

# UK GREEN SKILLS REPORT



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## Foreword

# There is a massive shift underway in the global economy

There is a massive shift underway in the global economy. In the wake of the pandemic, the world is witnessing a historic transformation in how people work, why they work and where they work. At LinkedIn, we call it the Great Reshuffle, an unprecedented moment in history where we are reimagining the future of work. People are actively acquiring new skills and pursuing new ventures. Employers are reinventing business models and creating new markets. And all of this economic upheaval, which would normally play out over the course of decades, is being compressed into a couple of years.

Amid this Great Reshuffle, we're faced with an urgent need to transition our society to a green economy to address the threat of climate change. How do we apply what we've learned from this unprecedented moment to power the enormous transition that needs to happen to meet the climate crisis?

Achieving our collective global climate targets is a monumental task and it is going to take a whole-of-economy effort to make it happen. That means we need a transformation in the skills and jobs people have if we're going to get there. The good news is that we are already seeing a shift to green skills and jobs underway on our platform, which has nearly 800 million members around the world. Green talent in the workforce worldwide is rising. The share of green talent increased from 9.6% in 2015, to 13.3% so far in 2021 (a growth rate of 38.5%).

Jobs are a critical part of the conversation about achieving this green transition. And rightly so. We expect to see millions of new jobs created globally in the next decade driven by new climate policies and commitments. For example, in the last five years, the number of Renewables & Environment jobs in the U.S. have increased by 237%, in stark contrast to the 19% increase for Oil & Gas Jobs. At this pace, the Renewables & Environment sector will outnumber Oil & Gas in total jobs on our platform by 2023.

It's more than jobs — we need to zoom in on the skills that power these jobs. Green skills. We believe real change will come through a skills-based approach to opportunity. We have seen double-digit growth across dozens of green skills over the last five years. The fastest-growing

green skills are in Ecosystem Management, Environmental Policy and Pollution Prevention. But the vast majority of green skills are being used in jobs that aren't traditionally thought of as green — such as fleet managers, data scientists or health workers.

Governments, companies, and individuals all need to come together to help transition the hiring market from focusing solely on titles and companies, degrees and schools, to also focusing on skills and abilities. We want to be a catalyst for job and skill transformations, and we have the tools to help.

This green skills report is one way we're doing our part. We leverage our unique data and labour market expertise to highlight actionable insights that are crucial to delivering a successful green transition and avoiding potential pitfalls.

I'm excited about this work and the ability to educate, inform and enable policy and investment decisions that will accelerate our transition to the green economy. LinkedIn is committed to tackling the climate change challenge. There is no more urgent one.



**Ryan Roslansky**  
CEO, LinkedIn

# Executive Summary

## Global

- In 2019 green hiring overtook non-green hiring for the first time, with green workers hired at a higher-rate than non-green workers.
- The number of green jobs is rising, although there is a mismatch between supply and demand with jobs requiring green skills growing at 31% over the past five years, whilst green talent has grown at 21%.
- The share of green talent in both high income and upper-middle income countries is more than double that of low income countries. There is therefore a danger that the global green focus will further exacerbate existing national divides.

## UK

- The UK is a world leader in green skills and has high green skill penetration across the economy relative to global competitors. However, green skill penetration is not uniform across sectors and more can be done to improve the position of certain very high polluting sectors, such as Transportation & Logistics.
- The fastest growing UK green jobs are Energy Auditors, Wind Turbine Technicians and Sustainability Managers. This demonstrates the impact policy has on job growth, as recent major policy shifts have contributed to their position as the fastest growing green jobs.
- There has been rapid growth in green hiring in the UK since 2019, with the change in the share of green hires almost double the global average. However the low starting base in the UK pre-2019 means the total share of hiring across job types aligns with the global average.

## Recommendations

- Skills providers must be better connected with businesses to ensure future skills reflect economic need and the skills gap can be closed.
- Policies and funding should be targeted to reflect the on the ground reality, as different industries and parts of the country have different needs.
- Systemic inequalities remain a challenge, so initiatives to address the inequitable distribution of green skills and jobs on income, gender and educational lines is essential.

# The Great Reshuffle and the importance of green skills

We are living in a time of global upheaval, with the Great Reshuffle taking place as people rethink what they work on, where they work and how they do it. This global shift in working habits and patterns has been driven by multiple factors – the pandemic, digital connectivity and our increasingly globalised economy – which provides both an opportunity and a challenge for policy-makers globally.

At LinkedIn we are seeing first-hand how business leaders are reimagining working models, cultures and company values – and how job-seekers are responding to that – whilst governments simultaneously seek to ensure skills can support the green economies and jobs of tomorrow.

In few areas is this Great Reshuffle, which has seen decades of change compressed into just a few years, more stark than in the green economy. We are seeing the world wake up to the fact we cannot wait any longer to address climate change.

Positively, this has manifested in a recognition that our institutional frameworks, working practices and skills approaches must adapt in order to address the threat of climate change.

Indeed, on the LinkedIn platform, which has nearly 810 million members, we are seeing an increase in green talent, green skills and ultimately green jobs.

