8	1.8	0.5	0.5	0.6	1.1	0.3

Level 1	Level 2	Netherlands	Pakistan	Poland	Portugal	Romania	Russia	Saudi Arabia	Singapore	South Africa	South Korea	Sweden	Taiwan	Thailand	Turkey	UAE	US
E. & H.	Battery Technologies	1.7	4.5	2.7	1.2	1.7	1.3	3.3	2.6	1.3	1.4	0.9	4.6	4.6	2.8	2.5	0.9
E. & H.	Biogas	2.8	7.5	4.7	2.0	2.9	2.3	5.4	4.5	2.2	2.4	1.5	7.7	7.7	4.8	4.2	1.6
E. & H.	Biomass	2.7	7.0	4.4	1.9	2.8	2.1	5.1	4.3	2.1	2.2	1.4	7.3	7.4	4.5	4.0	1.5
E. & H.	Combination Systems	0.3	0.9	0.6	0.2	0.3	0.3	0.6	0.5	0.3	0.3	0.2	0.9	0.9	0.6	0.5	0.2
E. & H.	Electric Heating	1.7	4.2	2.6	1.1	1.7	1.3	3.1	2.6	1.2	1.4	0.8	4.3	4.3	2.6	2.4	0.9
E. & H.	E. V. Charge Point	1.9	4.9	3.1	1.3	1.9	1.5	3.6	3.0	1.5	1.6	1.0	5.2	5.0	3.2	2.7	1.0
E. & H.	Geothermal	1.2	3.2	2.0	0.8	1.2	0.9	2.3	1.9	0.9	1.0	0.6	3.2	3.4	2.1	1.8	0.7
E. & H.	Heat Networks	1.0	2.8	1.7	0.7	1.1	0.8	2.0	1.6	0.8	0.9	0.6	2.8	2.8	1.8	1.5	0.6
E. & H.	Heat Pumps	6.0	15.8	9.8	4.1	6.1	4.7	11.6	9.2	4.6	5.1	3.1	16.1	15.8	10.1	8.7	3.3
E. & H.	Hot Water	2.0	5.2	3.2	1.4	2.0	1.5	3.8	3.1	1.5	1.6	1.0	5.2	5.1	3.2	3.0	1.0
E. & H.	Hydrogen	0.8	2.2	1.4	0.6	0.9	0.7	1.6	1.3	0.7	0.7	0.5	2.3	2.2	1.4	1.3	0.5
E. & H.	Photovoltaic	3.7	9.2	5.6	2.5	3.6	2.9	7.3	5.7	2.8	3.0	1.9	9.8	10.0	6.1	5.2	2.0
E. & H.	Wind	0.7	1.8	1.1	0.5	0.7	0.5	1.3	1.0	0.5	0.6	0.3	1.8	1.8	1.1	1.0	0.4

Table 12 shows a similar pattern to Table 11, with China the top export country, across all sub-sectors, with slightly more variation between the other countries of a similar export size, for example, Taiwan is a larger export destination than Thailand, but Thailand had £9.9m of Photovoltaics exported, compared with Taiwan with £9.7m.

Appendix 1

Definition of the Sector

The **Domestic Energy Efficiency Supply Chain** sector is divided into four Level 1 sub-sectors – Electricity & Heat, Energy Efficiency Measures, Making Good After Works and Advisory & Related Services. These are in turn divided into 23 Level 2 sub-sectors:

- The Electricity & Heat sub-sector is made up of the following: Battery Technologies, Biogas, Biomass, Heat Pumps, Electric Heating, Hot Water Geothermal, Heat Networks (Domestic Assets Only), Hydrogen, Photovoltaic, Wind, Electric Vehicle Charge Point and Combination Systems
- The Energy Efficiency Measures sub-sector is made up of the following: Energy Saving Lighting, Energy Management and Ventilation and Air-tightness
- The Making Good After Works sub-sector is made up of the following: Cleaning Services, Walls & Ceilings and Floors
- The Advisory & Related Services sub-sector is made up of the following: Consumer Advisory Services, Technical Services, Information Dissemination and Sector Development

Electricity & Heat activities include 14 Level 2 sub-sectors, divided into 28 Level 3 activity groupings:

- Battery Technologies includes both electrical and thermal stores and batteries
- Biogas includes furnace and energy systems, domestic plants and boilers and related systems
- Biomass includes furnace and energy systems and boilers and related systems
- Heat Pumps includes Air, Ground and Water Sources Heat Pumps
- Electric Heating includes High Retention Storage Heaters
- Hot Water includes Hot Water Systems
- Geothermal includes both horizontal and vertical systems
- Heat Networks (Domestic Assets Only) includes both external and internal physical assets present on the property, it excludes the wider Heat Network
- Hydrogen includes fuels cells, cooking appliances and boilers
- Photovoltaic includes both Photovoltaic PV and Solar Thermal
- Wind entails domestic small wind turbines
- Electric Vehicle Charge Point include both on-road and off-road solutions
- Combination Systems entail project where two or more of the above technologies are combined

Energy Efficiency Measures includes 3 Level 2 sub-sectors, divided into 87 Level 3 activity groupings:

- Energy Saving Lighting Equipment includes all energy saving lighting
- Energy Management includes Home Automation, Smart Heating Controls, Home Energy Systems Integration and Energy Management Systems

- Ventilation and Air-tightness includes Ventilation and Heat Recovery Systems, Energy efficient windows and doors and insulation for walls, roof/lofts and floors and roofing including Park Home Insulation

Making Good After Works includes 3 Level 2 sub-sectors, divided into 13 Level 3 activity groupings:

- Cleaning Services includes Contract Cleaning
- Walls & Ceilings includes plastering and plaster boarding, painting and decorating
- Floors includes both hard flooring and carpet fitting

Advisory & Related Services includes 4 Level 2 sub-sectors, divided into 18 Level 3 activity groupings:

- Consumer Advisory Services includes Funding Advice, After Sales Support and Energy Tariff Advice
- Technical Services includes a range of services such as specification, project planning, retrofit coordination, architectural services, environmental consultancy, monitoring and evaluation, building surveys and planning application services
- Information Dissemination includes Societal Engagement Campaigns, Newscasting and Industry-oriented Publications
- Sector Development includes Societal Behaviour Studies and activities related to Business Model Development, Business Support & Development and Sales Strategy Training

Level 2 sub-sector detail within Level 1 groupings:

Electricity & Heat

Battery Technologies sub-sector includes both electrical and heat battery storage. The activity codes relating to each Level 3 sub-sector include:

- Electrical Batteries, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Thermal Stores (Sensible Heat Storage), split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Thermal Batteries (Latent Heat Storage), split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Thermal Batteries (Thermochemical Heat Storage), split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Biogas sub-sector includes furnace and energy systems, domestic plants and boilers and related systems. The activity codes relating to each Level 3 sub-sector include:

- Biogas Furnace Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Biogas Energy Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

- Biogas Plant (Domestic), split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Biogas Boilers and Related Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Biomass Technologies sub-sector includes furnace and energy systems and boilers and related systems. The activity codes relating to each Level 3 sub-sector include:

- Biomass Furnace Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Biomass Energy Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Biomass Boilers and Related Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Heat Pumps sub-sector includes Air, Ground and Water Sources Heat Pumps. The activity codes relating to each Level 3 sub-sector include:

- Air Source Heat Pumps, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Ground Source Heat Pumps, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Water Source Heat Pumps, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Geothermal sub-sector includes both horizontal and vertical systems. The activity codes relating to each Level 3 sub-sector include:

- Horizontal Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Vertical Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Heat Networks (Domestic Assets Only) sub-sector includes both external and internal physical assets present on the property, it excludes the wider Heat Network. The activity codes relating to each Level 3 sub-sector include:

- External Physical Assets, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Internal Physical Assets, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Hydrogen sub-sector includes fuels cells, cooking appliances and boilers. The activity codes relating to each Level 3 sub-sector include:

- Hydrogen Fuel Cells, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

- Hydrogen Cooking Appliances, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Hydrogen Boilers, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Photovoltaic sub-sector includes both Photovoltaic PV and Solar Thermal. The activity codes relating to each Level 3 sub-sector include:

- Photovoltaic PV, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Solar Thermal, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Wind sub-sector includes domestic small wind turbines. The activity codes relating to the Level 3 sub-sector include:

- Domestic Small Wind Turbines, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Electric Vehicle Charge Point sub-sector includes both on-road and off-road Solutions. The activity codes relating to each Level 3 sub-sector include:

- On-road Solutions, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Off-road Solutions, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Combination Systems sub-sector entail projects where two or more of the above technologies are combined. The activity codes relating to each Level 3 sub-sector include:

- Combination Systems Design includes only the Advisory activity code
- Combination Systems Installation includes only the Installation activity code

Energy Efficiency Measures

Energy Saving Lighting sub-sector includes all energy saving lighting. The activity codes relating to the Level 3 sub-sector include:

- Energy Saving Lighting Equipment, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Energy Management sub-sector includes Home Automation, Smart Heating Controls, Home Energy Systems Integration and Energy Management Systems. The activity codes relating to each Level 3 sub-sector include:

- Home Automation, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Smart Heating Controls, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

- Home Energy Systems Integration, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Energy Management Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance

Ventilation and Air-tightness sub-sector includes Ventilation and Heat Recovery Systems, Energy efficient windows and doors and insulation for walls, roof/lofts and floors and roofing. The activity codes relating to each Level 3 sub-sector include:

- Ventilation and Heat Recovery Systems, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Energy Efficient Windows, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Insulated Doors, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- External Cavity Wall Insulation, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- External Wall Insulating Cladding, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Internal Wall Insulation, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Park Home Insulation, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Roof/Loft Insulation, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Floor Insulation, split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Heating System Insulation (ducting/pipework/cylinders), split by services related to: R&D, Product Design, Manufacture, Advisory, Sales, Installation and Maintenance
- Roofing, split by services related to: Manufacture, Advisory, Sales, Installation and Maintenance

