Energy UK

The voice of the energy industry

OXFORD ECONOMICS

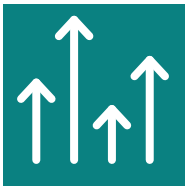
Community Capital

How winning globally delivers locally

Part of The Clean Growth Gap – a series of reports and economic analysis from Energy UK, supported by Oxford Economics

Executive Summary

Investing in an ambitious transition to Net Zero will see the British economy £240 billion (6.4%) larger in 2050 than it is set to be under our current trajectory.[1] But Net Zero isn't just about the headline numbers, it's about improving the living standards of people across the country. Community Capital is the fourth report in Energy UK's "The Clean Growth Gap" series and it examines how decarbonisation will impact every corner in the UK. It shows that not only will no region be left behind, but by reinvigorating industry, Net Zero investment has the potential to revive some of our least prosperous communities.



Closing regional disparities

By bringing economic growth to all parts of the UK, the transition to Net Zero has the potential to close regional disparities. Oxford Economics' scenario modelling shows the six regions which are predicted to experience the greatest increase in GDP by 2050 thanks to the transition, all had below the average GDP per head in 2022.[2] For regions outside of London and the South East, this GDP boost amounts to £141 billion, which is more than the current contribution to UK GDP made by Northern Ireland and Wales combined.[3]

New local industries

There are no one-size-fits-all solutions to Net Zero, and every community will be able to play to their strengths differently. Building on historic expertise and local geography, areas have the opportunity to specialise and grow new industries. This includes making components for windfarms in the North East, scaling Electric Vehicle (EV) manufacture in the Midlands and pioneering Carbon Capture Usage and Storage (CCUS) along the North Sea coast and beyond. All of this activity will bring long-term jobs and benefits to local people and businesses.

Powering communities

In addition, as the transition to Net Zero demands substantial growth in the UK's clean energy generating industry, this report examines how this sector can deliver benefits across the country. Wind, solar and other low-carbon power producers provide high wage employment in rural areas, where employment opportunities and earnings are less plentiful than elsewhere. Around 21% of the UK's operational low-carbon energy capacity is situated in the 10% of local authority districts (council areas) where the population has the highest economic inactivity rates.

We need action now

These benefits can only be realised by investing in the Net Zero transition. As our second report in the Clean Growth Gap series, Funding the Future, shows, the UK is falling significantly behind other major economies in providing the support and frameworks to enable clean investment, and as our third paper, Path to Prosperity, highlights - the difference in additional value to the economy varies hugely with the speed in which actions are taken. Unless the UK can sufficiently enable a rapid increase in investment, communities across the country will suffer from fewer jobs and weaker economies.

All regions and nations of the UK will benefit from Net Zero

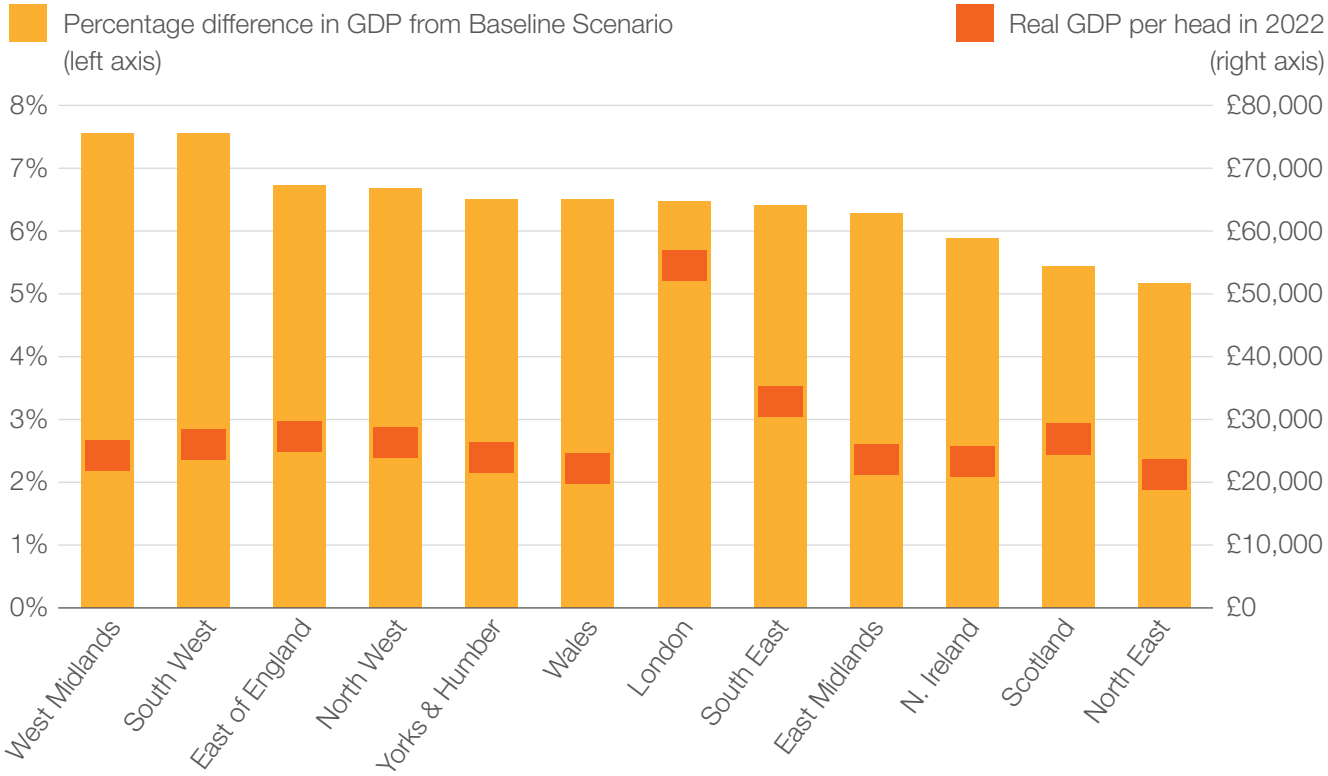
The transition to Net Zero will affect areas of the UK in different ways as certain sectors grow more than others to meet the need for decarbonisation. A successful global transition to Net Zero could mean that UK gross domestic product (GDP) will be up to 6.4% higher in 2050, with electricity generation, manufacturing, and construction sectors expected to be the largest beneficiaries.[4] More detail is given in the previous Clean Growth Gap report: Path to Prosperity.[5,6]

