Green Jobs and Skills in West London

West London Alliance final report summary

Prepared by WPI Economics on behalf of the West London Alliance

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Contents

This is a summary of the report ***Green Jobs and Skills in West London*** carried out by WPI Economics and the Institute for Employment Studies for West London Alliance. The full report, including all sources and reference for the information in this slidepack, can be found at: http://wpieconomics.com/publications/green-jobs-and-skills-in-west-London

Key findings

Green jobs today in West London

- The term "green job" is directly related to policies aiming to deliver environmental goals, so we define ***green jobs as those jobs that facilitate meeting net zero and broader environmental goals.***
- We estimate there were some **31,600 green jobs** in West London in 2020, **3.7% of total employment.** This represents 1 in 7 green jobs in the capital.
- The most prominent green sectors in West London, in line with the wider picture across the capital, **are Power and Homes and Buildings**, accounting for almost **8 in 10 of the subregion's green jobs**.
- Workers in green jobs in West London **are predominantly in higher level managerial, professional and associate professional occupations** (64%), but skilled craft manual workers (e.g. electricians and plumbers) are over-represented in green jobs in West London in comparison with the whole of London. There is **variation by sector**, with jobs in power and green finance/consultancy sectors being predominantly professional and associate professional, while the largest group in sectors related to homes, buildings and infrastructure, and reduce, reuse, recycle is skilled craft workers.
- There are higher than average proportions of male workers, and white workers, in green jobs compared with all jobs in West London. Furthermore, the green workforce has an older than average age profile, in comparison with all workers in West London.

Key findings

Green skills today in West London

- Around **three fifths** (59%) of West London residents in green jobs **have degrees** (above the proportion of graduates in all jobs in West London of 52%, and the proportion of graduates in green jobs across the UK as a whole of 38%), with **significant sectoral variation** (ranging from above three quarters in power, consultancy and finance to one quarter in homes and building and reuse, reduce and recycle sectors).
- Analysis at the national level shows **that green business tend to draw relatively few workers straight from education** and rely more on workers from other sectors. In West London, the pool of workers likely to have green-related skills but working in other sectors is around four times as large as the number of green workers, although this potential supply is only twice as large as the workforce in the power and homes, buildings and infrastructure sectors.
- There are **around 9,000 learners in FE** (19+) **and in apprenticeships** (all ages) **in relevant subject areas to green jobs**. These represent nearly **30% of the current green workforce**, higher than the level across the whole of London (18%), indicating a relatively large education and training pipeline at FE level within West London.
- The HE institutions in West London produce a relatively large number of business/finance and maths/computing graduates in relation to the numbers of graduate workers in green jobs with degrees in these subjects, although much smaller numbers of graduates in engineering and physical/environmental sciences in relation to the size of the graduate workforce with these degrees in green jobs.

Key findings

Projections of green jobs in West London

- The total number of green jobs in the central scenario is projected to rise **from 32,000 in 2020 to 64,000 in 2030** – a doubling of the green economy workforce over a decade - **and 122,000 in 2050**, representing a **near-4-fold increase**. By 2050, **three sectors are projected to account for 8 in 10 of West London's green jobs:** power (38%), homes and buildings (22%) and low carbon transport (19%).
- The central scenario is based on apparent most likely outcomes; we also present low and high scenarios to account for variations in policy, innovation and other factors that will impact on the growth of the green economy. The figures throughout this slide deck are for the central scenario unless otherwise stated. To illustrate the potential impact of variations, The **low scenario** estimates there to be **45,000 green jobs in 2030** while the **high scenario estimates 98,000.** For **2050,** the **low scenario** estimates there will be **61,000 green jobs in 2050** while the **high scenario** estimates **210,000.**
- In addition to the jobs that will be created by the transition to net zero, there will be many jobs lost in carbon-intensive industries. We identify that **117,000 are in carbon intensive industries** and therefore at highest risk of change, mostly in Construction, Aviation and Land transport, representing a **higher percentage of the total workforce than the rest of the UK and London economies**.
- However, we estimate there will be a **small positive impact on overall employment in West London** due to the shift to net zero, with an **increase of around 10,200 jobs in 2030 and around 3,700 jobs in 2050**.

Key findings

Projections of green skills in West London

- Under the central scenario, **the fastest growth rate is projected for skilled craft workers** (140% increase to 2030), which is also project to experience the largest increase in numbers of workers (9,800 increase). Under the high growth scenario, skilled craft workers would increase by 23,000, or 323%).
- In addition to the growth in numbers, there will be a need to replace workers who retire or leave the labour market. It is estimated that this replacement demand represents one third of the current employment level, with only minor variation across the occupational groups.
- These **projected total demands** for workers in green jobs in the central scenario **are very large in relation to the outputs from FE and HE**. The annual increase in consultancy-based jobs represents 12% of the annual output from education and training, while the annual increase in craft-based job is slightly larger than the total education and training output in craft-based subjects (2% larger).

Recommendations

The analysis in the report highlights a few areas where there is a potential for central, London, and local government to work with stakeholders to fully realise the benefits of the net zero transition.

- **Long term policy certainty and clarity** through long term signals needed by forms, workers and skills providers. Ultimately this requires leadership from **central Government,** but **London government** (**the boroughs – individually, at sub-regional level and through London Councils – and the Greater London Authority**) also have a role in stressing the importance of delivering certainty in a jobs and skills context.
- **Shape skills provision to equip London's future green workforce**: **Employers, sector bodies and skills providers** need to work together to help shape skills provision to ensure a pipeline of skilled individuals, including reskilling opportunities for existing workers.
- **Promote the opportunities of the green economy**: through careers information and guidance to make learners aware of opportunities and to increase progression rates into green economy jobs. **Skills providers, schools, employers and industry bodies** have a role in delivering this.
- **Monitor the growth of the green economy**: **London government** should measure the growth of the green economy over the coming years using a consistent framework, and identify areas where there are challenges in meeting skills needs which are holding back growth and limiting our ability to tackle emissions.