Making Good After Works

Cleaning Services sub-sector includes Contract Cleaning. The activity code relating to this Level 3 sub-sector include:

- Contract Cleaning includes only the Service Activity Code

Walls & Ceilings sub-sector includes plastering and plaster boarding, painting and decorating. The activity codes relating to each Level 3 sub-sector include:

- Plastering and plaster boarding, split by services related to: Manufacture, Advisory, Installation
- Painting and Decorating, split by services related to: Manufacture, Advisory, Installation

Floors sub-sector includes both hard flooring and carpet fitting. The activity codes relating to each Level 3 sub-sector include:

- Hard Flooring, split by services related to: Manufacture, Advisory, Installation
- Carpet Fitting, split by services related to: Manufacture, Advisory, Installation

Advisory & Related Services

Consumer Advisory Services sub-sector includes Funding Advice, After Sales Support and Energy Tariff Advice. The activity code relating to the Level 3 sub-sector are:

- Funding Advice includes only the Advisory Activity Code
- After Sales Support, includes only the Advisory Activity Code
- Energy Tariff Advice includes only the Advisory Activity Code

Technical Services sub-sector includes a range of services such as specification, project planning, architectural services, environmental consultancy, monitoring and evaluation, building surveys and planning application services. The activity code relating to the Level 3 sub-sector are:

- Specification includes only the Professional Services Activity Code
- Technical Advice includes only the Professional Services Activity Code
- Project Planning (Strategy/Approach) includes only the Professional Services Activity Code
- Architectural Services includes only the Professional Services Activity Code
- Environmental Consultancy includes only the Advisory Activity Code
- Monitoring and Evaluation includes only the Professional Services Activity Code
- Building Surveys includes only the Professional Services Activity Code
- Planning Application Services (Listed Buildings etc.) includes only the Professional Services Activity Code
- Retrofit Coordination includes only the Professional Services Activity Code

Information Dissemination sub-sector includes Societal Engagement Campaigns, Newscasting and Industry-oriented Publications. The activity code relating to the Level 3 sub-sector are:

- Societal Engagement Campaigns (e.g., info boards) includes only the Information Activity Code
- Newscasting (early-stage project engagement activities) includes only the Information Activity Code
- Industry-oriented Publication includes only the Information Activity Code

Sector Development sub-sector includes Societal Behaviour Studies and activities related to Business Model Development, Business Support & Development and Sales Strategy Training. The activity code relating to the Level 3 sub-sector are:

- Societal Behaviour Studies includes only the Information Activity Code
- Business Model Development includes only the Information Activity Code
- Business Support & Development includes only the Information Activity Code
- Sales Strategy Training includes only the Information Activity Code

Appendix 2

The kMatrix Methodology

Introduction

This sector is part of the wider LCEGS sector, which (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. Over 11,200 sources were used to compile the data set for this study.

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.

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

The kMatrix 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.

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 – how kMatrix differs

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.

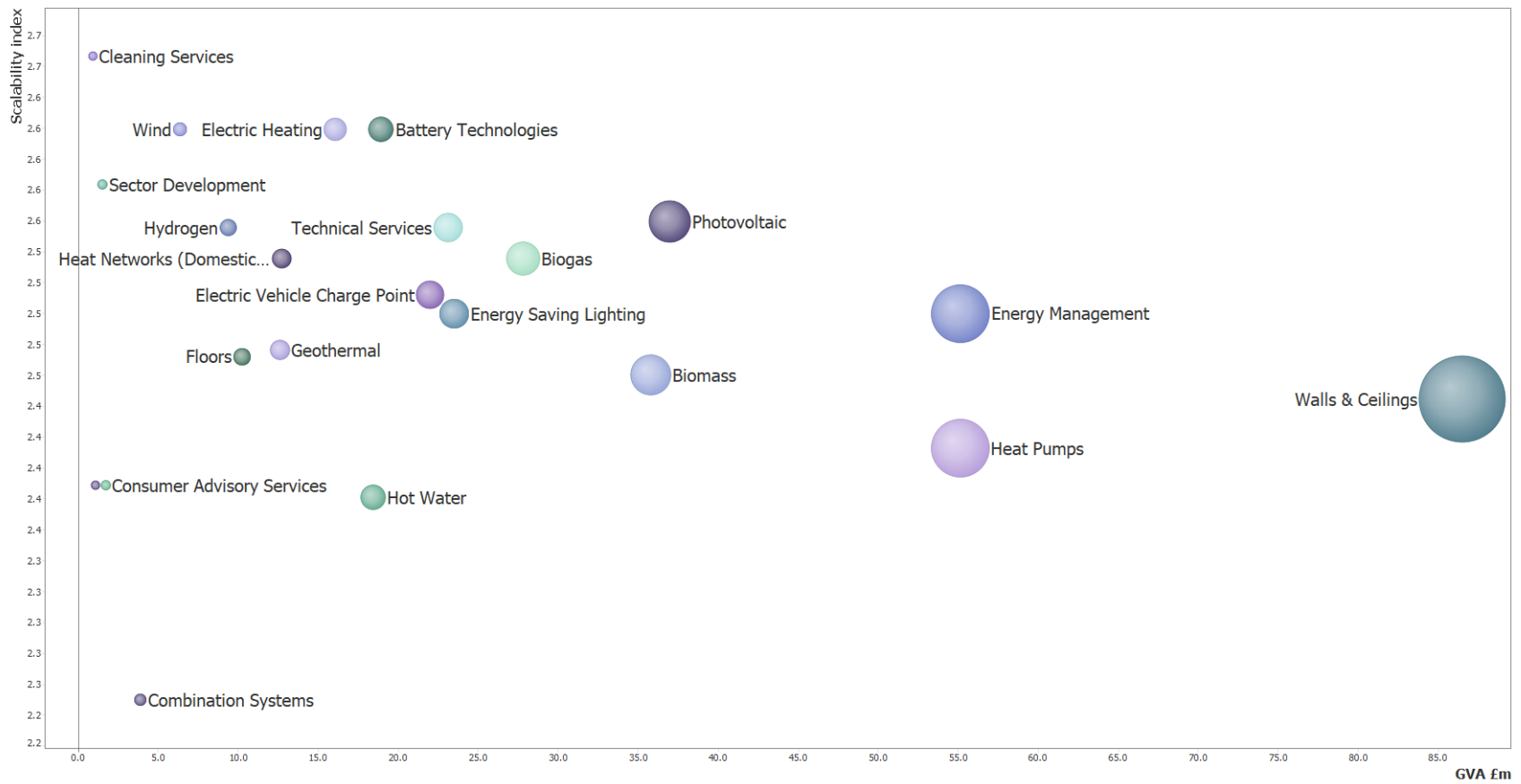
Appendix 4

LEP Scalability Graphs

BerksLEP – Full Sector



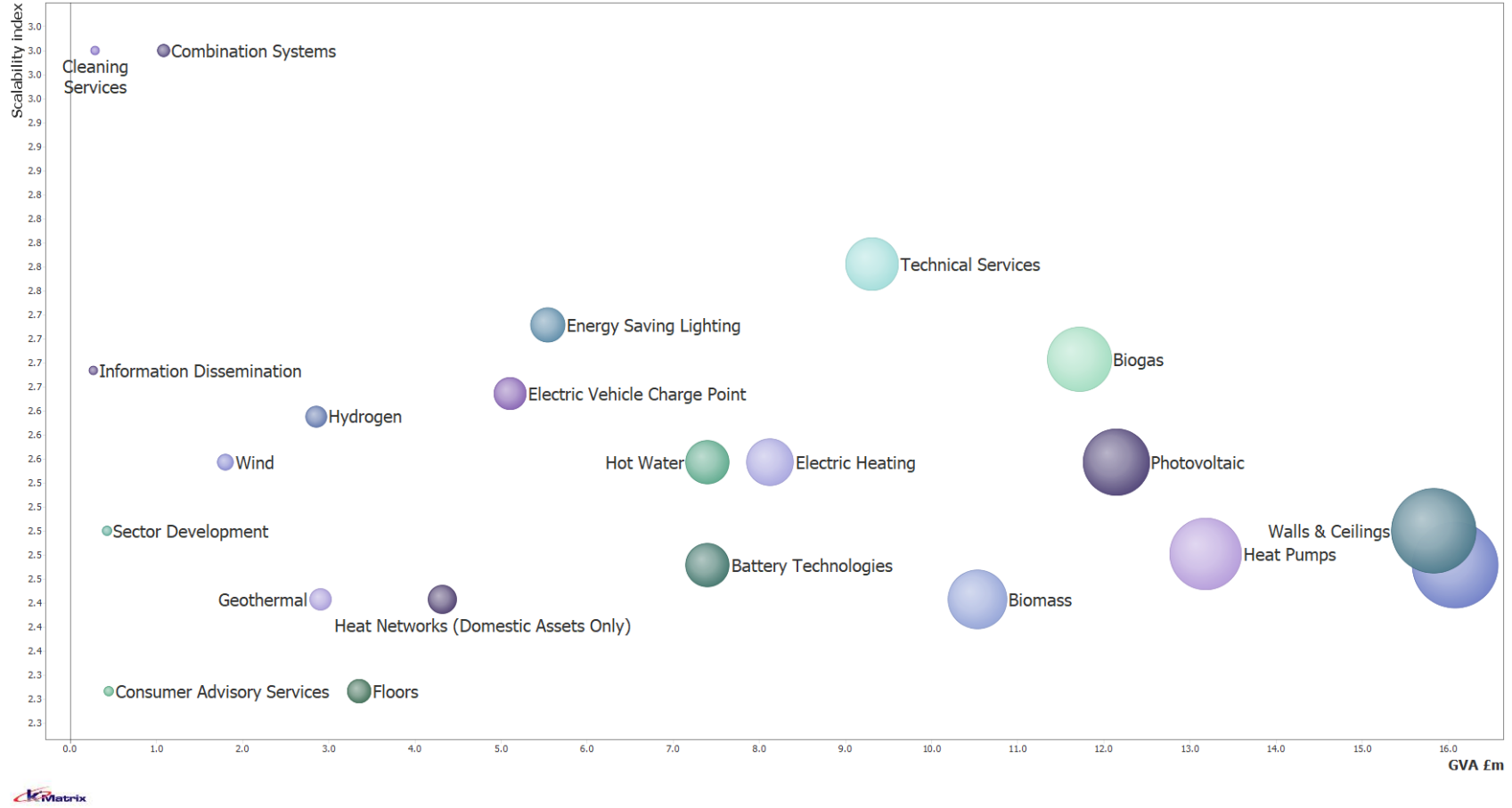
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BucksLEP – Full Sector



