CBI Economics datacity

The Road to Net Zero: The National, Regional & Sector Impacts of Net Zero

Yorkshire & Humber Climate Commission

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About the speakers

Alex Craven (CEO, The Data City)

Within The Data City, Alex is the CEO, responsible for the company and product vision. The Data City was formed to solve the market need created by the fact that the current Standard Industrial Classification (SIC) system was last updated in 2007, and the massive changes that have taken place since then mean that it doesn’t recognise the complexity of the modern economy.

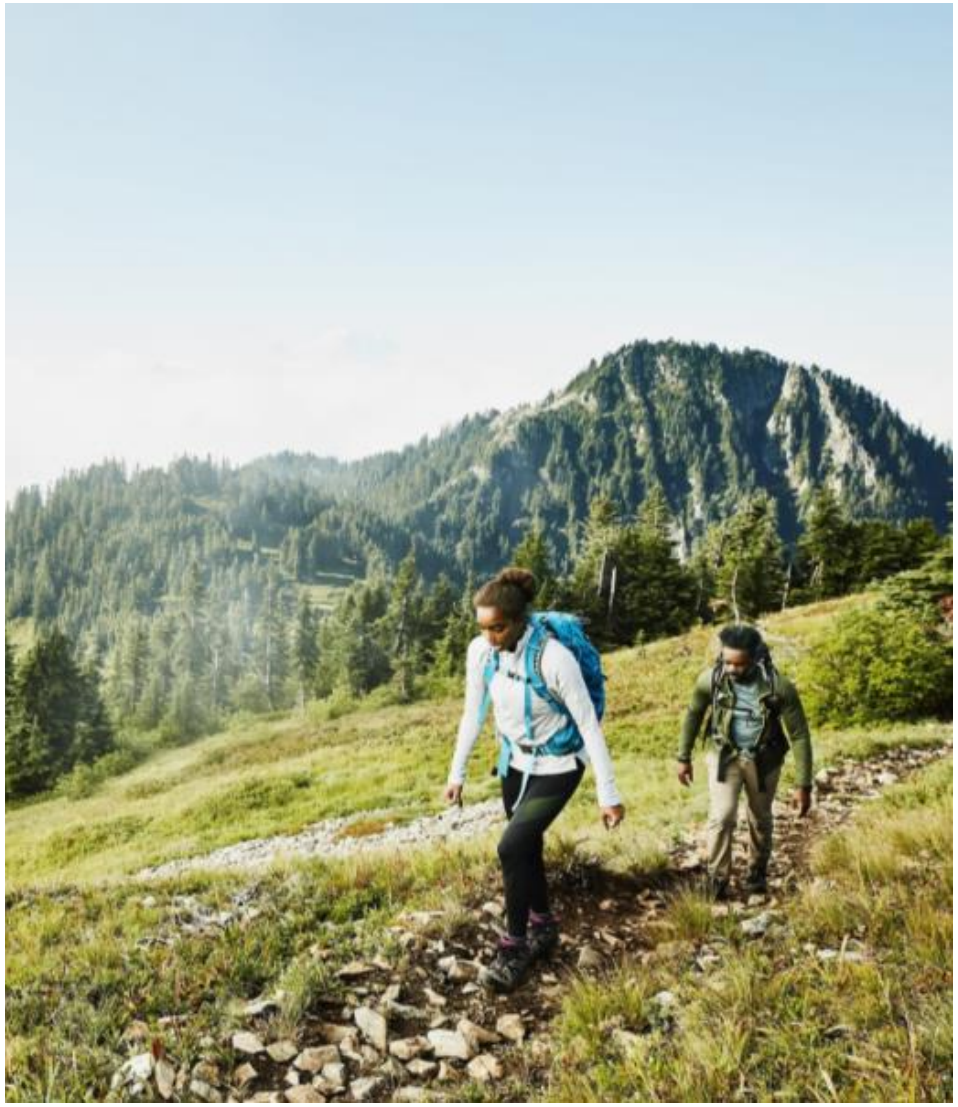
Mohammad Jamei (Director of CBI Economics)

Mohammad is the Director of CBI Economics with over 11 years of experience working as an economist. Mohammad leads CBI Economics, the CBI's economic consulting division, and helps clients to understand the economic and political landscape using economics to support their business needs, including in the environment sector. He has worked across the private and public sector, including in PwC, UK Finance and HM Treasury.

