Office for National Statistics

Developing estimates of green jobs in the UK

Official statistics in development - detailing the methods used, strengths and limitations of the data, and future developments.

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1 . About this methodology

This methodology article is part of our work to define and measure green jobs. We detail how the definition of green jobs was reached and the activities that make up the framework which underpins the overall definition of a green job. We summarise the methods used to produce estimates of green jobs using the industry, occupational and firm approaches. We also identify areas for future development. These are official statistics in development.

2 . How to define a green job

Definition

We define green jobs as employment in an activity that contributes to protecting or restoring the environment, including those that mitigate or adapt to climate change. A more detailed definition can be found in Section 3 of our "Green jobs" update, current and upcoming work: March 2023 article.

This definition was created following substantial stakeholder engagement which included a defining and measuring green jobs engagement exercise, an open user workshop, and follow-up discussions with important stakeholders. It is designed as a statistical definition that is not time-bound, is measurable, and is broad enough to encompass a range of green jobs.

We identified three approaches to measuring green jobs, with different measures supporting different user needs and types of analysis. These include:

- an industry-based approach, including all jobs in a green industry or sector, with industries classified according to the activities they carry out
- an occupation-based approach, including all jobs that are green regardless of the industry they are in, based on the activities carried out by workers or the objectives of their work
- a firm-based approach, including all jobs in a "green" firm, with such firms being classified based on, for example, their level of emissions

There are overlaps with each of the approaches, for example, an individual may have a green occupation in a green industry, in which case each measure should be considered in turn and cannot be aggregated to a whole.

Since we recognise that many jobs are not fully green, we continue the practice used with our existing related statistics of measuring full-time equivalents (FTEs). Under this approach, a person working full-time for one year would be counted as one FTE. In the longer term, we will look at this alongside the absolute number of individual jobs to enable monitoring of the transition to green jobs over time.

Our engagement work shows there is substantial interest in being able to identify whether individual jobs are neutral or positive in their impact on the environment. This is complex to do, for example, generating electricity using a wind farm would contribute to reducing the UK's carbon emissions, but it may displace local flora and fauna and so have an adverse impact on nature.

Therefore, our estimates focus on the activities carried out within jobs and form an extension of our labour market statistics. They do not consider the wider impact or outcome of individual jobs.

Activities

After reviewing relevant literature and engaging with important stakeholders, we have identified the activities that will form the composition of our definition of green jobs. These activities will help with the collection and dissemination of our green jobs statistics. We will continue to have discussions with stakeholders about the activities listed and welcome feedback.

The activities we have identified will be reviewed at an interval yet to be determined. This will ensure they can still be classified as green and allow the identification and addition of new activities. This section sets out the identified activities.

Alternative fuels, including hydrogen

Research and development, design, construction, production, operation and maintenance, and specialised consultancy services relating to energy alternative fuels which are not classed as bioenergy. This includes hydrogen, produced either by electrolysis or low carbon thermochemical processes, or both.

Bioenergy

Research and development, design, construction, production, operation and maintenance, and specialised consultancy services relating to energy from renewable biomass sources. This includes electricity, heat and combined heat, and power.

Carbon capture and storage

Research and development, design, construction, and operation and maintenance of the infrastructure related to the capture of either waste CO2 or other greenhouse gases, or both, at the point of emission or from the atmosphere more generally, using it for additional economic activity and depositing it where it will not enter the atmosphere.

Energy-efficient products group

Energy-efficient products, energy-efficient lighting, energy-efficient heating, energy-efficient windows and doors, insulation, other energy-efficient products n.e.c., and energy saving and monitoring.

Energy-efficient products

Research and development, design, manufacture, specialised consultancy services and installation of energy-efficient products.

Energy-efficient lighting

Research and development, design, manufacture, specialised consultancy services and installation of products relating to energy-efficient lighting.

Energy-efficient heating

Research and development, design, manufacture, specialised consultancy services and installation of energy-efficient products relating to heating and ventilation, such as condensing boilers, ventilation, and heating recovery.