However, the reality is that globally and in the UK – which on almost all measures performs better than international competitors – there is not the necessary human capital to meet our climate targets. To really address this, we cannot start from the end point of creating more green jobs. Instead this must be driven from the ground up, with a growth in green talent and subsequent skills – as that is what will drive the green jobs and ultimately the green progress of tomorrow.

To achieve this transition, governments, companies and individuals all need to come together to transition the hiring market to focus on skills and abilities – which will then drive green progress.

We are therefore committed to playing our part in this transition, with this Green Report providing policymakers, governments and business leaders with actionable insights to help them transition the global workforce to a green economic future.



# LinkedIn's green data

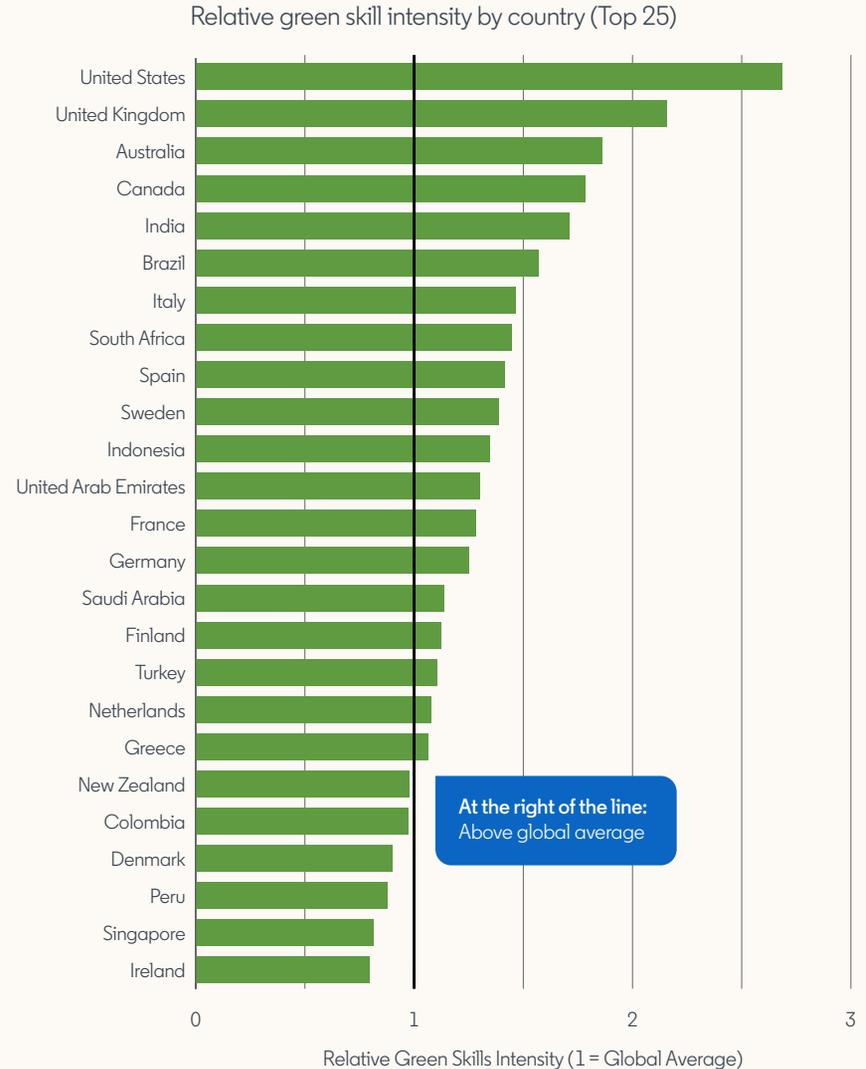


# The UK is a world leader in green skills

## GREEN SKILL PENETRATION BY COUNTRY

As compared to the global average, the average job in the UK requires more than double the green skill level, reflecting the extent to which the UK economy is ahead of international competitors on green skills. The green skill intensity in the UK is second only to the US, with the average UK job also significantly more green skill focused than broader competitors, including Australia, Canada and India.

Considering the green skill intensity by country and then across sectors, the UK is again second only to the US in terms of having the most sectors with an above average number of green skills. Of note for policy-makers when considering new initiatives in this area, the sectors where the UK has lower levels of green skills intensity to global peers are Consumer Goods, Hardware/Networking, Legal and Public Safety.



## GREEN SKILL PENETRATION BY JOB AND SECTOR

The fastest growing green jobs in the UK – Energy Auditors, Wind Turbine Technicians and Sustainability Managers – also significantly reflect key decarbonising areas of the economy and the UK's leadership in particular green areas. These jobs also map to broader policy and economic trends, with the growth of Energy Auditors being possibly explained by the introduction of the UK Emissions trading scheme, Wind Turbine Technicians linked to the UK's commitments around both offshore and onshore wind, and the rise in Sustainability Managers reflecting the broader business focus in the UK on sustainability and the drive to Net Zero.