Recommendations

In addition, regarding skills there is an urgent need to:

- **Increase education provision in subjects and courses that are relevant for green jobs**: **Skills providers** should particularly ensure there is increased provision related to craft-based jobs (particularly in roles for which there are existing skills shortages) in the Homes, Buildings and Landscape and Power through Further Education and apprenticeships, given the size of projected increases in employment in relation to current skills provision;
- **Increase the proportion of those taking relevant courses who progress to employment within green sectors**: **Skills providers, working with employers and sector bodies**, should ensure there is sufficient information and guidance for careers in the green economy, that informs learners of the growing range of opportunities within green sectors; and
- **Skills providers** should consider increasing targeted reskilling training, working with **employers and sector bodies** to increase the flows of potential recruits from non-green sectors into green jobs.

Project goals and method

Project goals

1. Develop a shared definition of green jobs to facilitate collaboration and joint working between London's sub-regional partnerships.
2. Understand demand for green jobs and skills to help member authorities shape employment and skills provision.
3. Develop a shared narrative on green jobs and skills, emphasising the sub-regional partnerships' collective commitment to de-carbonisation, to support their public affairs work.

How the project was carried out

Literature review: Review of literature on the definition of green jobs and skills, how to quantify them and sources for projecting growth in green jobs over time

Engagement with boroughs and stakeholders: Extensive engagement with, borough Skills Officers and Recovery Leads, range of external public and private stakeholders

Data analysis:

- Mapping of Low Carbon and Environment Goods and Services sector data to jobs in eleven key green policy areas
- Supervised machine learning to understand companies active in the green economy across sectors
- Analysis of Labour Force Survey data on current green skills and flows into and out of relevant occupations
- Analysis of Business Register and Employment Survey data for jobs at high risk from the transition, and the equalities implications

Defining green jobs

Existing definitions

We reviewed six potential approaches:

i. Environmental Goods and Services Sector (EGSS)

ii. Low Carbon and Renewable Economy survey (LCREE)

iii. Low Carbon and Environmental Goods and Services Sector (LCEGS)

iv. International Labor Organization (ILO) definition

v. Task based approach (American examples using O*Net data)

vi. Mission-based approach (Green Jobs Taskforce approach)

Through desk-research and stakeholder engagement we assessed the pros and cons against several criteria – see table overleaf. We concluded that there is no definition of the terms green jobs or the green economy that is divorced from policy goals – the terms exist because of the imperative to deliver on net zero and broader environmental goals.

We therefore recommended a practical "mission-based" definition:

Green jobs are those jobs that facilitate meeting net zero and broader environmental goals.

To decide which activity is likely to facilitate meeting net zero goals we follow the Committee on Climate Change's recommended pathways.

Summary prioritisation table for definitional approaches

Name	Definition	Government recognised definition?		Comprehensibility & strength of relationship to political narrative	Feasibility		Sector coverage			
							Broader than net zero?	Up to date with modern economy		In London context?
Environmental Goods and Services Sector (EGSS)	*Areas of the economy engaged in producing goods and services for environmental protection purposes, as well as those engaged in conserving and maintaining natural resources*	✓✓✓	National statistic	✓	✓✓	Would require ONS to provide data	✓✓✓	✓	Based on SIC codes	✓
Low Carbon and Renewable Energy Economy estimates (LCREE)	*Economic activities that deliver goods and services that are likely to help the UK generate lower emissions of greenhouse gases, predominantly carbon dioxide*	✓✓✓	National statistic	✓✓	✓✓	Would require ONS to provide data	X	✓✓	Survey updated annually but still misses areas due to SIC code limitations	✓
Low Carbon and Environmental Goods and Services Sector (LCEGS)	*EGSS sectors expanded to include activities that contribute and enable growth in the sector, including value and supply chains*	✓✓	GLA commissioned report	✓✓	✓✓✓	Requires data purchase	✓✓✓	✓✓✓	Approach updated regularly	✓✓✓
Task-based approaches	*Approaches typically from the United States that identify green tasks, and then the proportion of each job type that is spent on green tasks*	X	Current applications US based	✓✓✓	X	Timescale too short	✓✓✓	✓✓✓	Depending on approach	✓✓✓
International Labor Organization	*Jobs which reduce the consumption of energy and raw materials, limit greenhouse gas emissions, minimize waste and pollution, protect and restore ecosystems and enable enterprises and communities to adapt to climate change. In addition, green jobs have to be decent.*	✓	Internationally recognised	✓✓	X	Not operationalised	N/A	N/A		N/A
Mission-based definition following Green Jobs Taskforce	*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. 7 specific policy areas identified*	✓✓	National Government commissioned report	✓✓✓	✓✓✓ ✓✓	With modern methods With publicly available data	✓✓✓	✓✓✓	Can use modern methods	✓✓
Mission-based definition: tailored to London context	*Same as above but tailored to London context - suggested 11 areas including Green Finance, Environmental R&D and Reducing Localised Pollution (air, water and noise)*	✓	Adapting a government recognised approach	✓✓✓	✓✓✓ ✓✓	With modern methods With publicly available data	✓✓✓	✓✓✓	Can use modern methods	✓✓✓

Mission-based definition: sectors for a London based definition

To develop a mission-based definition for London we reviewed three key sources:

- The sectors used by the Green Jobs Taskforce (2020/2021)
- The London Councils and London Environment Director's Network Joint Statement on Climate Change
- The Mayor of London's London Environment Strategy (2018)

Combining these three sources we proposed 11 policy areas that reflect both net zero and broader environmental policy goals, shown overleaf. Although for this analysis it is useful to split these areas, it is important to stress that environmental policy crosses these boundaries – in particular, broader environmental goals and contribute to net zero and vice versa.

