CAREERS, CLIMATE CHANGE AND SUSTAINABILITY:

Your quick guide to the impact on jobs and careers

THE MARCHES EDUCATION PARTNERSHIP

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Welcome

to this careers guide from the Marches Education Partnership

Who are we?

The Marches Education Partnership is a collaboration of education and training organisations working together on ambitious new skills-boosting projects. We will provide the required training to meet demand as industry moves towards a better, more sustainable future.

Please reach out to us if you would like any further information at: admissions@hlcollege.ac.uk

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admissions@hlcollege.ac.uk
www.hlcollege.ac.uk

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Stopping waste - redesigning products for reuse and remanufacture

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Restoring good soil structure is critical for our future food supplies...

Moving away from fossil fuels, towards production and distribution of green hydrogen

Mining rare earth materials, whilst restoring the environment?

£300 billion to be spent on retrofitting homes and buildings to reduce green house gas emissions...

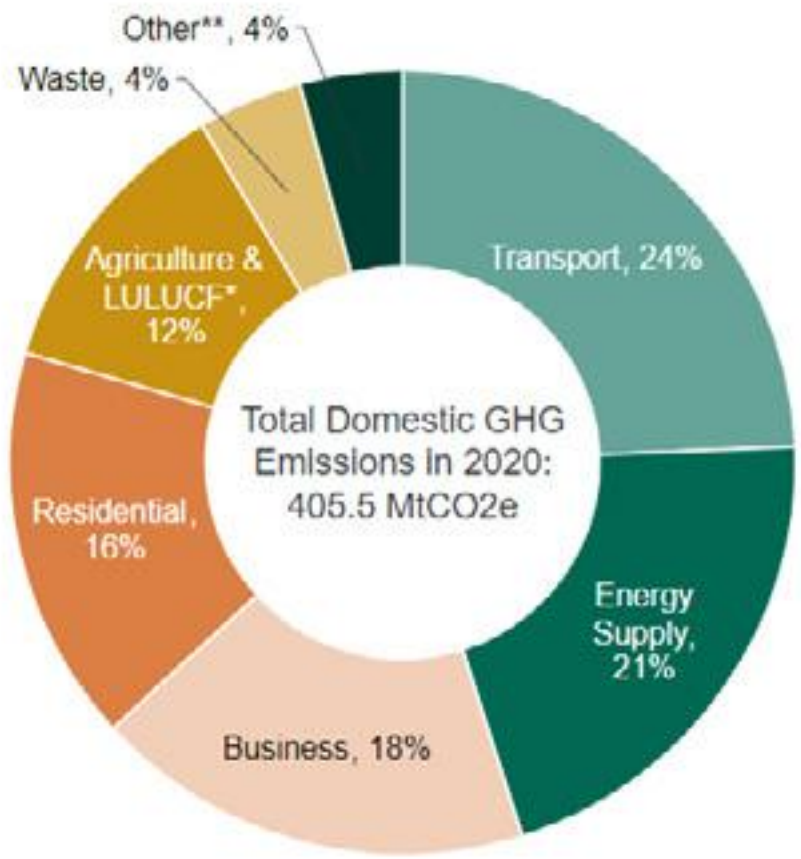
Peat bogs, restoration of nature's carbon sinks to reduce carbon emissions

Climate Change and Net Zero

As a nation, we have made a commitment to reduce the UK's green house gas emissions to Net Zero by 2050 (Gov, 2021)

Green house gas emissions are produced in a number of different ways, but transport remains the largest emitting sector in the UK (24%) of which over 91% were from domestic car use and taxis, closely followed by Energy supply (21%), Business (18%) and Residential (16%).

Figure 3: Greenhouse gas emissions by sector, 2020, by proportion (BEIS, 2022)



Net Zero means balancing what we emit with what we absorb:

what we produce = what we absorb

Still unsure? Why not watch this short video explaining Net Zero by National Grid...

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THE TEN POINT PLAN

We know that the planet is warming up due to excess green house gases, causing our climate to change catastrophically.

Forest fires, melting ice caps, extreme heat and flooding are becoming more regular.

The UK government responded to this crisis by launching the [“Ten Point Plan for a Green Industrial Revolution”] in 2020.

Point 1
Advancing Offshore Wind

Point 2
Driving the Growth of Low Carbon Hydrogen

Point 3
Delivering New and Advanced Nuclear Power

Point 4
Accelerating the Shift to Zero Emission Vehicles

Point 5
Green Public Transport, Cycling and Walking

Point 6
Jet Zero and Green Ships

Point 7
Greener Buildings

Point 8
Investing in Carbon Capture, Usage and Storage

Point 9
Protecting Our Natural Environment

Point 10
Green Finance and Innovation

The scale of transformation from the 10 point plan, across all industries and all sectors, will of course lead to significant impact upon existing and new jobs and careers.