Although green skill penetration is also growing globally, this is not uniform across sectors. Certain sectors, most notably Corporate Services, Manufacturing and Energy & Mining, have particularly high green skill penetration – with at least double the global average. For policy-makers, Public Administration is a sector that has high green skill penetration – likely

## UK Fastest-growing jobs

Green and greening jobs experiencing the fastest annual growth in 2016–2021 and their respective growth rates

### Green jobs

1. Energy auditor (34%)
2. Wind turbine technician (32%)
3. Sustainability manager (32%)

### Industries hiring green talent

Industries with the highest share of green talent hires in 2021

1. Construction
2. Manufacturing
3. Corporate services
4. Education
5. Software and IT services



## LinkedIn's green data

reflecting the increasing focus among public institutions on the climate challenge. For the UK specifically, the industries with the highest share of green talent hires in 2021 were Construction, Manufacturing and Corporate Services, which largely maps to the sectors that globally see the highest levels of green skill penetration.

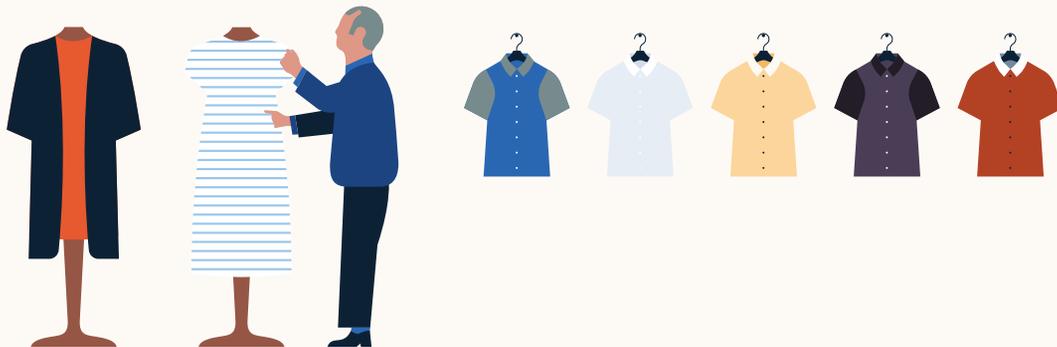
However concerningly, certain heavy polluting sectors, most notably Transportation & Logistics, currently lag significantly behind other sectors, with less than half the green skills penetration as compared to the global average. This should be of significant concern for policy-makers given the impact sectors such as Transportation & Logistics have on UK emissions and the challenge they pose when it comes to decarbonisation – which will only be further impeded if there is a lack of green skills in the sector as whole.



# Green skills are on the rise globally – but significant challenges remain

## GREEN HIRING IS AT A HIGHER RATE THAN OVERALL HIRING

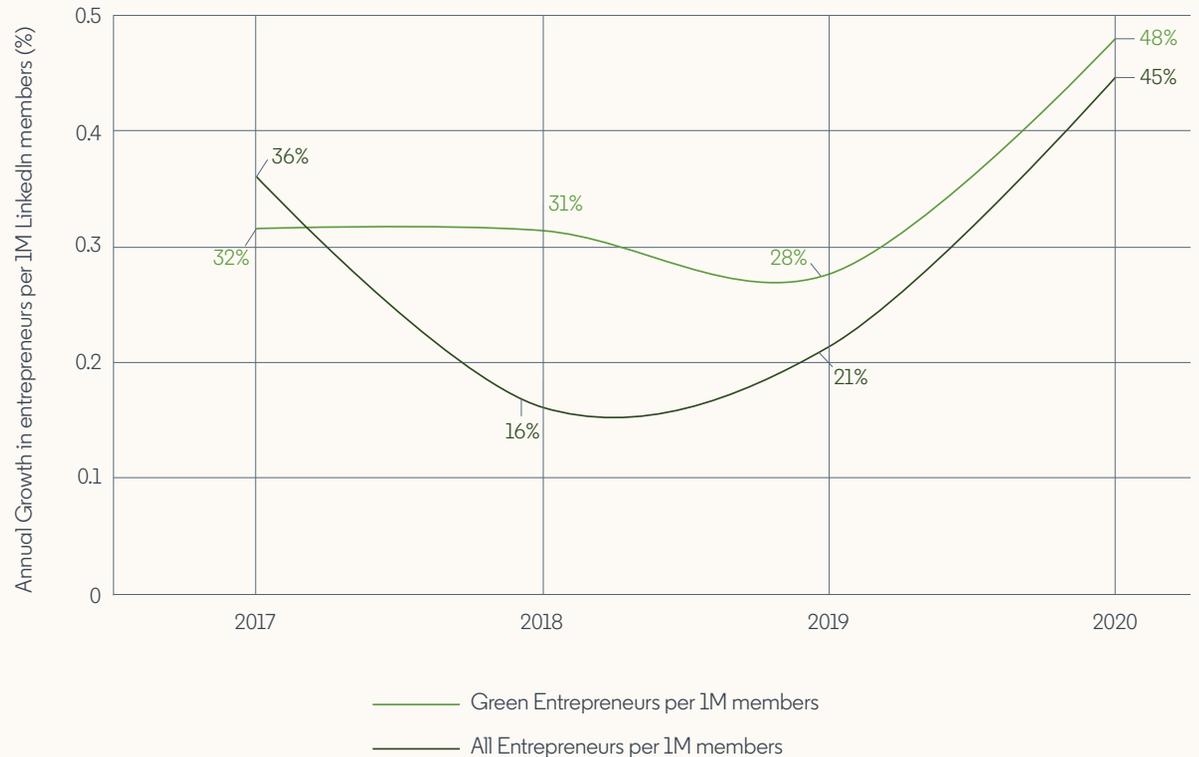
In 2019, the green hiring rate was at a faster hiring rate than the overall hiring rate for the first time, as the green hiring rate accelerated ahead of the overall hiring rate in most economies around the world (relative to previous hiring) – which means that green workers were hired at a higher rate than non-green workers. Notably this increased rate of green hiring has been accelerated by the pandemic, potentially suggesting that green talent is more resilient to economic downturns than non-green talent.