Mission-based definition: sectors for a London based definition

Net zero focus

1. **Homes and buildings:** Including retrofit, building new energy-efficient homes, heat pumps, smart devices and controls, heat networks and hydrogen boilers.
2. **Low carbon transport:** Including low or zero emission vehicles, aviation and maritime, rail, public transport and walking or cycling.
3. **Power:** Including renewables (such as wind, solar and hydropower), nuclear power, grid infrastructure, energy storage and smart systems technology.
4. **Industrial decarbonisation, hydrogen and carbon capture and storage**: Including hydrogen production and industrial use, carbon capture, utilisation & storage (CCUS) and industrial decarbonisation.
5. **Green Finance:** The concentration of financial activity in Central London means that in our context Green Finance could be a key area to identify separately.
6. **Climate change research & development:** Including private sector, academic and public research.
7. **Climate change strategy, policy, monitoring and planning:** Including public, private and NGO sector strategy and policy, outreach to citizens, environmental monitoring and use of planning system to achieve net zero.
8. **Climate adaptation:** Including flood defences, retrofitting of buildings to be resilient to extreme climate events, nature-based solutions to reduce climate impacts and civil and mechanical engineering for infrastructure adaptation.

Broader environmental goals (may have some impact on climate change goals)

1. **Reducing localised pollution:** Including air pollution, water pollution and noise; London has ambitious goals across all three of these areas.
2. **Reduce, reuse, recycle:** Including waste management and circular economy.
3. **Green infrastructure:** Within a London context this will focus on urban green infrastructure, and include activity aimed at increasing biodiversity directly or through offsetting.

Green jobs and skills in West London: now

Quantifying green jobs - sources

To quantify the gross number of jobs in London in the eleven green sectors we use two sources:

1) The Low Carbon Environmental Goods and Services (LCEGS) sector dataset

This dataset is prepared by the consultancy kMatrix and commissioned regularly for London by the Greater London Authority, and includes a broader set of activities than official definitions such as the ONS EGSS and LCREE data. However, we could not map our Climate Adaptation and Green and Blue infrastructure sectors sufficiently well so used the Data City tool discussed below. To allocate the jobs identified within LCEGS to our sectors these results we:

- Mapped data from the 2017/18 LCEGS dataset to our green jobs categories
- Estimated 2020 job figures using UK growth rates from the most recent LCEGS estimates. London figures for the period 2018/19 to 2020/21 have not been published yet, so we have currently assumed that growth for London has been in line with UK growth rates.

2) The Data City Real-Time Industrial Classification tool

This guided machine learning tool allows us find companies working within specific fields, based on the way companies actually describe themselves on their websites. We worked with the Data City team to provide an initial "training set" of companies and keywords, and then iteratively improve the results by guiding the machine learning algorithm on which companies should be excluded or included. This tool allows us to identify data for the two sectors that the LCEGS data does not and identify a broad range of companies within each sector that are operating within London. As it is a tool ultimately geared towards finding companies, it is limited in its ability identify green jobs within firms that are not fully within our definition of the green economy.

Estimated green jobs in West London, 2020

- Using these two sources, gives us these estimates of green jobs in West London in 2020:

Sector	Numbers of jobs	West London % of total employment	% of green jobs
Climate adaptation, green infrastructure and reducing localised pollution	500	0.1 %	1.6%
Climate change Research and Development	630	0.1%	2.0%
Climate change strategy, policy, monitoring and planning	640	0.1%	2.0%
Green finance	300	0.03%	0.9%
Homes and Buildings	9,300	0.9%	29.4%
Industrial decarbonisation, hydrogen and carbon capture	230	0.07%	0.7%
Low Carbon Transport	2,400	0.2%	7.6%
Power	15,200	1.5%	48.1%
Reduce, reuse, recycle	2,400	0.2%	7.6%
Total	**31,600**	**3.2%**	**100.0%**

Source: WPI Economics calculations based on data supplied by kMatrix on their Low Carbon Environmental Goods and Services methodology and The Data City, and ONS Business Register and Employment Survey for total employment

Estimated green jobs in West London

Total estimated green jobs by borough, 2020

Note: Analysis relates to the location of the job, not the location of the worker

Borough	Climate adaptation, green infrastructure, reducing localised pollution	Climate change Research and Development	Climate change strategy, policy, monitoring and planning	Green finance	Homes and Buildings	Industrial decarbonisation, hydrogen and CCUS	Low Carbon Transport	Power	Reduce, reuse, recycle	All Green Jobs
Barnet	120	190	190	80	2,700	70	300	3,580	680	7,900
Brent	90	60	80	60	1,050	<50	260	1,920	250	3,800
Ealing	<50	70	70	<50	1,060	<50	330	1,800	320	3,800
Hammersmith and Fulham	<50	60	50	<50	800	<50	460	1,630	160	3,200
Harrow	60	80	80	50	1,110	<50	190	1,670	310	3,600
Hillingdon	60	100	100	<50	1,740	<50	530	3,060	420	6,000
Hounslow	<50	70	60	<50	870	<50	340	1,560	280	3,300

Note that this borough-level data represents 2017 data uprated by UK growth rate of green jobs to 2020, so will not reflect areas that may have seen growth out of line with national averages due to e.g. the establishment of a large local green employer since 2017. 2020/21 data is expected to be available shortly. As with any data analysis, there is a confidence level around the accuracy of the data. Much of our underlying data is supplied by kMatrix, who monitor the confidence level through a rigorous source selection process. Confidence levels vary by activity, geography and by forecast year. All borough level employment data has a confidence level of over 80%

Source: WPI Economics calculations based on data supplied by kMatrix on their Low Carbon Environmental Goods and Services methodology and The Data City, and ONS Business Register and Employment Survey for total employment by borough.

Estimated green jobs in West London

Estimated green jobs as a proportion of total employment by London borough, 2020

Note: Analysis relates to the location of the job, not the location of the worker

Borough	Climate adaptation, green infrastructure, reducing localised pollution	Climate change Research and Development	Climate change strategy, policy, monitoring and planning	Green finance	Homes and Buildings	Industrial decarbonisation, hydrogen and CCUS	Low Carbon Transport	Power	Reduce, reuse, recycle	All Green Jobs
Barnet	0.1%	0.1%	0.1%	0.1%	2.0%	0.1%	0.2%	2.6%	0.5%	5.7%
Brent	0.1%	0.05%	0.1%	0.05%	0.8%	-	0.2%	1.5%	0.2%	2.9%
Ealing	-	0.05%	0.05%	-	0.8%	-	0.2%	1.3%	0.2%	2.7%
Hammersmith and Fulham	-	0.04%	0.04%	-	0.6%	-	0.3%	1.1%	0.1%	2.2%
Harrow	0.1%	0.1%	0.1%	0.1%	1.4%	-	0.2%	2.1%	0.4%	4.6%
Hillingdon	0.0%	0.1%	0.1%	-	0.9%	-	0.3%	1.6%	0.2%	3.0%
Hounslow	-	0.04%	0.04%	-	0.5%	-	0.2%	0.9%	0.2%	2.0%

