Energy&Climate
INTELLIGENCE UNIT

MAPPING THE NET ZERO ECONOMY

Net zero impacts in national, regional and local economies

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In partnership with

datacity

CBI Economics

Contents

Foreword: Energy and Climate Intelligence Unit

On the banks of the Tyne and Tees, set against a backdrop of years of industrial decline, the green shoots of a different kind of re-industrialisation are now apparent. From the manufacture of offshore wind turbine platforms to green hydrogen glass production, new industry is emerging in our industrial heartlands.

We were keen to understand the scale and scope of this net zero economy. CBI Economics has for the first time laid out publicly the detail of where and how big this clean economy is.

Companies leading the way on net zero are now contributing more than £70 billion to the UK economy, more than twice that of the energy sector itself. And while London languishes in last place on the leader board, it is other regions where net zero is playing a larger role in local economies with net zero hot spots from Derbyshire and Yorkshire to Merseyside and Tyneside.

The analysis suggests that net zero business is addressing the challenge of levelling-up but also of struggling productivity rates. The net zero economy generates £112,300 in GVA per employee, 1.7 times higher than the national average.

While policy interventions have stimulated markets, the relative lifecycle costs of many net zero technologies compared to legacy alternatives are now driving an accelerating rate of deployment. In spite of high energy prices, electric cars are still typically three times cheaper to run than their internal combustion competitors with UK sales up 40% in 2022 replacing diesel as second most popular 'powertrain'.

The UK was the first major economy to set a net zero emissions target, but in doing so it kicked off a global race with 91% of global GDP now covered by a commitment to bring emissions to net zero. This race has further stimulated growing global markets for renewables, electric vehicles and other clean technologies.

In 2022, global renewables growth was spurred on in part by the gas crisis, by providing a cheaper, more secure alternative. EV sales were estimated to be 10.6 million in 2022, up 57% from 2021. Recent predictions from Oxford Economics suggest that net zero industries could be worth $10.3 trillion to the global economy by 2050.

Previous decisions to cut investment in energy efficiency and effectively ban onshore wind farms in the UK are costing the UK billions of pounds during the gas crisis. Research has found the UK lagging well behind Europe in the adoption of clean hydrogen steel production. Set against the clouds of troubled economic times there is an imperative to generate growth. Could the net zero economy be the silver lining? Important choices for the UK lie ahead with impacts for places like Merseyside and Teeside.

Peter Chalkley

Director, Energy and Climate Intelligence Unit

Foreword: CBI Economics

The science of climate change is widely established, however further evidence and research is needed around its potential impacts to economy and society. Historically, economic growth has been strongly linked to the use of limited natural resources, yet the growth of the net zero economy demonstrates how businesses can achieve economic growth while minimising their impact on the environment.

As highlighted in this report by CBI Economics, in collaboration with the Energy & Climate Intelligence Unit, these opportunities span across the regions of the UK and support wider objectives such as levelling up. With one of the most comprehensive databases on this topic, provided by The Data City, this report identifies key hotspots of business activity by focusing on the concentration of the net zero economy within each region.

As a result, this report has found that the net zero economy is stronger – and significantly more productive – in regions such as Scotland, the Midlands, and Yorkshire & the Humber, compared to London and the South East.

The availability of this data is crucial in enabling businesses and for effective policymaking, to understand the size of the opportunity and engage in the transition to net zero. While it remains one of the most significant long-term challenges, businesses which invest and act early are best placed to seize the opportunities from the transition.

Mohammad Jamei
Director of CBI Economics

Executive summary

Businesses and policymakers can decouple the long-standing relation that has held true since the industrial revolution between economic growth and resource usage through the pursuit of net zero greenhouse gas emissions.

Whilst making strides towards the UK's target to reach net zero greenhouse gas emissions by 2050, the net zero transition can bring benefits to the economy as a whole, and also level up the regions across the country.

Businesses within the net zero economy are distributed across the UK – alleviating some of the disparities that exist within the UK through economic activity, high-paid jobs and productive jobs, and investment.

CBI Economics was commissioned by the Energy & Climate Intelligence Unit to measure the scale of the UK's net zero economy and its geographic concentration.

This analysis has found that at the national level:

£71 billion

Gross Value Added to the UK economy

There are almost 20,000 businesses currently within the net zero economy which contributed £71 billion (3.7%) in Gross Value Added to the UK economy in a year. This is more than twice of the energy sector.

840,000 jobs

supported by businesses in the net zero economy

840,000 (3.2%) jobs are supported by businesses in the net zero economy, with an average wage of £42,600 within this economy, compared to £33,400 for the average UK employee, reflecting the high productivity in the net zero economy. The average skill requirement for a job in a carbon-intensive industry is also 46% lower than the average net zero-related job. [1]

1.7x higher

Gross Value Added per employee

The net zero economy generates £112,300 in GVA per employee. This is 1.7 times higher than the national average for the total UK economy, which generated £64,400 in GVA per employee. Again, reflecting the high productivity within the net zero economy.

Growth & jobs

for different net zero sectors

The energy and construction sectors within the net zero economy created the most economic growth, while the labour-intensive sectors supported the most jobs (professional activities, wholesale and retail trade, and construction).

30% growth

of ventrue investment in net zero economy

Venture investment into the net zero economy is growing at a trend rate of over 30% per year, over 10 times higher than venture investment into the oil and gas sub-industry.[2]

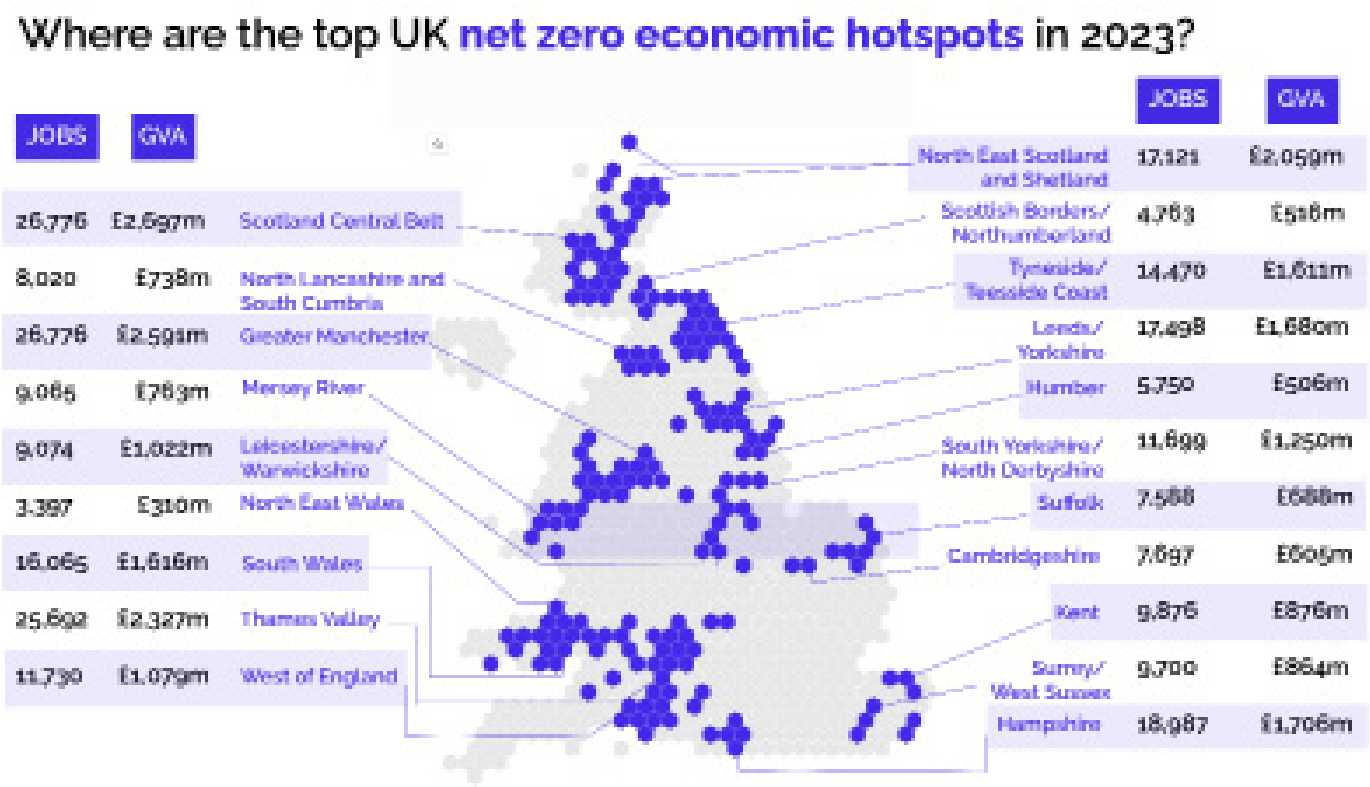
The economic activity of these businesses brings substantial impacts across the UK. Areas such as the North East, Scotland, Northern Ireland, and the South West have a higher concentration of businesses within the net zero economy, compared to traditional concentrations of activity in London and the South East.

The economic impacts of the net zero economy are stronger within each of the regional economies (around 3.8% of the size of its local economy) and outperform London, where only 3.1% of its economy is made up by the net zero economy. The net zero economy has also demonstrated its ability to be highly productive in regions where productivity is historically lower. For example, the net zero economy in the Midlands (East and West) is over 2.5 times more productive than the regional average.

Net zero hotspot	% of area GVA from the net zero economy	£m of area GVA from the net zero economy	Jobs in net zero economy, FTEs	% of net zero economy jobs in area
Leicestershire & Warwickshire	7.00%	1,022	9,074	4.6%
North East Scotland and Shetland	6.50%	2,059	17,121	4.0%
Scottish Borders & Northumberland	5.90%	516	4,763	4.0%
South Yorkshire & North Derbyshire	5.90%	1,250	11,699	4.0%
Tyneside & Teesside Coast	5.30%	1,611	14,470	3.5%
Scotland Central Belt	4.80%	2,697	26,776	3.5%
North Lancashire and South Cumbria	4.80%	738	8,020	3.8%
Leeds & Yorkshire	4.70%	1,680	17,498	3.6%
Thames Valley	4.70%	2,327	25,692	3.8%
Greater Manchester	4.60%	2,591	26,776	3.5%
South Wales	4.60%	1,616	16,090	3.3%
Mersey River	4.40%	763	9,065	4.4%
West of England	4.40%	1,079	11,730	3.5%
Kent	4.40%	876	9,876	3.7%
North East Wales	4.40%	310	3,397	3.5%
Suffolk	4.30%	688	7,588	3.5%
Hampshire	4.20%	1,706	18,987	3.4%
Surrey & West Sussex	4.20%	864	9,700	3.5%
Humber	4.10%	506	5,750	3.5%
Cambridgeshire	4.10%	605	7,697	3.8%

Please note that a breakdown of each of the constituencies that make up these hotspots can be found in Appendix 2 of this report.

Economic modelling at the constituency level also highlights the opportunities for net zero hotspots across the UK, and 20 areas where the GVA contribution by the net zero economy to the local economy was particularly strong:



Introduction

CBI Economics was commissioned by the Energy & Climate Intelligence Unit to explore the size, scale, and regional distribution of the net zero economy – the businesses driving the UK's transition to net zero greenhouse gas emissions.

The transition will be one of the major growth stories of the decade, with structural shifts across the economy and society. The UK was the first major economy to enshrine in law a target to achieve net zero by 2050, setting in motion a call to action to businesses, regulators, and policymakers.

This target was quickly followed by other countries and now over 90% of the world's GDP is covered by a net zero commitment. [3]
For businesses, there are opportunities to capitalise on these trends with investments into low-carbon goods and services that cater to rapidly shifting spending patterns.