Why net zero?

Net zero is the growth story of the decade

- If no climate action is taken, a Swiss Re assessment of direct and indirect impacts projects a 3.1% – 8.7% loss to UK GDP by 2050 in their 2.6°C-3.2°C warming scenario.
- The 2006 Stern Review of the Economics of Climate Change estimated the overall costs and risks of global warming to be equivalent to losing 5% - 20% of global GDP each year.
- The transition to net zero greenhouse gas emissions will be the growth story of the decade, with structural shifts both in the economy and society.
- Businesses that embark on the transition to net zero emissions have the opportunity to capitalise in these markets, as household spending patterns change and low-carbon industries grow.
- As an emerging industry, data is also more scarce.



Developing a methodology for net zero

Defining the net zero ecosystem

Machine learning to identify relevant businesses

- The UK's traditional industry classifications do not provide an insight into the emergence or growth of business activity in green or low-carbon sectors.
- Our partner, The Data City, developed a taxonomy to build a training set for each industry vertical (subsector). Each training set consists of companies which are highly representative of the industry vertical, as well as companies which are not within the industry, in order to improve the identification of relevant (and not relevant) businesses. This is then used to build a full list of businesses.

16 verticals which form the net zero ecosystem

Net zero taxonomy	
1. Agritech	9. Renewable energy planning database
2. Building technologies	10. Diversion of biodegradable waste from landfill
3. Carbon capture	11. Low carbon
4. Low emission vehicles	12. Pollution control & mitigation
5. Energy cooperatives	13. Renewables
6. Energy storage	14. Waste management & recycling
7. Grid, demand side response & efficiency	15. Low carbon consultancy, advisory & offsetting services
8. Heating	16. Green finance

National analysis

Almost 16,000 UK businesses are part of the net zero ecosystem, contributing £60 billion a year

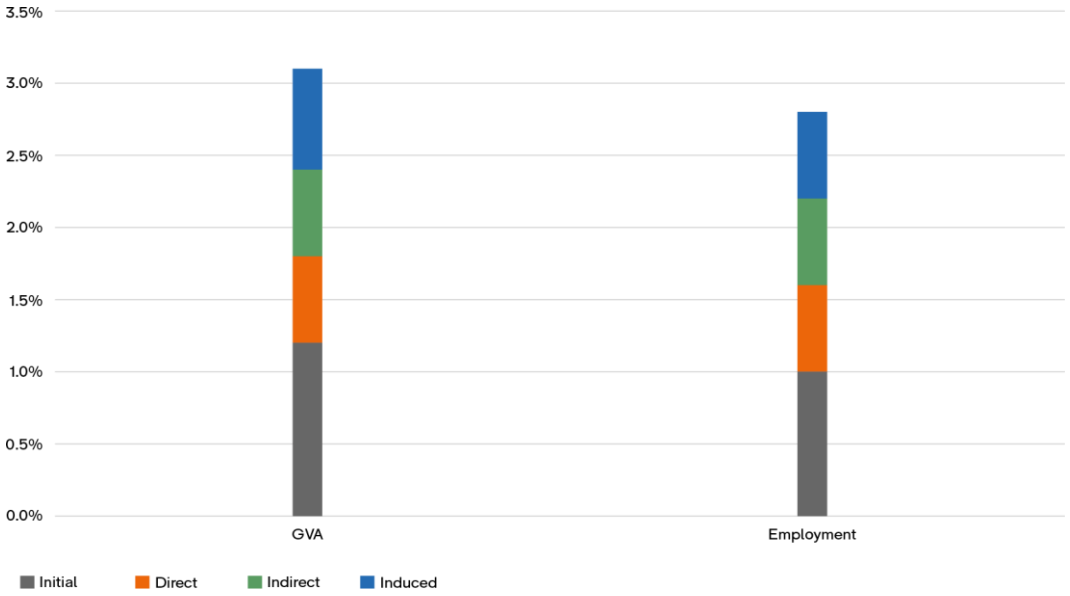
16,000 UK businesses are part of the net zero ecosystem

- The Data City mapped almost 16,000 businesses in the net zero ecosystem, operating in at least one of the 16 verticals.
- These businesses also generate an estimated £200bn in turnover.
- The energy sector is the biggest sector, with large energy providers such as SSE, EDF, and E.ON Energy.