Energy-efficient windows and doors

Research and development, design, manufacture, specialised consultancy services and installation of energy-efficient doors and windows, including double glazing.

Insulation

Research and development, design, manufacture, specialised consultancy services and installation of insulation for floor, loft, external wall, roof, and so on. This includes products that reduce energy consumption for heat or air conditioning by minimising "leakage" of heat, and advanced materials with greater insulation properties.

Other energy-efficient products n.e.c.

Research and development, design, manufacture, specialised consultancy services and installation of other energy-efficient products not elsewhere classified (n.e.c.). This includes energy-efficient building materials or technologies, including advanced materials with greater durability.

Energy saving and monitoring

Research and development, design, production, installation, operation and maintenance, and specialised consultancy services relating to systems that reduce energy consumption through effective heat or electricity management, including equipment and related systems for doing this.

Energy storage

Research and development, design, construction, operation and maintenance of the infrastructure for energy storage. This includes the storage of electricity, hydrogen, thermal energy, and other energy.

Environmental charities

This activity includes charities whose purpose is to protect or manage the environment and natural resources. Environmental charities include those providing environmental education and training, conservation and preservation of fauna and flora, and promotion of environmental issues (for example pollution abatement and control).

Environmental consultancy n.e.c.

Expert advice, training and education (academic and work-based) on protecting or restoring the environment that is not elsewhere categorised (n.e.c.).

Environmental-related education

This activity includes education aimed at environmental protection and management of natural resources. This activity includes tertiary education (non-university tertiary education and university tertiary education).

Grid infrastructure

Research and development, design, construction, operation and maintenance of the infrastructure related to the decarbonisation of grid networks. This would include the conversion of gas networks to be suitable for hydrogen, and the decarbonisation of the electricity grid.

In-house environmental activities

This includes activities that businesses carry out in-house to protect the environment against the damaging or depleting impact of the business's activity. It includes activities such as waste management and wastewater treatment on site.

Low carbon transport

The research and development, design, specialised consultancy services and manufacture of equipment related to transport designed to specifically reduce or remove emissions. It also includes the research and development, design, production and installation of infrastructure to support low and zero carbon transport, including electric vehicle (EV) charging infrastructure.

Low carbon transport includes zero and low emission vehicles, low carbon water transport, low carbon road and public transport, low carbon air travel and other low carbon travel. We will continue to consult with users on the scope of these activities, for example, whether all rail will be included or only employment activity relating to decarbonising rail.

This category includes the manufacture of bicycles where it is for specific large-scale projects, such as city bikes. Leisure bikes are excluded.

Management of forests

This activity includes activities relating to forests available for wood supply (but not currently cultivated) and for forests not available for wood supply (such as, protected forests, nature reserves, national parks). Associated activities carried out for their maintenance and management (restoration activities and prevention and control of forest fires) are included. This includes restoration activities (reforestation and afforestation) as well as the prevention and control of forest fires.

Activities and products concerning measurement, control, laboratories and so on are also included, as well as education, training and information, and general administration activities linked to the management of non-cultivated forest and forests not available for wood supply. This division does not include cultivated forests for wood supply or reforestation activities of cultivated forests.

Managerial activities of government bodies

This category includes public administration aimed at protecting the environment and management of natural resources. Activities such as the issuing of environmental permits and licenses, monitoring of air, land and water, protection of biodiversity and landscapes, and the development of environmental policies are included.

Nature protection and restoration (excluding forests)

Activities and measures aimed at the conservation, reintroduction or recovery of fauna and flora species, as well as the restoring, reshaping and rehabilitation of damaged habitats for the purpose of strengthening their natural functions.

This includes activities that promote a return to original conditions of soil and wetlands (including peatlands), and economic activities that improve soil and wetland functions without necessarily promoting a return to pre-disturbance conditions.