## GREEN ENTREPRENEURSHIP IS OVERTAKING NORMAL ENTREPRENEURSHIP

Simultaneously green entrepreneurship is also growing at a faster rate than overall entrepreneurship. The majority of this green entrepreneurship is also happening outside of traditionally green sectors, with the Software, Architecture and Design & Finance sectors seeing some of the highest entrepreneurial activity among green founders. Not only does this demonstrate the increasing proliferation of green skills across sectors, but also the extent to which entrepreneurs are increasingly identifying opportunities in green sectors – a significantly positive sign when it comes to driving green innovation and new green businesses.

Global growth in entrepreneurs



## HIRING FOR GREEN JOBS IS ON THE UP – ALTHOUGH THERE IS A MISMATCH BETWEEN SUPPLY AND DEMAND

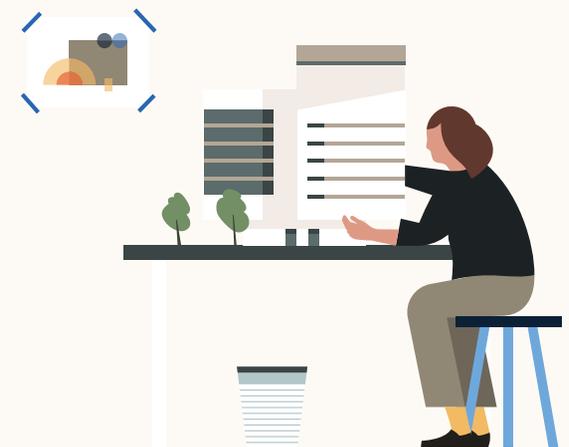
The number of green jobs in the global workforce is rising. However, whilst job postings requiring green skills grew at 31% over the past five years, green talent has only grown at 21% over the same period.

The mismatch in the UK over the period is similar, with job postings requiring green skills growing at 35% whilst green talent has only grown at 26%. This mismatch has also accelerated recently in the UK, as last year job postings requiring green skills grew at 12% whereas green talent grew at 9% (compared to an annual average over the five-year period of 7% and 5%).

For policy-makers this should be a significant concern as green and greening jobs are the catalyst for real world change – driving new innovation, opportunities and underlying

green progress. The mismatch between demand for green will therefore stifle the green transition and limit our ability to progress change at the necessary pace.

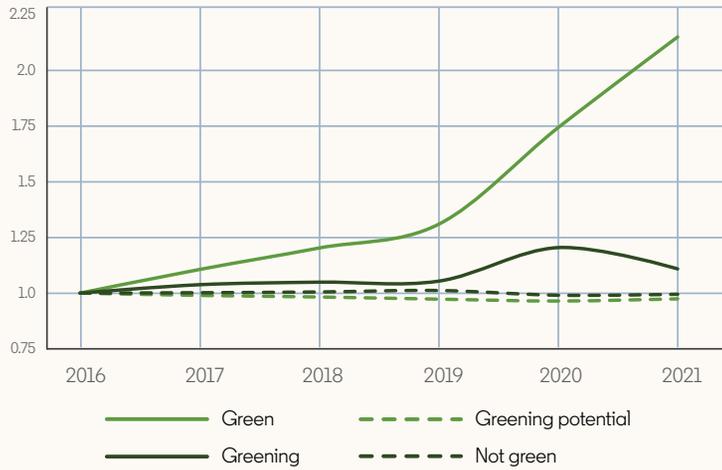
Positively for the UK, there is now significant growth in green hiring rates, 2.1 times the level of 2016 green hiring, compared with 1.2 times the 2016 level globally. However, globally and in the UK the current hiring splits demonstrates the work that still needs to be done, with non-green jobs dominating 50% of hiring – showing why it is essential to go further and faster in transitioning non-green industries. Concerningly, at the levels beneath green jobs, the share of hiring for greening and greening potential jobs is stagnating or declining. At the same time, the share of non-green jobs is continuing to grow.