To support this transition and help to prioritise the work in this area, the government created the Green Jobs Taskforce.

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“This year, our Ten Point Plan will lay the foundations for a Green Industrial Revolution. We will start by supporting 90,000 jobs across the UK within this Parliament, and up to 250,000 by 2030. Engineers, fitters, construction workers and many others will be engaged in harnessing British science and technology to create and use clean energy and forge great new industries that export to new markets around the world.”

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Green Jobs Taskforce

2 million green jobs to be created by 2030

The Green Jobs Taskforce was set up by government with industry and ran between November 2020 and July 2021. Their research suggested that there would be a requirement for "**a system-wide transformation of the economy; most occupations, to varying extents, will become green."**

The priority sectors they identified to tackle net zero and climate change were:

Power – including renewables (such as wind, solar and hydropower), nuclear power, grid infrastructure, energy storage and smart systems technology;

Business and industry – including hydrogen production and industrial use, carbon capture, utilisation & storage (CCUS) and industrial decarbonisation;

Homes and buildings – including retrofit, building new energy-efficient homes, heat pumps, smart devices and controls, heat networks and hydrogen boilers;

Transport – including low or zero emission vehicles, aviation and maritime, rail, public transport and walking or cycling;

Natural resources – including nature restoration, tree planting and decarbonising agriculture, waste management and recycling;

Enabling decarbonisation – including science and innovation for climate change, green finance, circular economy and energy networks;

Climate adaptation – including flood defences, retrofitting of buildings to be resilient to extreme weather/climate events, nature-based solutions to reduce climate impacts and civil and mechanical engineering for infrastructure adaptation.

To read more about the work of the Green Jobs Taskforce and access their report, click here

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“a ‘green job’ is used to signify employment in an activity that directly contributes to - or indirectly supports - the achievement of the UK’s net zero emissions target and other environmental goals, such as nature restoration and mitigation against climate risks.”

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Changes to education and training pathways

Apprenticeships

Many of these priority sectors rely on technical skills and technical training pathways, including apprenticeships.

Building upon the research of the Green Jobs Taskforce, the **Green Apprenticeship Advisory Panel** was commissioned to review and update existing apprenticeship standards against the net zero targets, plus create new apprenticeships to reflect new occupations.

There are now 70 apprenticeships which directly support the UK's transition to Net Zero, plus another 100 existing apprenticeships which have been revised.

They have also produced a new **sustainability framework for employers** to help trailblazers apprenticeship groups from any sector to embed these key themes.

Sustainability and Climate Education Bill

Running parallel to this, we also have a new education strategy; **"Sustainability and Climate Change: a strategy for the education and children's services systems"**, building upon the Green Jobs Taskforce report, the Dasgupta Review and the Committee for Climate Change.

The Dasgupta Review states that "**connection with nature declines in childhood to an overall low in the mid-teens. Creating an environment from an early age where we are able to connect to nature is essential for self-enforcement in protecting and valuing nature'**.

There are several recommendations, including the need to; **"Transform our institutions and systems – in particular our finance and education systems – to enable these changes and sustain them for future generations".**(Economics of Biodiversity: The Dasgupta Review)

“Through their learned and lived experiences from early years to further and higher education, we will provide opportunities to develop a broad knowledge and understanding of the importance of nature, sustainability and the causes and impact of climate change and to translate this knowledge into positive action and solutions.”

(DFE, 2022)

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POWER

Including renewables (such as wind, solar and hydropower), nuclear power, grid infrastructure, energy storage and smart systems technology;

Many of us know about alternative forms of renewable energy, such as solar, wind and waves. What we have to do now is connect our buildings and homes in to these more sustainable forms of energy, and switch away from fossil fuels. To do this we need to upgrade our national electricity grid and the energy infrastructure within our homes and buildings.