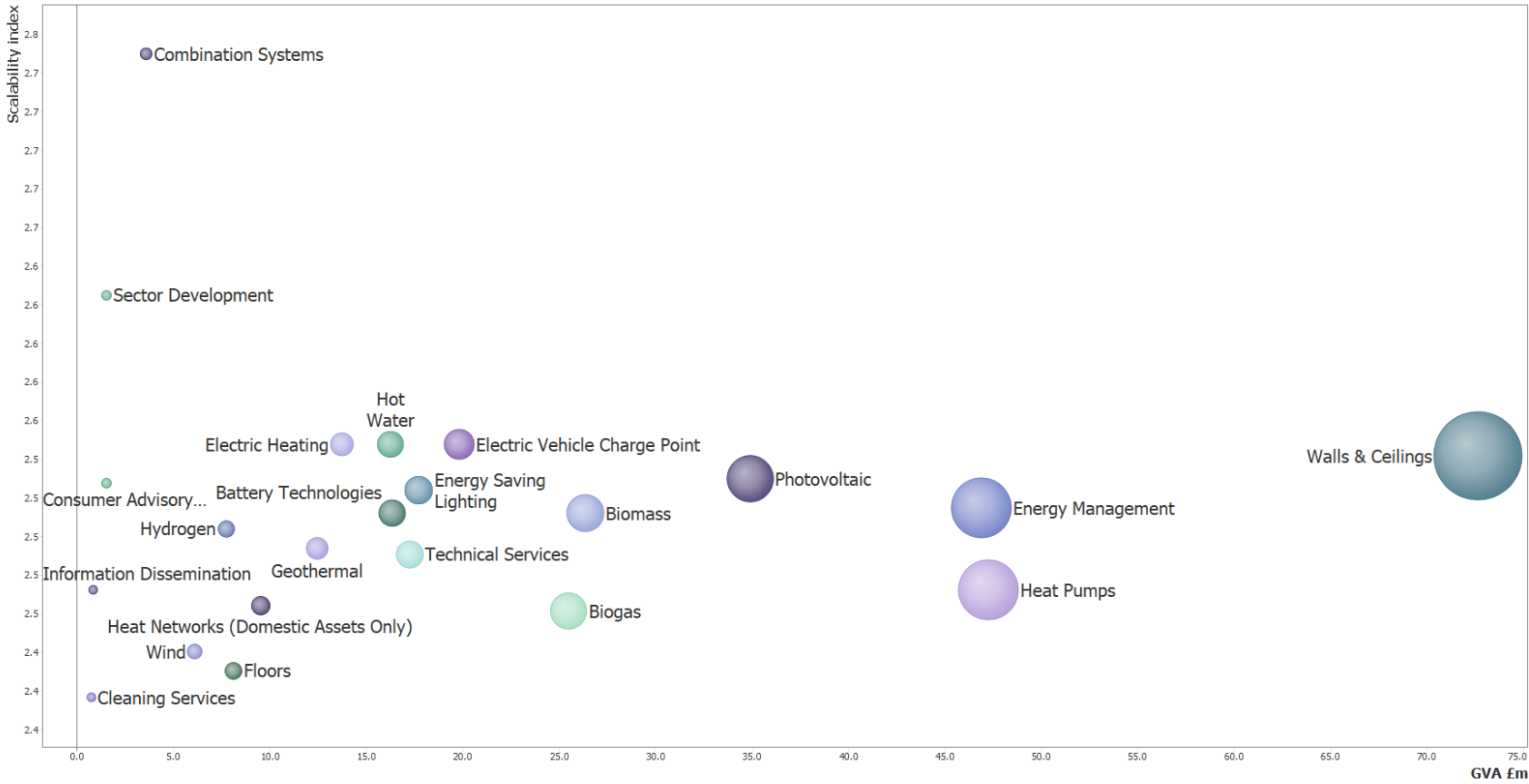
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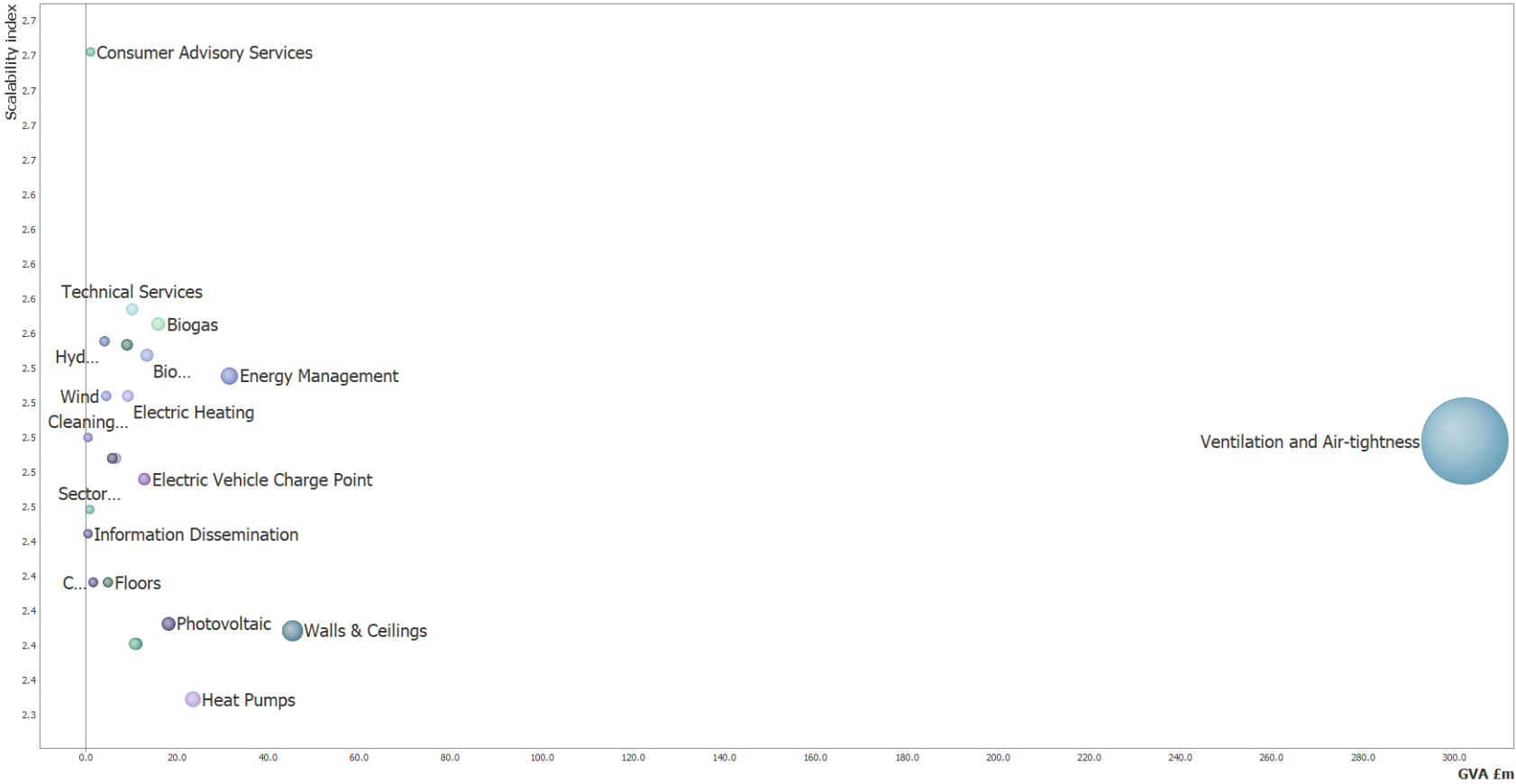
C2CLEP – Full Sector