## LinkedIn's green data

### UK Change in the share of hiring

Data indexed to 2016 hiring levels

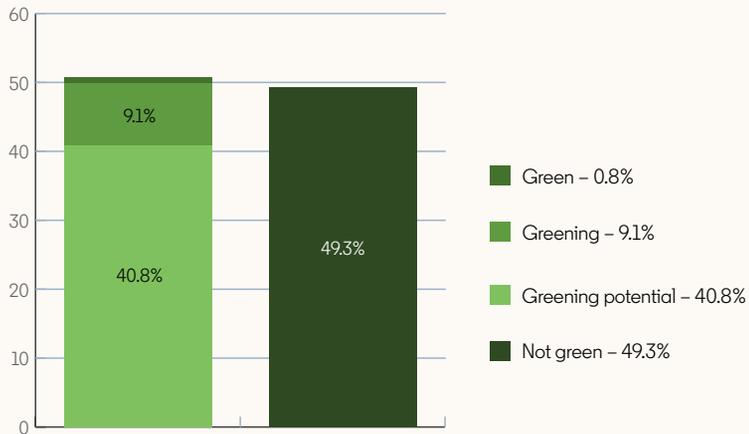


### Change in the share of global hiring by job type

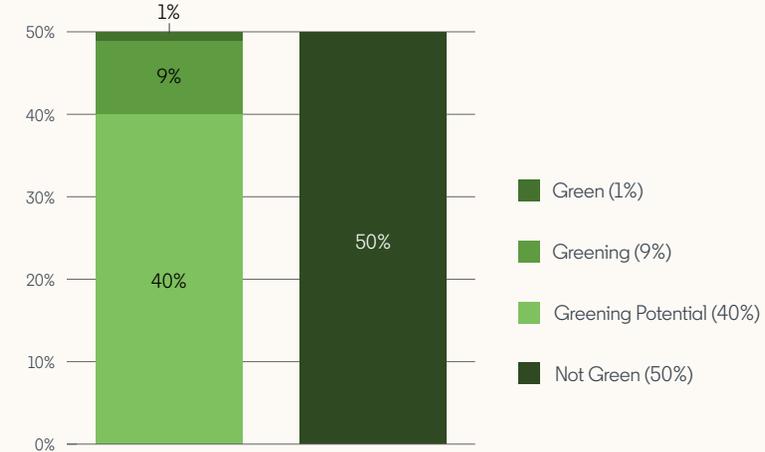
Data indexed to 2016 hiring levels



### UK Share of 2021 hiring



### Share of 2021 Hiring, by job type (2021)



<sup>1</sup> Green jobs are occupations that cannot be performed without extensive knowledge of green skills. Greening and greening potential jobs can be performed without green skills, but require some level of green skills, with greening jobs typically having a higher green skills intensity than greening potential ones. Non-green jobs are jobs that do not require green skills to be performed.