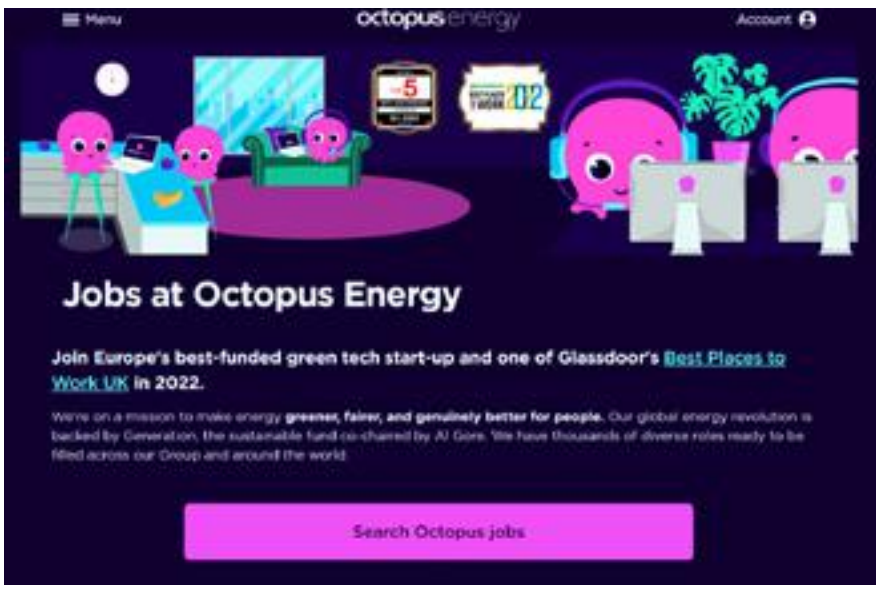
Not all renewable energy works all of the time, solar and wind for example. So when the sun is shining the surplus energy is stored in batteries, to be used at another time e.g. at night using a smart device. Another example is extracting heat from water or the ground and storing it in a thermal heat store.

The skills required to connect all of the different energy sources through electrical control devices in our homes include engineering, electrical, plumbing and digital.

These technologies can provide substantial lifetime cost savings and carbon savings, especially if you use existing energy sources such as oil, which many off-grid Shropshire homes still rely on.

Electricity: The National Grid estimates there is a need to recruit for an additional 260,000 energy jobs between now and 2050 to get to net zero. Such jobs will require skills in both smart and traditional network engineering.

Careers Resources



[Octopus Energy Careers]

[National Grid Careers]

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Curious? Find out more here - National Careers Service – Electricity Distribution Worker

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admissions@hlcollege.ac.uk
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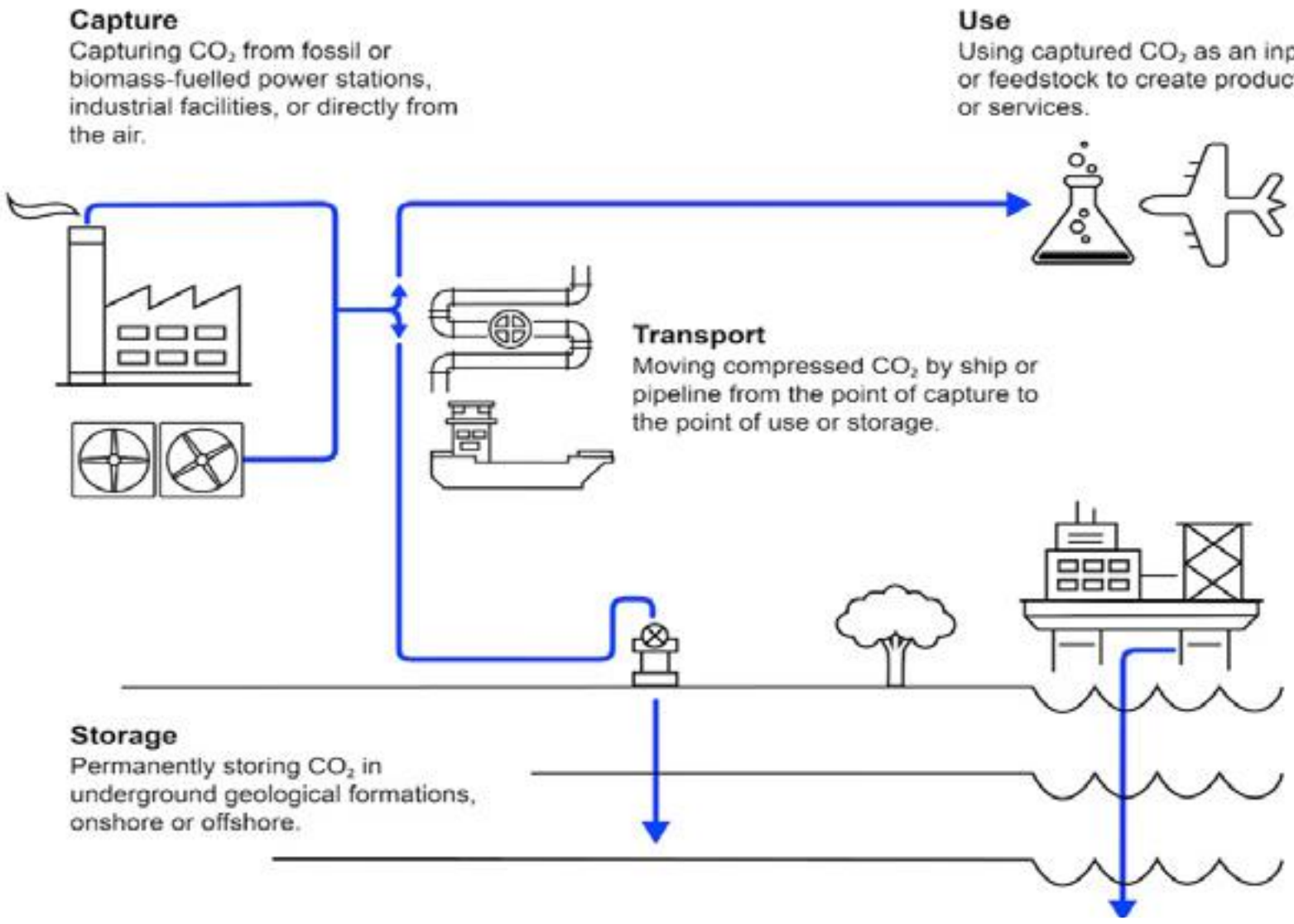
BUSINESS & INDUSTRY