Oxford Economics' modelling shows that all regions are expected to benefit from the transition to Net Zero.[7,8] Under the most optimistic scenario for the transition to Net Zero, by 2050 each area's GDP is expected to be between 5.4%-7.5% larger (Fig. 1). For regions outside London and the South East, this amounts to a boost of £141 billion in today's prices. This is more than the current contribution to UK GDP made by Northern Ireland and Wales combined.[9] The regions which are predicted to experience the greatest increase in GDP, all had below the average GDP per head (a simple measure of living standards) in 2022.

The gap in predicted GDP growth between the current trajectory and the most optimistic scenario reflects variation in the industrial structure of different parts of the UK. The South West and the West Midlands (which both had low GDP per head in 2022) are expected to be the biggest beneficiaries under the most optimistic transition scenario. Both of these regions host large manufacturing sectors which are set to benefit from the green transition. This is because manufacturing plays a vital part in the supply chains of clean technology products such as wind turbines, transmission infrastructure, and the equipment needed to power electrification.

Despite the challenges from transitioning away from extraction industries (eg. oil and gas), Scotland and the North East are still expected to grow by over 5% under this Net Zero pathway than they would otherwise. Even so, it is incumbent on Government and industry to manage the transition fairly and support workers to move into growing sectors.

Fig. 1: Percentage difference in real GDP in 2050 under the Net Zero Transformation Scenario versus the Baseline Scenario and GDP per head in 2022