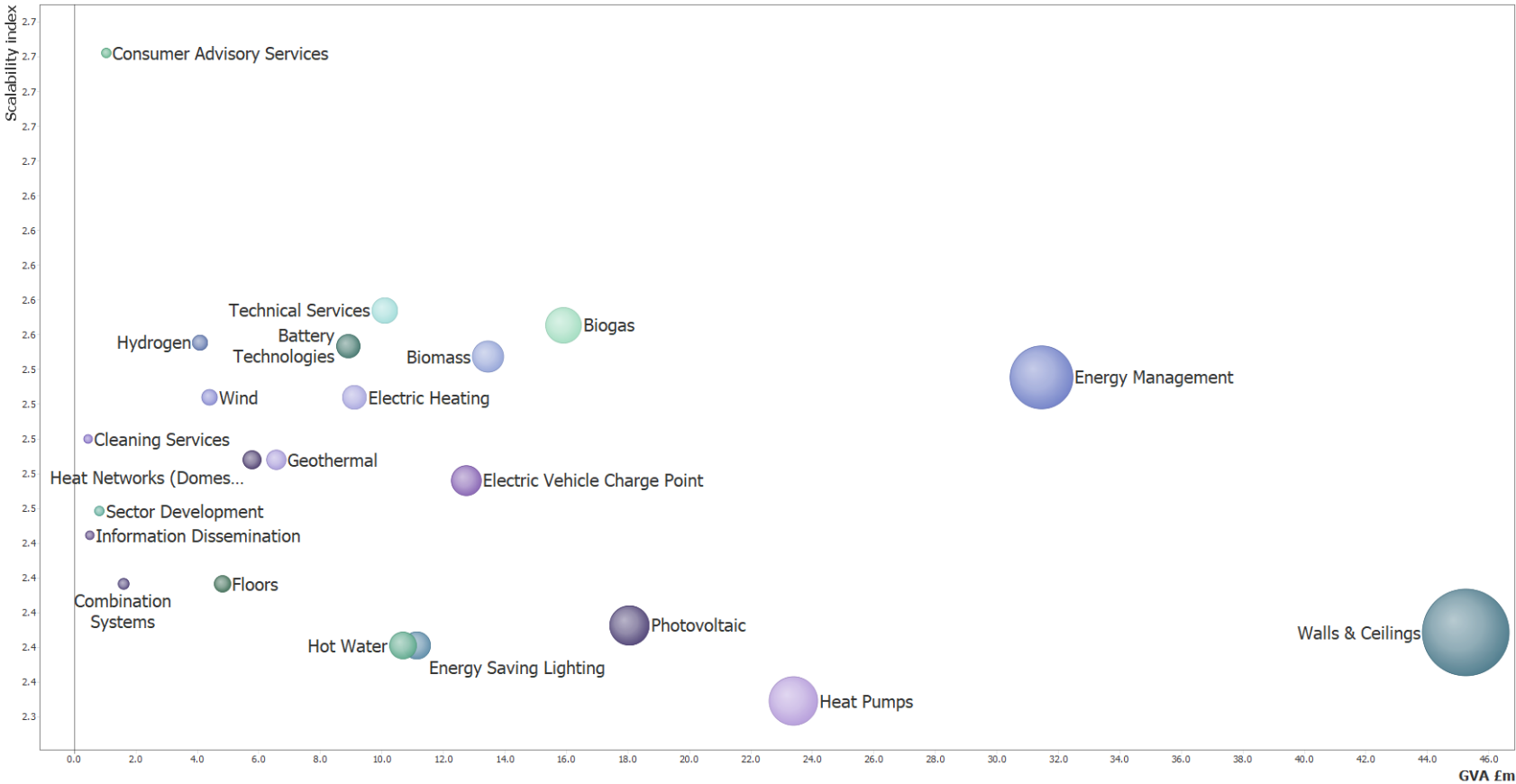
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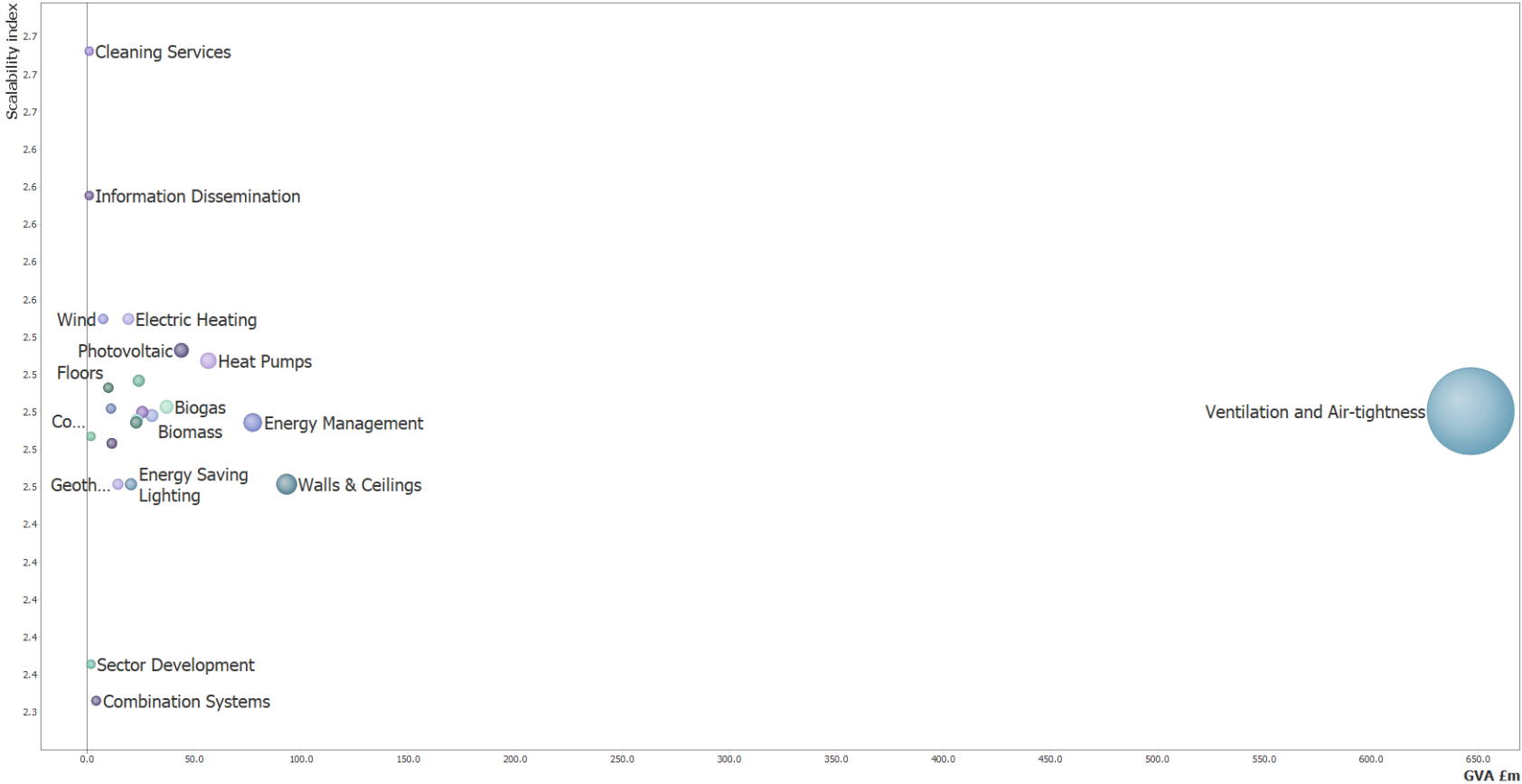
CPCALEP – Full Sector



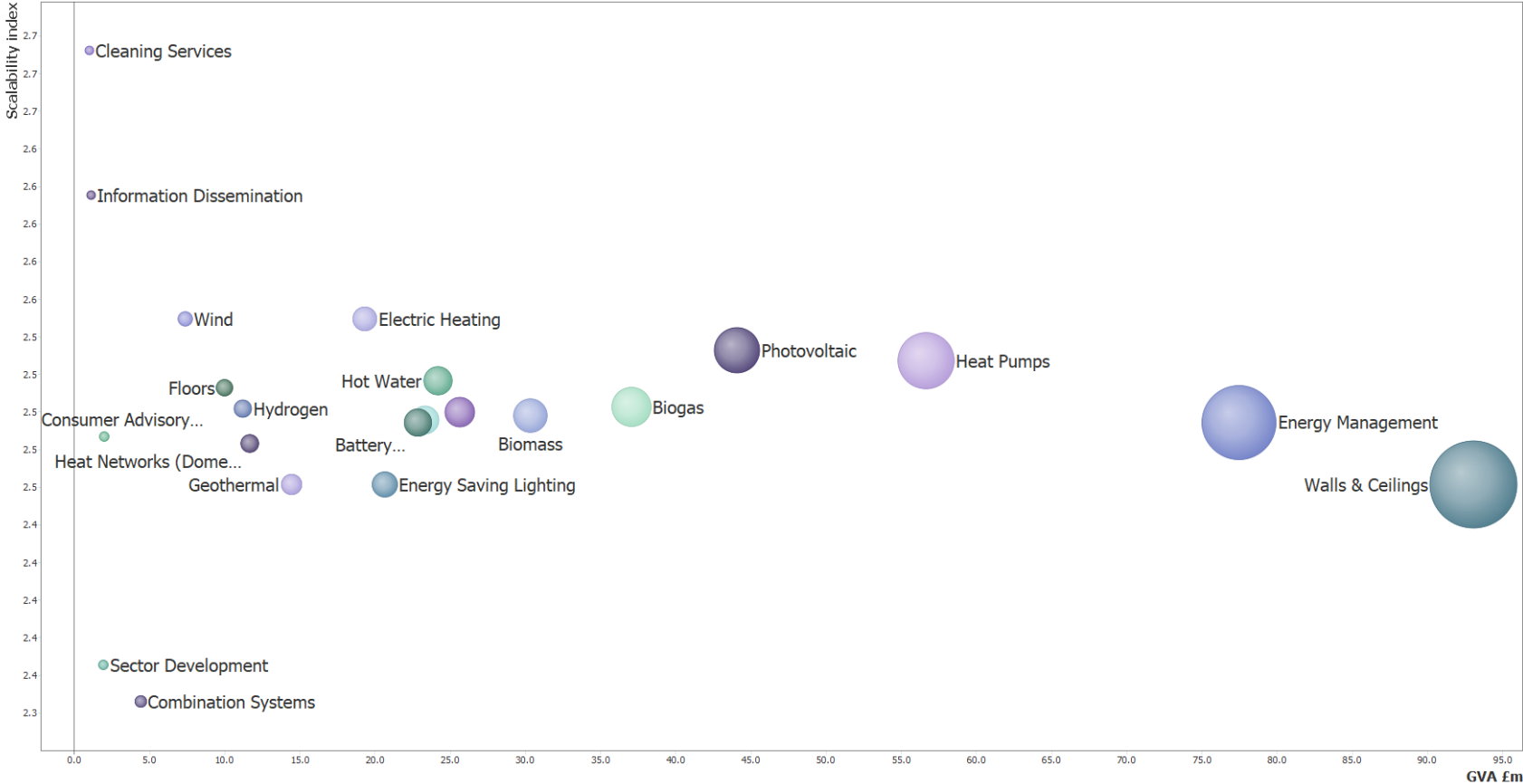
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EM3LEP – Full Sector