Including hydrogen production and industrial use, carbon capture, utilisation & storage (CCUS) and industrial decarbonisation;

To reach net zero will require 'wide-scale deployment' of low carbon technologies. Examples of these emerging sectors are **hydrogen** and **carbon capture and storage (CCUS)**. By the middle of this decade the government expects to have at least 2 industrial clusters operational in the UK. This is set to continue as hydrogen and CCUS displaces traditional fossil fuels for industry. Hynet is a local industrial hydrogen and CCUS cluster in the North West.

The below image describes the CCUS process from the International Energy Agency (2023).



Careers Resources

BP Careers - Hydrogen

Careers Wales

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“In England’s peatlands some 580 million tonnes of carbon are locked away in the ground and out of the atmosphere, at the same time filtering high-quality water into rivers that is worth up to £888 million annually”. (DEFRA, 2023)

Image: David Robertson/Alamy

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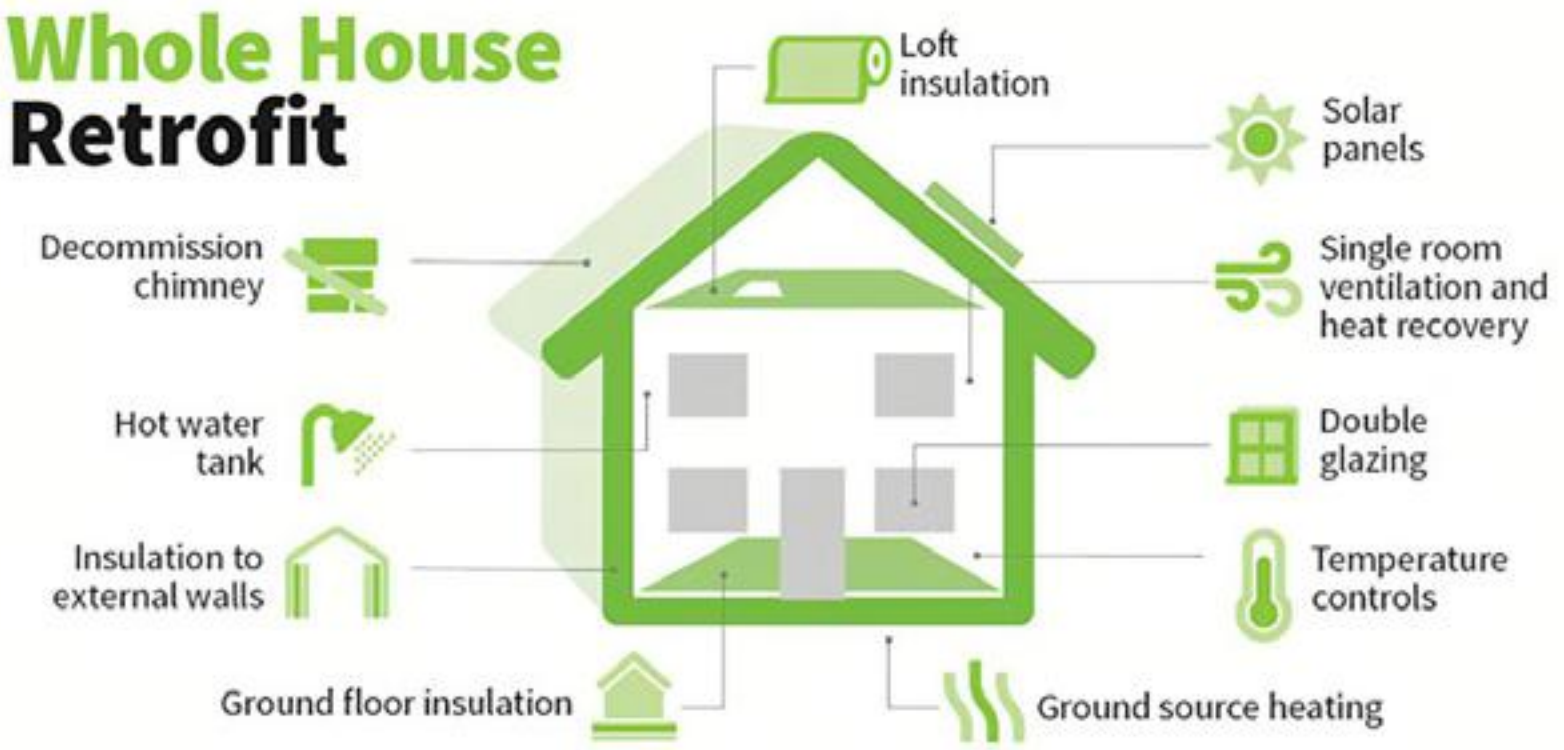
HOMES & BUILDINGS