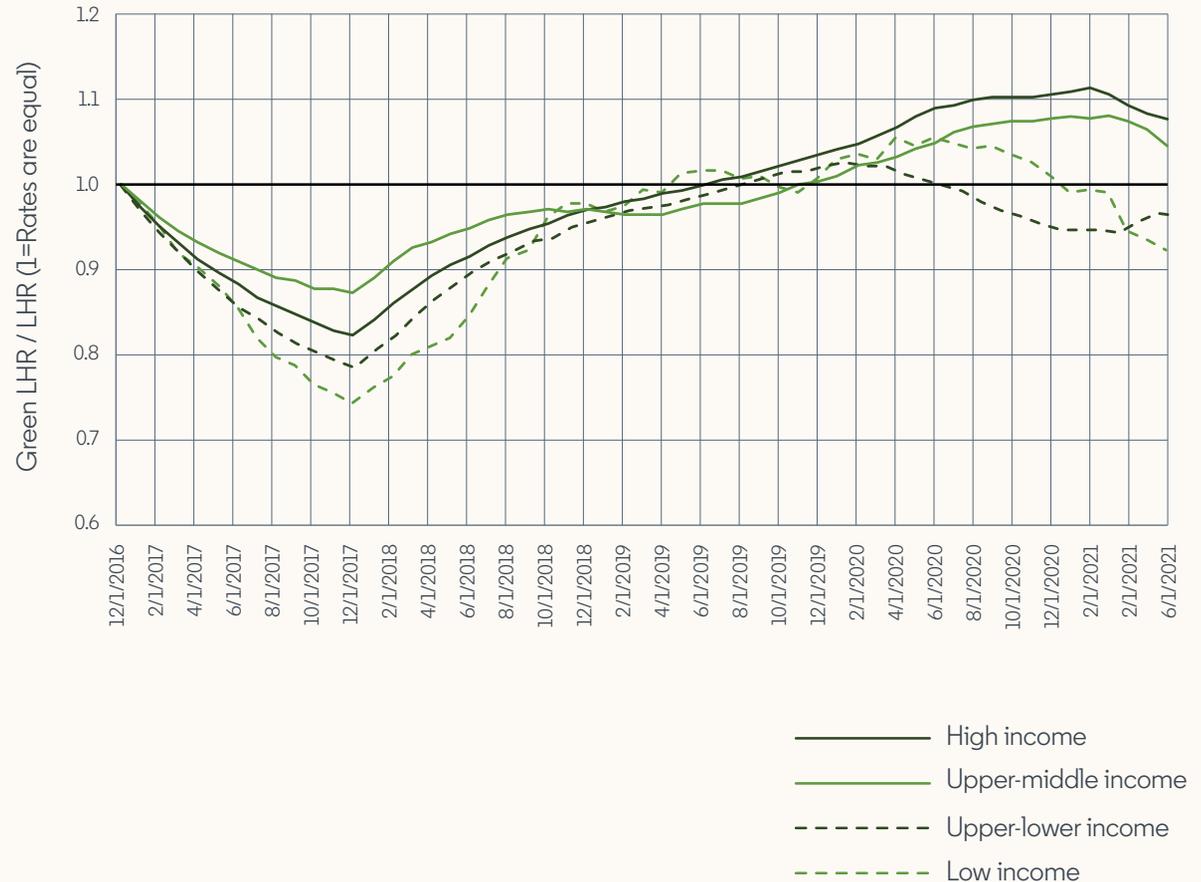
# Delivering an equitable transition

## THE PACE OF CHANGE IS NOT UNIFORM BETWEEN COUNTRIES

Green skilling trends vary significantly based on country income levels. Although all countries are seeing high upskilling and reskilling in broad green skills, such as Environmental Services and Organic Farming, low income countries are falling behind in the more niche-skills, for example around Environmental Awareness.

This is particularly stark when comparing the increase in the share of green talent since 2015 based on country income. The share of green talent grew cumulatively by 39% between 2015 and 2021 in high-income countries, 37% in upper-middle income countries, 31% in lower-middle income countries and only 18% in low income countries. This discrepancy demonstrates the extent of the challenge and also the opportunity available to rapidly accelerate change in low income countries – with there being an opportunity for this development

Relative Green Hiring Rate, by country income-level



## LinkedIn's green data

to be 'green by design' from the outset. Delivering a green by design approach in low income countries would both drive rapid green innovation, with a green mindset from the outset, and also avoid countries having to follow the same path as high-income countries with expensive retrofitting changes needed down the line.

Of particular concern, high-income and upper-middle income countries have maintained a steady green hiring rate – whereas lower income countries' green hiring rates have started to decelerate. This poses a challenge for policy-makers, as there is a real danger that lower income countries will be left behind as economies and necessarily jobs transition to green.

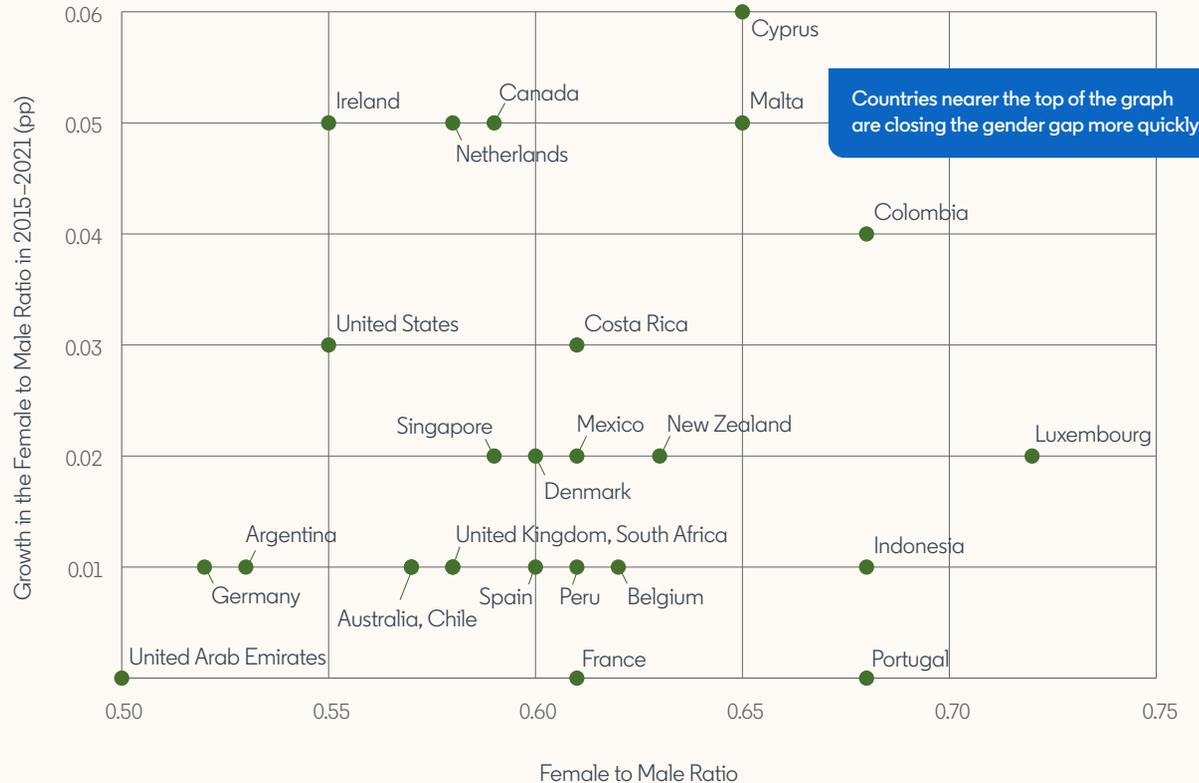


## GREEN SKILL DISCREPANCIES ARE PRESENT WHEN CONSIDERING GENDER AND EDUCATIONAL ATTAINMENT

Concerningly the green gender gap hasn't improved since 2015, with only 62 women for every 100 men globally considered to be green talent. On this measure the UK also falls below the global average, with less than 60 women for every 100 men considered green talent. However, the UK is making some progress in this area and is in the top 25 countries most quickly narrowing the gender gap.