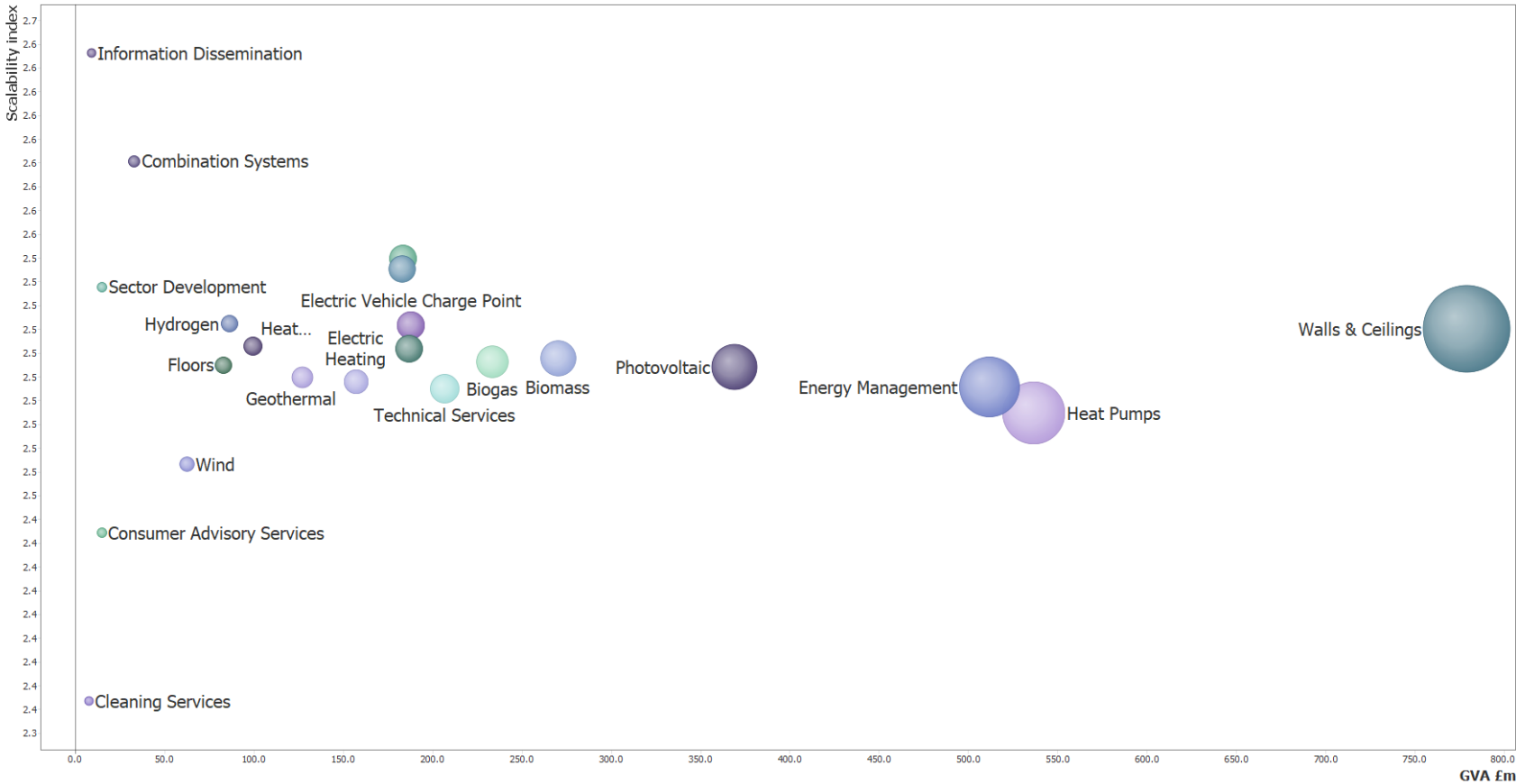
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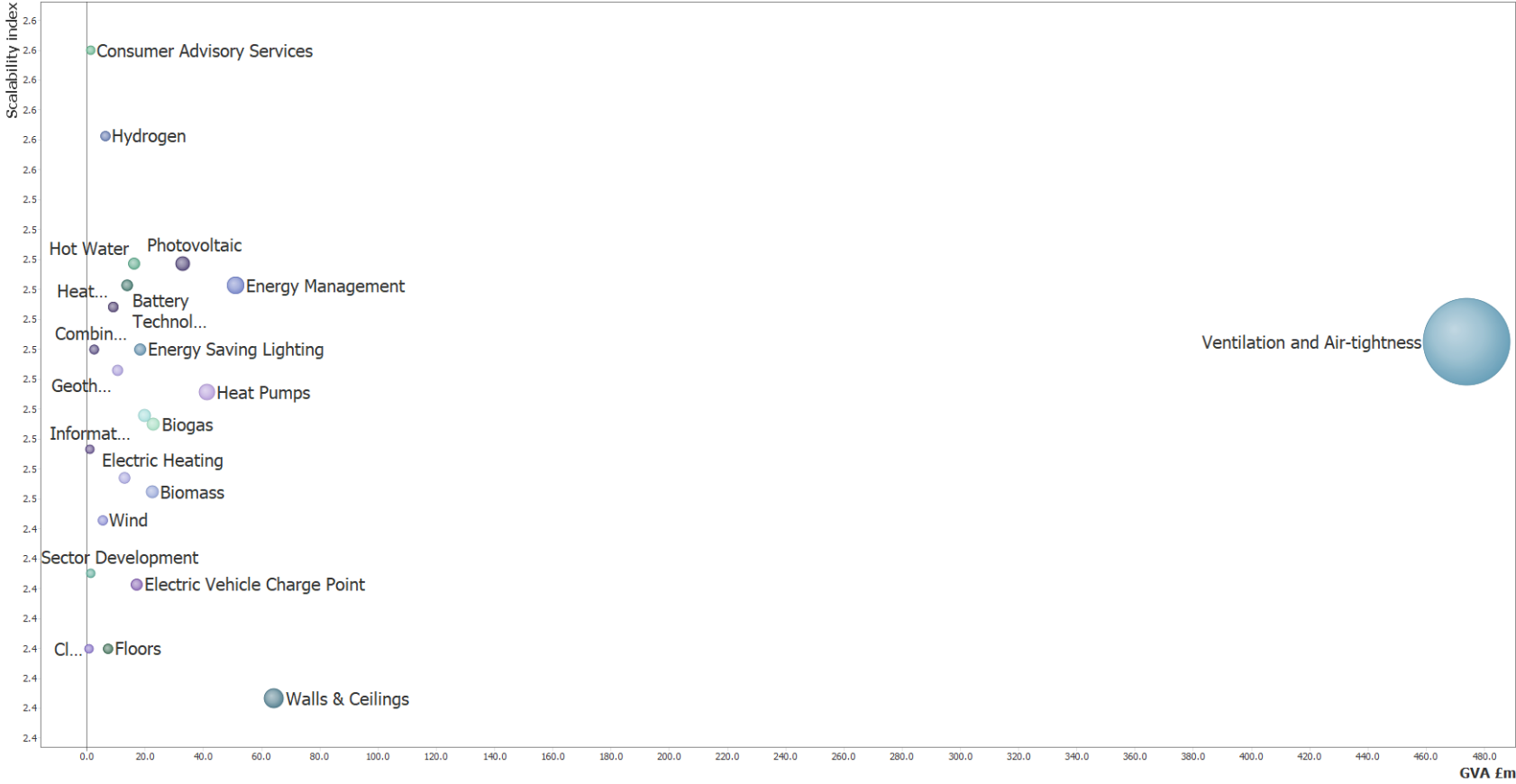
GLALEP – Full Sector