Similarly, regional and local authorities have an important role in driving climate action and enabling businesses to take advantage of these opportunities. This is also an opportunity to redistribute economic activity through attracting investment, skilled jobs, and export markets as more of the world's economies implement net zero strategies.

The analysis is presented in two sections:

1. Net zero and its contribution to the UK economy: explores the impacts and opportunities from the transition to net zero at the UK level, including growth, employment and wages, investment, and the key sectors.

2. Net zero economic hot spots across the UK: evaluates the distribution of businesses within the net zero economy and the economic impacts this has to regions in terms of Gross Value Added (GVA) and employment. This chapter also identifies 20 local areas of high activity within the net zero economy.

Defining the net zero economy

The low-carbon and renewable energy economy has grown rapidly to support the UK's ambitions to achieve net zero greenhouse gas emissions. However, the traditional sectoral classifications in the UK were last updated in 2007, prior to the net zero commitment.

As a result, they provide limited insight into business activity in green or low-carbon sectors. Therefore, there is less data available for businesses and local authorities to understand the opportunities for investments and the potential implications of the transition on their operations.

This study aims to fill this gap by using Real-Time Industrial Classifications (RTICs) to define the net zero economy based on the 16 sub-sectors outlined in Table 1. This taxonomy is used to build a machine learning training set for each sub-sector.

Each training set consists of companies which are highly representative of the industry sub-sector, as well as companies which are not within the industry.

Almost 20,000 businesses were identified through this methodology, compared to around 2,300 businesses sampled by the ONS' low-carbon and renewable energy economy database. [4]

These 16 sub-sectors are defined to ensure that all relevant businesses in the net zero economy are identified, by picking up on all the keywords that could be on a relevant company's website. Note that businesses can operate in multiple sub-sectors, but this double-counting is taken into consideration in the analysis.

Table 1: Net zero economy taxonomy

Sub-sector	Definition
AgriTech	Companies developing technologies and services transforming traditional agricultural practices.
Building & Building Technologies	Companies providing technology and services for increased energy efficiency in buildings.
Carbon Capture	Companies dedicated to carbon capture, storage, and utilisation.
Low Emission Vehicles	Companies focusing on the development of technology and infrastructure for electric vehicles.
Energy Cooperatives	Energy producers where citizens have ownership over the energy source.
Energy Storage	Companies providing services and technology to capture energy for use at a later time.
Grid, Demand Side Response & Efficiency	Organisations dedicated to energy management and energy infrastructure development.
Heating	Companies supporting low-carbon heating.
Diversion of Biodegradable Waste from Landfill	Companies focusing on landfill management.
Low-Carbon	Companies providing energy from low-carbon sources.
Pollution Control & Mitigation	Companies providing services and technology for the mitigation of pollution.
Renewables	Companies providing energy from renewable sources.
Waste Management & Recycling	Companies dedicated to solid waste removal, management and processing.
Low-Carbon Consultancy, Advisory & Offsetting Services	Companies providing environmental consultancy for the low-carbon economy.
Green Finance	Structured financial activity aimed to create a better environmental outcome.
Renewable Energy Planning Database (REPD)	A list of companies generated based on the REPD – a database of renewable energy projects over 150KW to capture additional renewable energy businesses.

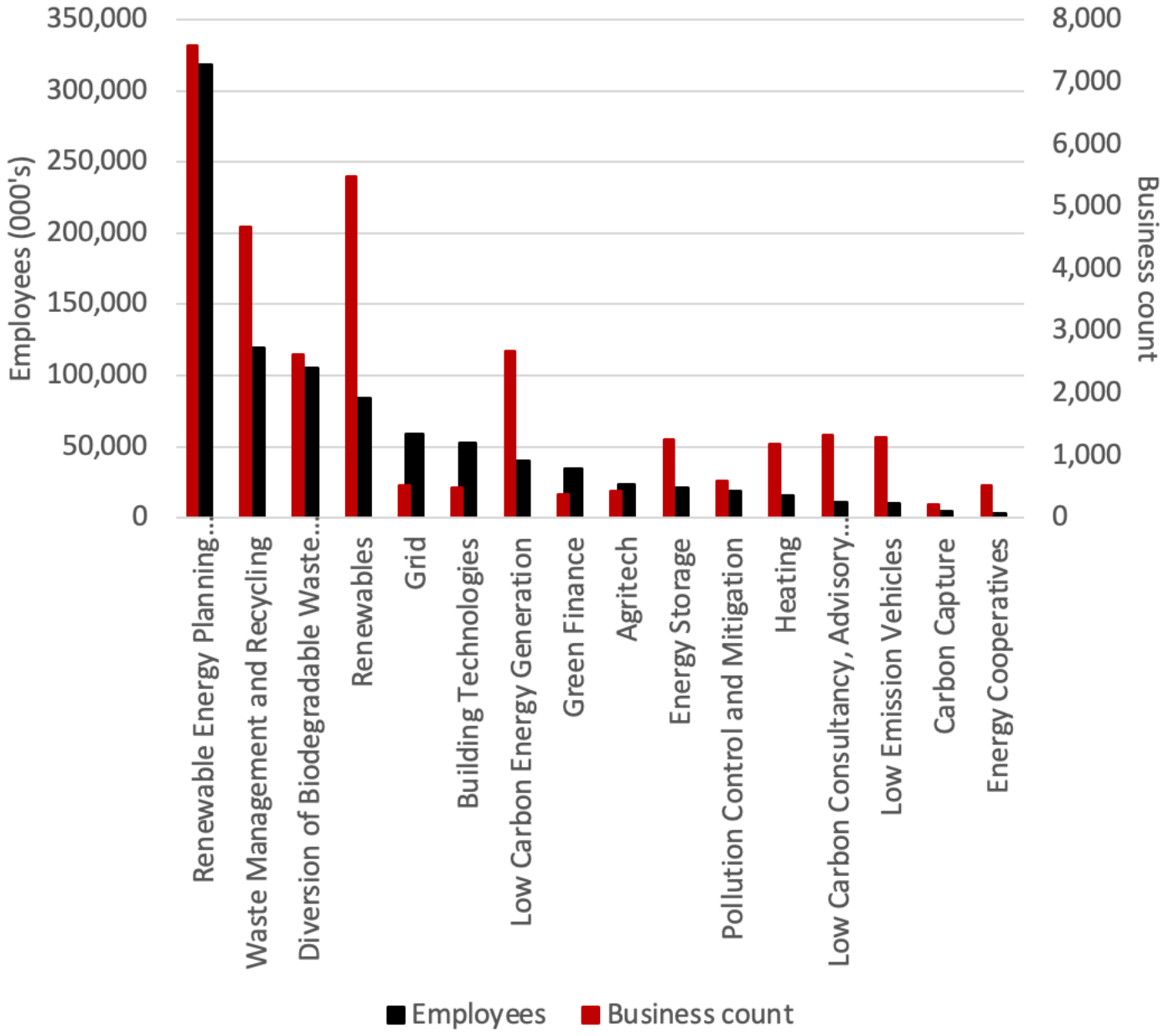
Net zero and its impact on the UK economy

20,000 businesses encompass the UK's net zero economy

Almost 20,000 businesses have been identified in the net zero economy as operating in at least one of the 16 sub-sectors described in Table 1. These businesses are in sectors such as energy and manufacturing, as well as financial services, and include both large multinationals and SMEs.

From the 16 sub-sectors, the renewable energy planning database has the largest composition with around 320,000 employees and 7,500 businesses. Given the net zero economy is composed of almost 20,000 businesses, this forms almost 40% of businesses.

Exhibit 1: Employees and business counts within the net zero economy, split by sub-sector[5]



Source: The Data City

Waste management and recycling formed the second largest sub-sector, with over 4,500 businesses identified. This sub-sector includes companies that collect and manage waste, recycle, and generally support the circular economy.

These businesses currently contribute £71 billion (3.7%) of the UK's economy per year

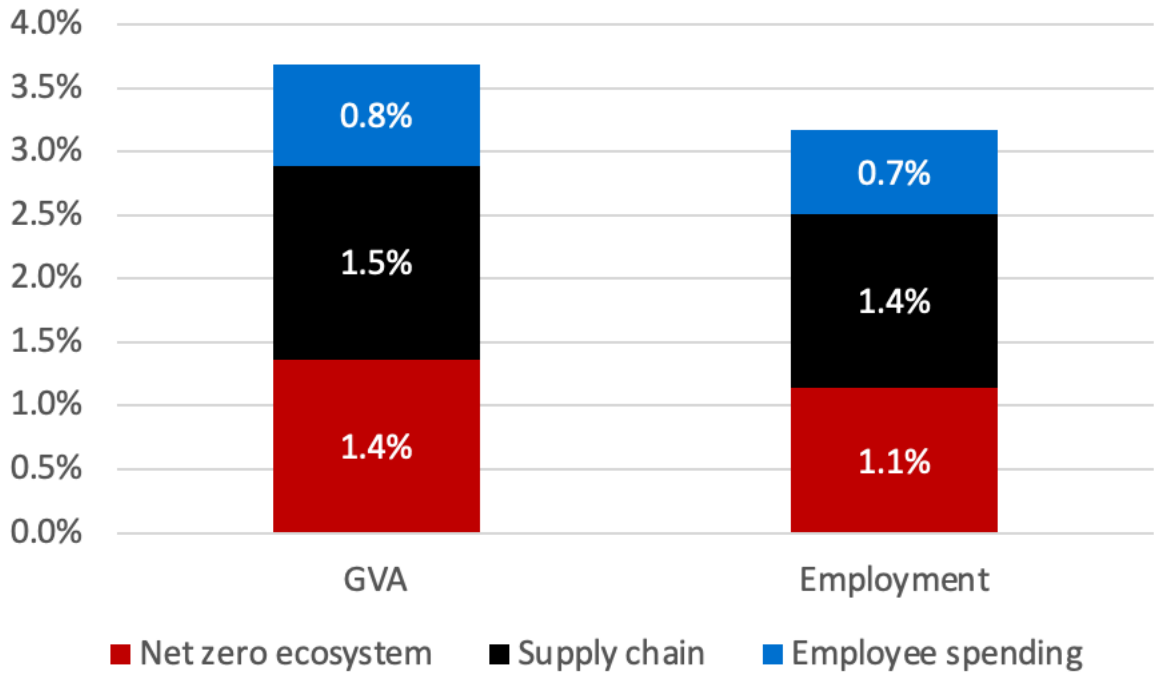
According to economic modelling by CBI Economics, these 20,000 businesses within the net

zero economy accounted for £71 billion of the UK's Gross Value Added (GVA). This contributed 3.7% of the UK economy, including the direct contributions and the contributions from the supply chain and increased household income. For comparison, this is more than twice the size of the energy sector.

From the 3.7% GVA annual contribution, Exhibit 2 shows that 1.4% was directly accounted for by the 20,000 businesses. This is approximately £26.5 billion as shown in Exhibit 3.

The net zero economy is highly connected to the wider UK supply chain, leading to a multiplier effect across the economy as goods and services are purchased from other industries. This supply chain contribution represents £29.5 billion in GVA, contributing 1.5% to the UK economy.