Nuclear power

This includes research and development, design, construction, production, specialised consultancy services and installation of infrastructure for producing electricity from nuclear power, as well as the production of electricity from nuclear power, and the operation and maintenance of related infrastructure.

This category excludes energy attained from nuclear decay, which is covered in our section on Renewable combined heat and power. It also excludes activities relating to decommissioning, nuclear medicine, and military nuclear programmes.

Recycling

This activity includes the salvage of wrecks (automobiles, ships, computers, televisions and other equipment) and the processing of metal and non-metal waste and scrap and other articles into secondary raw materials. It also includes the separating and sorting of materials from waste streams and mixed recoverable materials into distinct categories. The production of energy from waste is excluded here and captured under Bioenergy.

Renewable energy

Research and development, design, construction, production, manufacture and installation of infrastructure, and specialised consultancy services for producing energy from offshore wind, onshore wind, solar, hydropower, and other renewable sources (such as tidal or wave power, or geothermal sources).

Renewable electricity

Research and development, design, construction, production, manufacture and installation of infrastructure, and specialised consultancy services for producing electricity from offshore wind, onshore wind, solar, hydropower, and other renewable sources (such as tidal or wave power, or geothermal sources). It does not include jobs involved with decarbonising the power grid.

Renewable heat

Research and development, design, construction, production, manufacture and installation of infrastructure, and specialised consultancy services for producing heat from renewable sources.

Renewable combined heat and power

Research and development, design, construction, production, manufacture and installation of infrastructure, and specialised consultancy services for producing combined heat and power from renewable sources.

Repairs

These activities relate to the repair of personal and household goods, and computers. It excludes the repair and installation of machinery and equipment in the manufacturing sector.

Waste

These activities relate to the collection, treatment, and disposal of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites. The output of the waste can either be disposed of or become an input into other production processes.

Wastewater

These activities relate to the collection, treatment, and disposal of wastewater, industrial or household, as well as contaminated sites. The output of the wastewater or sewage treatment process can either be disposed of or become an input into other production processes.

Water quantity

This category includes natural water, water treatment and supply services for domestic and industrial needs. Management of water includes activities aimed at minimising the intake of inland water through in-process modification as well as the reduction of water losses and leaks, and the installation and construction of facilities for water reuses and savings.

We understand that some users may not classify nuclear power as green, and so estimates of employment in nuclear power are available for users to exclude from the total if they choose. We also make users aware in our bulletins that nuclear power is included. We will continue to monitor the inclusion of this and other activities, including considering the development of the UK's green taxonomy.

3 . Jobs in green industries

The industry-based approach includes all jobs in a green industry or sector and will be used for our headline estimates of employment in green jobs.

Data we use in the compilation of these estimates

The Office for National Statistics (ONS) currently produces two sets of estimates that relate to the industry approach: the environmental goods and services sector (EGSS) estimates and estimates from the Low Carbon and Renewable Energy Economy (LCREE) Survey.

We know from stakeholder feedback that the scope of green jobs is wider than these two individual estimates. The LCREE survey does not provide data on jobs that relate to wider environmental activities, such as nature jobs, while the EGSS estimates do not provide the breakdowns that users require in this context. For example, EGSS includes estimates of employment in the production of renewable electricity but not by source, such as by onshore wind, offshore wind.

By combining data from both sources, in addition to data from the Business Register Employment Survey, we have been able to estimate employment in green industries using the listed activities as the basis of our composition. Efforts have been made to minimise double counting when combining data sources, but some instances may remain, and further work will be needed to further reduce double counting.

At this time, our total estimates exclude some activities for which data are not currently available, most notably those working on decarbonising grid networks, and in low-carbon travel (other than low and zero emission vehicles). Further work will be required to identify appropriate data sources and include them in future annual estimates.

Partial estimates are available at a sub-national level but would require further work to provide full breakdowns.