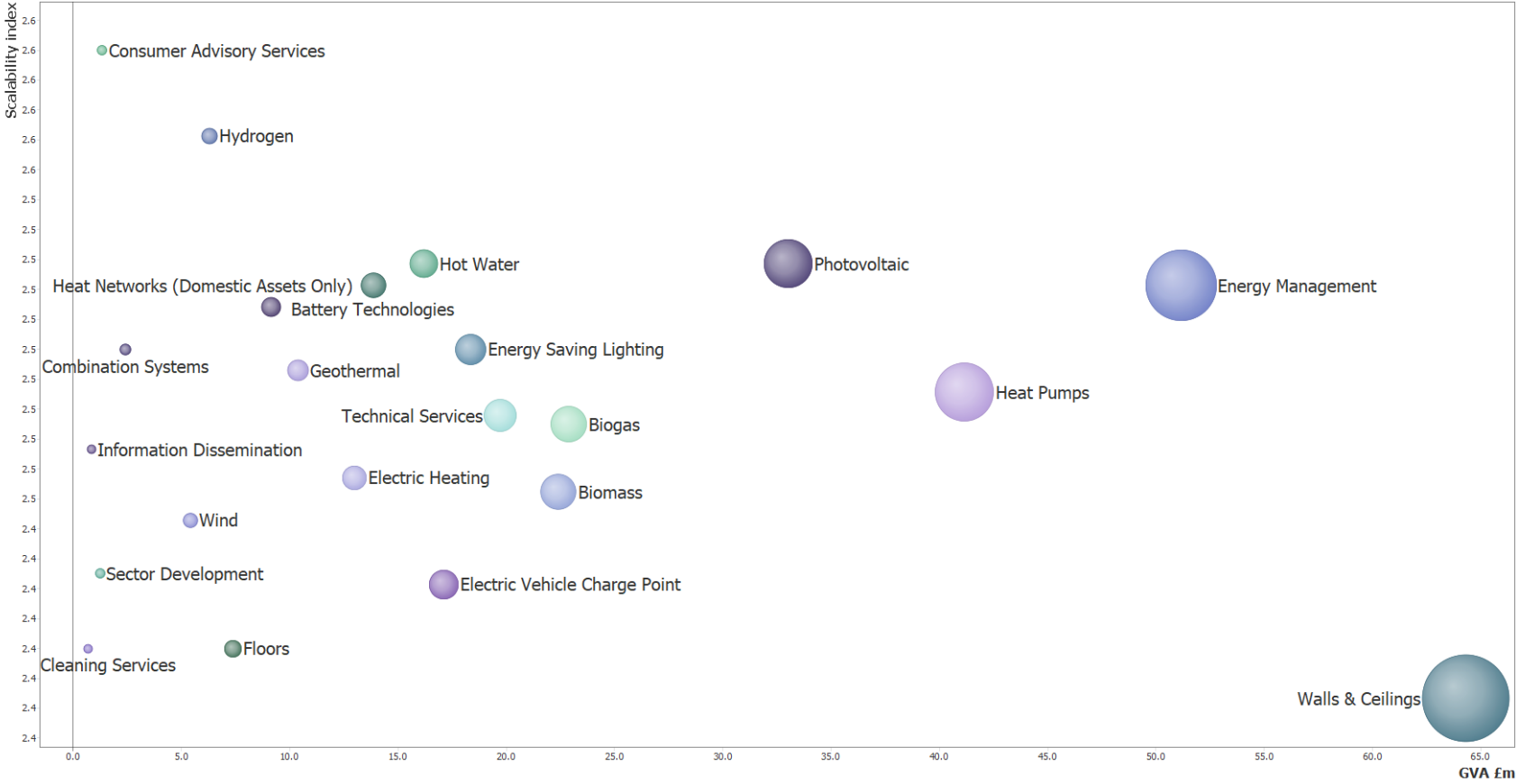
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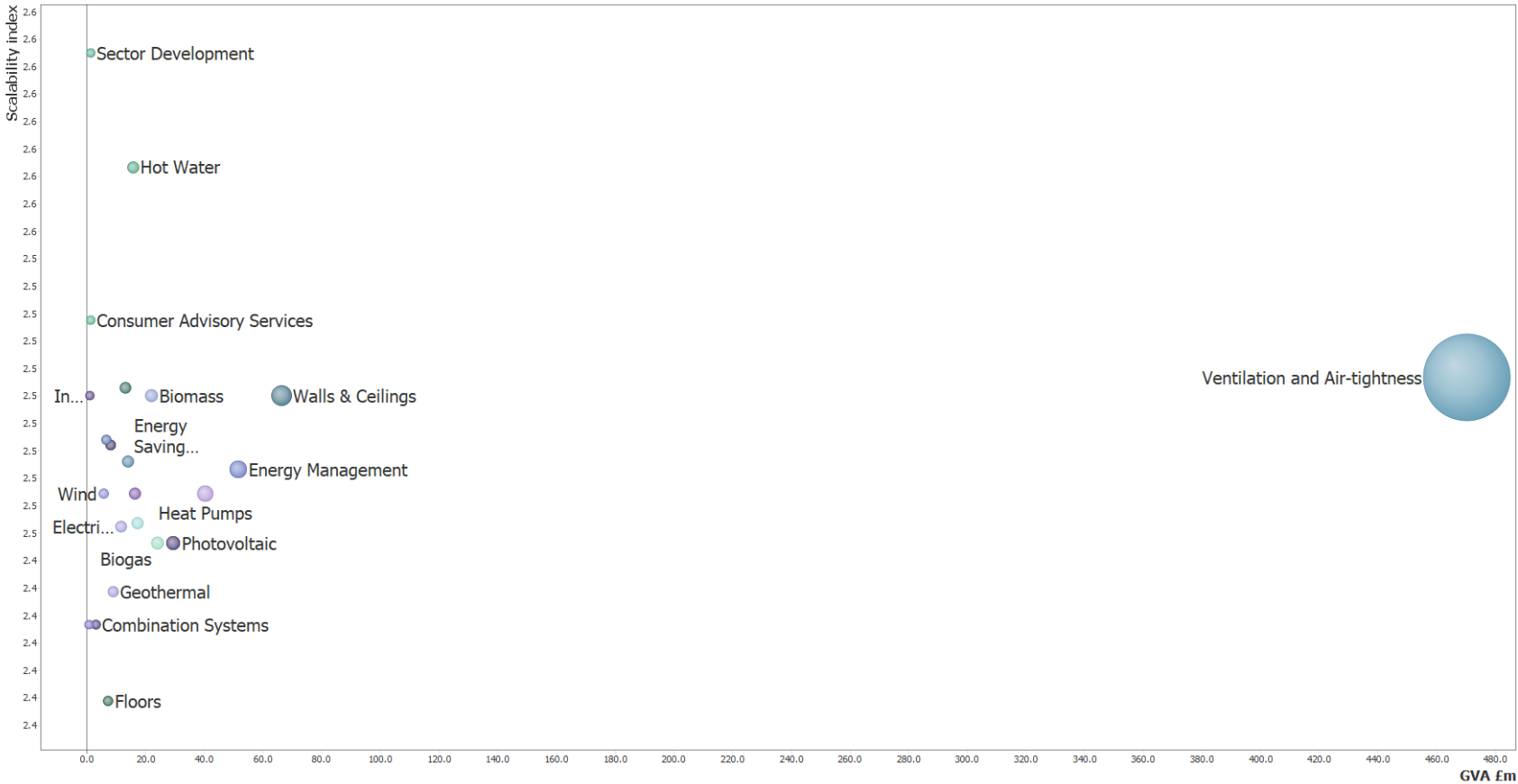
HertsLEP – Full Sector



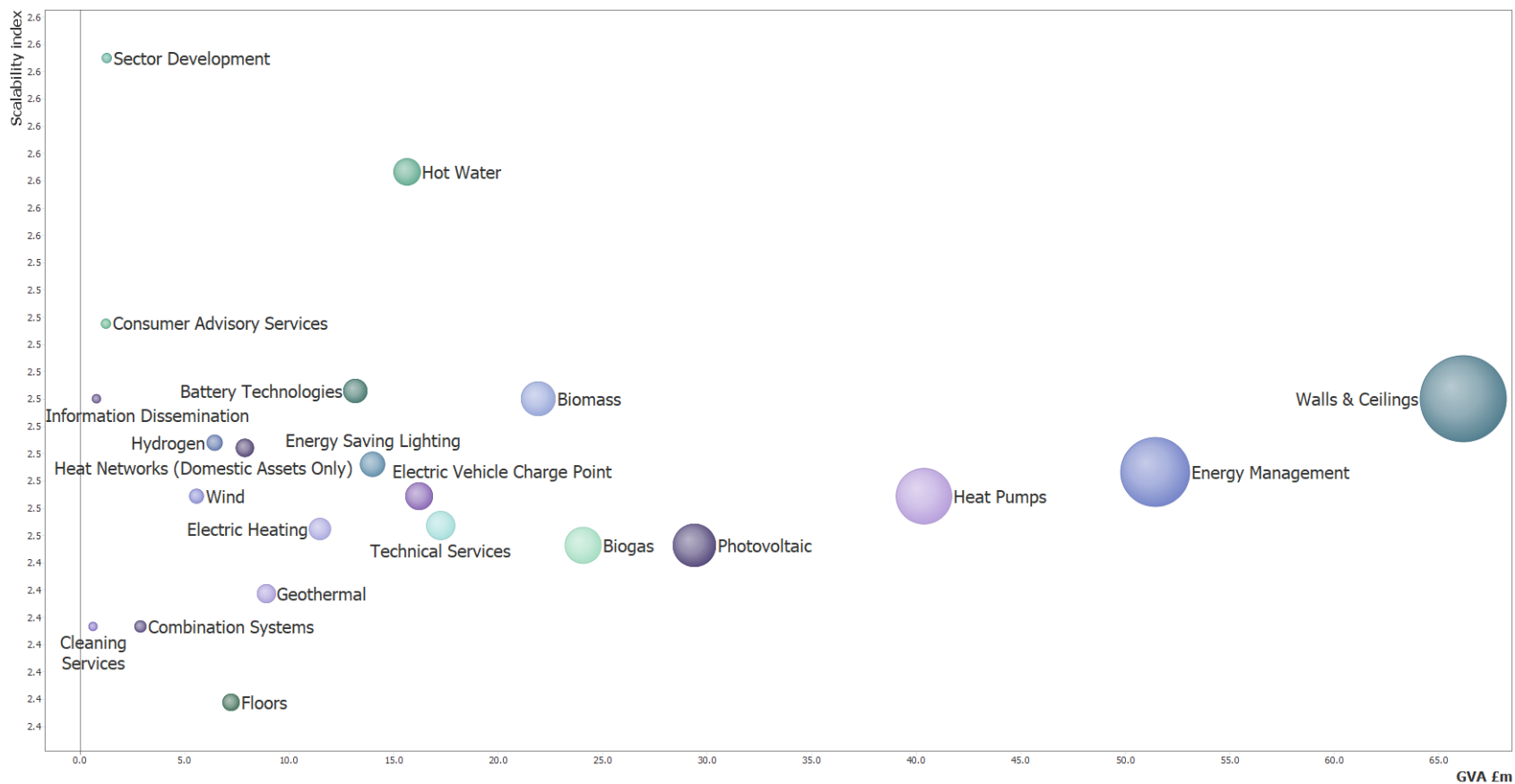
HertsLEP – Ventilation and Air-tightness Removed