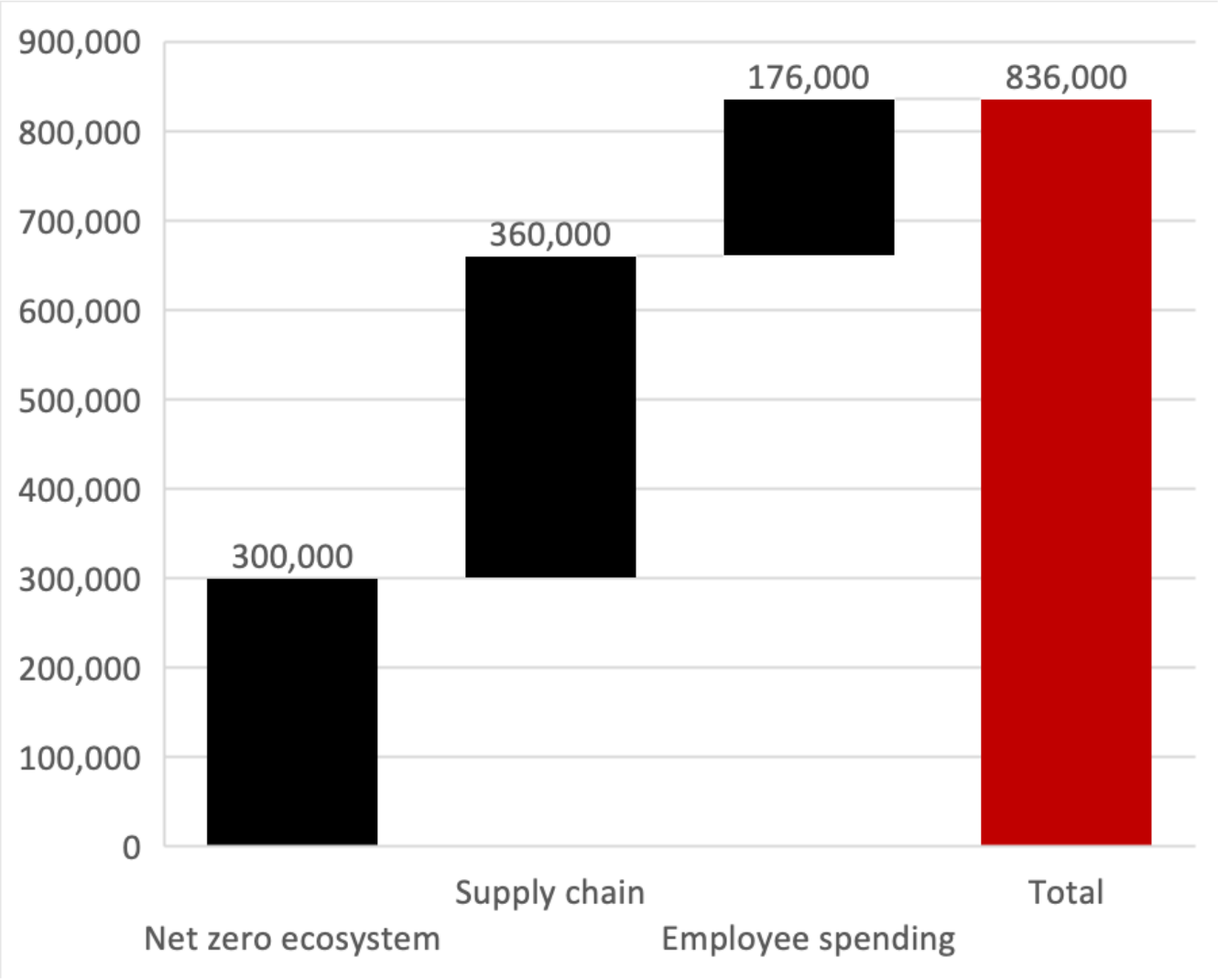
Exhibit 2: GVA and employment contributions



Source: CBI Economics

The employee spending from these businesses is substantial. In part this may be due to the above-average wages in the net zero economy as illustrated in Exhibit 5. This resulted in an additional economic contribution of £15.5 billion in GVA, or an additional 0.8% in GVA contribution. This brought the total contribution to £71 billion.

Exhibit 3: GVA contribution breakdown (£ billion)

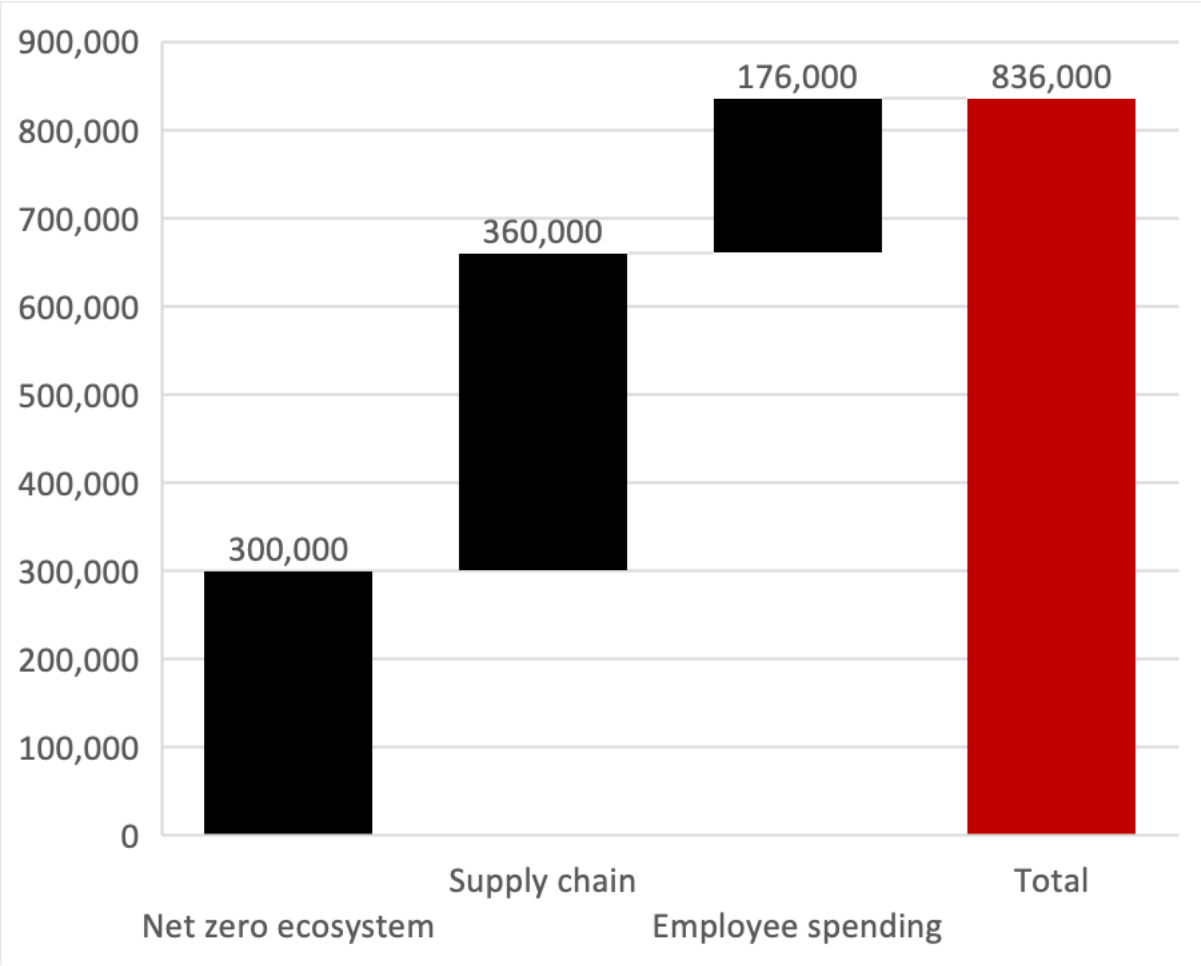


Net zero creates high-skilled employment opportunities

Businesses in the net zero economy supports a total of 840,000 full-time equivalent (FTE) jobs and accounts for 3.2% of total jobs in the UK economy. This is more than the mining, energy and water supply sector. As with GVA, an additional 1.4% of jobs are supported along the supply chain, in addition to 1.1% of jobs created within the net zero economy itself.

As shown in Exhibit 4, activities by the net zero economy itself directly contributed to 300,000 jobs to the UK economy. From the total 840,000 jobs, the supply chain contributed 360,000 jobs and employee spending from these businesses resulted in 176,000 jobs.

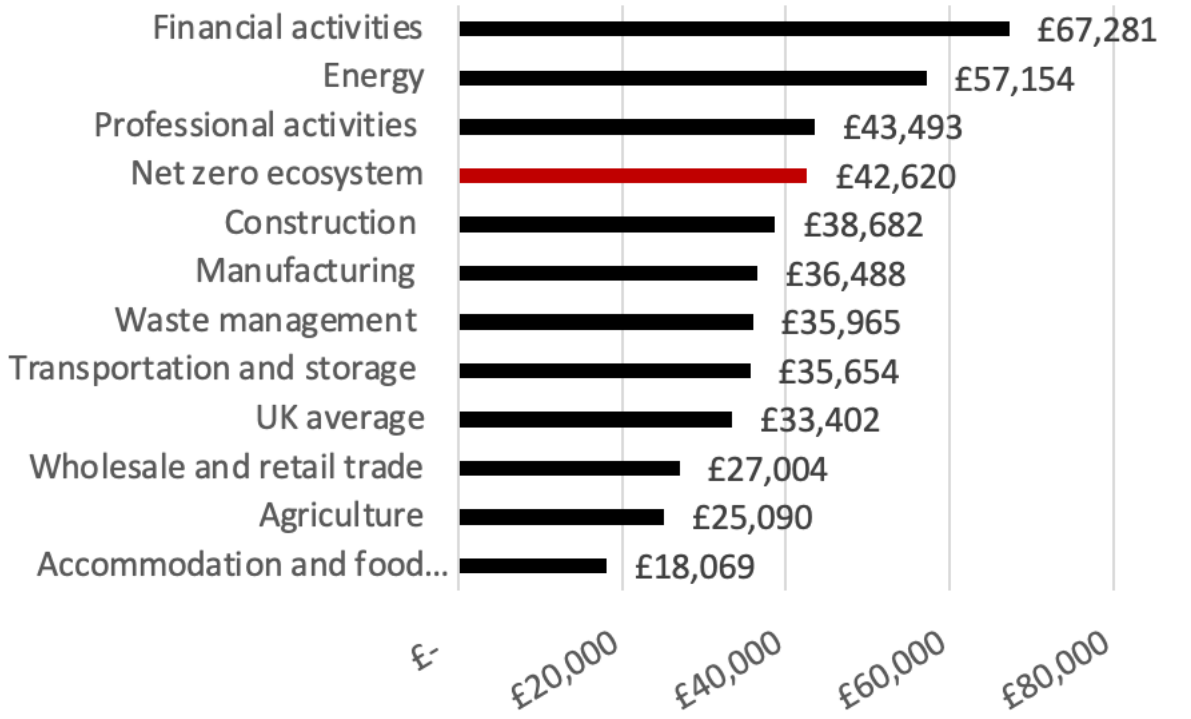
Exhibit 4: Employment contribution breakdown



Source: CBI Economics

The mean wage within the net zero economy is estimated to be £42,600, this was calculated using a figure of all employees (full-time and part-time). This is above the equivalent UK average (£33,400) as well as most industries within the UK including manufacturing and construction. [7] This is illustrated in Exhibit 5 below.