Note that this borough-level data represents 2017 data uprated by UK growth rate of green jobs to 2020, so will not reflect areas that may have seen growth out of line with national averages due to e.g. the establishment of a large local green employer since 2017. 2020/21 data is expected to be available shortly. As with any data analysis, there is a confidence level around the accuracy of the data. Much of our underlying data is supplied by kMatrix, who monitor the confidence level through a rigorous source selection process. Confidence levels vary by activity, geography and by forecast year. All borough level employment data has a confidence level of over 80%

Source: WPI Economics calculations based on data supplied by kMatrix on their Low Carbon Environmental Goods and Services methodology and The Data City, and ONS Business Register and Employment Survey for total employment by borough.

Understanding green skills in London

Best place to start in understanding skills needed for green jobs, is to consider the skills of those currently in green jobs.

We have used Labour Force Survey data to understand the skills and demographic characteristics of those working in green jobs, through identifying the most common SIC codes within each sector.

The table shows the three most common sector classes (4-digit SIC) within each of our sectors. This illustrates both:

- a good matching (e.g. electrical installation in Low Carbon Transport, or plumbing in Homes and Buildings),
- but also a shortcoming of SIC codes in that many green companies fall into 'other activities not elsewhere classified.

The skills analysis has combined these sectors into four broader ones:

- Power
- Homes, buildings and infrastructure (including transport, industry and localised pollution)
- Reduce, reuse, recycle
- Consultancy/finance (including climate adaptation and strategy)

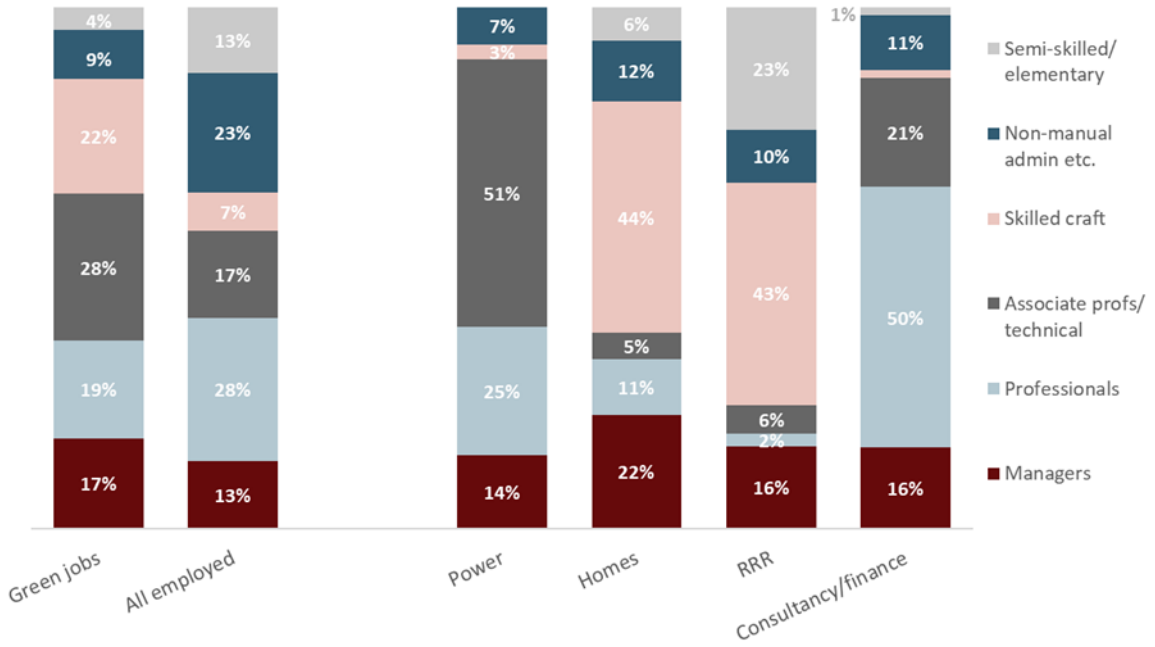
Climate adaptation	
Environmental consulting activities	21
Engineering related scientific and technical consulting	11
Management consultancy activities other than financial	11
Green and blue infrastructure	
Other business support service activities n.e.c.	11
Landscape service activities	8
Environmental consulting activities	8
Low Carbon Transport	
Electrical installation	29
Retail sale via mail order houses or via Internet	19
Other business support service activities n.e.c.	12
Reducing localised pollution	
Environmental consulting activities	37
Other professional, scientific and technical activities n.e.c.	25
Engineering related scientific and technical consulting	16

Climate change strategy, research & monitoring	
Environmental consulting activities	75
Management consultancy activities other than financial	59
Other business support service activities n.e.c.	38
Homes and Buildings	
Plumbing, heat and air-conditioning installation	59
Other business support service activities n.e.c.	27
Electrical installation	16
Power	
Production of electricity	409
Other business support service activities n.e.c.	140
Management consultancy activities other than financial	82

Green Finance	
Management consultancy activities other than financial	20
Other business support service activities n.e.c.	14
Financial intermediation not elsewhere classified	12
Industrial decarbonisation, hydrogen and CCUS	
Engineering related scientific and technical consulting	11
Other business support service activities n.e.c.	8
Management consultancy activities other than financial	8
Reduce, re-use and recycle	
Collection of non-hazardous waste	34
Recovery of sorted materials	31
Treatment and disposal of non-hazardous waste	30

Occupational patterns of employment

- Managerial and associate professional jobs are over-represented in green sectors, although the proportion of professional occupations in green sectors is below the overall proportion.
- There are more than three times as many skilled craft jobs in green sectors compared with all sectors (22% and 7% respectively)
- Professional, technical and managerial occupations are most prominent in the Power and Consultancy/Finance sector, whereas skilled craft workers are the largest occupational group in the Homes an reduce, reuse and recycle sector.