Including retrofit, building new energy-efficient homes, heat pumps, smart devices and controls, heat networks and hydrogen boilers;

According to the Construction Leadership Council, the retrofit market will be valued at £309 billion by 2030 and create 500,000 jobs. In Shropshire many older homes were not built to a specific standard. This means that they are drafty, damp and not easy to plug new technologies into such as air source heat pumps and so cost a lot of energy (and money) to keep warm.

Buildings are one of the biggest producers of carbon emissions through wasted heat. To tackle this problem, the UK government is supporting the 'retrofit' of buildings which means fitting new insulation, windows and doors that don't leak heat as quickly, which means that they need less energy to keep warm. This then also means that they can switch homes from fossil fuels to alternative energy sources. This is known as a 'whole house retrofit'.



(Image: https://northernretrofit.com/whole-house-retrofit/)

Careers Resources

[Career Map from Green Buildings]

[CITB resources for careers advisors]

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“Currently, there is a critical shortage of retrofit designers and co-ordinators, coupled with education and training being mostly focussed on new-build using traditional onsite techniques, and insufficient emphasis on low carbon systems.”(Green Jobs Taskforce, 2021)

Image: Leo Fosdal on Unsplash

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TRANSPORT

Including low or zero emission vehicles, aviation and maritime, rail, public transport and walking or cycling;

The decarbonisation of transport includes:

- Zero emission vehicles
- Alternative fuels and zero emission HGV's
- Active travel, increasing walking and cycling
- Decarbonising our railways
- Zero emission fleet of cars, vans, motorcycles and scooters
- Maritime decarbonisation
- Aviation decarbonisation

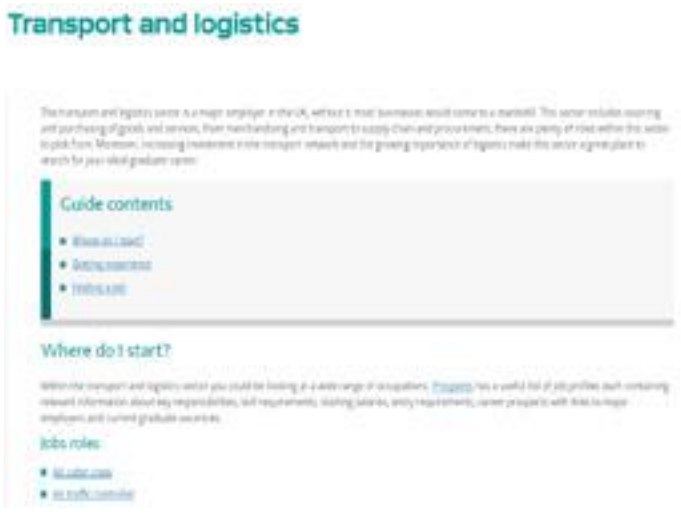
All of this transformation means that there is significant employment, upskilling and reskilling opportunities across all of these supply chains. You can see a clear overview of these changes in the Decarbonising Transport report. 2.8% of businesses in Shropshire are in transport and logistics and in 2019 it employed 4750 people (Shropshire.gov.uk, 2022). An industry report from Shell and Deloitte is beginning to talk about the need for skills and recruitment;

"To reduce this barrier, OEMs will need to scale and spread maintenance capabilities in tandem with production; possibly by expanding and opening their vocational education programmes to other stakeholders."
(Decarbonising road freight, 2022)