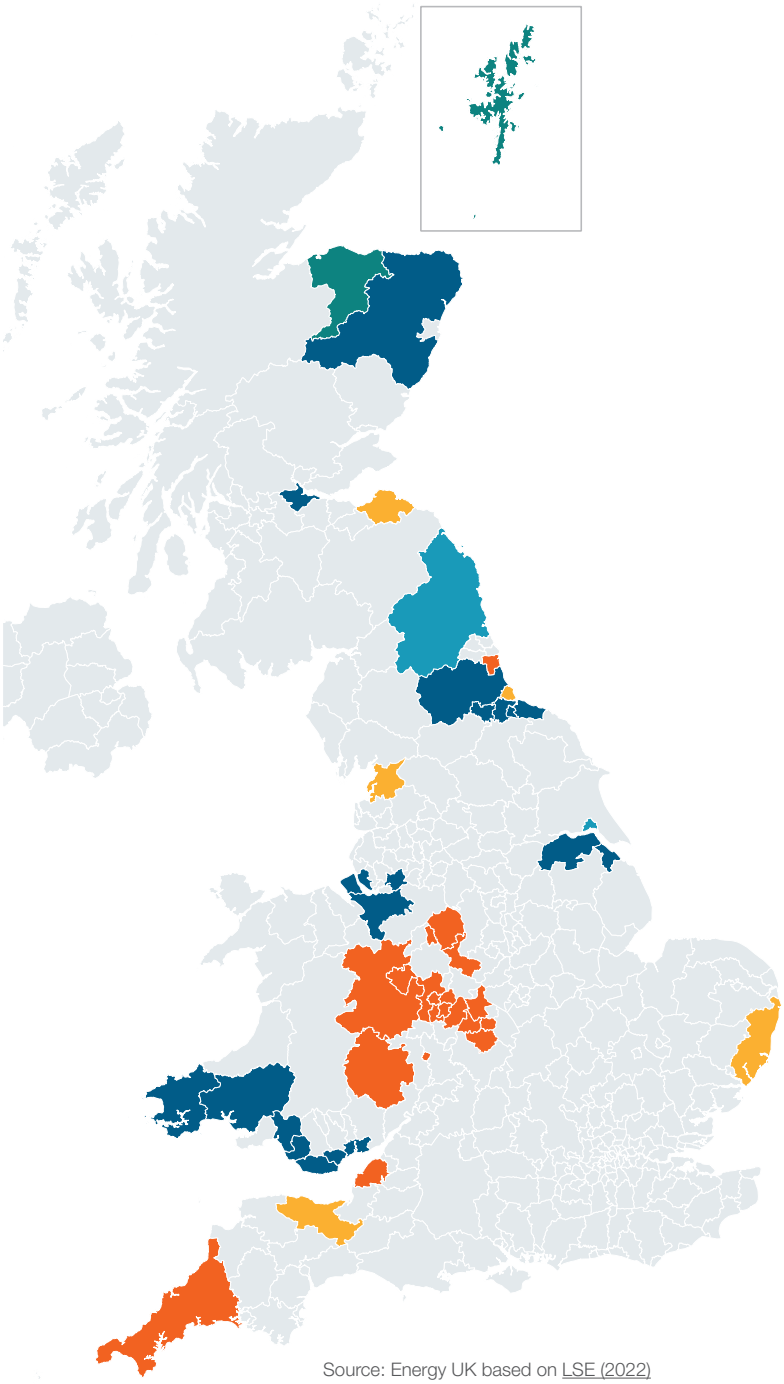


Source: ONS; Oxford Economics

Areas will forge their own paths

The whole UK economy will be transformed as it decarbonises, with opportunities available across many sectors, from repurposing manufacturing facilities and new applications for existing technologies, to innovative products and services. This includes building up the UK's expertise in technologies that allow us to electrify heat and transport – like heat pumps and EVs – to growing our existing base of low-carbon generation. Equally, there are key opportunities in decarbonising existing industrial sectors by harnessing CCUS or by producing green steel using hydrogen. Areas that have suffered from deindustrialisation in recent years are particularly well placed to benefit from these opportunities. Fig. 2 gives examples of some regions that have an existing or potential technology specialism relevant to decarbonisation.[10]

Fig. 2. Examples of regional specialisms and opportunities, by technology



Source: Energy UK based on LSE (2022)

Floating offshore wind

Using technology from the oil and gas sector, floating offshore can operate in deeper waters.

CCUS/Hydrogen

Oil and gas industries and their depleted fields are the foundations for the new CCUS and hydrogen sectors.

Offshore wind

Proximity to the North Sea, port facilities and manufacturing create opportunities in offshore wind.

Electric vehicles and supply chain

The UK's leading automotive sector will switch to EVs.

Nuclear

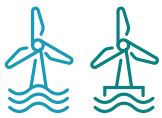
New nuclear developments at existing facilities around the coast.

Carbon Capture and Hydrogen

Areas with a large concentration of carbon-intensive industries and a proximity to depleted oil and gas fields are well suited to develop industrial Carbon Capture, Usage and Storage (CCUS) sites. These include Country Durham and Sunderland which have a high concentration of CCUS patents, illustrating leadership in developing CCUS technology.[11] Nearby, Tees Valley currently produces half of the commercially available hydrogen in the UK. Although production there is currently grey (produced using natural gas and emitting carbon), there are plans to significantly increase production through developing green (produced using renewable electricity) and blue (produced using natural gas with carbon sequestered) sources of hydrogen.[12]

Moreover, the UK Government has provided funding for a series of Net Zero industrial clusters which will use CCUS and hydrogen technologies to decarbonise new and existing sites.[13] These are situated in South Wales (SWIC), Northwest England (HyNet), Northeast Scotland (Acorn project), and the East Coast Cluster (which includes Teesside and the Viking Project in South Humber).[14] These locations generally score highly on metrics of deprivation.[15] Development of hydrogen technologies is also expected to help decarbonise energy intensive industries such as steel (currently concentrated in locations such as Port Talbot and Scunthorpe), helping to support future UK jobs in these industries. Additionally, as these locations are often home to legacy sectors (for example, oil and gas extraction in Aberdeen), the green transition will be an important source of opportunities for workers in these industries.

Offshore/Floating Offshore wind



The East coast of England (near Hull) and Scotland (near Aberdeen) have seen a significant number of recent large-scale offshore wind developments. Inward investments include a new factory for foundations in Teesside, a new factory for cables in Blyth, and a major expansion of Siemens Gamesa's offshore wind turbine factory in Hull.[16] Cromarty and Moray Firth are where the Department for Business and Trade is seeking to establish a portside facility for the manufacture of floating substructures and associated components.[17]

Electric Vehicles and Batteries

Manufacturing regions with an existing automotive specialism such as the West Midlands and Sunderland are also well placed to develop EV and battery technologies. Nissan's Sunderland site is the single biggest EV production site in Europe. Envision has begun building works for its battery factory in Sunderland.[18] Tata, the parent company of Jaguar Land Rover is set to build a $4 billion new EV battery plant in Somerset.[19] Lastly, in August of this year the UK Infrastructure Bank announced additional financing to Cornish Lithium; the company intends to set up commercial production of lithium in the region.[20] Lithium is crucial for the scaling up of battery production for electric vehicles and the development of battery energy storage.

Decarbonising buildings

Buildings directly contribute 17% of the UK's greenhouse gas emissions, mostly thanks to heating.[21] Decarbonising buildings will require a significant amount of activity that will boost local economies, including retrofitting buildings with insulation and installing heat pumps. The challenge is particularly acute when it comes to housing, with 15 million homes requiring retrofitting by 2030.[22] Investments to improve the energy efficiency of homes is likely to provide jobs across the country as well as saving households hundreds of pounds in energy bills every year. Research by IPPR has shown that jobs in retrofitting are likely to play an outsized role in areas such as Middlesborough, Norfolk, Doncaster and Sheffield.[23]