The detailed occupations reflect the main activities within each sector, for example:

- Electricians, gardeners and plumbers in homes, buildings and landscape
- Management consultants and other finance, sales and marketing professionals and managers in consultancy/finance

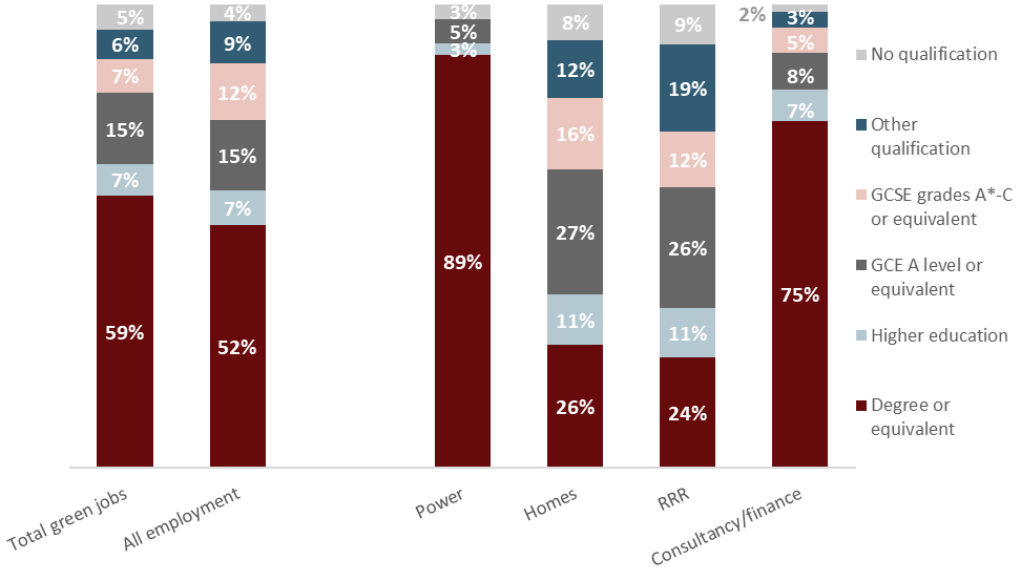
Source: Quarterly Labour Force Survey, Jan-Mar 2020 to Oct-Dec 2020 combined

Demographics and qualifications of the workforce

- The green workforce is male dominated, with a lower proportion of workers from Black, Asian and Minority Ethnic backgrounds in comparison with all sectors in West London.
- The proportion of workers from Black, Asian and Minority Ethnic backgrounds is highest in the consultancy and finance sector (40%), followed by reduce, reuse, recycle sector (36%), and lowest in the power sector (6%).

	All green jobs	All jobs	Power	Homes	Reduce, re-use and recycle	Consultancy/ finance
Male	77%	53%	77%	81%	76%	57%
Female	23%	47%	23%	19%	24%	43%
White	83%	62%	94%	74%	68%	60%
Black, Asian and Minority Ethnic	17%	38%	6%	26%	32%	40%

Source: Quarterly Labour Force Survey, Jan-Mar 2020 to Oct-Dec 2020 combined



- The green workforce is highly qualified, and three fifths have first degrees or equivalent or higher qualifications (more than three quarters in power, and consultancy/finance).
- Engineering graduates, those with physical/environmental science degrees, and those with business/finance degrees are over-represented.
- Among those with vocational qualifications, building and civil engineering, and electricity and energy are the most common subject areas.

Source: Quarterly Labour Force Survey, Jan-Mar 2020 to Oct-Dec 2020 combined

Skills supply considerations

Green sectors tend to draw staff from other sectors, rather than straight from education

- Around 1% of the workforce enter straight from full-time education each year, compared with 3% across all sectors.
- Entrants from other sectors to green sectors make up 6% of the current workforce each year.
- Manufacturing sectors are a key source of labour and skills.

There is a substantial pool of relevant skills in other sectors

- The number of workers in key occupations related to green sectors but working in non-green sectors is around four times as large as the current green workforce.
- This additional 'pool' is largest for consultancy/finance, and smallest for power and homes, buildings and landscape.

Provision in the FE sector

- Just over 5,000 learners in relevant courses in FE, having increased around one fifth in recent years.
- Similarly, around 4,000 apprenticeship starts in relevant sector subject areas - mostly in business apprenticeships rather than craft apprenticeships.
- More than 1,500 apprenticeship achievements.
- Learners in FE/apprenticeships are 29% of the size of the workforce, above London-wide averages.

Provision in the HE sector

- One fifth of all HE students in London (c. 250,000) study in West London universities.
- The number of business/finance graduates each year is nearly as large as the workforce with these degrees.
- However, new engineering graduates represent a third of the number of employed in green sectors.
- And new graduates in physical/environmental sciences represent under just 5% of the graduate workforce.

Green jobs and skills in West London: the future

Projections for growth in jobs

- We reviewed a wide range of UK based and international literature to gather sources for anticipated growth rates in green employment in each of the policy areas. Where available we have used London specific data
- Key sources include:
  - CCC (2017): UK business opportunities of moving to a low carbon economy
  - LGA / Ecuity (2020): Local green jobs - accelerating a sustainable economic recovery
  - Building the net zero energy workforce (National Grid)
  - Net Zero Housing workforce / London Councils Pathways Report (Parity Projects)
  - ILO (2020) The employment impact of climate change adaptation
  - Vivid Economics and Barton Willmore (2020) Levelling Up and Building Back Better Through Urban Green Infrastructure: An Investment Options Appraisal
  - Green Alliance / Wrap (2015) Opportunities to tackle Britain's labour market challenges through growth in the circular economy
- We constructed a central scenario on the basis of the apparently most likely outcomes, and a low and high scenario that represent issues such as:
  - **Low:** More likely outcome if there are green skills shortages, lower uptake rates of green technology and / or less effective policy
  - **High:** Possible outcome if London captures a greater share of exportable green services and makes fast progress towards the 2030 net zero target that allows London green industry to capture more of the market both in London and outside