NALEP – Full Sector



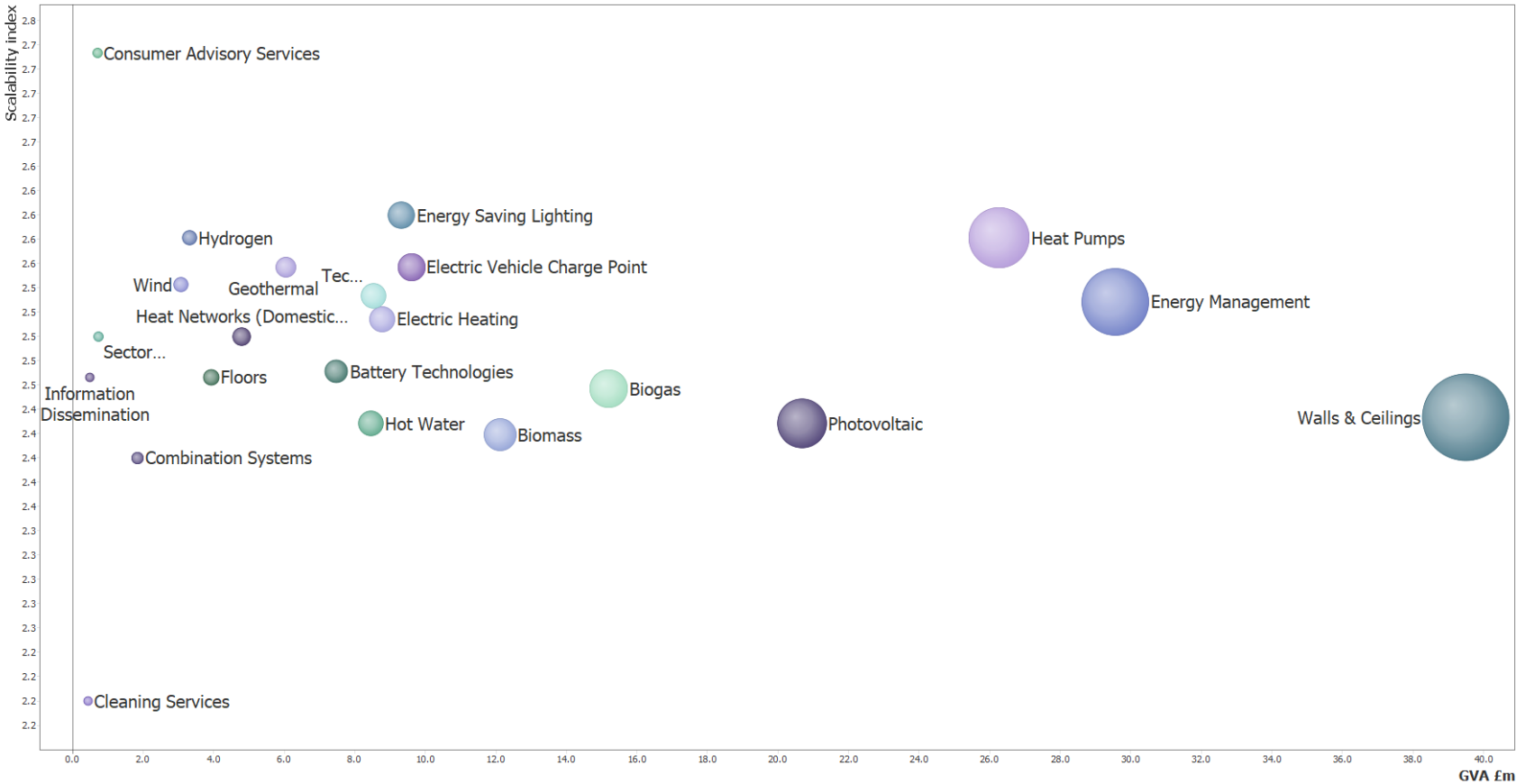
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OxLEP – Full Sector



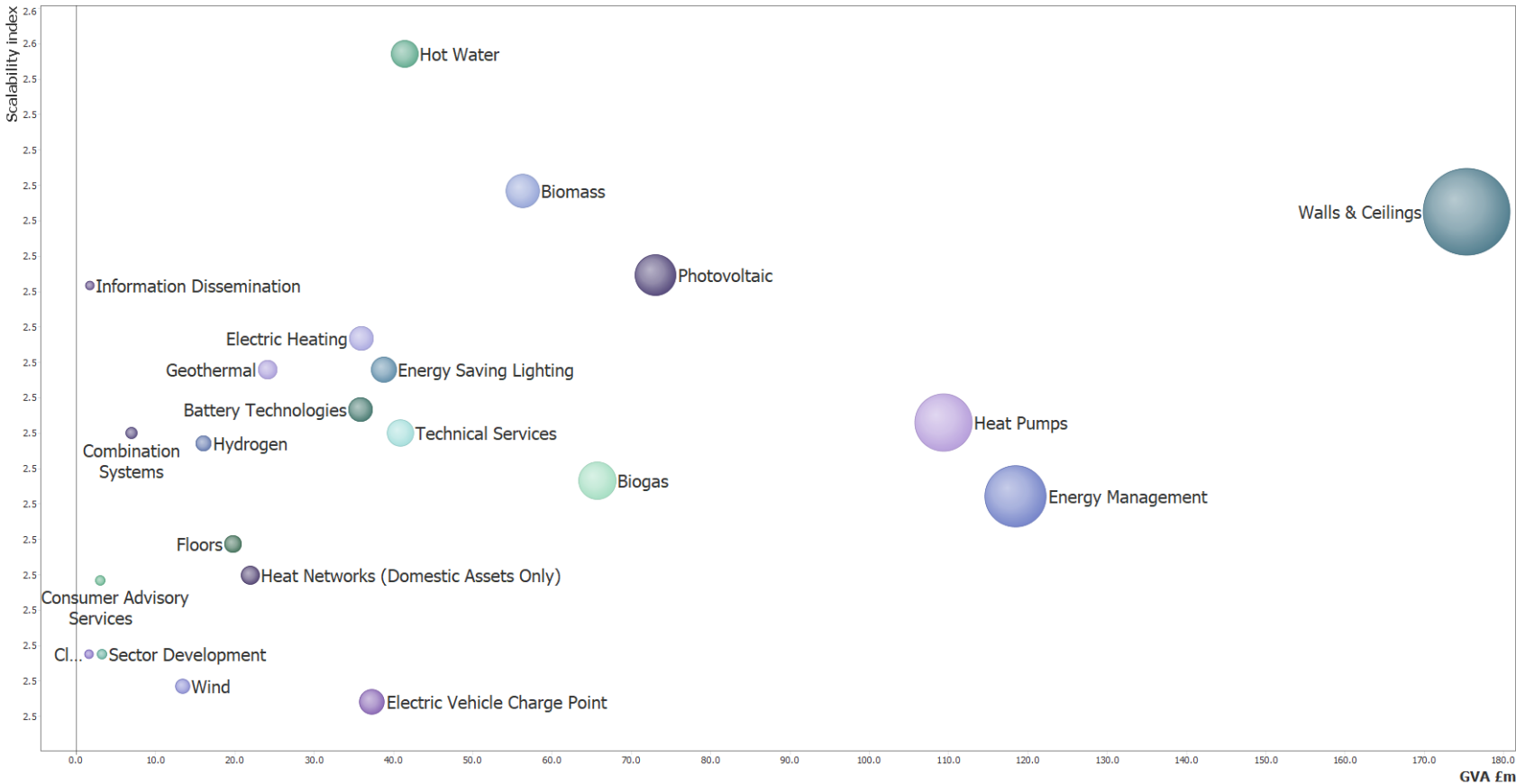
OxLEP – Ventilation and Air-tightness Removed



SELEP – Full Sector



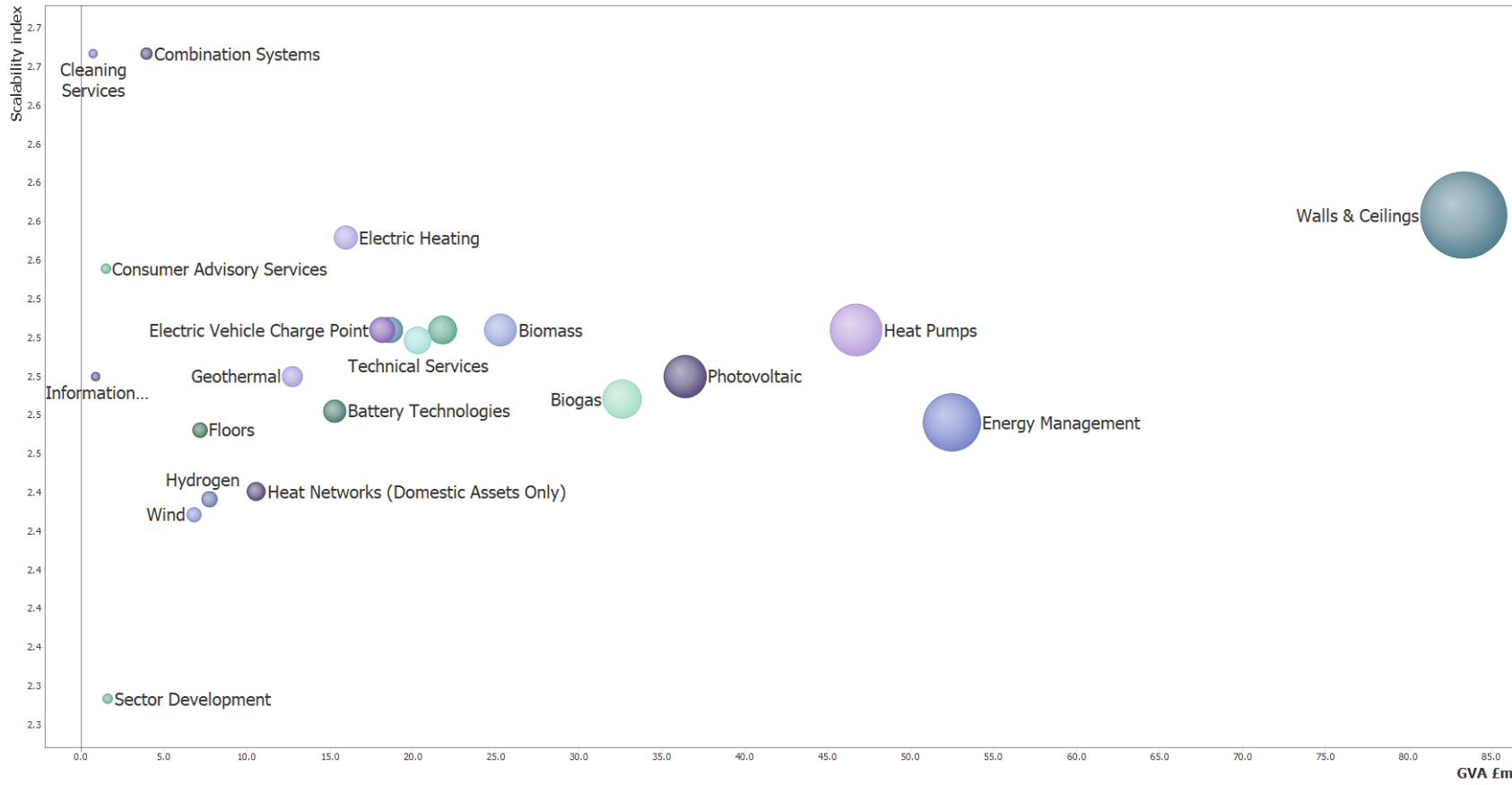
SELEP – Ventilation and Air-tightness Removed