This demonstrates a clear area in which the UK can and should take action, especially as current improvements are slow with the female to male ratio from 2015-2021 narrowing by only 1% - which although is on par with Germany and Spain, and ahead of France, lags significantly behind other European competitors such as Ireland and the Netherlands, as well as the US.

Top 25 countries with the fastest narrowing of the gender gap

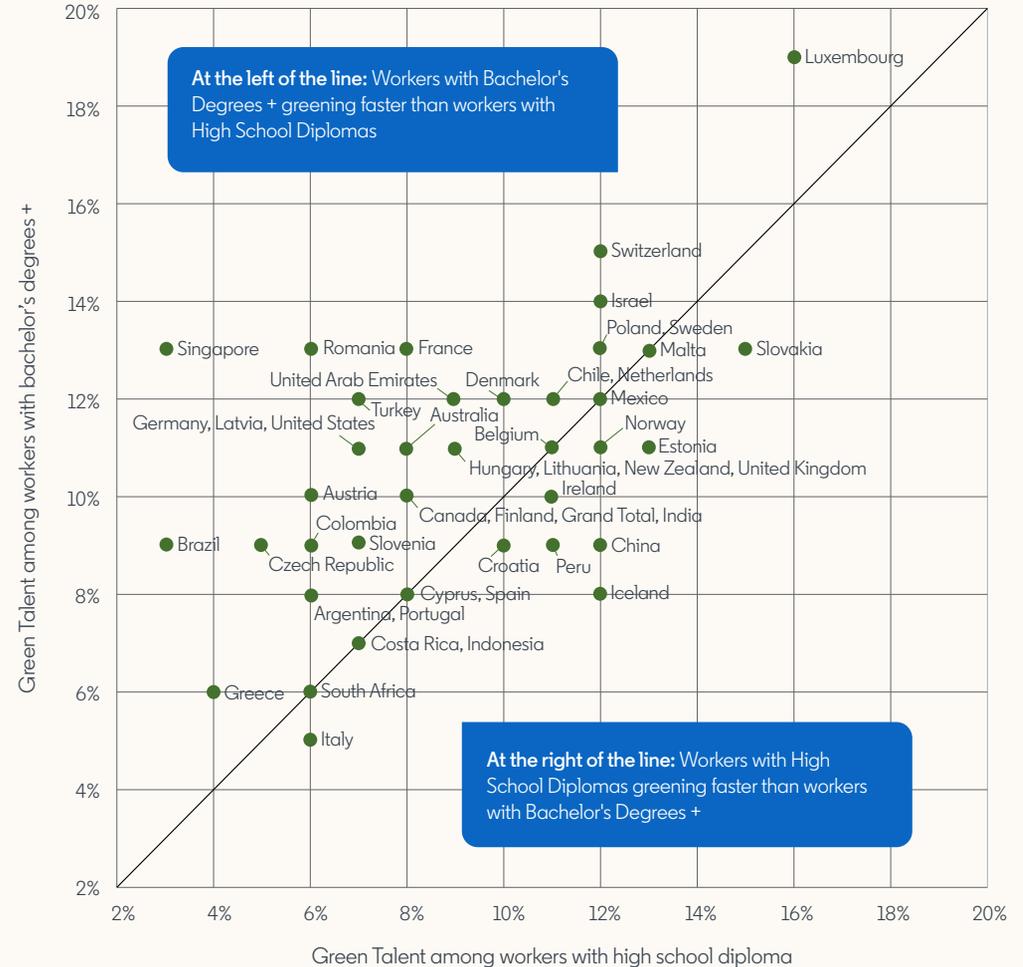


## LinkedIn's green data

When considering educational attainment globally, the share of green talent among workers with a bachelor's degree or higher has grown at an average rate of 11% annually from 2015–2021, compared to 9% among other workers. The UK is in line with the global average, alongside many other European countries. However, given the increased importance of green sectors in the economy of tomorrow, ensuring this educational divide does not continue and harm the prospects of those without a bachelors degree will be vital.



Annual growth in the share of green talent by education level (2015–2021)



# Recommendations: how can government, policy-makers and business leaders deliver the green transition?



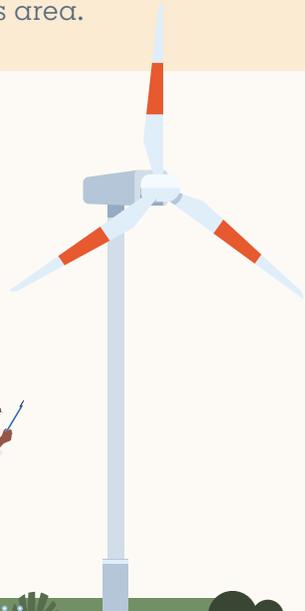
Governments, companies and individuals must come together to address the climate crisis, with there a shared opportunity and responsibility to do so.

LinkedIn's Green Report and the underlying data from the platform shows that green skills are at the core of the green transition. Governments must therefore focus on how best to harness the shift of talent in the Great Reshuffle, with a commitment to a progressive shift towards green jobs that will then turn our underlying economies green and deliver the necessary climate progress.