In 2021, over 18% of new cars sold had a plug, up from just over 3% in 2019, reflected in changes within training. Motor vehicle apprenticeships now include low emission vehicle technology and maintenance for hybrid and electric vehicle systems - this is important as both battery and hydrogen cars enter the market. 60% of new vehicles are EV sales meaning these apprenticeships are in high demand from employers. Taking a rural view - the integration of transport modes, including drones and e-scooters is an exciting development - you can see more about this here

Careers Resources

Careers info from the Department of Transport



Careers Guide from the University of Portsmouth

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“Hundreds of thousands of people are now choosing to go electric, and since announcing in October 2021 that we will introduce a zero emission vehicle (ZEV) mandate from 2024, more car manufacturers are committing to having 100% of their UK sales zero emission by 2030”.
(*Gov, July 2022)

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NATURAL RESOURCES

Including nature restoration, tree planting and decarbonising agriculture, waste management and recycling;

There is a lot of work to do to repair the damage we have done and move from balancing the scales of Net Zero to becoming Net Positive or Nature Positive.

This recognition that industry and restoration of nature must work hand in hand has led to investment in the infrastructure that supports nature. Much of this is led by government support organisations such as Natural England, DEFRA and the Environment Agency, who also legislate and regulate. It is also attracting investment from across the globe as individuals and organisations purchase land to prevent it from being developed or to see it restored to its natural habitat.

Agroecology is sustainable farming that works with nature. Decarbonising agriculture includes its energy sources, plus how food is produced and managed and links with how we produce, treat and reuse our waste.