SEMLEP – Full Sector



SEMLEP – Ventilation and Air-tightness Removed



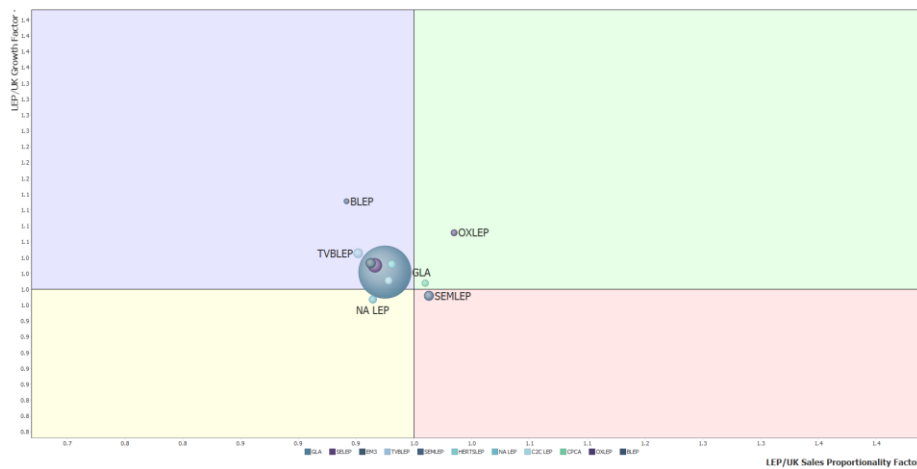
Appendix 5

LEP Strengths and Weaknesses Compared

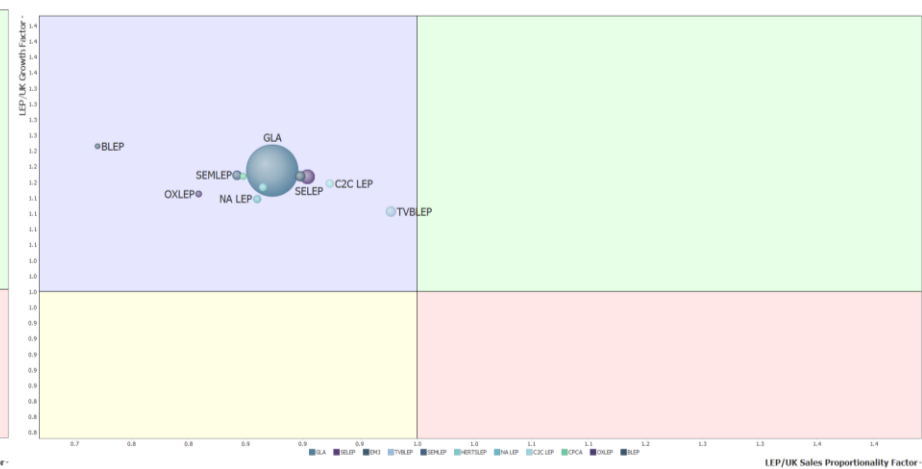
In the strengths and weaknesses section, Section 1.10 DEESC Historic Growth (Figure 45), the GSENZH sales and proportionality factors for Level 2 sub-sectors were plotted. The figure illustrated the relative difference between sub-sectors within the hub region in terms of how their proportion of the UK sales market compared with the sector average, and how their 3-year growth rates compared with the UK DEESC average. The LEP reports include the same section, for the sub-sectors within each LEP, which illustrate some differences in the performance of sub-sectors.

Here we provide some example figures, of single sub-sectors, with the LEP values plotted for proportionality along the x-axis and growth on the y-axis. The top right-hand corner of the chart is most desirable, combining a larger market than the sector average and stronger growth than the wider UK. Although there are differences, a similar pattern is seen throughout the LEPs, who remain grouped.

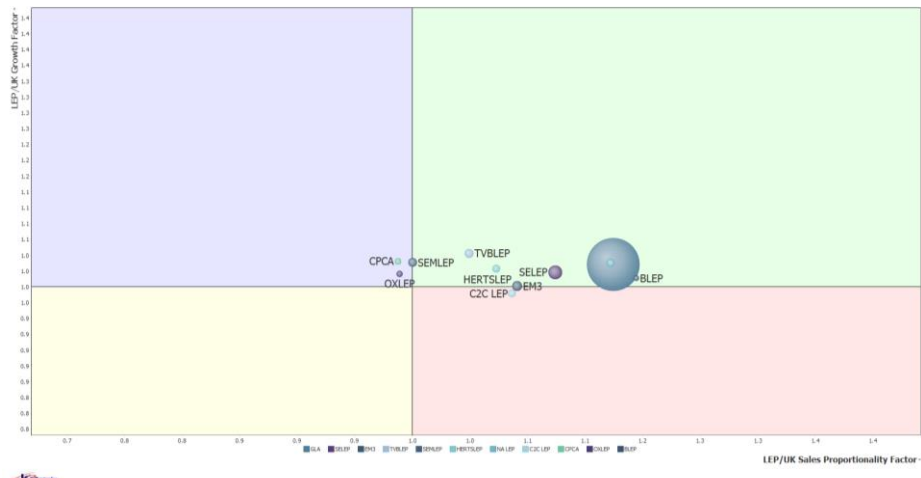
Ventilation and Air-tightness



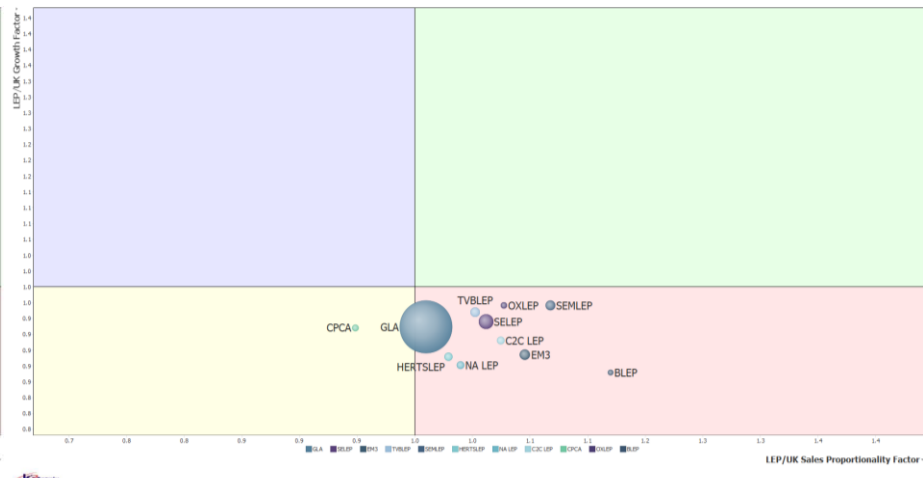
Walls & Ceilings



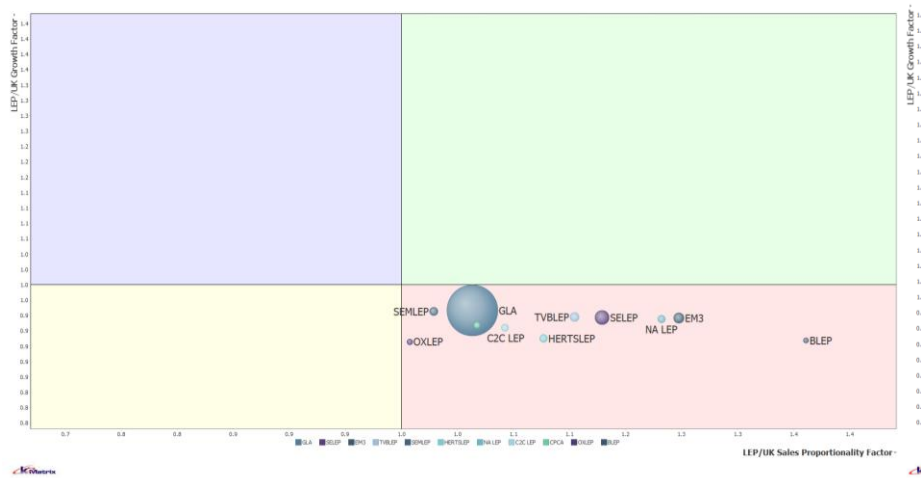
Heat Pumps



Photovoltaic



Energy Management



Battery Technologies