Exhibit 5: Average wages in the net zero ecosystem, relative to traditional sector classifications[8]



Source: CBI Economics

Note that within the traditional sector classifications, some of these jobs will be part of the net zero economy. Further growth of green jobs will require a substantial redistribution from high-carbon to low-carbon jobs. To enable this, re-training and upskilling in many areas will be needed as the average skill requirement for a job in a carbon-intensive industry is 46% lower than the average net zero-related job.[9] Jobs related to net zero are also in high demand, and green hiring overtook non-green hiring for the first time in 2019 and continues to rise. [10]

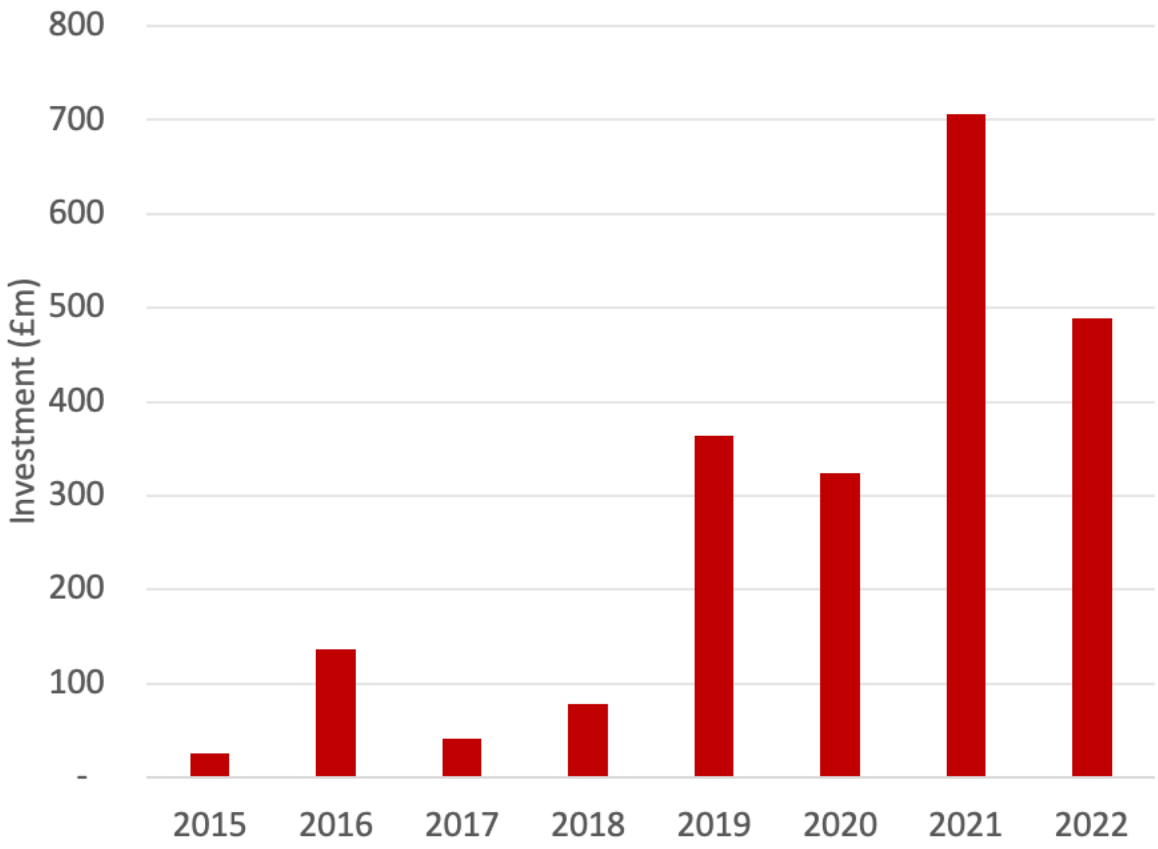
This data also suggests that areas which have high employment within the net zero economy will tend to have a premium in wages and bring further benefits to the region through increased wages and spending.

Net zero innovation will boost investment within the UK

Given the transformations required across all sectors to become net zero, the transition is an opportunity for the UK to boost investment and for businesses to grow. The tracked net zero economy has seen considerable growth in investment in recent years. Over the 6-year period from 2016 to 2021, venture funding into the net zero economy has grown at a constant annual growth rate of over 30%.

In 2021, venture funding into the net zero economy reached £710 million, as shown in Exhibit 6 below. This was over 10 times higher than venture investment into the oil and gas sub-industry, which saw a total of £49 million in venture investment. [11]

Exhibit 6: Venture investment into the net zero economy



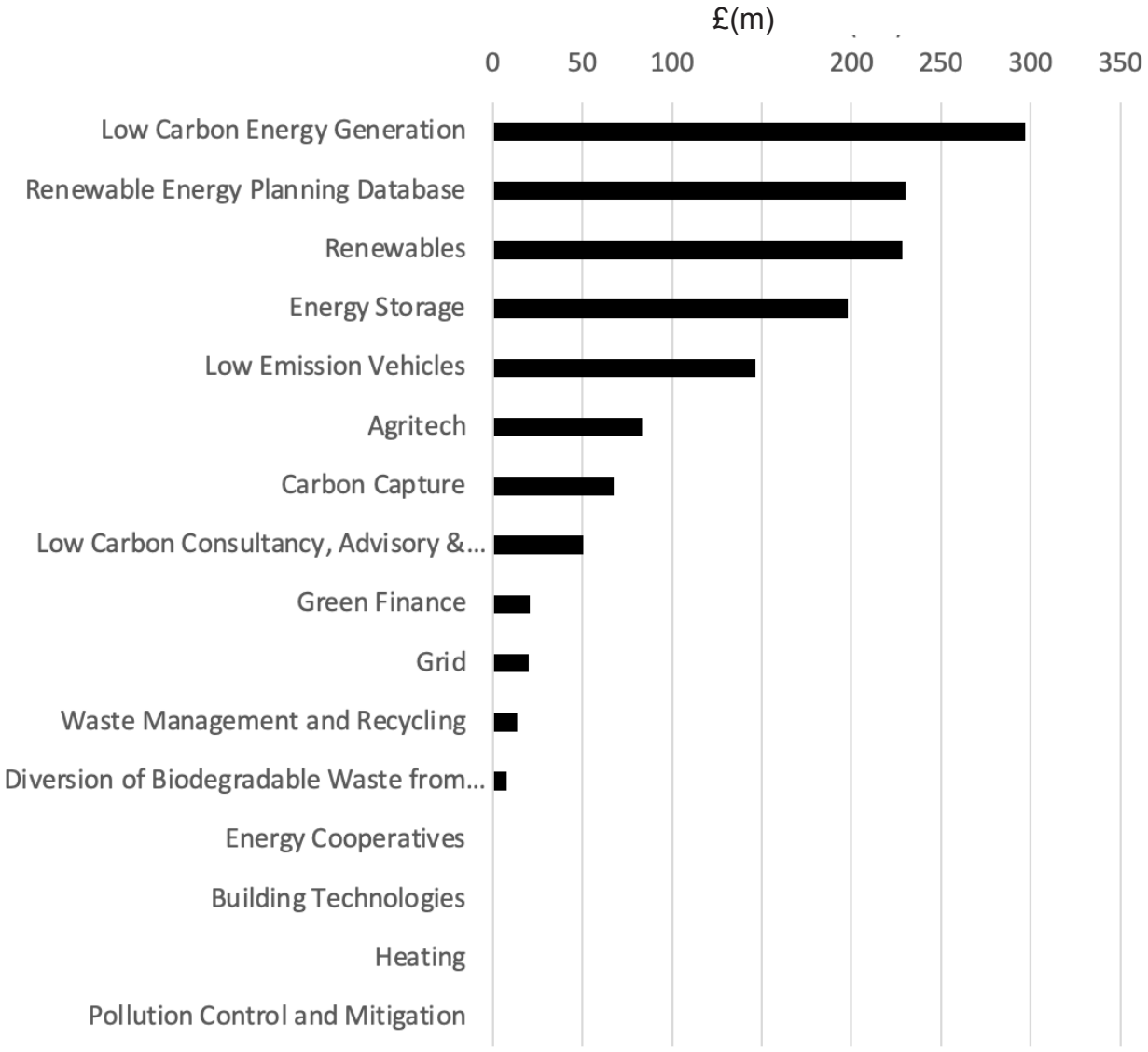
Source: The Data City

There is a clear long-term growth trend in venture funding within the net zero economy, despite year-on-year volatilities, which may be as a result of the macroeconomic environment. For example, research has shown that GDP growth rates directly impact venture capital fundraising, and this holds similarly for unemployment and labour costs. [12,13] This could be one of the key reasons for the drop in venture funding in 2022, given the high macroeconomic uncertainty around recessions, inflation, and increased labour costs.

The majority of the venture funding into the net zero economy was into the low-carbon energy generation sub-sector (£297 million), as shown in Exhibit 7 below. Waste management and recycling, despite being one of the largest sub-sectors by business count and employment, is

amongst the lowest in receiving venture investment.

Exhibit 7: Venture investment into the net zero economy, split by sub-sector[14]



Source: The Data City

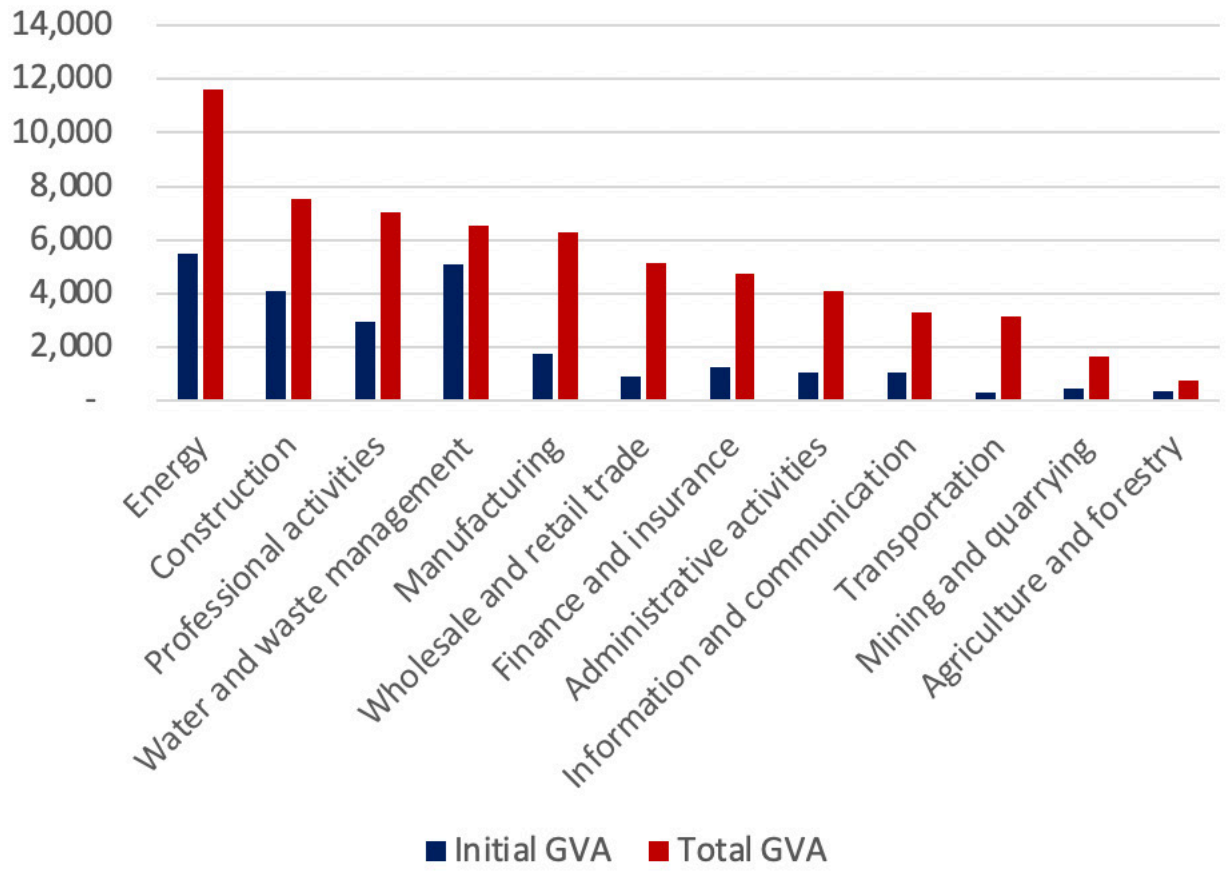
The energy and construction sectors within the net zero economy created the most economic activity to the UK

The energy and the construction sectors had the highest contribution of GVA to the UK economy, accounting for 16% and 11% of the total £71 billion GVA contribution, respectively. This contribution to the UK GVA is closely followed by professional activities, water & waste management, and manufacturing, with the top five sectors contributing to over half of the GVA.