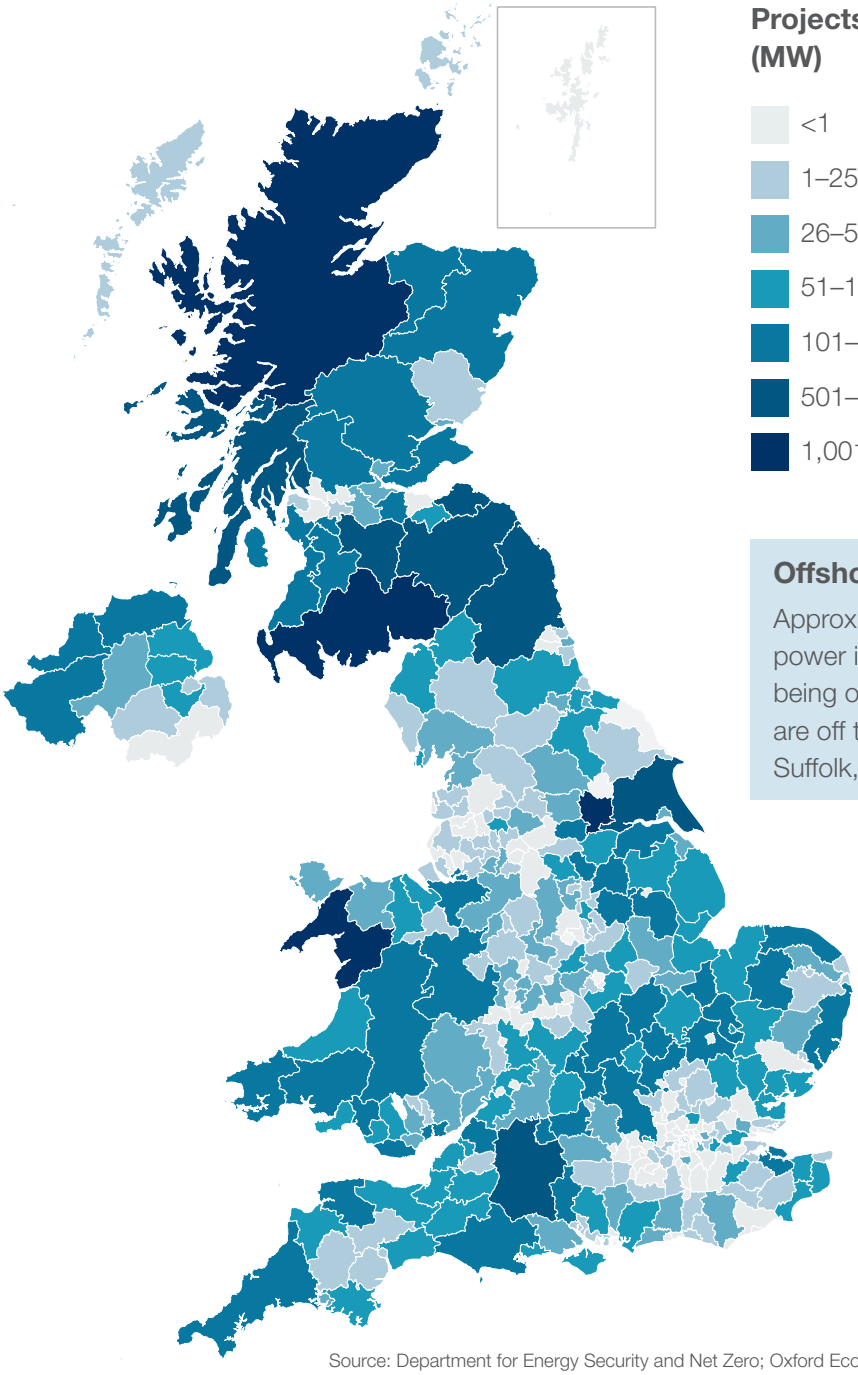
Nuclear

There are currently five operational nuclear stations across England and Scotland.[24] Most of these will close this decade, with new facilities opening at Hinkley Point C in Somerset (under construction) and Sizewell C (planned) in Suffolk. In the past year, the UK Government has committed over £1 billion in investment into Sizewell C.[25] In addition to these gigawatt-scale developments, small modular reactors (SMRs), advanced modular reactors (AMRs) and further developments in nuclear fusion may play a role in providing clean energy.[26]

A focus on low-carbon generation

The transition to Net Zero will require substantial growth in the UK's clean energy generation capacity. Many areas of the country are already benefiting from the massive investment and community benefits these projects bring and are set to reap even more rewards into the future. The map (Fig. 3) shows that the Local Authority districts with the highest levels of onshore operational low-carbon generation are the Highlands (Scotland), Selby (North Yorkshire), Dumfries and Galloway (Scotland), and Gwynedd (Wales).[27] For Gwynedd and Selby, hydropower and biomass are the predominant low-carbon technologies respectively. For the Scottish local authority districts (Highlands and Dumfries and Galloway), onshore wind is the predominant low-carbon technology. Just under a third of onshore wind capacity (31%) is located in Scotland.