These businesses contributed to £60bn (3.2%) of the UK's economy

- Economic modelling by CBI Economics using our in-house model show that these businesses accounted for £60bn of the UK's gross value added (GVA) in 2019.
- They also support almost 766,000 full-time equivalent (FTE) jobs, accounting for 2.8% of total jobs in the UK economy, including direct and indirect employment.

Exhibit 1: GVA and employment contributions

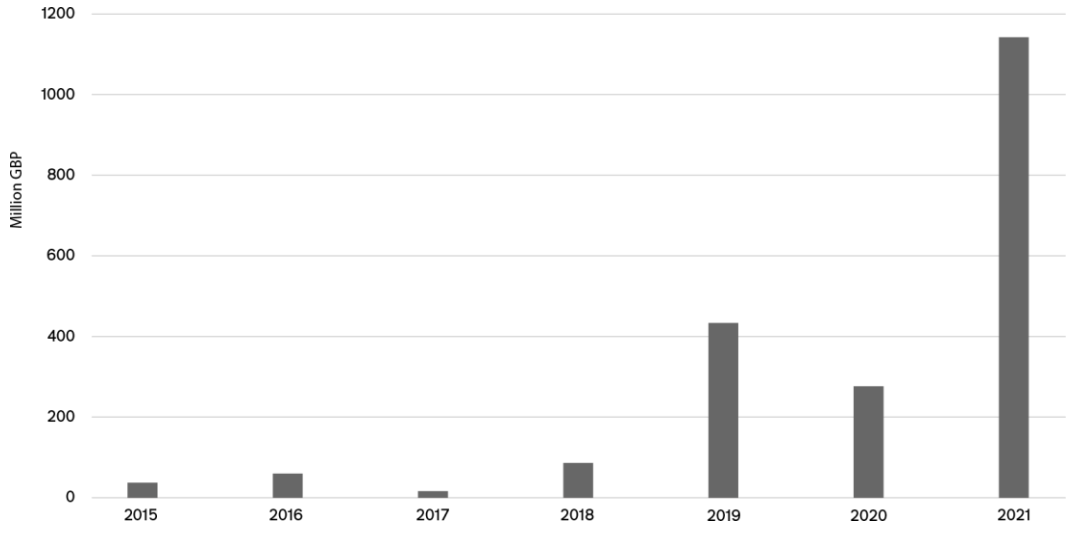


Opportunities for businesses to invest

Net zero is an opportunity for the UK to boost investment and for businesses to grow

- Business investment in the UK has been below the G7 average since the 1990s, and in recent years leaving the EU and Covid further reduced demand for businesses to invest.[1]
- £1.4tn of additional investment by 2050 is estimated to be needed to reach net zero, with majority coming from the private sector.[2]
- There is tremendous growth in recent years within the net zero ecosystem that we are tracking.
  - Matching businesses identified with funding data tracked by Dealroom.
  - In 2021, venture funding into the net zero ecosystem reached £1.1bn.
- Businesses that do not engage with the transition risk being left behind as significant learning-by-doing, network effects, and economies of scale operate.[3]