The EGSS estimates, one of our main data sources, are released three years after the period to which they relate. As such, in 2025 we have released estimates of employment in green industries for 2023. Data for some activities in 2023 have been modelled using two-year average growth rates. These activities include: environmental charities, environmental education, in-house environmental activities, management of forests, managerial activities of government bodies, nature protection, and restoration water quantity. The Northern Ireland proportion of the Repairs activity has also been modelled using a one-year growth rate because of data availability.

Further work is required to improve the timeliness of the jobs in green industries estimates.

The EGSS estimates are also classified as official statistics in development, and this should be considered when using the green jobs statistics that use this source.

Quality of the data

Our Low Carbon and Renewable Energy Economy (LCREE) Survey data and BRES data, used in the estimation for a number of activities, are survey-based and gather information from a sample rather than the whole population. This means that they are subject to measurable sampling uncertainty, which affects how changes in the estimates across periods should be interpreted.

Estimates of the level of uncertainty associated with all figures to help support interpretation (including confidence intervals and coefficients of variation) can be found in our LCREE datasets. For example, our 2023 LCREE survey produced an estimate of 16,400 full-time equivalent (FTE) employees working in the offshore wind sector in the UK, but with a 23% coefficient of variation. The lower confidence interval for this activity in 2023 was 9,100 FTEs, the upper confidence interval was 23,800 FTEs

Methodology varies for each of the activities constructed under the EGSS estimates, which are a primary source for our estimates of employment in green industries. Consequently, the robustness of estimates for activities that use the EGSS as a source also varies. For more information, see our Environmental accounts on the environmental goods and services sector (EGSS) QMI, and the methods annex that accompanies our EGSS dataset.

Estimates of employment for repair activities are taken from the BRES. This survey collects comprehensive employment information from UK businesses and is a main source for employment estimates for the EGSS.

Revisions

Estimates of jobs in green industries are experimental and will be subject to revision as we review data sources to identify potential improvements to methods and alternative data sources.

4 . Green occupations

Our occupation-based approach measures all jobs that are "green", regardless of the industry they are in, based on the activities carried out by workers or the objectives of their work. It is useful to understand the characteristics of who is working in green jobs, regardless of the sector they are in.

While we explored adding green-jobs-related questions to Office for National Statistics (ONS) surveys, we also used our Opinions and Lifestyle Survey (OPN) to gain an understanding of the number of people who believe that part of their job is green, based on the agreed definition. During the survey periods from 4 to 14 January and 17 to 28 January 2024, OPN respondents were asked a series of questions on green jobs.

Opinions and Lifestyle Survey data

In the periods from 4 to 14 January 2024 and 17 to 28 January 2024, we sampled 4,985 adults and 4,980 adults, respectively, through the OPN. These samples were randomly selected from people who had previously completed the Labour Market Survey (LMS) or OPN. The responding sample for 4 to 14 January 2024 contained 2,594 individuals, representing a 52% response rate. For 17 to 29 January 2024 the responding sample contained 2,764 individuals, representing a 56% response rate.

The green jobs questions were asked of working adults only, resulting in a pooled responding sample size of 2,557 working adults. Our analysis included those who did not respond to the green jobs questions.

Survey weights were applied to make estimates representative of the population (based on ONS population estimates). Further information on the survey design and quality can be found in our Opinions and Lifestyle Survey QMI. Because of the limitations of the survey, we advise against drawing comparisons of green jobs estimates between waves at different time periods.

As part of the ongoing development of our data collection, we updated the questions used for the 2024 wave. The data we collected from OPN waves in 2023 were not edited prior to the production of estimates, resulting in estimates which represent respondent opinion of whether their job is green or not.

Reviewing this process, it was identified that not validating responses could result in inconsistencies in the dataset. For example, 23% of respondents who reported that they would describe part of their job as green, also reported that they spend no time on green activities. At the same time, 18% reported that they would not describe part of their job as green, but they also said they spend some time on green activities.

OPN questions asked in the 2024 waves were developed to enable validation of responses about whether a respondent's job is green, using information about their occupation. This validation reduced the number of people that appear to have a green job under the occupation approach by 7 percentage points. This additional validation check will be applied to future waves.