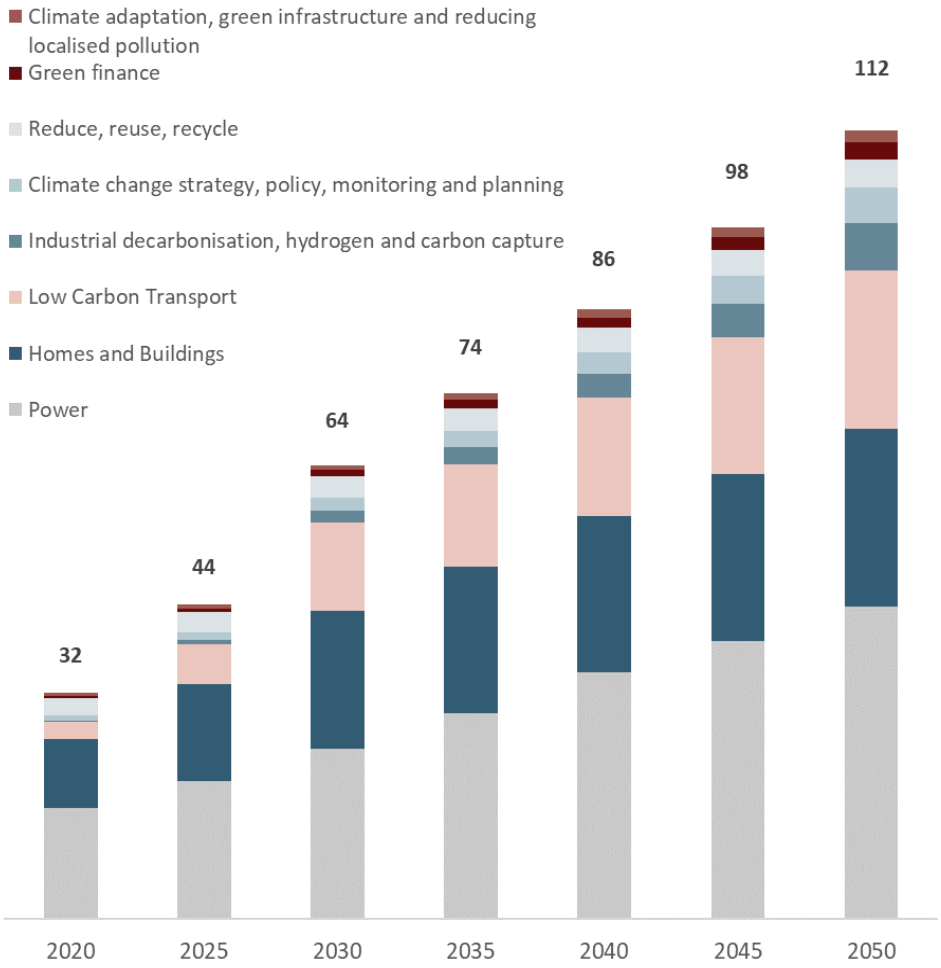
Projections of yearly growth rates of green jobs by sector, central scenario (gross increase)

	2021-2030	2031-2040	2041-2050
Climate adaptation	5%	5%	5%
Climate change Research and Development	11%	5%	5%
Climate change strategy, policy, monitoring and planning	11%	5%	5%
Green and Blue infrastructure	4%	2%	2%
Green finance	11%	5%	5%
Homes and Buildings	7%	1%	1%
Industrial decarbonisation, hydrogen and carbon capture	22%	7%	7%
Low Carbon Transport	18%	3%	3%
Power	4%	4%	2%
Reduce, reuse, recycle	2%	1%	1%
Reducing localised pollution	5%	5%	5%

Source: WPI Economics calculations

Central projection for green jobs by 2050

Projections of green jobs in West London (thousands)