Exhibit 2: Venture funding into the net zero ecosystem



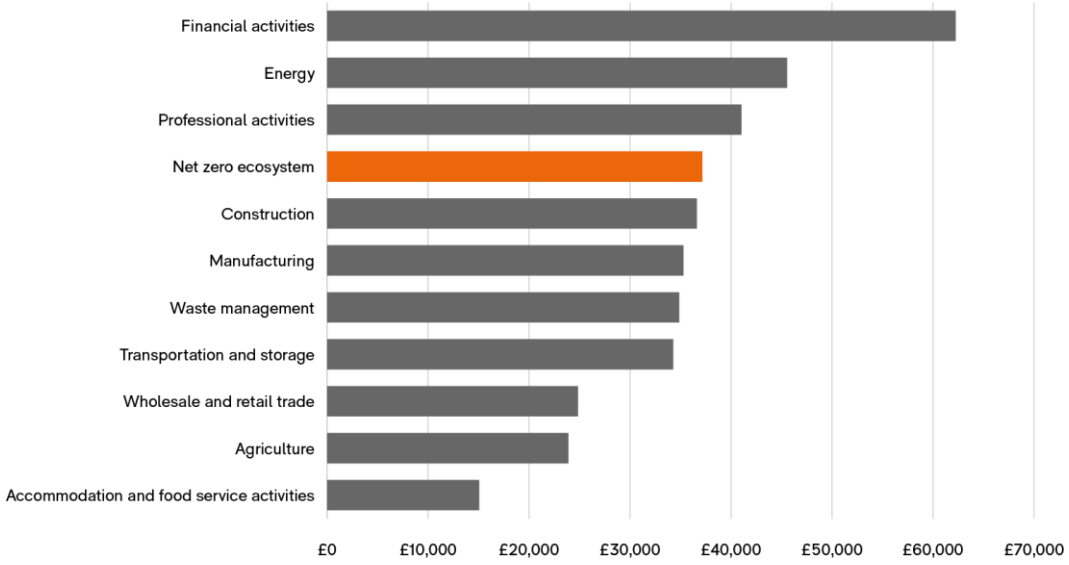
1. Bunn, P., et al. (2021), Influences on investment by UK businesses: evidence from the Decision Maker Panel. Bank of England Quarterly Bulletin.
2. Climate Change Committee (2020), Sixth Carbon Budget.
3. Zenghelis, D. (2019), Securing decarbonisation and growth. National Institute Economic Review, 250(1), R54-R60.

Higher wages within the net zero ecosystem compared to many traditional sectors

Average wages estimated at £37,160 within the ecosystem

- A substantial redistribution from high-carbon to low-carbon jobs requires re-training and upskilling in many areas.
  - Average skill requirement for a job in a carbon-intensive industry is 46% lower than the average net zero-related job.[1]
- Jobs related to net zero are also in high demand.
  - Green hiring overtook non-green hiring for the first time in 2019 and continues to rise.[2]

Exhibit 3: Sector wage averages compared to the net zero ecosystem



1. Onward (2021), Qualifying for the race to net zero.
2. LinkedIn (2019), UK Green Skills Report.

Sector analysis

Key verticals (subsectors) in the net zero ecosystem

- Of the 16 verticals, the renewable energy planning and database vertical formed the largest composition with around 170,000 employees and 7,000 companies mapped by The Data City (40% of total employees and 45% of the businesses mapped).
- Waste management and recycling also formed one of the largest verticals with 94,000 employees and 3,100 businesses.
    - Department for Environment, Food & Rural Affairs estimates that UK businesses could benefit by £5.7-7.2bn per year through low/no-cost improvements in resource efficiency.[1]
    - Venture funding in waste management and recycling, however, was low overall.
- Funding was strong in electric vehicles and renewable energy, both secured around £885mn each in 2021.

1. Oakdene Hollins (2017), Business Resource Efficiency – Quantification of the no cost / low cost resource efficiency opportunities in the UK economy in 2014.

Economic contributions of key sectors

Energy and construction sectors had the highest economic contributions

- The energy and the construction sectors had the highest contribution to the UK economy, accounting for 14.9% and 13.9% of the total £60bn contribution, respectively.
- The two sectors had similar economic contributions, but the employment impacts were significantly larger within construction.