Exhibit 8 below shows that whilst the initial GVA contribution of the energy sector and the water & waste management sector are quite similar, the water & waste management sector is more insular and does not have as much of an outsized effect on the economy.

The largest 'multiplier effects' are in the transportation sector and wholesale & retail trade. For example, direct economic activity in the transportation sector is multiplied by over 10 as it is highly interlinked with the wider economy.

Exhibit 8: Initial versus total GVA contribution within the net zero economy, split by sector



Source: CBI Economics

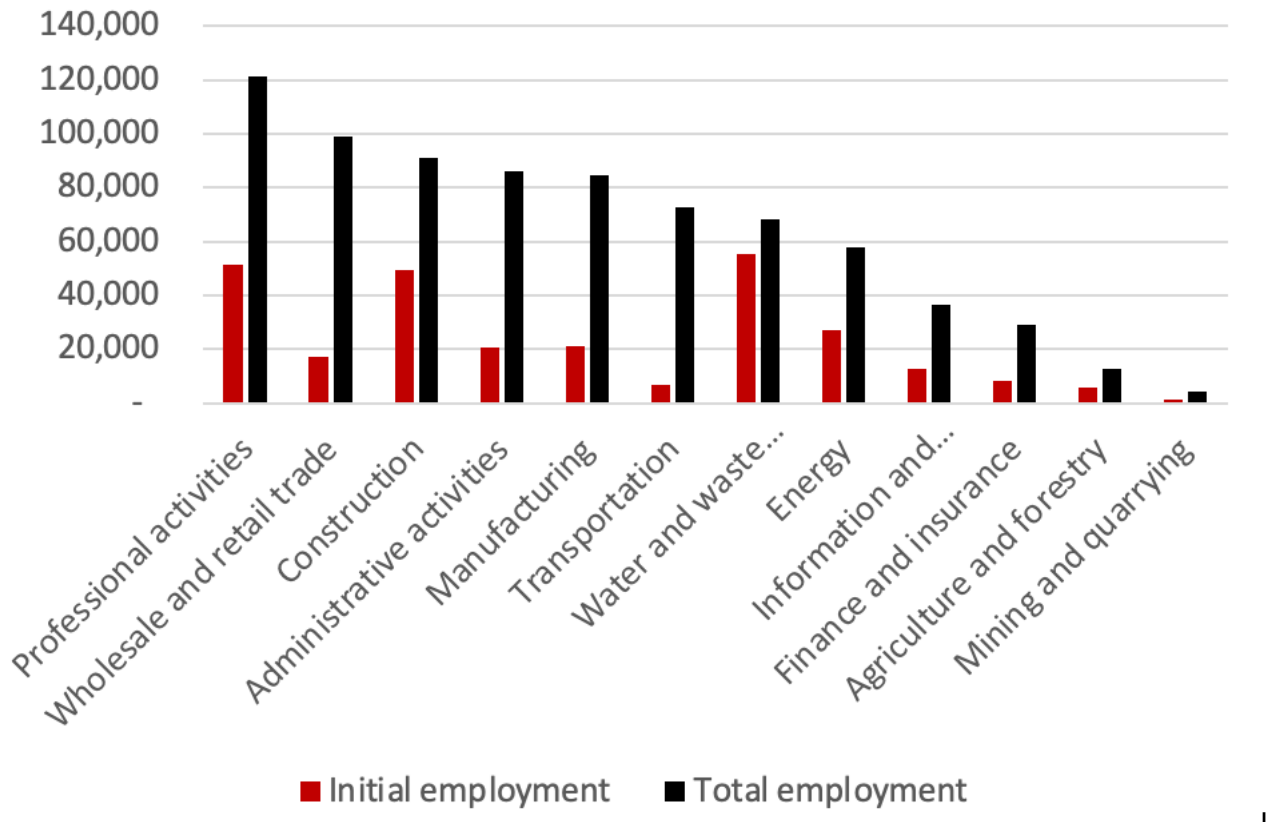
Labour-intensive sectors within the net zero economy created the most employment activity within the UK

Labour-intensive industries dominate the employment contributions with professional activities accounting for 15% of the 836,000 jobs created. This is followed by 12% by the wholesale & retail trade sector, and 11% by the construction sector.

As above, transportation has the highest multiplier effect of over 10, with 6,800 jobs created directly within the net zero ecosystem, leading to a total of 73,000 jobs, as a result of high expenditure across its supply chain. This is illustrated in Exhibit 9 below.

Whilst the energy sector is an outlier in GVA contributions, with 16% of the total GVA contribution, it contributes only 7% of jobs created, demonstrating the capital-intensive nature of this sector.

Exhibit 9: Initial versus total employment contribution within the net zero economy, split by sector



Source: CBI Economics

Net zero in regional economies

Businesses within the net zero economy are dispersed across the UK

The diversity of businesses within the net zero economy complements a multitude of competitive advantages across the UK. As the UK transitions to net zero and more businesses encompass the net zero economy, this will further redistribute economic activity and help to level up regions that may have fallen behind.

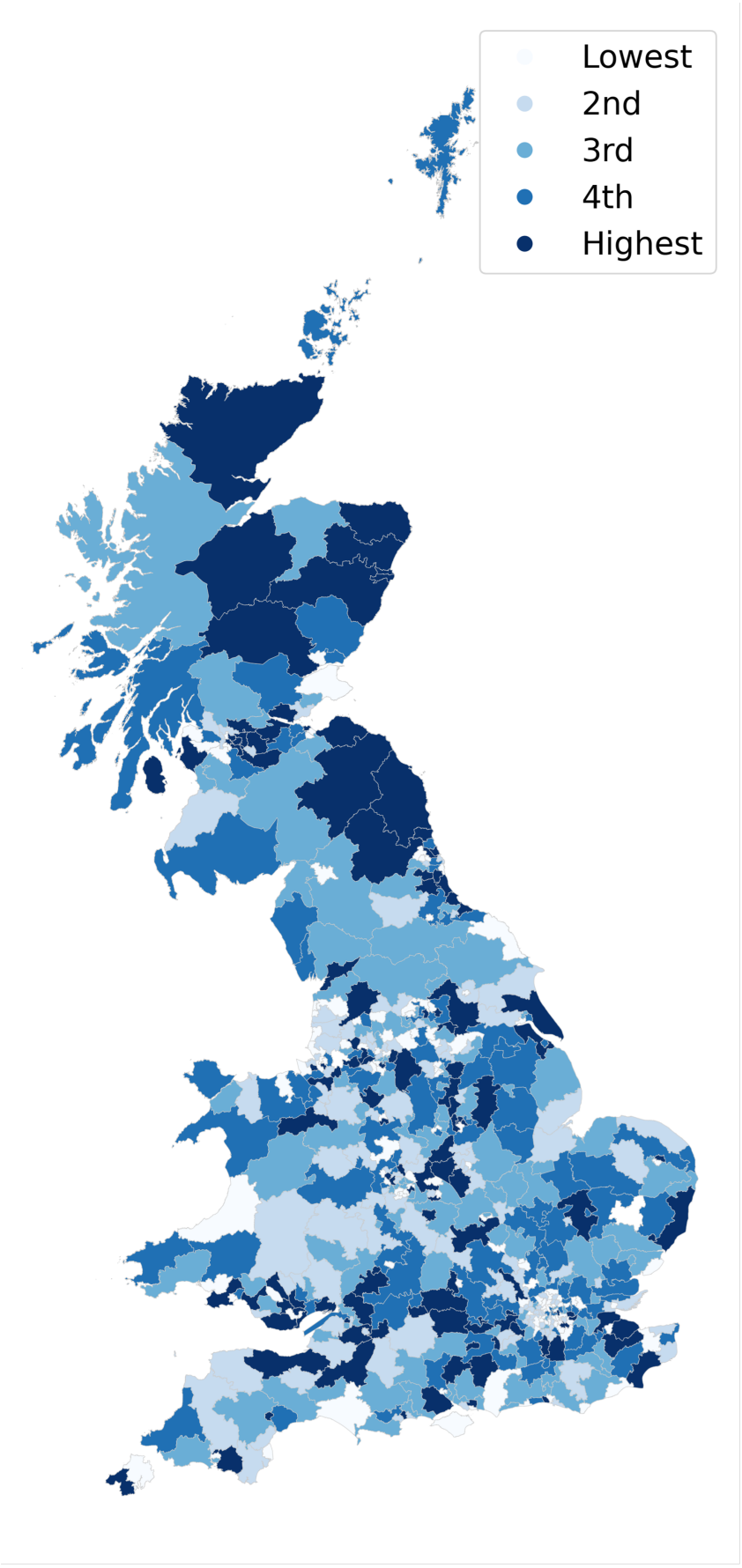
Levelling up across the regions was a flagship government policy of Prime Minister Boris Johnson, supported by a new Department for Levelling Up, Housing and Communities. The Government's Levelling Up White Paper was framed as a 'plan to transform the UK by spreading opportunity and prosperity to all parts of it', with ambitious, long term policy to change the UK's economic geography and narrow the country's regional inequality.

Reports by thinktanks including Onward's Green Jobs, Red Wall [15] highlight that British industry is 'often concentrated in precisely the communities the Government wants to level up, creating both a policy challenge in turning around these areas' economic fortunes and a political challenge in maintaining the confidence of left behind communities' and find that 'green industrial jobs will be vital to levelling up'.

This report finds that net zero represents a good opportunity to both level up and decarbonise the UK's economy.

The economic contribution by GVA as a proportion of the local economy's GVA is illustrated in Exhibit 10 below, split into quintiles (five equally sized groups). This shows how each constituency is ranked across the UK. For example, the Houghton and Sunderland South is in the highest quintile and would therefore rank in the top 20% of all constituencies in the UK in terms of the percentage of its local economy made up by the net zero economy.