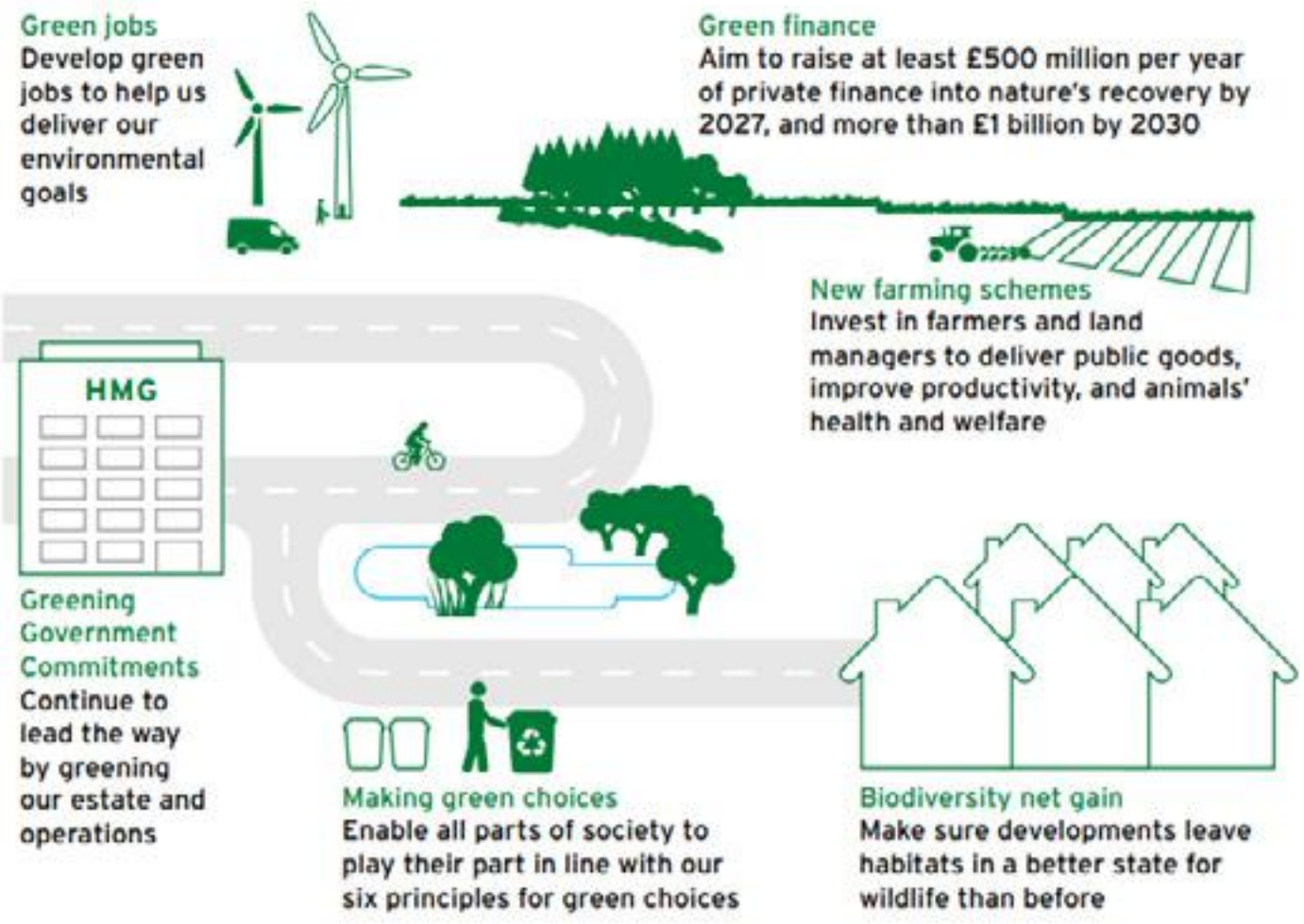

image: Environmental Improvement Plan (2023)

Careers Resources

[Careers at Natural England]

[Green Jobs for Nature (CIWEM)]

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“Agroforestry is a great example of agroecology. It’s the practice of combining trees and farming; it demonstrates how food production and nature can co-exist”.
(Soil Association, 2023)

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ENABLING DECARBONISATION

Including science and innovation for climate change, green finance, circular economy and energy networks;

The UK Science and Technology Framework from the new Department of Science, Innovation and Technology is focussed upon 5 “critical sectors” from which you can expect future investment and therefore future careers and jobs.

Artificial intelligence (AI) – Machines that perform tasks normally performed by human intelligence, especially when the machines learn from data how to do those tasks.

Engineering biology – the application of rigorous engineering principles to the design of biological systems.

Future telecommunications - evolutions of the infrastructure for digitised data and communications.

Semiconductors – a class of electronic materials with unique properties that sit at the heart of the devices and technology we use every day.

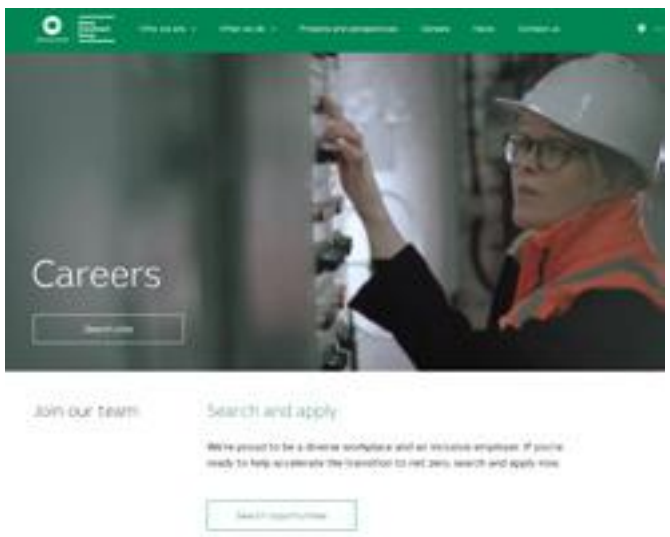
Quantum technologies – devices and systems which rely on quantum mechanics, to provide capabilities that ‘classical’ machines cannot.

By 2030 they hope to create “...an agile and responsive skills system, which will articulate and where possible, forecast skills gaps in critical technologies”.

Green or Sustainable Finance is a growing sector which has spun out from the traditional finance sector. This is related to investing in natural and physical assets and technologies which benefit the planet.

The circular economy is reforming the way that industries currently produce products for consumers, so that instead of products being disposable, they are infinintely reusable or recyclable. This conserves precious resources and prevents waste. This applies to all industries - you can find out more about this below.

Careers Resources



Green Investment Group Careers

More about circular economy from the Ellen McArthur Foundation

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Take a look at Closing the Loop - a film about Circular Economy on [Youtube]

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CLIMATE ADAPTATION

Including flood defences, retrofitting of buildings to be resilient to extreme weather/climate events, nature-based solutions to reduce climate impacts and civil and mechanical engineering for infrastructure adaptation