Exhibit 4: Initial versus total contribution - GVA

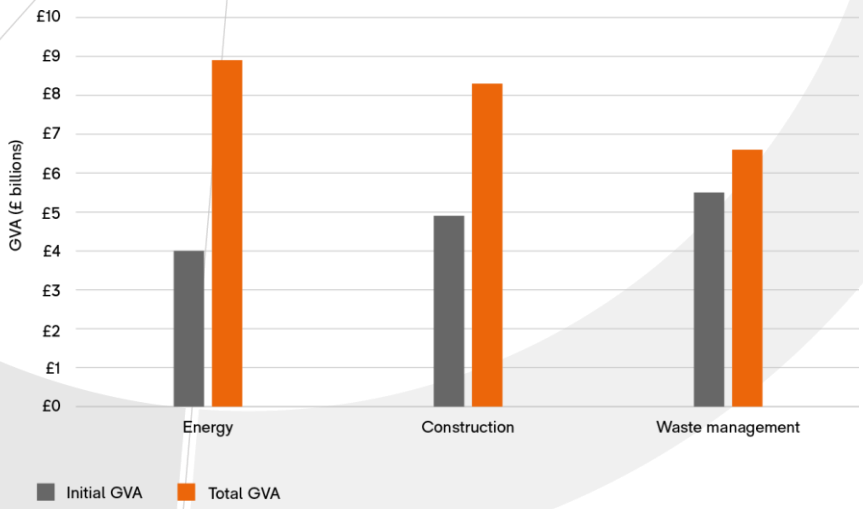
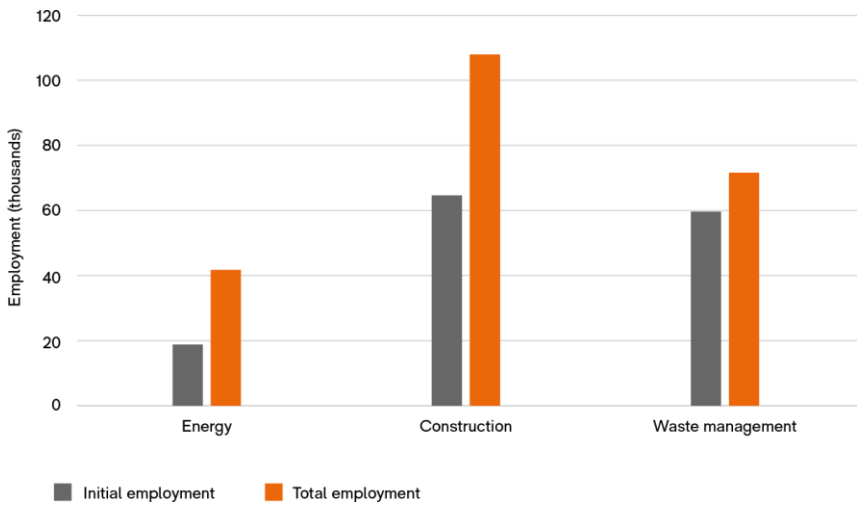


Exhibit 5: Initial versus total contribution – employment



Regional analysis

Distributional impacts in the net zero transition

Redistribution of economic activity

- Closing the output gap in the UK's underperforming cities could boost the economy by almost £70bn per year.[1]
- Regions that seize the growth opportunities of the net zero transition benefit from high-paying jobs, due to the wage premium of net zero-related jobs.
    - For example, renewable energy is more geographically distributed.
- The transition to net zero will bring a boost to regional manufacturing hubs such as Sunderland, Swindon, and Solihull with the growth of manufacturing and construction of EVs.
- The North, Midlands, and Scotland have more net zero businesses, and less concentrated in London (19% of the net zero ecosystem GVA is in London compared to 24% for the UK average).
- Although many are based in London and the South East, their activities are more likely to be distributed across the UK, for example wind energy generation and management across rural and coastal areas.

Exhibit 6: Distribution of net zero ecosystem

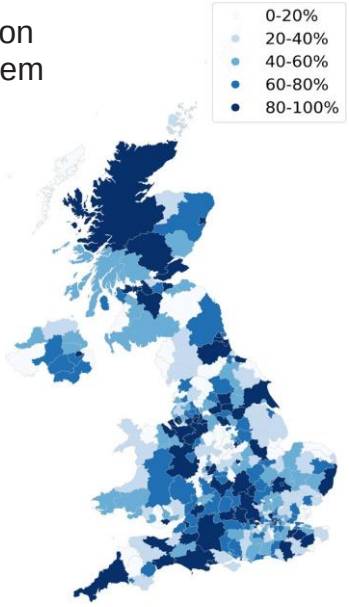
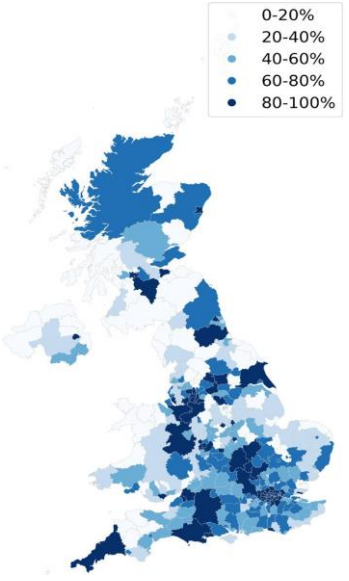