Fig. 3: Distribution operational onshore low-carbon capacity by local authority district



Source: Department for Energy Security and Net Zero; Oxford Economics

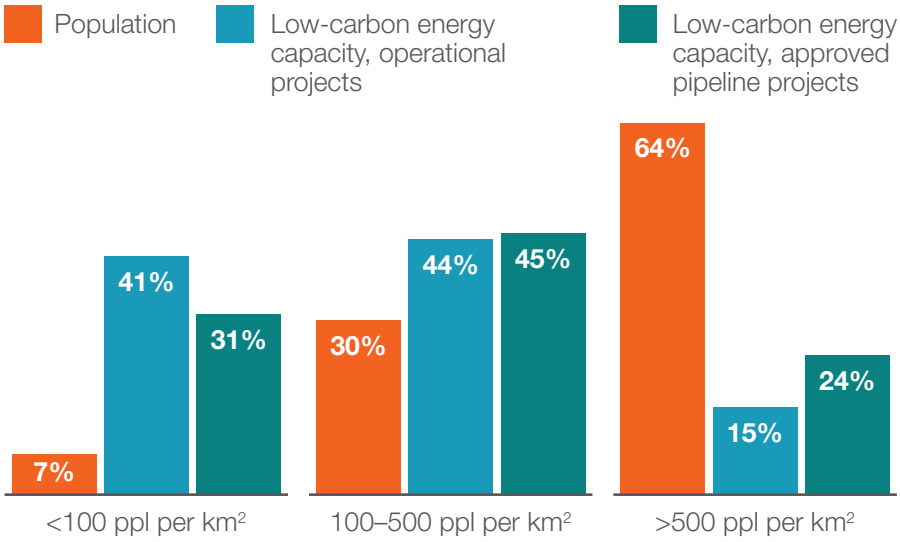
Offshore

Approximately 28% of operational low-carbon power is offshore, with the majority of projects being offshore wind. The largest projects are off the coast of Lincolnshire, Yorkshire, Suffolk, Moray, Northumberland and Cumbria.

Low-carbon generation is a mostly rural affair

Clean energy generation capacity is currently concentrated in the more remote parts of the country (Fig. 4). This is important as rural areas often suffer from structural problems such as a lack of attractive employment opportunities, skills shortages, poor connectivity and underinvestment in infrastructure and essential services.[28] The box below illustrates the benefits that clean energy technologies offer to the local communities in which they are situated.

Fig. 4: Distribution of onshore low-carbon energy capacity and population split by population density of local authority district



Source: Department for Energy Security and Net Zero; Oxford Economics

How clean energy technologies benefit their host communities

Investment in clean technologies benefits both the areas where technologies are operated, and the regions included in the supply chains. Local people and businesses gain from their communities hosting low-carbon technology in a variety of ways, including:

Benefits during development and construction

Local supply chains are boosted when projects procure inputs locally. A study of Crossdykes, a 48MW onshore windfarm in Scotland, found that in the development and construction phase £1.7 million of the economic activity took place within the local area - defined as within 40km from the site.[29] Most of the local activity related to plants contracts (e.g., plant hire, road/bridge surfacing works, and provision of stone and aggregate), but the local hospitality sector also benefitted from the attraction of additional workers into the area.

Benefits during operational use

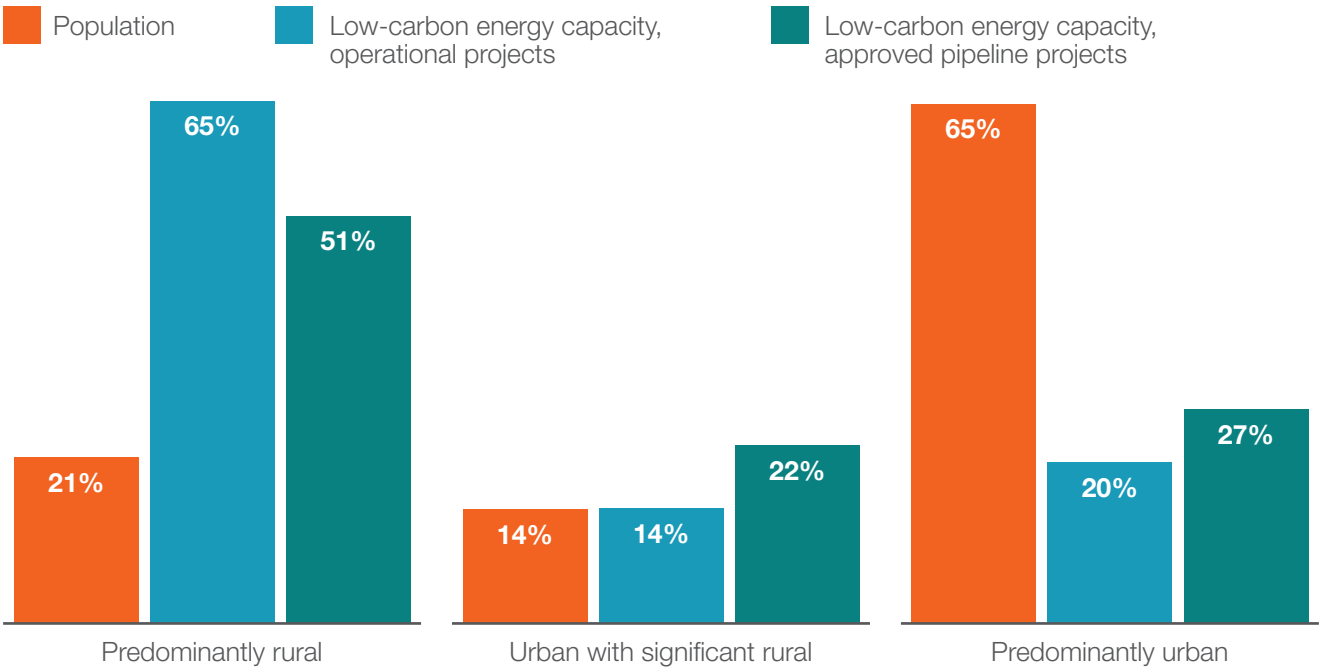
An analysis of UK offshore windfarms found that 75% of operational expenditure, which includes services such as logistics or maintenance, was in the UK. Local communities gain hugely, as services to offshore windfarms are typically located along the UK coastline, within easy reach of sites.[30]