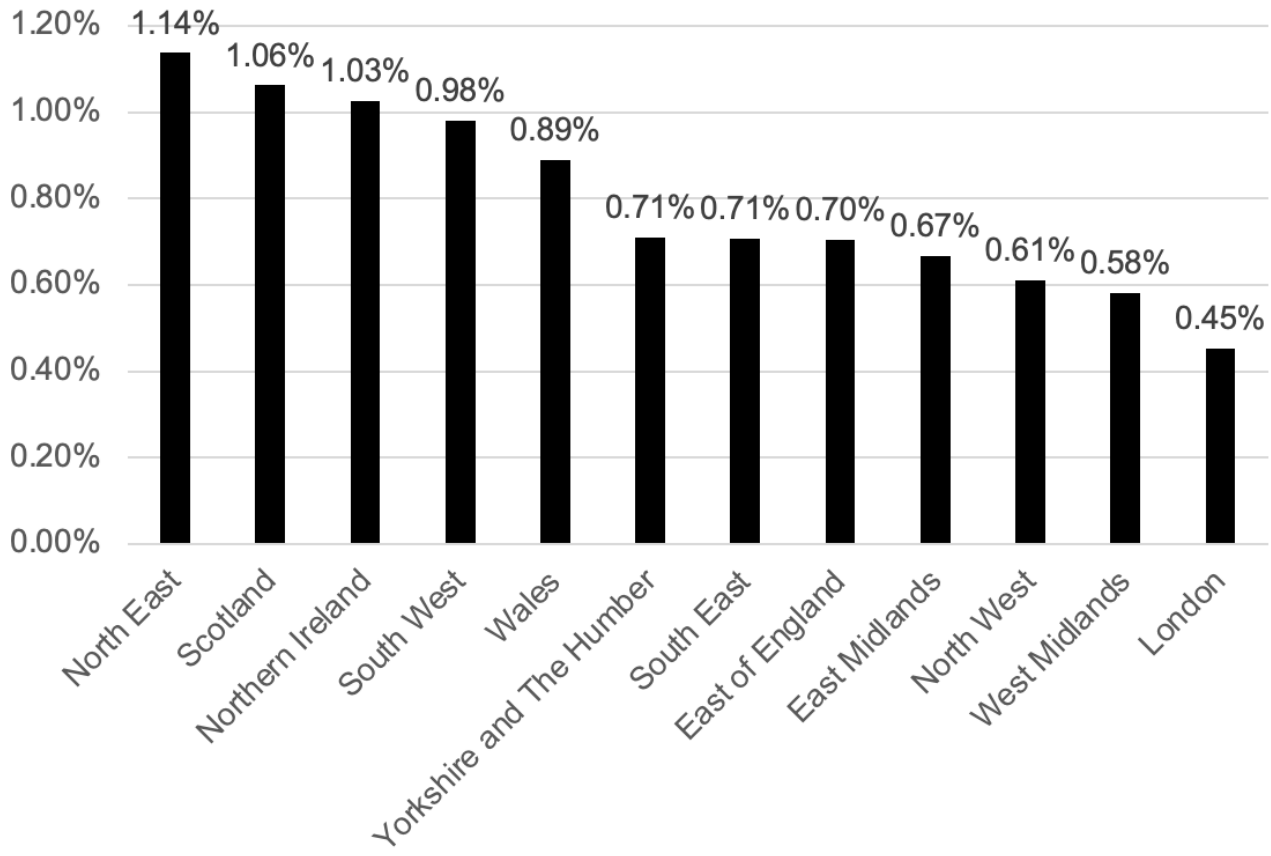
Exhibit 10: Net zero economy GVA as a proportion of local economy GVA, split by quintile



Quantifying the net zero economy as a percentage of all businesses across the UK regions shows a higher potential for the growth of businesses within the net zero economy outside of London.

In Exhibit 11 below, the North East, Scotland, Northern Ireland, and the South West have the highest concentration of net zero economy businesses as a proportion of total businesses in the region. On the other side, London represents the lowest with only 0.45% of London businesses operating within the net zero economy.

Exhibit 11: Businesses in the net zero economy as a percentage of all businesses in the region



In the North East, there is a particular hotspot of activity within the net zero economy in the Tyneside and Teesside Coast area. There are substantial hotspots across Scotland as well, particularly in the North East and Central Belt. Full details of these hot spots are illustrated in Exhibit 14.

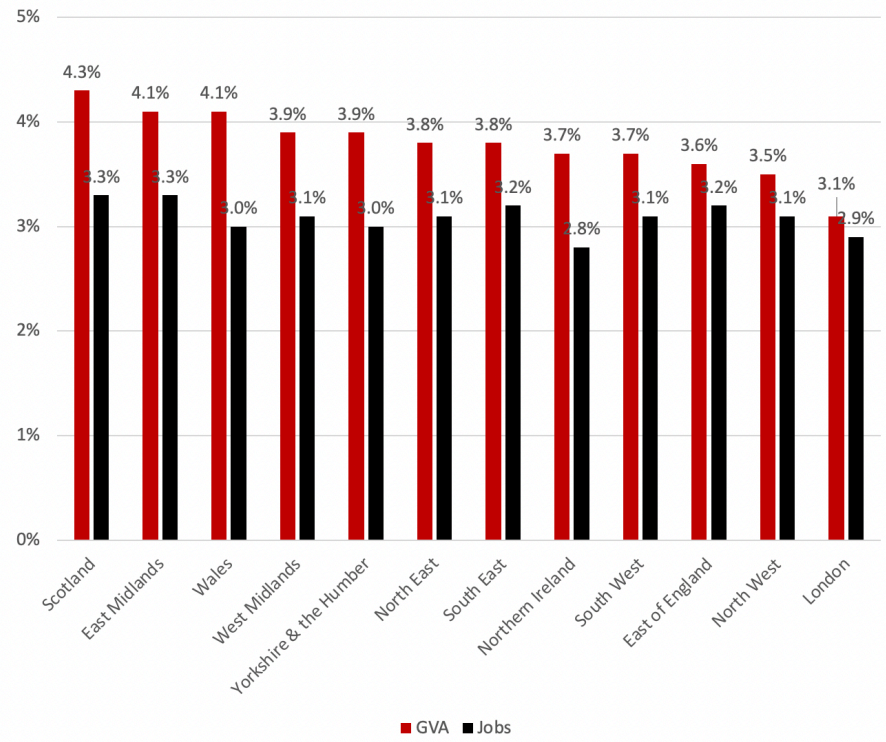
Growth of the net zero economy can provide a boost to regions across the UK

The net zero economy is more concentrated in regions outside of London. In fact, the net zero economy is 24% more concentrated outside of London, when comparing the share of a region's GVA contributed by the net zero economy.

These findings are in line with findings from the Local Green Jobs report published by the Local Government Association (LGA), where it was predicted that regions outside of London would be home to 1.04 million, or 88%, of the 1.18 million direct green jobs projected to reside in England by 2050.[16] This reinforces that the net zero economy is not centred around London and has great potential as an opportunity for regions across the UK to boost growth and reduce regional inequality.

The net zero economy is particularly strong in Scotland, as shown in Exhibit 12 below, where it forms 4.3% of the country's economy – 39% higher than London's economy. This coincides with Scotland's aims to reach net zero greenhouse gas emissions five years earlier than the rest of the UK: in 2045 compared to 2050 for the UK. Scotland also benefits from natural advantages and policy decisions that helped to grow the renewable energy industry, such as in onshore and offshore wind, as well as net zero hotspots to foster the development of new technologies, such as carbon capture and storage.

Exhibit 12: Net zero economy GVA and jobs as a percentage of the region's economy



Source: CBI Economics

The Midlands also demonstrates a strong net zero economy. In both the East and West Midlands, the energy sector drives over a fifth of the net zero economy GVA. This is followed by manufacturing at over 12%, and then construction and water & waste management at approximately 10% each. This compares to Scotland where the energy sector drives more growth in the net zero economy (27%), while manufacturing is lower (9%).

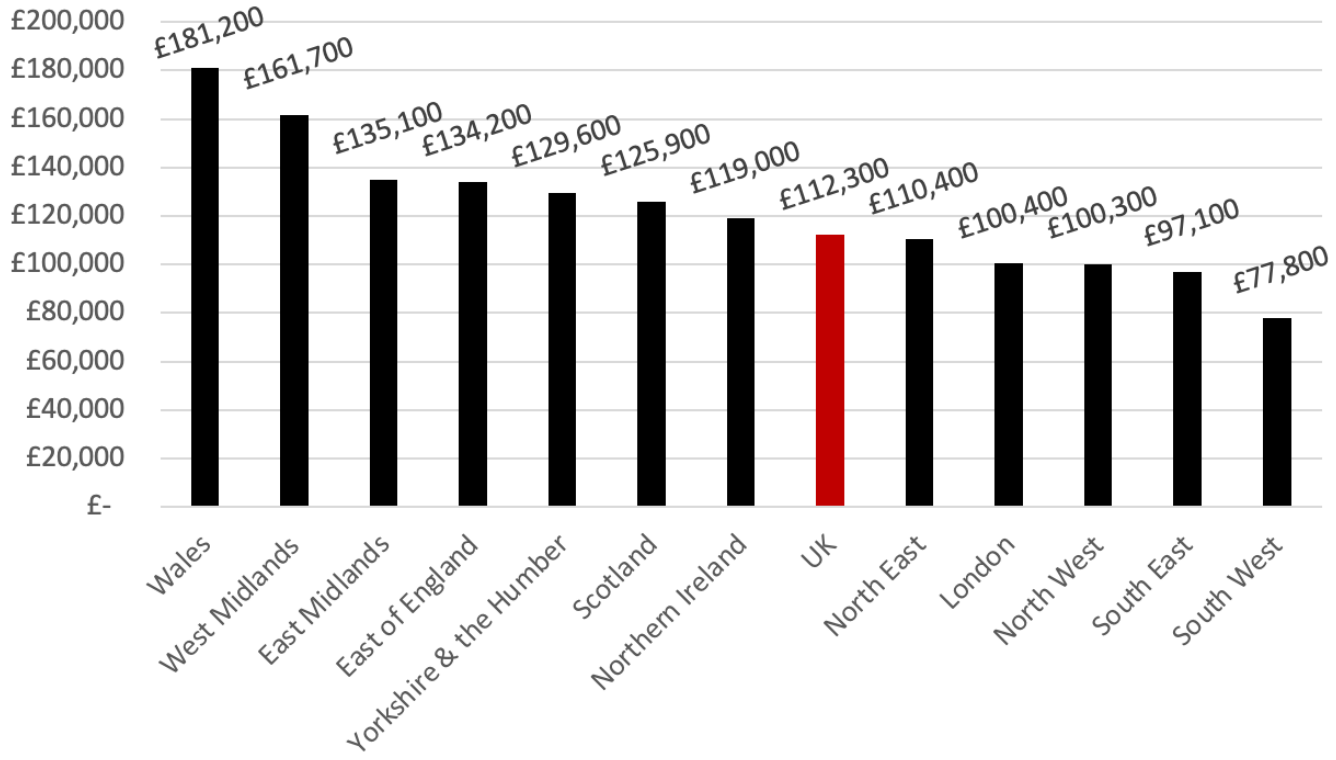
Given London's global competitive advantage in financial services, the economic impacts of the net zero economy is largely driven by the financial & insurance activities sector (18%) and the professional activities sector (16%). Compared to the Midlands where manufacturing is second, it represents less than 2% in London. While London's net zero economy may not be as prevalent compared to other regions across the UK, it does demonstrate London's competitive advantage as the major hub in the UK to lead in green finance.

Net zero can bring highly positive impacts to the UK's productivity puzzle

As an indicator of productivity, GVA per employee is explored in Exhibit 13. This productivity measure within the net zero economy in many regions contrasts to the economy-wide levels. While Wales does not experience high economy-wide productivity (where London and the South East dominate above the UK average), the net zero economy in Wales is over three times more productive than its regional average.

In addition, both the East and West Midlands are approximately 2.5 times more productive than their regional average, whilst London's average productivity within the net zero economy is broadly in-line with its local economy productivity. One of the contributors to the high productivity in the Midlands is the strong presence of the energy sector within the net zero economy in these regions – which is highly capital-intensive. In the Midlands, the energy sector contributes over 20% of its respective net zero economy, whilst this is 8% for London.