Exhibit 7: Distribution of all businesses



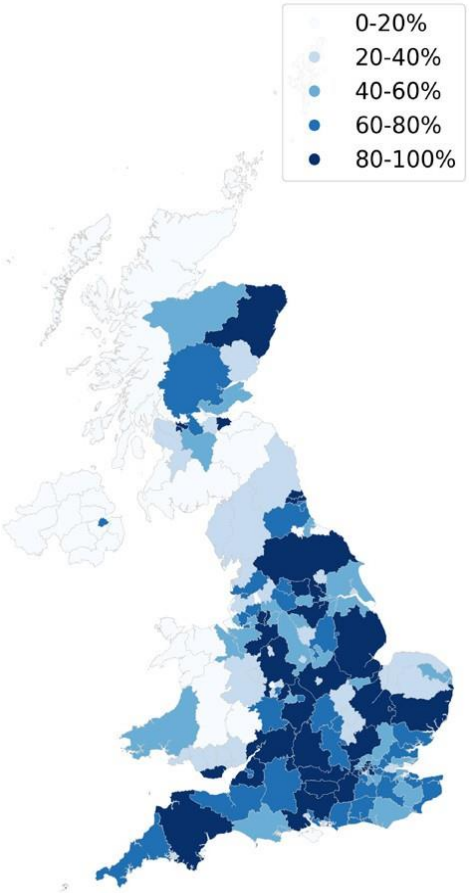
1. Swinney P. & Enenkel K. (2020), Why big cities are crucial to levelling up, London: Centre for Cities.

Distribution of the net zero ecosystem

The economic contribution of the net zero ecosystem is distributed across the UK

- After adjusting for each region's size, the net zero ecosystem has a similar share of each regional economy (3%)
- The only outlier being London with a 2.3% share. This aligns with potential for the transition to net zero to redistribute economic activity more evenly across the UK.

Exhibit 8: Distribution of GVA contributions of the net zero ecosystem, by quintile



Spotlight on Yorkshire & the Humber: key sectors

The net zero ecosystem contributed £3,960 million (3.1%) in GVA to the Yorkshire & the Humber economy in a year

- The net zero ecosystem is the largest within the energy sector in Yorkshire & the Humber, closely followed by waste & water management, manufacturing, and construction.
- Compared to the UK average, the net zero ecosystem in Yorkshire & the Humber is overweight on energy (15% across the UK), manufacturing (9%), waste & water management (12%).
- On the other hand, it is underweight in financial activities (4% across the UK) and information and communication (5%).

GVA of the net zero ecosystem in Yorkshire & the Humber, select sectors

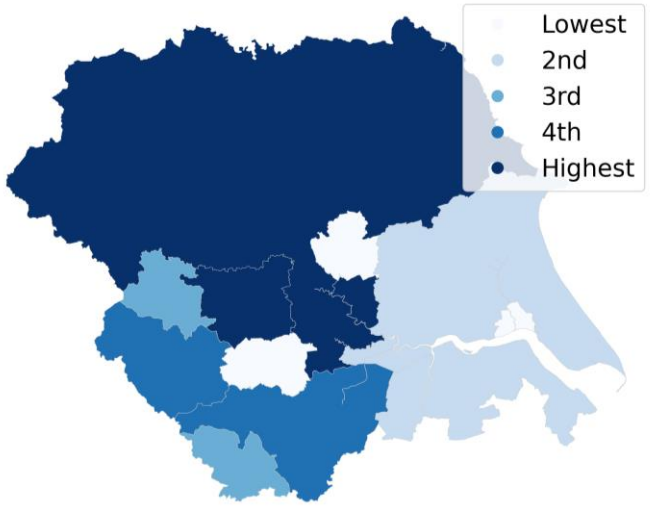
Sector	GVA (£ m)	% of total net zero ecosystem contribution in Yorkshire & the Humber
Energy	670	17%
Waste and water management	570	14%
Manufacturing	550	14%
Construction	530	13%
Professional, scientific and technical activities	460	12%
Wholesale and retail trade	310	8%
Transport	130	3%
Financial and insurance activities	110	3%
Information and communication	100	3%
Accommodation and food service activities	50	1%
Agriculture, forestry and fishing	30	1%
Mining and quarrying	7	0%

Spotlight on Yorkshire & the Humber: key ITL3 areas

Leeds has the highest net zero ecosystem GVA within Yorkshire & the Humber, followed by North Yorkshire CC, and Barnsley, Doncaster & Rotherham

- The net zero ecosystem contributes £900 million in GVA to Leeds, and £500 million to North Yorkshire County Council.
- £500 million in GVA is also contributed to the combined area of Barnsley, Doncaster & Rotherham.
- Despite the size of the Leeds economy, the net zero ecosystem is broadly distributed across these ITL3 regions, at around 3.5% of each area's total economy size.
- However, in Sheffield, only 2.7% of the region's economy is composed of the net zero ecosystem (the lowest in Yorkshire & the Humber).
- On the other side of the scale, 4.1% of North and North East Lincolnshire's economy is made up of the net zero ecosystem.