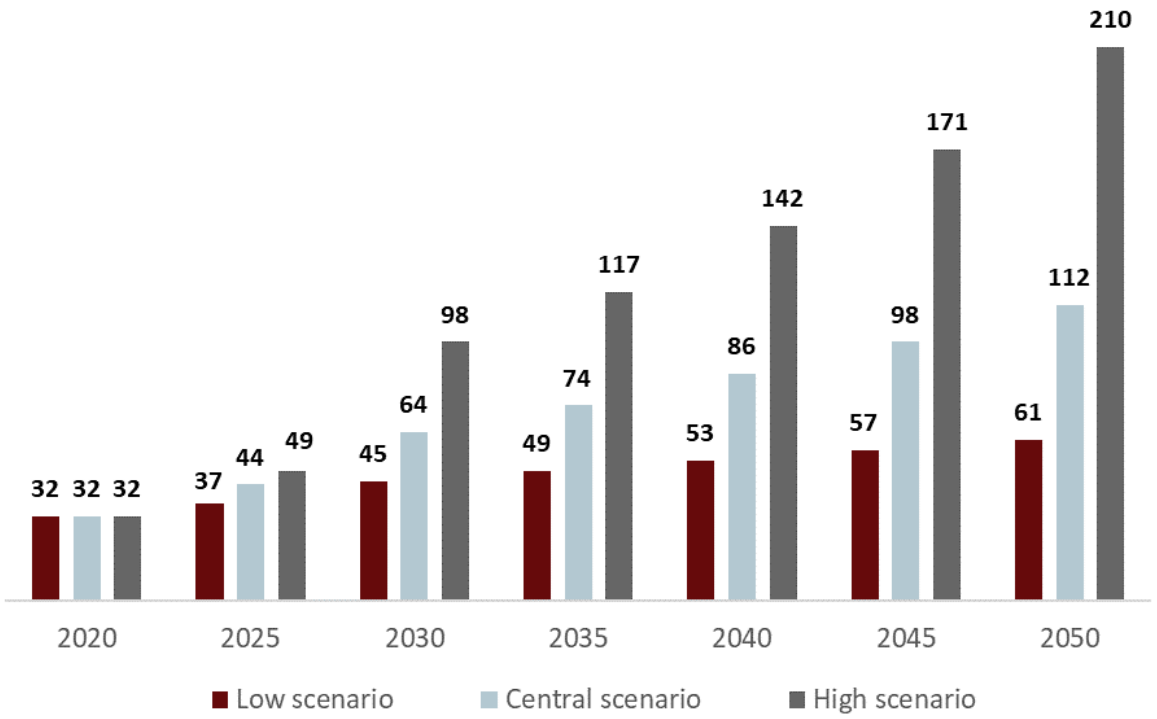


- Our central projection is around 64,000 green jobs in West London by 2030 and around 112,000 by 2050.
- By 2050, three sectors are projected to account for 8 in 10 of West London's green jobs:
  - power (38%),
  - Homes and Buildings (22%), and
  - low carbon transport (19%).
- Over the decade preceding the pandemic, total employment grew by 13% over the whole period, or 1.2% per year, while the estimated growth rates for most green sectors in the coming decades tend to be above 4%.
- The sectors expected to have fastest growth are:
  - Industrial decarbonization, hydrogen and carbon capture,
  - and Low carbon transport.
- Across the majority of green sectors, employment is expected to grow faster in the 2020s in comparison to subsequent decades.

Source: WPI Economics calculations

The number of green jobs in the next three decades is highly uncertain

Scenarios for projections of total green jobs in West London (thousands)



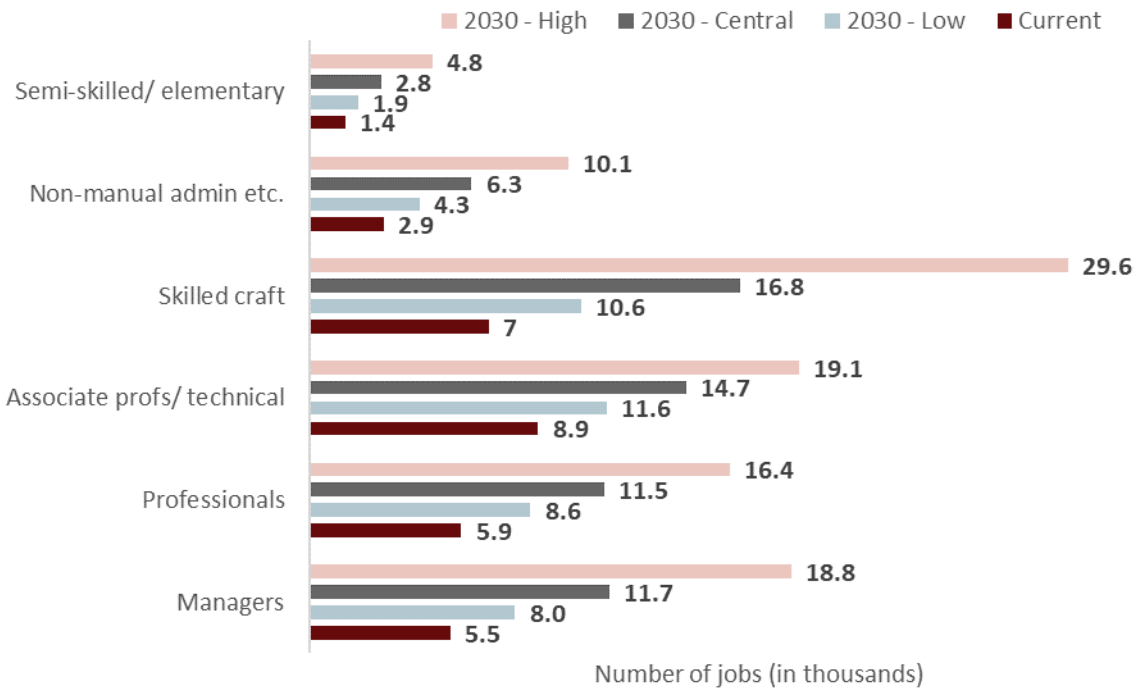
- Our low projection still sees substantial growth, but to only around 61,000 green jobs by 2050, rather than 112,000. This represents the potential impact of skills shortages, lower uptake rates and / or less effective policy
- Our high projection represents potential benefit of moving faster to meet the 2030 net zero target, leading to up to 210,000 green jobs by 2050

Source: WPI Economics calculations

Projections of jobs by occupation to 2030

- The implications of the central scenario for employment by occupation to 2030 are an increase of 140% in skilled craft workers, and increases of 113% and 95% in managerial and professional employment respectively; associate professionals are projected to grow more slowly (65%).
- In 2030, there would be 17,000 skilled craft workers, 15,000 associate professional workers, 12,000 managers and 11,000 professionals.

- But under the high growth scenario, the number of skilled craft workers in 2030 would be 29,600, more than four times the current level …
- … with a threefold increase in managers and professionals
- These occupational projections assume the occupational mix within each of the four broad sectors will remain the same over time, but each sector grows at a different rate



Detailed occupational changes, and skills supply implications

Largest increases to 2030 among skilled craft workers under central scenario

- 3,000 more electricians – 146% increase
- 2,200 more gardeners and landscape gardeners – 168% increase
- 1,700 more plumbers and heating & ventilation engineers – 168% increase

Largest increases to 2030 among man/prof/ technical workers under central scenario

- 4,000 more business associate professionals (business systems analysts, data analysts etc.) – 56% increase
- 1,700 more production managers and directors in construction – 168% increase
- 900 more financial managers and directors– 168% increase

- Nationally, there are skills shortages currently for many of these occupations – electricians, plumbers, and production managers in construction
- Green sectors currently draw substantially more staff from other sectors, than straight from education – but if all new jobs were filled by entrants from education, the sector would need to attract half of all FE/HE leavers with relevant skills
- To ensure a sufficient supply for these new jobs, there is an urgent need to:
    - Increase education provision in subjects and courses that are relevant for green jobs
    - Increase the proportion of those taking relevant courses who progress to employment within green sectors; and
    - Increase the flows from other, non-green, sectors into green sectors, including through re-skilling training

Impact of net zero on the total number of jobs in West London

Overall impact on employment

These jobs are not all additional jobs to the London economy because:

- A non-green job may have become a green job;
- Some jobs may cease to exist.