Community Benefit Schemes

Areas which host large scale infrastructure can make use of "community benefit" financial packages that make payments directly, or in kind, to projects in the local area.[31] For example, under the Community Benefits Protocol for the onshore wind industry, developers of onshore wind in England commit to provide funding of £5,000 per megawatt of installed capacity, or equivalent benefits-in-kind, directly to host communities, per year.[32] This investment can have a long-lasting positive impact on residents and can take many forms depending on the needs of the community. For example, engagement with the local community in Powys, Wales, revealed a need to support local educational facilities. The windfarm developer provided £2.5 million to build a new school building, saving it from closure.[33]

Although 7% of the population live in local authority districts with fewer than 100 people per km^2, these areas contain 41% of the operational low-carbon energy generating capacity in the UK. Some 85% of low-carbon energy capacity is situated in areas with fewer than 500 people per km^2. Analysis of the Department for Environment Food & Rural Affairs' Rural Urban Classification (which is only available for England) reinforces the view that onshore clean energy capacity is concentrated in predominantly rural areas (Fig. 5).[34] Whilst 21% of the English population live in predominantly rural areas, 65% of low-carbon energy capacity is situated there.

Fig. 5: Proportion of England's low-carbon energy capacity and population in different local authority districts split by DEFRA's rural urban classifications



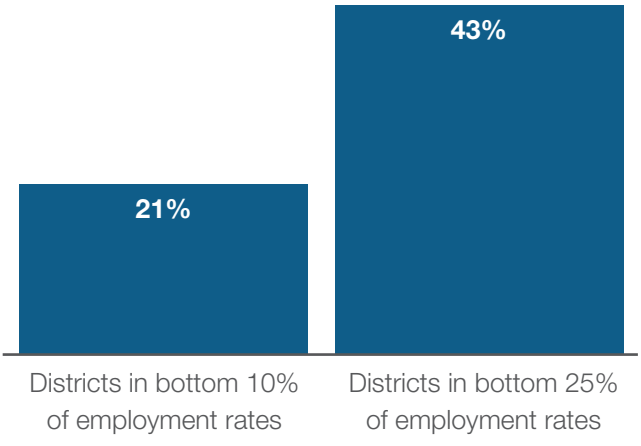
Source: Department for Energy Security and Net Zero; DEFRA: Oxford Economics

Clean generation supports areas with high unemployment

Analysis of where operational low-carbon energy capacity in 2023 is located also shows it is concentrated in areas with low employment rates. Around 21% of currently operational low-carbon energy capacity in 2023 is sited in the top 10% of local authority districts by economic inactivity rates (Fig. 6). This rises to 43% in the top 25% of local authority districts.[35]

Similarly, investment in low-carbon energy generation can provide high-wage jobs in areas with poor earnings.[36] The local authority districts in the bottom 10% of employment rates have average earnings of £24,000, but 16% of low-carbon energy capacity takes place there, providing vital opportunities for local people.

Fig. 6: Share of operational low-carbon energy capacity in local authority districts with lowest employment rates



Source: Department for Energy Security and Net Zero; ONS; Oxford Economics

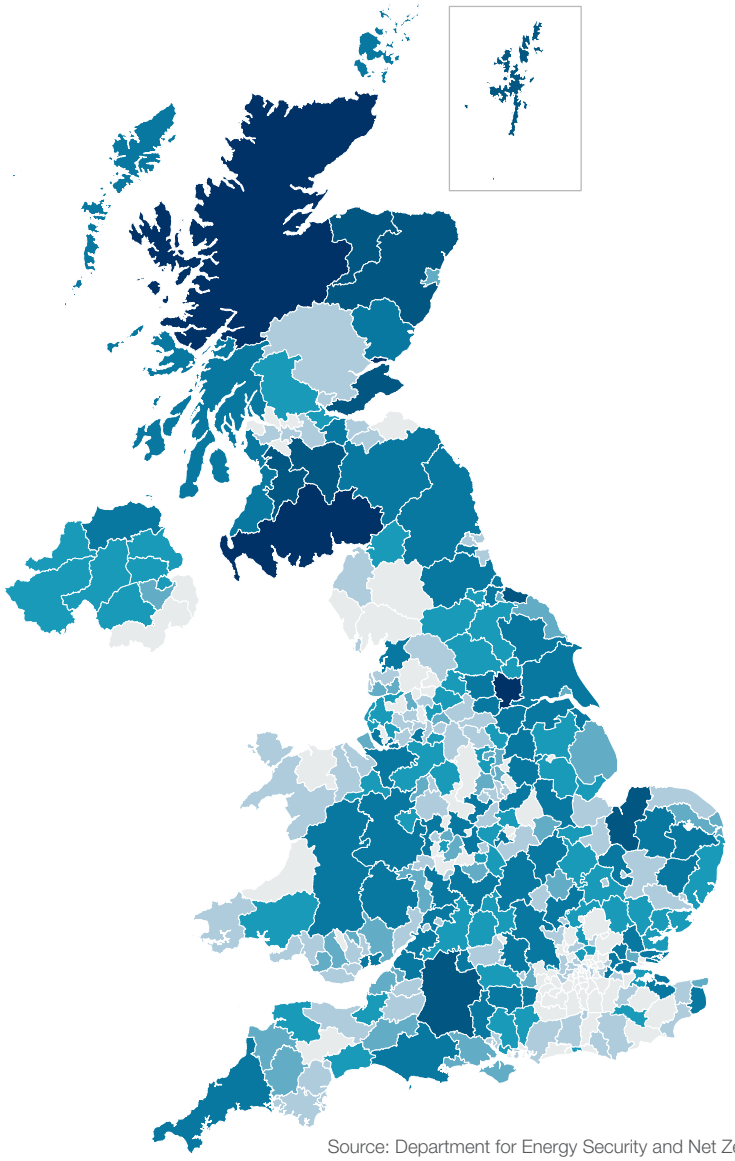
Note: includes offshore projects. Offshore sites are assigned the closest local authority district.