Exhibit 9: Distribution of GVA contributions of the net zero ecosystem – Yorkshire & the Humber, by quintile



Net zero scorecards

Redistribution across regions, but disparities at the local authority level

- Coincides with research demonstrating that inequalities between local authorities within regions are larger than the inequalities between regions.[1]
- To explore this further in relation to net zero, our scorecard consists of eight metrics that cover the energy, economy, and emissions themes and provides a snapshot of the transition to net zero of 374 local authorities
- The Red-Amber-Green (RAG) rating is used to summarise how the local authority is performing against all other local authorities. This was determined for each metric based on the distribution of the values such that the bottom 25% of local authorities received a red rating, 50% received an amber rating, and the top 25% received a green rating.
- The full set of scorecards is accessible for all here.

1. Agrawal, S., & Phillips, D. (2020), Catching up or falling behind? Geographical inequalities in the UK and how they have changed in recent years. The Institute for Fiscal Studies.

Net zero scorecards highlight coastal areas

The scorecard highlights the growth potential of coastal areas.

- Hastings (England's South East coast), Gosport (southern coast), and East Ayrshire (close to the western coast of Scotland), all have a high exposure to the net zero ecosystem at over 4% of the local economy size.

	Hastings	Gosport	Nottingham	Bristol	East Ayrshire
Renewable electricity generation per household (MWh)					
Electricity consumption per household (KWh)					
% of net zero businesses					
% of net zero employees					
CO_2 emissions per thousand people - commercial					
CO_2 emissions per thousand people - domestic					
CO_2 emissions per thousand people - industry					
CO_2 emissions per thousand people - transport					

	Mole Valley	North West Leicestershire	Hertsmere	Richmondshire	Surrey Heath
Renewable electricity generation per household (MWh)					
Electricity consumption per household (KWh)					
% of net zero businesses					
% of net zero employees					
CO_2 emissions per thousand people - commercial					
CO_2 emissions per thousand people - domestic					
CO_2 emissions per thousand people - industry					
CO_2 emissions per thousand people - transport					

Net zero scorecards – Yorkshire & the Humber

Whilst Yorkshire & the Humber have traditionally polluting industries, the scorecards reflect the transformations taking place in the region. In particular, in the Humber region with Humber Zero driving large-scale decarbonisation in North and North East Lincolnshire, with businesses such as Phillips 66 and Drax. Other businesses identified in the region include European Metal Recycling and Veolia Environmental Services.

Local authority	Renewable electricity generation per household (MWh)	Electricity consumption per household (KWh)	% of net zero businesses	% of net zero employees	Commercial CO2 emissions/thousand people	Domestic CO2 emissions/thousand people	Industry CO2 emissions/ thousand people	Transport CO2 emissions/thousand people
Barnsley								
Bradford								
Calderdale								
Craven								
Doncaster								
East Riding of Yorkshire								
Hambleton								
Harrogate								
Kingston upon Hull, City of								
Kirklees								
Leeds								
North East Lincolnshire								
North Lincolnshire								
Richmondshire								
Rotherham								
Ryedale								
Scarborough								
Selby								
Sheffield								
Wakefield								
York								

What's next?

Continued use of this methodology

Since the release of this report in July, businesses and public bodies have shown interest in re-using this methodology, including:

- Upcoming project on green growth and its impacts at the local level.
- 2023 refreshed version of the report.
- Mapping other emerging sectors such as the Air Quality Ecosystem, the Sharing Economy and FinTech.
- Two live projects with a waste energy generation and a multinational energy company evaluating how their business contribute to the net zero ecosystem and where they fit into it.
- Extension of the methodology to evaluate environmental impacts, as well as economic (emissions, water usage, waste production).

Question & answer session

Got any questions or comments? Let us know in the chat.

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Thank you

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