Exhibit 13: Net zero economy GVA per employee, split by region



Source: CBI Economics

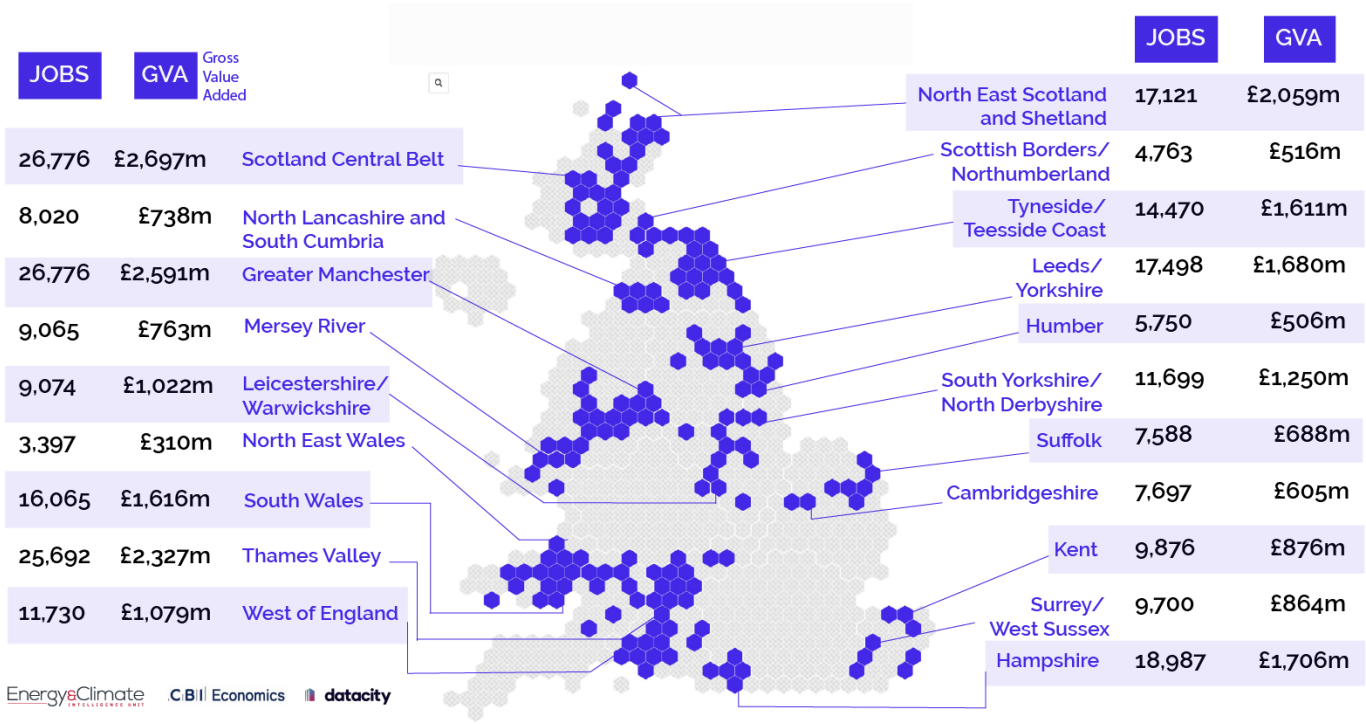
Comparing the productivity of the net zero economy across the UK with other sectors demonstrates this economy as a highly productive sector. It is above all UK sectors excluding financial & insurance activities and the energy sector.

Opportunities for net zero hotspots across the UK

Economic modelling at the constituency level highlights the opportunities for net zero hotspots across the UK. These are defined as connected areas with concentrated net zero activity, where businesses create jobs and add to the local hotspot's economy.

Exhibit 14 shows key areas where the GVA contribution by the net zero economy to the local economy is particularly strong. These hotspots are then described in more detail below.

Exhibit 14: Net zero economy hotspots of economic activity, and percentage of area's GVA contributed by the net zero economy



Net zero economy hotspots

1. North East Scotland, Orkney and Shetland

The region announced a formal bid to gain the Green Freeport status, stating it will unlock an additional £7.5 billion in GVA over the next decade, and highlights the regions objective of becoming a pioneer for the transition to net zero.[17]

In this hotspot, the net zero economy contributes almost 7% of the area's GVA. This compares to 4.3% for Scotland as a whole. The sector with the largest presence is renewable energy.

Furthermore, within this region, key areas of activities within the net zero economy include Gordon, West Aberdeenshire and Kincardine, and Perth and North Perthshire.

2. Scotland Central Belt

Across Scotland's Central Belt, the net zero economy contributes close to 5% of the area's GVA. Cumbernauld, Kilsyth and Kirkintilloch East, and Rutherglen and Hamilton West standout as constituencies within this area with particularly high activity.

This hotspot has particularly strong activity in renewable energy generation, as well as waste management and recycling, and diversion of biodegradable waste from landfill.

3. Scottish Borders & Northumberland

Along the Scottish Borders & Northumberland, almost 6% of the area's GVA is contributed by the net zero economy, with particular areas of activity in Wansbeck and East Lothian.

East Lothian, a constituency within the area, has high net zero investment and innovation with 6.6% of its GVA contributed by the net zero economy. The largest is the energy sector, which has seen local businesses such as Sunamp recently securing funding of £9.25 million to support its creation of new thermal storage batteries to tackle periods of low renewable energy generation.[18]

4. Tyneside & Teesside Coast

In the Tyneside & Teesside Coast area, over 5% of the area's GVA is supported by the net zero economy, including gigafactories to produce batteries for electric vehicles. The Houghton and Sunderland South constituency stands out as an extremely high area of activity with 25% of the area's GVA attributed to the net zero economy.

This is the highest proportion of contribution by the net zero economy to a single constituency's GVA within the UK, which is home to EDF Energy Renewables which would support net zero activity in the area. In particular, there is high activity in producing offshore wind energy, which is set to grow further as one of the world's largest offshore wind farms is under construction in the area.

5. North Lancashire & South Cumbria

In the North Lancashire & South Cumbria area, 4.8% of the area's GVA is contributed by the net zero economy. This compares to 3.5% for the North West region.

Within this area, renewable energy businesses have a strong presence, as well as waste management and recycling, and the diversion of biodegradable waste from landfill.

6. Leeds & Yorkshire

In Leeds & Yorkshire, 4.6% of the area's GVA is contributed by the net zero economy. The Leeds East constituency stands out relative to the size of its economy, and has high business activity in renewable energy.

7. Humberside

Humber Zero is an ambitious plan to decarbonise the Humber Industrial Cluster by 2040 – currently the largest CO2 emitting cluster in the UK – to become the world's first net zero industrial cluster. This includes scaling offshore wind farms and the development of new technologies such as carbon capture and storage (CCS) and green hydrogen.

The Humber is an area of high net zero activity, and renewable energy in particular, with just under 4% of the area's GVA being coming from this economy. The area of Cleethorpes stands out as a particular area of high activity.

8. Greater Manchester

In Greater Manchester, nearly 5% of the area's GVA is contributed by the net zero economy. There is significant investment by local business to transition to net zero, for example a £21 million net zero operational tech hub is nearing completion at Manchester Science Park.[19]

Stockport stands out as a particular constituency of high net zero activity with just under 17% of the area GVA supported by the net zero economy. Stockport has seen huge investments made by the local council, such as securing funding for a £4.44 million investment into Cheadle Eco Business Park, to support the local net zero economy.

9. Mersey River

In the area surrounding the Mersey River the net zero economy contributes over 4% of the local GVA. In this hotspot, the Ellesmere Port and Neston constituency is an area of high net zero economy activity. Ellesmere Port is also home to Stanlow refinery where Vertex Hydrogen (a joint venture between Essar Oil UK and Progressive Energy) have announced the development of the UKs first large-scale low carbon hydrogen plant.

In this area, waste management and recycling, as well as the diversion of biodegradable waste from landfill, have the most significant presence within the net zero economy.

10. South Yorkshire & North Derbyshire

In South Yorkshire and North Derbyshire, 6% of the area's GVA is attributed to the net zero economy. Nottingham East stands out as a particular area of high activity with 11% of the areas GVA coming from the net zero economy.

In this area, the renewables sub-sector has a significant presence within the net zero economy.

11. North East Wales

In the North East of Wales area, almost 4.3% of the area's GVA is contributed by the net zero economy, with renewable energy being the most prominent, and stands above the 4.1% regional average for Wales (already amongst the highest regional averages).

In this area, the renewable energy planning database sub-sector has the most significant presence within the net zero economy, with both solar and wind farms operating in the area.

12. Leicestershire & Warwickshire

In Leicestershire and Warwickshire, 7% of the area's GVA is supported by the net zero economy. South Leicestershire and Bosworth stand out as areas of particularly high activity. In this area, the waste management and recycling sub-sector is most dominant within the area's net zero economy, followed by the renewable energy planning database sub-sector.

13. Cambridgeshire

The net zero economy within Cambridgeshire contributes 4% of the area's GVA. South Cambridgeshire, South East Cambridgeshire, and Huntingdon stand out as key areas of the local net zero economy. Whilst renewable energy features prominently, there is also a high presence of agritech businesses.

The UK is home to cutting edge research and innovation, and the University of Cambridge a key institute in this area. The University helps to share knowledge and commercialise research through programmes such as the Accelerator and Sustainability Hub to boost activity in the surrounding area.

14. Suffolk

In Suffolk, 4% of the local area's GVA is contributed by the net zero economy. Ipswich and Suffolk Coastal are areas of high activity in this area.

In this hotspot, waste management and recycling and renewables have a strong presence within the net zero economy, with businesses such as Sackers providing scrap metal and waste recycling services.

15. South Wales

In South Wales, 4.6% of the area's GVA is supported by the net zero economy. The constituencies of Cardiff South and Penarth, Cardiff North and Pontypridd are key areas of activity for the net zero economy.

In this hotspot, renewables and low-carbon energy generation has the strongest presence within this area's net zero economy.

16. Thames Valley

In Thames Valley, over 4.3% of the area's GVA is supported by the net zero economy. Newbury, Oxford West and Abingdon, Wokingham, Windsor and Slough are constituencies with high levels of net zero activity.

In this hotspot, the renewable energy planning database has significantly the largest presence within this area's net zero economy.

17. West of England

In the West of England, the net zero economy contributes 4.4% of the areas GVA, with Gloucester and Stroud as constituencies of particular high activity. Renewable energy, waste management and recycling, and energy storage businesses are the most active in this area.

18. Kent

Kent is another area where the local university helps support business activity in the net zero economy. There are many projects taking place in Kent working in conjunction with Net Zero Pathway for Change, a Kent Invicta Chamber of Commerce programme, to support and grow the net zero economy in the area.

In the area surrounding Kent, over 4% of the area's GVA is contributed by the net zero economy, with Folkestone and Hythe, and Faversham and Mid Kent standing out as key areas for the net zero economy.

19. Surrey & West Sussex

In the Surrey & West Sussex area, 4.2% of the area's GVA is contributed by the net zero economy, above the 3.8% regional average for the South East.

In this hotspot, the renewable energy planning database sub-sector has the highest presence within the net zero economy, followed by waste management and recycling.

20. Hampshire

In Hampshire, 4.2% of the area's GVA is contributed by the net zero economy. New Forest East and Portsmouth North stand out as key constituencies for this areas net zero economy.

In this area, both the renewable energy planning database and waste management and recycling have a strong presence within the net zero economy. This is followed by the diversion of biodegradable waste from landfill sub-sector.

Conclusion

The UK's transition to net zero greenhouse gas emissions will be a challenge for industries, businesses, and policymakers. Yet, those who do engage in the transformation have the opportunity to capitalise on these trends. These benefits are substantial for the UK:

- There are almost 20,000 businesses currently within the net zero economy which contribute £71bn (3.7%) to the UK economy in a year.
- 840,000 (3.2%) jobs are supported by businesses in the net zero economy, both by businesses within the economy as well as those supported along the supply chain. The average wage of the jobs by businesses within the net zero economy is estimated at £42,600 – a premium compared to the UK average and most sectors.
- Venture funding into the net zero economy is growing at a trend rate of over 30%.