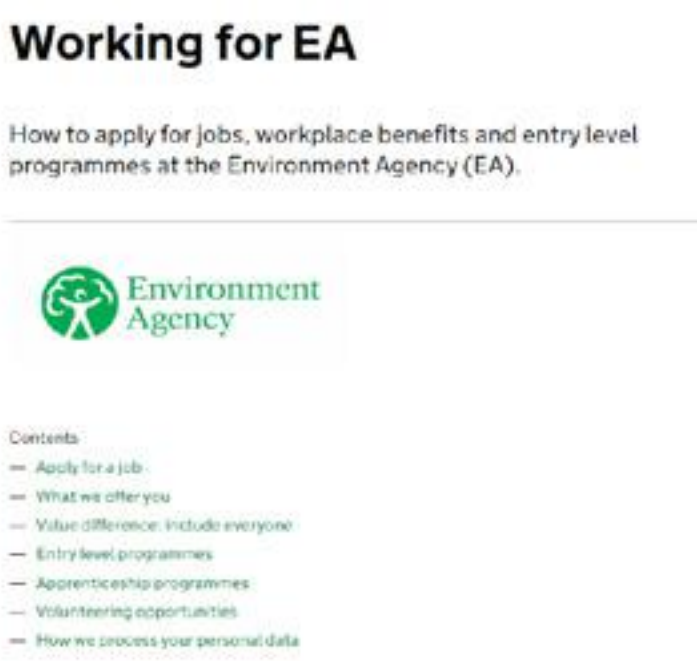
We have all experienced extreme weather over the past few years, whether that is excess heat, wind, cold or flooding. As this continues, we are strengthening our defences against flooding, storing water for drought and upgrading our homes and buildings.

At the same time we are understanding how nature can support climate mitigation, through activities such as deliberate planting of trees and hedges to protect from wind, sun and flooding.

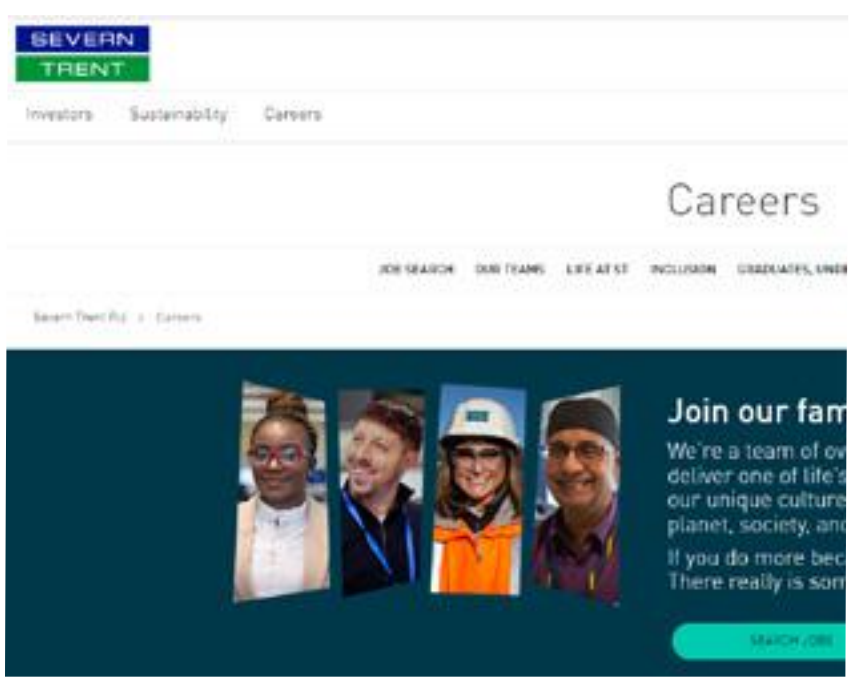
Many different types of organisations deal with climate adaptation, from surveying and engineering to the Environment Agency and it is part of most infrastructure focused sectors, including construction, transport, energy and telecoms.

Image: World Economic Forum

Careers Resources



Careers at the Environment Agency



Careers at Severn Trent

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Shropshire is rich in natural assets and in particular the River Severn dominates the landscape. The water industry is a key asset and employer and will become increasingly important as water supplies become strained by 2040. Scan the QR code to find out more about the 12 priorities for water.

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Links

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National Grid Careers
Octopus Energy Careers
The Education Hub - What is a green job? Everything you need to know
The Parent's Guide to Green Careers Week 2022
World Wildlife Fund - Calculate your carbon footprint

Research

25 Year Environment Plan (DEFRA, 2021)
Apprenticeships Sustainability framework for employers(IFA, 2022)
Decarbonising Transport - 1 year on review (DFT, 2022)
Decarbonising road freight (Shell & Deloitte, 2021)
Economics of Biodiversity: The Dasgupta Review (
Environmental Improvement Plan (DEFRA, 2022)
Future of rural transport (DFT, 2021)
House of Commons Environmental Audit Committee - Green Jobs (2021-22)
International Energy Agency (2023)
"Ten Point Plan for a Green Industrial Revolution" (BEIS, 2020)
Net zero jobs - The impact of the transition to net zero on the UK labour market (BEIS, 2021)
Net Zero Strategy - Build Back Greener (GOV, 2022)
Sustainability and Climate Change: a strategy for the education and children's services systems (DFE, 2022)
UK Science and Technology Framework (BEIS, 2023)

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