The future of low-carbon generation

The pipeline of future developments gives an idea of where clean energy generation will grow in the immediate future (Fig. 7).[37] The Highlands and Dumfries and Galloway remain the Scottish regions with the highest levels of low-carbon energy expected to come online; onshore wind and hydro are the predominant technologies. Of the ten local authority districts with the largest amount of onshore low-carbon generation capacity to come online, eight of them are located in Scotland.[38] This may in part reflect the changes in planning policy in England which have acted as barriers to development of onshore renewables in England. As Energy UK has set out in previous work, unlocking onshore in England wind is popular, will boost our energy security and will bring jobs and economic benefits.[39]

As with operational plants, low-carbon developments due to come online are concentrated in rural areas and those with poor employment and earning opportunities. For example, of approved low-carbon projects, 41% of energy capacity is situated in the lowest 25% of local authority districts for employment rates. Whilst 21% of energy capacity is situated in the lowest 10% of local authority districts for workplace earnings.[40] That means that these areas can expect to see even greater benefits from the transition to Net Zero in the years and decades to come as we accelerate investment in decarbonisation.

Fig. 7: Approved onshore low-carbon capacity, under/awaiting construction distribution by local authority district



Source: Department for Energy Security and Net Zero; Oxford Economics

Offshore

The majority of offshore projects that have had planning permission approved and are under/awaiting construction are offshore wind projects. This makes up approximately 25% of future low-carbon power capacity. The largest projects are off the coast of Kent, North Norfolk, Yorkshire, Suffolk and Angus.

Conclusion

The transition to Net Zero will revolutionise the economic landscape of the UK as it breathes fresh life into new industries and allows us to leverage our island geography in new ways. This holds immense opportunities for local communities across the UK, with areas outside of London and the South East potentially growing by £141 billion more by 2050 than they are set to on the current trajectory. This growth will be especially targeted in areas of high deprivation, low employment and below average incomes, making the energy transition a once-in-a-century opportunity to rebalance the UK's geographic divisions. With the right set of ambitious policies, the future energy system will grow incomes and create jobs in every corner of the country.

The historical expertise and natural geography of different areas will steer the path they take. Our coastlines will continue to grow as the home of offshore wind whilst port-side industrial clusters such as the Humber will pioneer CCUS technology. Areas historically focused on oil and gas will use that expertise and infrastructure to transition to clean technologies like low-carbon hydrogen and floating offshore wind. Demand in the manufacturing sector will rise, benefiting established industrial areas such as the automotive sector in the West Midlands.

Not only does decarbonisation allow local areas to play to their strengths, it also focuses growth and opportunities on the places that have historically been economically marginalised. 43% of existing clean generation capacity is in areas in the bottom quarter of employment. 21% of new low-carbon projects are planned in places with average earnings of less than £24,000. The investment brought by the energy transition will bring vital, long-term, well-paying jobs to these areas.

This future is only possible if we make the right decisions to attract investment today. However, the UK is currently falling far behind competitor economies, with the lowest forecast growth in low-carbon electricity among the eight largest economies in the world. This is not a fait accompli for the UK. With the right steps and decisive actions, we can set ourselves on a course that will deliver prosperity throughout our regions. Accelerating Action, the final instalment in the Clean Growth Gap series, will explore in more depth the actions that the UK Government needs to take to unlock the investment needed for the transition. Doing so – as this report shows – is vital for local communities across the country.

Read the full series of reports here:
https://bit.ly/CleanGrowthGap

Endnotes

1. Energy UK. The Path to Prosperity, September 2023

2. Net Zero Transformation Scenario. See Oxford Economics, Industry Climate Service for more details.

3. ONS. "Non-financial business economy, UK and regional", May 2023. Accessed August 2023.

4. Net Zero Transformation Scenario. The Baseline Scenario assumes government implements further policies consistent with stated commitments. See Oxford Economics, Industry Climate Service for more details.

5. As in our previous Path to Prosperity paper we use Oxford Economics' Global Economic Model to generate transition scenarios at an industry and national level. We then use Oxford Economics' UK Regional Model to feed the overall impacts of transitioning to Net Zero down to UK local authority districts and regions.