- The energy and construction sectors within the net zero economy create the most economic activity, while the labour-intensive sectors supported the most jobs (professional activities, wholesale and retail trade, and construction).

This report demonstrates that environmentally sustainable economic growth, for example the development and scaling of renewable energy, is beneficial in distributing economic activity across the UK. According to economic modelling by CBI Economics:

- Areas such as the North East, Scotland, Northern Ireland, and the South West have a higher concentration of businesses within the net zero economy compared to London and the South East.

- The economic impacts, as measured by GVA, of these businesses have a similar share within each of the regional economies (3.8%) and outperform London, where only 3.1% of its economy is made up by the net zero economy.

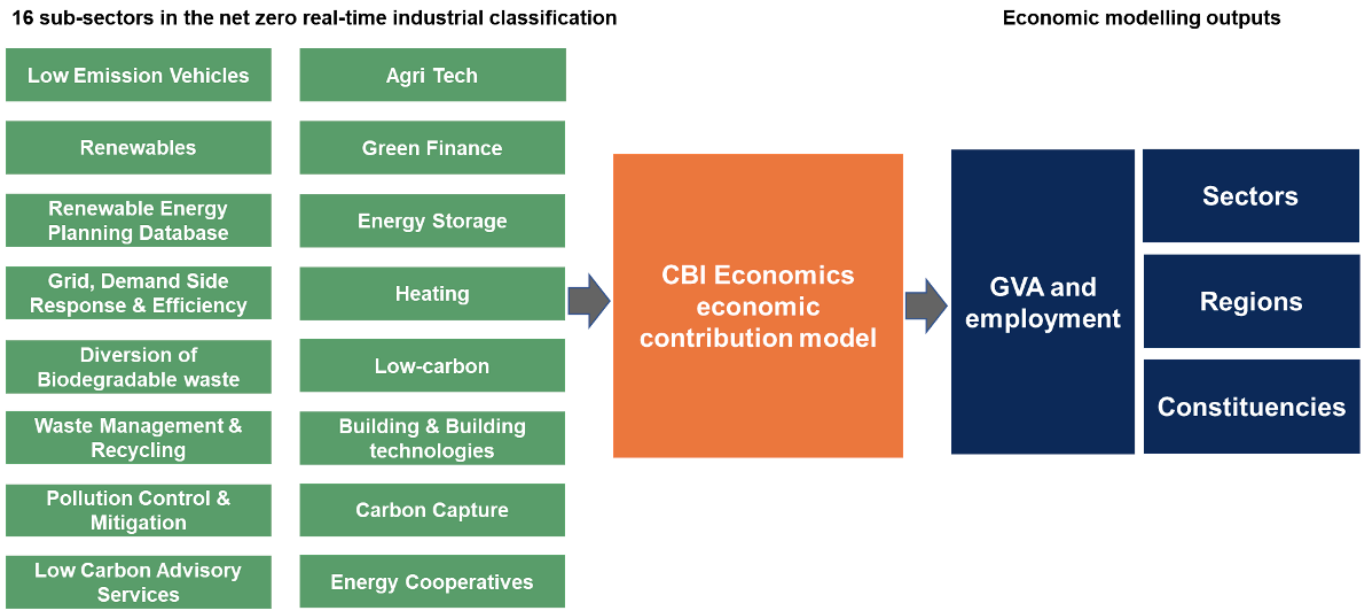
- The net zero economy is highly productive when compared to other sectors and is particularly high in areas where productivity is historically below the UK average.

This report estimates the economic benefits of pursuing net zero, both across different regions of the UK and the economy as a whole. alleviating some of the regional disparities that exist. Targeting net zero can bring economic activity, high-paid and productive jobs, and investment across the UK, while also making strides towards the UK reaching net zero greenhouse gas emissions by 2050.

Appendix 1: CBI Economics modelling

An overview of the data inputs, modelling process, and modelling outputs is illustrated below.

Exhibit 15: Overview of modelling proces



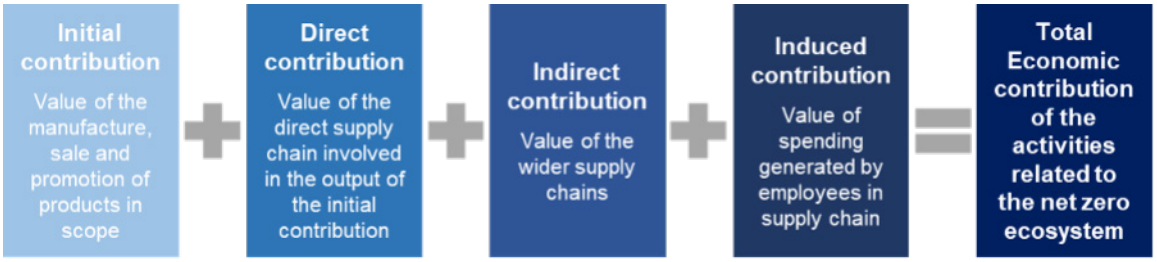
Overview of modelling methodology

The core basis of this modelling uses the Input-Output (IO) Analytical Tables from the Office for National Statistics (ONS). An input-output table does the following:

- Traces out the relationships between different industries.
- Outlines the sets of inputs required to produce one unit of output.
- Quantify the interactions between the sector and its supply chain and households.

The IO framework allows for Type I and Type II output multipliers to be calculated. Type I multipliers include the direct and indirect effects. Type II multipliers are used in this analysis which include direct, indirect, and induced effects. This captures the wider extent of the economic contribution throughout the economy which is summarised in Exhibit 17 below.

Exhibit 16: Total economic contribution methodology



The economic activities of the net zero economy is based on data provided by The Data City. The Data City platform and its machine learning algorithm gathers real-time data on emerging industries that do not conform to the traditional industry classifications, such as the net zero economy. In particular, employment data is aggregated across the businesses identified and their proportion of total employment is calculated. These are estimated at the sector level and are inputted into the CBI Economics model. As a result of this bespoke approach, findings from this report may not completely align with existing studies.

Note that a measure of employment typically referred to is Full-Time Equivalent (FTE) jobs, which accounts for differences in part-time/ full-time employment rates by industry. The assumption behind this measure is that 1 FTE employee works an average of 37 hours per week.

It is important to note that the final outputs are based on the 2019 input-output table. This was chosen as the shocks of COVID-19 would have a multitude of impacts beyond the scope of the model.

Finally, the induced contribution is quantified, which captures the effect of additional household consumption associated with the jobs supported through the initial, direct, and indirect activity. Type II multipliers are calculated for this step.

The direct, indirect and induced contribution are combined with the initial contribution derived to provide an estimate of the total economic contribution of the initial economic activity, both in terms of the GVA the activity generates and the employment required.

Apportioning national results to the UK's regions

Having derived estimates for the total economic contribution of the net zero economy in the UK, additional analysis provides a regional perspective for these estimates.

In the absence of sub-national IO tables, the UK-level impacts were apportioned to ITL1

(regions) and parliamentary constituency geographies according to their share of the UK corresponding sector.

Additional data was drawn upon to apportion the UK-level contributions to sub-national levels. In particular, the use of regional GVA data and regional employment data provided by the ONS and applied for each industry.

Appendix 2: Net zero hotspots breakdown

The breakdown of the 20 net zero hotspots identified within the net zero economy are detailed below.

North East Scotland	Scotland Central Belt
Banff and Buchan	Glasgow Central
Gordon	Glasgow North East
Aberdeen North	Glasgow East
Aberdeen South	Rutherglen and Hamilton West
West Aberdeenshire and Kincardine	Coatbridge, Chryston and Bellshill
Angus	Lanark and Hamilton East
Dundee East	Airdrie and Shotts
Ochil and South Perthshire	Cumbernauld, Kilsyth and Kirkintilloch East
Perth and North Perthshire	Linlithgow and East Falkirk
Caithness, Sutherland and Easter Ross	Livingston
Orkney and Shetland	Dunfermline and West Fife
Inverness, Nairn, Badenoch and Strathspey	Edinburgh West
	Edinburgh North and Leith
	Edinburgh South West
	East Kilbride, Strathaven and Lesmahagow

Scottish Borders/Northumberland	North Lancashire/South Cumbria
East Lothian	Copeland
Berwickshire, Roxburgh and Selkirk	Westmorland and Lonsdale
Berwick-Upon-Tweed	Morecambe and Lunesdale
Hexham	Ribble Valley
Wansbeck	Lancaster and Fleetwood
	Barrow and Furness

Mersey River	North East Wales
Birkenhead	Clwyd West
Wirral South	Clwyd South
Ellesmere Port and Neston	Alyn and Deeside
Warrington North	Delyn
Warrington South	
Halton	

Tyneside/Teesside Coast	Greater Manchester
Blyth Valley	Bolton West
Tynemouth	Leigh
North Tyneside	Worsley and Eccles South
Jarrow	Salford and Eccles
South Shields	Stretford and Urmston
Washington and Sunderland West	Altrincham and Sale West
Sunderland Central	Manchester Central
North Durham	Manchester, Gorton
Houghton and Sunderland South	Manchester, Withington
City of Durham	Wythenshawe and Sale East
Easington	Stockport
Sedgefield	Denton and Reddish
Hartlepool	Hazel Grove
Redcar	Stalybridge and Hyde
Middlesbrough South and East Cleveland	High Peak

Leeds/Yorkshire	South Yorkshire/North Derbyshire
Selby and Ainsty	Rother Valley
Elmet and Rothwell	Bolsover
Leeds East	Ashfield
Leeds Central	North East Derbyshire
Pudsey	Broxtowe
Leeds West	Bassetlaw
Morley and Outwood	Newark
Bradford South	Nottingham North
Normanton, Pontefract and Castleford	Nottingham East

Humber	Leicestershire/Warwickshire
Beverley and Holderness	North West Leicestershire
Kingston Upon Hull East	Bosworth
Cleethorpes	South Leicestershire
Scunthorpe	North Warwickshire
Great Grimsby	

Cambridgeshire	Suffolk
South Cambridgeshire	Suffolk Coastal
South East Cambridgeshire	Central Suffolk and North Ipswich
Huntingdon	Ipswich
North East Cambridgeshire	Bury St Edmunds
	West Suffolk

South Wales	Thames Valley
Newport East	Wantage
Newport West	Newbury
Islwyn	Oxford West and Abingdon
Caerphilly	Reading West
Cardiff North	Reading East
Cardiff Central	Wokingham
Cardiff South and Penarth	Henley
Cardiff West	Windsor
Vale of Glamorgan	Maidenhead
Pontypridd	Beaconsfield
Cynon Valley	Spelthorne
Aberavon	Runnymede and Weybridge
Neath	Slough
Swansea East	
Gower	

West of England	Hampshire
Cheltenham	New Forest East
The Cotswolds	Romsey and Southampton North
Gloucester	Southampton, Test
Stroud	Southampton, Itchen
Thornbury and Yate	Eastleigh
North East Somerset	Winchester
Chippenham	Fareham
North Wiltshire	Meon Valley
Somerton and Frome	Portsmouth North
	East Hampshire
	North East Hampshire
	Aldershot
	Basingstoke

Kent	Surrey/ West Sussex
Folkestone and Hythe	East Surrey
Ashford	Reigate
Faversham and Mid Kent	Epsom and Ewell
Sittingbourne and Sheppey	Mole Valley
Sevenoaks	Crawley
Tonbridge and Malling	Horsham
Rochester and Strood	

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5. Employees and businesses can be present in multiple sub-sectors, but this double counting is removed when looking at the net zero economy as a whole.
6. GVA is the value generated by any unit engaged in the production of goods and services.
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