In the UK LinkedIn recommend the following overarching actions. Baking this in across the economy will ensure the UK makes great strides towards its climate targets whilst also being a world exemplar and driving progress globally.

### 1. Connect skills providers with businesses so future skills reflect economic need:

Green skills are fundamental to the green transition. As a result, policy-makers must ensure green skills, jobs and broader green economic policies reflect and interlink with each other – helping balance development with demand and transformation in the skills marketplace. The more those providing green skills and education can be connected in with business, who are broadly best placed to identify future skills needs, the better for the UK's transition. The Government's Local Skills Improvement Plan pilots are therefore welcomed in this area.



### 2. Target policies and funding geographically to reflect on the ground realities:

The UK has a geographically diverse economy, reflecting historical idiosyncrasies and centuries of modern economic development. The focus on Levelling Up and broadening economic growth around the UK is therefore essential and can be underpinned by ensuring policies map to the economy reality that exists on the ground – whether to target greening chemical manufacturing in the North East; energy generation around the Humber or the technology sector in the South.

### 3. Address systemic economic inequalities and deliver an equitable green skills revolution:

Throughout the policy development process policy-makers must be cognisant of and address the challenges posed by the inequitable distribution of green skills and jobs. They will need to consider the influence of external factors in how potential skill discrepancies impact historically disadvantage groups, with a focus on removing barriers, convening discussion and pooling resources.



## Glossary of key terms and data descriptions

### Skills

Skills are the main building blocks of the insights in this report. They are sourced from LinkedIn members (skills explicitly listed on member profiles, or inferred from other aspects of members' profiles, such as job titles, fields of study, etc.) or from job postings. Skill names are standardised by expert taxonomists into approximately 38,000 skills, categorised into 249 skill groups, and subsequently annotated to identify the following categories: tech skills, disruptive tech skills (these first two can be combined into digital skills), sector-specialised skills, business skills, soft skills and green skills.

### Skill genome

For any entity (occupation or job, country, sector, etc.), the skill genome is an ordered list (a vector) of the 50 'most characteristic skills' of that entity. These most characteristic skills are identified using a TF-IDF algorithm to identify the most representative skills of the target entity, while down-ranking ubiquitous skills that add little information about that specific entity (e.g., Microsoft Word).

### TF-IDF

TF-IDF is a statistical measure that evaluates how representative a word (in this case a skill) is to a selected entity. This is done by multiplying two metrics: The term frequency of a skill in an entity ('TF').

1. The logarithmic inverse entity frequency of the skill across a set of entities ('IDF'). This indicates how common or rare a word is in the entire entity set. The closer IDF is to 0, the more common a word is.

So, if the skill is very common across LinkedIn entities, and appears in many job or member descriptions, the IDF will approach 0. If, on the other hand, the skill is unique to specific entities, the IDF will approach 1.

Details available at [LinkedIn's Skills Genome](#) and [LinkedIn-World Bank Methodology](#) note.

### Skill intensity

Based on the skill genome of an entity, skill penetration shows the 'intensity' of a set of skills that we call 'skill groups' or 'skill categories' (e.g., digital literacy, green) in that entity.

Skill intensity/penetration rates are calculated at an aggregated entity level (usually occupation or job, but also can be done at the country, company or sector level), for example, if 'green skills' are five of the 50 skills in the skill genome vector for an occupation, the **green skills intensity** for that entity is 10%.

## Glossary of key terms and data descriptions

### Green skills

Green skills are those that enable the environmental sustainability of economic activities, such as skills in pollution mitigation and waste prevention, environmental remediation, sustainable procurement, energy generation and management, etc. ‘Core’ green skills (such as recycling) are most directly related to these sustainability-promoting activities; ‘ambivalent’ green skills (such as fleet management) may or may not be used for sustainability and ‘adjacent’ green skills (such as biology) can support acquisition of core and ambivalent green skills.

### Jobs or occupations

LinkedIn member titles are standardised and grouped into approximately 15,000 occupations. These are not sector or country specific. These occupations are further standardised into approximately 3,600 occupation representatives. Occupation representatives group occupations with a common role and specialty, regardless of seniority.

### Green jobs or occupations

A **‘green’ job (technically, occupation representative)** is an occupation representative that cannot be performed without extensive knowledge of green skills. Skills are used as a signal for whether the greening of the economy is the main/primary focus of the occupation representative, in any sector where the occupation representative may exist. ‘Green’ jobs are those occupation representatives that have the highest **green skills intensity**, to capture the fact that green knowledge needs to be extensive.

– E.g., sustainability specialist, solar consultant.

A **‘greening’ job or a ‘greening potential’ job (technically, occupation representatives)** is an occupation representative that could be performed without green skills, but typically requires some level of knowledge of green skills. Skills are used as a signal for whether the occupation representative’s main function is different from greening the economy in any sector. The main distinction between ‘greening’ and ‘greening potential’ comes from the level

of **green skills intensity** typically encountered in the occupation representative, with greening occupation representatives typically having a higher **green skills intensity** than greening potential ones.

– E.g., HVAC technician, logistics manager, construction worker.

**Non-green job** (technically, occupation representative) is an occupation representative that does not require green skills to be performed.

**LinkedIn**  Economic Graph