Sample sizes on the OPN mean that we have not been able to carry out analysis of characteristics of those who describe any part of their job as green within regions. Further work would be required to explore how we can develop estimates and analysis to support understanding of green jobs across regions.

Other methods used in the occupational approach

A common method for estimating the number of green jobs under the occupation-based approach is to use the US O*NET classification system.

Occupations labelled as green under the US classification system can be mapped to the UK standard occupation classification (SOC) system, and the number of jobs within these identified occupations counted.

There are a number of disadvantages to this approach. For example:

- the identification of green occupations has been based on research on US employees, although there is some evidence to suggest this may be transferable to the UK context
- there is not a one-to-one mapping between the US and UK classification systems, which can lead to an overestimation of green jobs
- the work carried out in the US to identify green occupations was last conducted in 2019 and there are no current plans to update it, meaning any new green occupations will not be captured
- the work assumes that all jobs within an occupation are green, and does not allow for variation within an occupation; for example, all engineers are classified as green
- any regional analysis reflects variation in occupations between regions, rather than reflecting how the same occupations may be transitioning to green at a different pace across regions

Despite these disadvantages, the O*NET approach is a useful way to measure and analyse green occupations in the absence of UK-specific data. Recent examples include the Organisation for Economic Co-operation and Development (OECD) Job Creation and Local Economic Development 2023: Bridging the Great Green Divide report.

We have also carried out previous research using the US O*NET classification system to understand time spent on green tasks. More information can be found in our Research into "green jobs": time spent on green tasks, UK: 1997 to 2019 article and our Developing a method for measuring time spent on green tasks: March 2022 article.

5 . Jobs in green firms

A firm-based approach to measuring green jobs would measure all jobs in firms classified as "green". By looking at this, we can also identify firms which will need to transition towards green, and therefore the number and characteristics of employees within them. Further consideration is needed to define a "green" firm and explore relevant firm-level data.

We have initially focused on comparing total greenhouse gas (GHG) emissions by industry and full-time equivalents (FTEs) employment by industry, as a measure of one aspect of firms' greenness.

We use residence-based emissions data – which are directly comparable with economic output – from our latest UK Environmental Accounts bulletin (excluding emissions from households, which these accounts consider as an industry). We also use employment data from our latest Business Register and Employment Survey (BRES) on Nomis, and converted to FTEs. This provides us with information about the number of FTE employees within the lowest-emission and highest-emission industries.

Estimates of employment by industry are not available for Northern Ireland, so employee figures have been used, which excludes the self-employed. This has a particular impact on the agriculture, fishing and forestry industry, which has large numbers of self-employed people. The impact is relatively small for other industries.

Full employee data by industry for Northern Ireland are only available for 2017, 2019, 2021 and 2022. For 2023, UK estimates include modelled Northern Ireland data.

The number of employees for "activities of households as employers; undifferentiated goods and services-producing activities of households for own use" (Industry "T") is not available. For this reason, GHG emissions per employee cannot be calculated for this industry.

6 . Related links

Estimates of green jobs, UK: July 2025
Bulletin | Released 18 July 2025
Experimental estimates of green jobs using the industry, occupation and firm approaches. These are official statistics in development.

Experimental estimates of green jobs, UK: 2024
Bulletin | Released 14 March 2024
Experimental estimates of green jobs using the industry, occupation and firm approaches. These are official statistics in development.

Green jobs update, current and upcoming work: March 2023
Article | Released 13 March 2023
An update to our work on green jobs, including a summary of user engagement, our definition, and future work.

UK Environmental Accounts: 2025
Bulletin| Released 5 June 2025
Measuring the contribution of the environment to the economy, impact of economic activity on the environment, and response to environmental issues.

Low carbon and renewable energy economy, UK: 2023
Bulletin | Released 9 July 2025
Estimates of the size of the UK's Low Carbon and Renewable Energy Economy (LCREE), including turnover and employment.

7 . Cite this methodology

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