But modelling for the CCC has found that there will be an increase in the **net number of jobs in the UK** due to the change to a net-zero carbon economy by 2050 because:

i. The transition to a low carbon economy requires that investment is brought forward into capital-intensive technologies, stimulating economic demand;

ii. The decarbonisation of power reduces the imports of oil and gas, which in turn increases domestic production, leading to increases in GDP and employment; and

iii. Electricity prices are expected to fall, as economies of scale for low carbon energy technologies are substantial. Low electricity prices boost GDP and employment and also reduce consumer prices across the economy.

Employment is projected to be around 1% higher by 2035, equivalent to 300,000 net jobs across the whole of the UK economy.

We have estimated the impact on West London economy of the move to net zero policies by overlaying these sectoral changes on West London's pattern of sectoral employment.

Estimated impact of net zero policies on net employment in the UK, by sector

Sector	Employment, UK (% change from baseline of current policies rolled forward)	
	2030	2050
Agriculture	4.2%	2.9%
Mining and refinery	-7.8%	-11.0%
Utilities	4.5%	35.5%
Manufacturing and construction	1.1%	0.5%
Distribution, retail, hotel and catering	1.8%	0.9%
Transport and communications	2.0%	0.1%
Services	0.2%	0.0%

Source: Climate Change Committee (2020) Economic Impact of the Sixth Carbon Budget (Cambridge Econometrics)

Estimated impact of net zero policies on net employment in West London

- We find that if West London's sectoral changes are in proportion to the rest of the UK then overall employment in London could increase by around 10,200 by 2030, and 3,700 by 2050 due to the move to net zero policies compared to current policies.
- This is a positive, although represents only a small proportion of overall employment (less than 1%)

Estimated impact of net zero policies on net employment in West London

Sector	Latest data	Estimated jobs in West London (2030)			Estimated jobs in West London (2050)		
		Based on current policies	With net zero policies	Change due to net zero policies	Based on current policies	With net zero policies	Change due to net zero policies
Agriculture	200	200	200	**0**	200	200	**0**
Mining and refinery	800	700	600	**-100**	500	500	**0**
Utilities	4,100	3,700	3,900	**200**	2,900	3,900	**1,000**
Manufacturing and construction	86,500	83,500	84,500	**1,000**	76,200	76,600	**400**
Distribution, retail, hotel and catering	229,000	237,800	242,100	**4,300**	238,900	241,000	**2,100**
Transport and communications	183,500	190,000	193,800	**3,800**	191,700	191,900	**200**
Services	460,300	516,000	517,000	**1,000**	592,300	592,300	**0**
Total - West London	964,000	1,032,000	1,042,000	**10,200**	1,103,000	1,106,000	**3,700**
Whole of London	5,368,000	5,853,000	5,900,000	**47,200**	6,443,000	6,462,000	**19,400**

Source: WPI calculations based on Climate Change Committee (2020) Economic Impact of the Sixth Carbon Budget (Cambridge Econometrics) and ONS Business Register and Employment Survey

Jobs at risk from decarbonisation

Carbon intensive industries

Following the method in the report *Greening the Giants (Onward, 2021)* we gathered information on "carbon intensive sectors" i.e. those sectors that either have emissions above 100tCO2e per job or which contribute more than 2% of annual total UK emissions. These are:

- Agriculture
- Aviation
- Carbon intensive manufacturing
- Coal and lignite mining
- Construction
- Electricity, gas, steam and air conditioning supply
- Land Transport
- Oil and gas
- Retail*
- Shipping and fishing
- Steel
- Waste and sewerage

*In common with Onward, we exclude retail from the cross-sectoral analysis because the sector has been assessed as having 91% of jobs not exposed to the transition. We also exclude Coal and lignite mining, as there are no jobs in this sector in London in 2019.

Jobs in carbon intensive sectors, West London

- We identify that 117,000 of West London's 964,000 jobs (12%) are in carbon intensive industries and therefore at highest risk of change. This is higher than the rest of the UK (11%) and London(7%) economy.
- Although it is not possible to get demographic data at a detailed industrial breakdown, we can establish the likely picture by using the broad section level SIC codes for each of the ten areas.
- Construction, Aviation and Land Transport are the key areas of focus by employment size:
- Construction has a lower proportion of non-white workers than compared to all industries across London (24% versus 36%), and the national data suggests it is male-dominated (14% of workers are women, compared to an average of 48% across all industries). The sector also tends to employ fewer younger workers and a greater number of older workers than other industries.

Jobs in carbon intensive sectors

	SIC code section	Employment, 2019	Proportion of employees that identify as an ethnicity other than "White"		Proportion of people in employment that identify as female		Proportion of people in employment aged 16-64 that are under 25		Proportion of people in employment aged 16-64 that are over 50	
		West London Alliance	*London*	*United Kingdom*	*London*	*United Kingdom*	*London*	*United Kingdom*	*London*	*United Kingdom*
			NB/ This data is at the SIC code section level only for London and the United Kingdom, not lower level geographies							
Construction	F	45,000	24%	7%	-	14%	4%	10%	35%	38%
Aviation	H	34,555	55%	18%	39%	22%	4%	7%	22%	31%
Land Transport	H	29,940	55%	18%	39%	22%	4%	7%	22%	31%
Waste and sewerage	E	2,765	56%	7%	-	23%	8%	8%	19%	31%
Carbon intensive manufacturing	C	2,240	38%	9%	-	27%	10%	9%	35%	36%
Electricity, gas, steam and air conditioning supply	D	965	44%	10%	-	23%	8%	8%	19%	31%
Oil and gas	B	640	44%	7%	-	23%	8%	8%	19%	31%
Shipping and fishing	Mostly H	470	55%	18%	39%	22%	4%	7%	22%	31%
Agriculture	A	170	4%	1%	-	26%	N/A	14%	30%	62%
Steel	C	70	38%	9%	-	27%	10%	9%	35%	36%
Total in carbon intensive sectors		**117,000**								
All industries		**964,000**	**36%**	**13%**	**-**	**48%**	**7%**	**11%**	**27%**	**34%**

Source: ONS Business Register and Employment Survey (BRES) and Annual Population Survey (APS). Notes: The data on gender breakdown of industries in London for SIC codes A-F is not available; the ONS say the figures are suppressed as they are statistically unreliable.

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