

Powering the labour market: skilled work in a low carbon energy system

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Methodology and assumptions

Methodology

Our analysis uses various data sources to estimate the regional skills gaps in the UK power sector, under two different scenarios, as follows:

- The number of jobs is calculated based on data on the jobs (or job years if temporary) created per MW of additional capacity for each power source.¹
- The current power sector capacity is determined from available government data.^{2,3}
- The future additional capacity data for 2035 is derived from the government's energy security strategy and the 'Day in the life' study produced by Regen.^{4,5} The Regen scenario for 2035 is based on the National Grid ESO Future Energy Scenarios 'Consumer Transformation' scenario and the Climate Change Committee's Balanced Pathways.
- The number of additional jobs created under these scenarios are distributed regionally, based on the relative distribution of power generation capacity for each power source across the different regions of the UK. For renewable and fossil fuel sources, this is based on current relative capacities while for nuclear only future project locations and their capacities are considered (only considering those likely to be ready by 2035).^{6,7}
- The relative skill levels of these additional jobs are obtained from data by E Dominish, et al (2019), with further data for nuclear obtained from the Nuclear Skills Strategy Group (NSSG).^{8,9}
- The calculations assume a decline in fossil fuel generation capacity. The workers associated with these lost jobs have been deducted from the additional jobs needed under each scenario. The skills gap is calculated as the additional jobs required divided by the total number of jobs supported by the current capacity.

To analyse how 'secure' employment in a green power sector is likely to be, we distinguish 'temporary' and 'permanent' job types across these sources of power.

Temporary roles focus on the manufacturing and construction of green power infrastructure, whereas permanent roles are created through their operation and maintenance. We classify permanent roles as 'secure'. Jobs in manufacturing and construction are temporary and, therefore, not defined as 'secure' in this analysis. To reflect this, we calculate temporary job creation in 'job years'.

To analyse how 'skilled' employment in green power will be, we translate the skills composition of each type of power source in its current form into the Office of National Statistics' (ONS) Standard Occupational Classification.¹⁰

We classify level 4 (corporate managers, engineers and other professionals) and level 3 (other managers, technicians, electricians and skilled construction and metal trades) as 'highly skilled' and, therefore, likely to be 'well paid'. We classify level 2 (less skilled construction and metal trades, plant and machine operators and assemblers) and level 1 (elementary occupations, ship crew) as 'less skilled'. The full conversion of job classifications into ONS skill levels is shown in the table below.

Assumptions

Scenarios:

Energy security strategy scenario (using 2035 as approximate target year):¹¹

- Gas generating capacity in 2035 will be 20.9GW, based on the statement: "...we will have reduced our gas consumption by over 40% by 2030" and assuming that UK gas generation is reduced by an equivalent amount.
- Coal capacity in 2035 will be 0GW based on no mention of coal in the strategy and the government's long stated goal of phasing out coal generation.
- Solar capacity in 2035 will be 70GW, based on the statement: "We expect a five-fold increase in deployment by 2035."
- Offshore wind capacity in 2035 will be 50GW, based on the statement: "Our ambition is to deliver up to 50GW by 2030" and assuming capacity in 2035 is the same as in 2030.
- Onshore wind capacity is assumed to be the same as in 2020 as the strategy does not provide any future capacity targets.
- Nuclear capacity will be 14.5GW in 2035, based on the statement: "increasing our plans for deployment of civil nuclear to up to 24GW by 2050" and assuming that only Hinkley Point C (3.2GW) and Sizewell C (3.2GW) will be operational by 2035.

Low carbon acceleration to 2035 scenario based on Regen's 'Day in the life':¹²

- The capacities in 2035 are assumed to be the average of the range of values given by Regen: eg for solar, a range of 40-50GW is given and the capacity is assumed to be 45GW.
- The gas generating capacity in 2035 is assumed to be equivalent to the 'fossil fuel backup' capacity.

Skill levels:

- The skills required for fossil fuel production are approximately equal to those required for low carbon power generation, meaning that fossil fuel workers could take up a job in renewables or nuclear at an equal skill level.
- The conversion of job classifications (for all but nuclear) into ONS skill levels is as shown in the table below and, if the classification falls into multiple skill levels, the relative skill levels associated with these classifications are divided equally between all relevant levels.
- The skill level distributions for fossil fuel generation (coal and gas) are compared to low carbon power sources by making the following equivalences regarding the specified job sectors for fossil fuel generation¹³:
 - o The relative ONS skill levels in coal and gas ‘generation’ are equivalent to those for the ‘operation and maintenance’ of coal and gas plants.
 - o The relative ONS skill levels in the ‘supply’ of gas are equivalent to those in ‘manufacturing’ and ‘construction’ of gas plants.
 - o The relative ONS skill levels in coal ‘mining’ are equivalent to those in the ‘manufacturing’ and ‘construction’ of coal plants.
- Due to lack of available refined data, the nuclear relative skill levels across construction, manufacturing and operations are assumed to be equal to the relative skill levels of the civil nuclear workforce overall in 2021.¹⁴
- The civil nuclear skill levels are converted from the level 1-8 scale used by Nuclear Skills Strategy Group (NSSG) to the ONS skill levels, based on a conversion where NSSG levels 1 and 2 correspond to ONS level 1, NSSG levels 3 and 4 correspond to ONS level 2 etc.

Conversion of job classifications into ONS skill levels

Job classification	ONS skill levels
Managers	3, 4
Engineers (Industrial, electrical, civil)	4
Other professionals (legal, finance, scientific)	4
Technicians & associate professionals	3
Clerical support workers	2
Construction trades	3, 2, 1
Metal trades	3, 2, 1
Electricians	3
Plant & machine operators & assemblers	2
Elementary occupations	1
Ship crew	1

Endnotes

¹ R Hanna, P Heptonstall and R Gross, 2022, *Green job creation, quality and skills: a review of the evidence on low carbon energy*

² Department for Business, Energy and Industrial Strategy (BEIS), 30 September 2021, 'Regional renewable statistics'

³ BEIS, 29 July 2021, 'Digest of UK energy statistics (DUKES): electricity'

⁴ BEIS, 2022, *British energy security strategy*

⁵ J Haynes, P Sumaria and J Gowdy, 2022, *A day in the life 2035: how a fully decarbonised electricity system might operate*, Regen and National Grid ESO

⁶ BEIS, 30 September 2021, 'Regional renewable statistics'

⁷ BEIS, 29 July 2021, 'Digest of UK energy statistics (DUKES): electricity'

⁸ E Dominish, C Briggs, S Teske and F Mey, 'Just transition: employment projections for the 2.0 °C and 1.5 °C scenarios' in S Teske, 2019, *Achieving the Paris Climate Agreement goals*, Springer

⁹ Nuclear Skills Strategy Group, 2021, *Nuclear workforce assessment 2021: a scenario based approach to nuclear workforce planning*

¹⁰ Office for National Statistics, 2020, 'SOC 2020 volume 1: structure and descriptions of unit groups'

¹¹ BEIS, 2022, op cit

¹² J Haynes, op cit

¹³ E Dominish, op cit

¹⁴ Nuclear Skills Strategy Group, op cit