6. To isolate the effect of the Net Zero transition we compare the percentage difference in GDP between the Baseline Scenario and the Net Zero Transformation Scenario for each UK region in 2050. (It is necessary for us to compare against the Baseline scenario as regions are projected to grow at different rates due to other factors than the Net Zero transition). For a description of the different scenarios, please see Oxford Economics. "Climate change". 2023.

7. The "regions" used in this report are Scotland, Wales and Northern Ireland plus the nine regions of England (eg. South West and East Midlands)

8. Oxford Economics. City Climate Scenarios. 2023. Accessed August 2023.

9. ONS. "Non-financial business economy, UK and regional", May 2023. Accessed August 2023.

10. The London School of Economics and Political Science, "Growth, Net Zero and levelling up", 2022. Accessed August 2023.

11. The London School of Economics and Political Science, "Growth, Net Zero and levelling up", 2022. Accessed August 2023.

12. Arup, "A vision for hydrogen in the Tees Valley", 2023. Accessed August 2023.

13. BEIS. "What is the Industrial Clusters mission?" 2019. Accessed August 2023.

14. Department of Energy Security and Net Zero. "CCUS Net Zero investment roadmap: Capturing carbon and a global opportunity" 5 April 2023. Accessed August 2023.

15. ONS English Indices of Deprivation, Scottish Index of Multiple Deprivation, Welsh Index of Multiple Deprivation.

16. UK Onward, "Getting to Zero, December 2022", accessed August 2023.

17. Department for Business & Trade, "Offshore wind floating substructures in Scotland", Accessed August 2023.

18. AESC. "First pillar ceremony unveils start of construction on AESC's second UK gigafactory". 9 December 2022. Accessed August 2023.

19. "Tata Group to invest over £4 billion in UK gigafactory creating thousands of jobs". 19 July 2023. Accessed August 2023.

20. UK Infrastructure Bank, "Bank invests to strengthen domestic lithium supply chain and boost Cornish economy", 8th August 2023. Accessed August 2023.

21. CCC, "The Sixth Carbon Budget, Buildings", December 2020

22. "Reinventing retrofit: How to scale up home energy efficiency in the UK", November 2021.

23. IPPR, Train Local, Work Local, Stay Local, September 2022

24. Office for Nuclear Regulation Operational reactors, Accessed September 2023.

25. Gov.uk. "New Steps will speed up Sizewell C preparations", 29 August 2023. Accessed August 2023.

26. UK Parliament, "Strategic plan needed to deliver nuclear power and close the power gap", 31st July 2023. Accessed August 2023.

27. Department for Energy Security and Net Zero. "Renewable Energy Planning Database: quarterly extract". 2023. Accessed July 2023. Nuclear technologies are not included in this database.

28. European Economic and Social Committee, "Rural areas have the potential to deliver more", Accessed August 2023.

29. BiGGAR Economics, "Crossdykes Wind farm Impact Case Study", 2021. This is a relatively small windfarm with an operating capacity of 48MW; this is less than 0.1% of total UK operational low-carbon capacity.

30. Renewable UK, "Offshore Wind Industry Investment in the UK", 2017.

31. Department for Energy and Net Zero, "Developing Local Partnerships for Onshore Wind in England", 2023. These schemes are legally immaterial to planning decisions.

32. Community Benefits protocol Department for Energy and Net Zero, "Developing Local Partnerships for Onshore Wind in England", 2023.

33. Gov.UK, "Improved rewards and benefits to be offered to communities backing onshore wind farms", May 2023, Accessed August 2023.

34. Department for Environment, Food and Rural Affairs. "Rural Urban Classification". 2021. Accessed August 2023.

35. A person of working age is defined as economically inactive if they are not in employment, have not been seeking work within the last four weeks, and/or are unable to start work within the next two weeks by the ONS.

36. CBI Economics examine the GVA per employee in the Net Zero economy. They find that average pay in these jobs was £42,620, 28% higher than the UK average. Energy & Climate Intelligence Unit and CBI Economics, "Mapping the Net Zero Economy", January 2023. Accessed August 2023.

37. Department for Energy Security and Net Zero. "Renewable Energy Planning Database: quarterly extract". 2023. Accessed July 2023. Nuclear technologies are not included in this database.

38. Refers to onshore projects only.

39. Energy UK, "Onshore wind brings down bills, is popular and vital for UK energy security", November 2022

40. Includes offshore projects. Offshore sites are assigned the closest local authority district.

Energy UK is the trade association for the energy industry with over 100 members - from established FTSE 100 companies right through to new, growing suppliers, generators and service providers across energy, transport, heat and technology.

Our members deliver nearly 80% of the UK's power generation and over 95% of the energy supply for 28 million UK homes as well as businesses.

The sector invests £13 billion annually and delivers nearly £30 billion in gross value - on top of the nearly £100 billion in economic activity through its supply chain and interaction with other sectors. The energy industry is key to delivering growth and plans to invest £100 billion over the course of this decade in new energy sources.

The energy sector supports 700,000 jobs in every corner of the country. Energy UK plays a key role in ensuring we attract and retain a diverse workforce. In addition to our Young Energy Professionals Forum, we are a founding member of TIDE, an industry-wide taskforce to tackle Inclusion and Diversity across energy.

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To discuss the findings of this report please contact
mark.williams@energy-uk.org.uk

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alogan@oxfordeconomics.com

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