Wind EUROPE

Europe's Wind Energy Workforce Report

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Executive summary

Europe's wind energy sector is pivotal for energy security, competitiveness and as a source of employment. In 2024 wind energy supported 442,800 jobs across Europe[1], a clear sign of its growing economic and social importance. To ensure training and investment are targeted effectively, it is vital that our workforce data is accurate and up to date. The wind industry must work to fill critical roles at every stage of the wind farm lifecycle - and to allocate resources and plan strategically for our future workforce.

2024 employment figures

Of the 442,800 jobs in 2024, 210,700 (48%) were directly employed by companies in the wind industry. A further 232,100 (52%) were employed indirectly, in roles where the wind industry interacts with other sectors of the economy. This distribution is a reminder of wind energy's broad economic footprint, driving activity well beyond core manufacturing and installation.

Onshore wind accounts for 161,300 direct and 185,500 indirect jobs. Offshore wind accounts for 49,400 direct and 46,600 indirect jobs.

Direct employment spans five phases in a turbine lifecycle: development and project management, manufacturing, installation, operation and maintenance, and decommissioning. Manufacturing is the largest employer, with nearly half of all direct jobs (100,050). Over 250 factories across Europe produce turbine components, bringing high-value jobs and supporting a resilient supply chain.

Acute shortages

The sector faces a critical shortage of engineers, technicians, project managers, and specialised operators. Identifying priority roles at every stage of the lifecycle is vital for targeted training and resource allocation. Reliable workforce data informs policy, guides investment, and ensures skills are available where and when they are needed.

To address this, WindEurope carried out a detailed study mapping 235 job profiles across the wind farm lifecycle. The report introduces a harmonised job classification in line with international classification systems and highlights the roles with the largest projected skills gaps. The aim is to support strategic workforce planning and policy development.

2030 employment figures

By 2030 wind energy employment in Europe is projected to reach 607,000—a 36% increase. This growth assumes that Europe installs an average of 30 GW a year between 2025 and 2030.

In the EU-27 wind energy employment is expected to grow from 360,000 today to 483,000 by 2030. This growth is based on an average of 22 GW being installed annually to reach 350 GW by 2030, still short of the EU's 425 GW target[2].

Closing the skills gaps and securing a steady pipeline of qualified workers is key to meeting these ambitions.

Key actions for success

Meeting Europe's wind energy ambitions will require urgent action. That means strategic workforce planning, targeted skills investment, and a bold push to make renewable careers attractive and accessible. Success will hinge on strong collaboration between industry, Government, and education—ensuring the right people, with the right skills, are in the right place at the right time.

1. Europe including Turkey, excluding Russia.
2. Based on 2030 REPowerEU wind energy production targets after the compromise target of 42.5% renewable energy by 2030 was reached in 2023.

Installed capacity

- Europe currently has 291 GW of installed wind power capacity; 234 GW are in the EU-27.
- We expect installations in Europe to average 30 GW a year between 2025 and 2030, reaching 441 GW in 2030.
- We expect the EU-27 to install 22 GW a year on average between 2025 and 2030.
- This will give the EU-27 an installed capacity of 344 GW by 2030.

2024 job figures

- Wind energy supports 442,800 jobs across Europe – 210,700 direct and 232,100 indirect.
- In the EU-27, there are 360,000 jobs - 168,800 direct and 191,100 indirect.

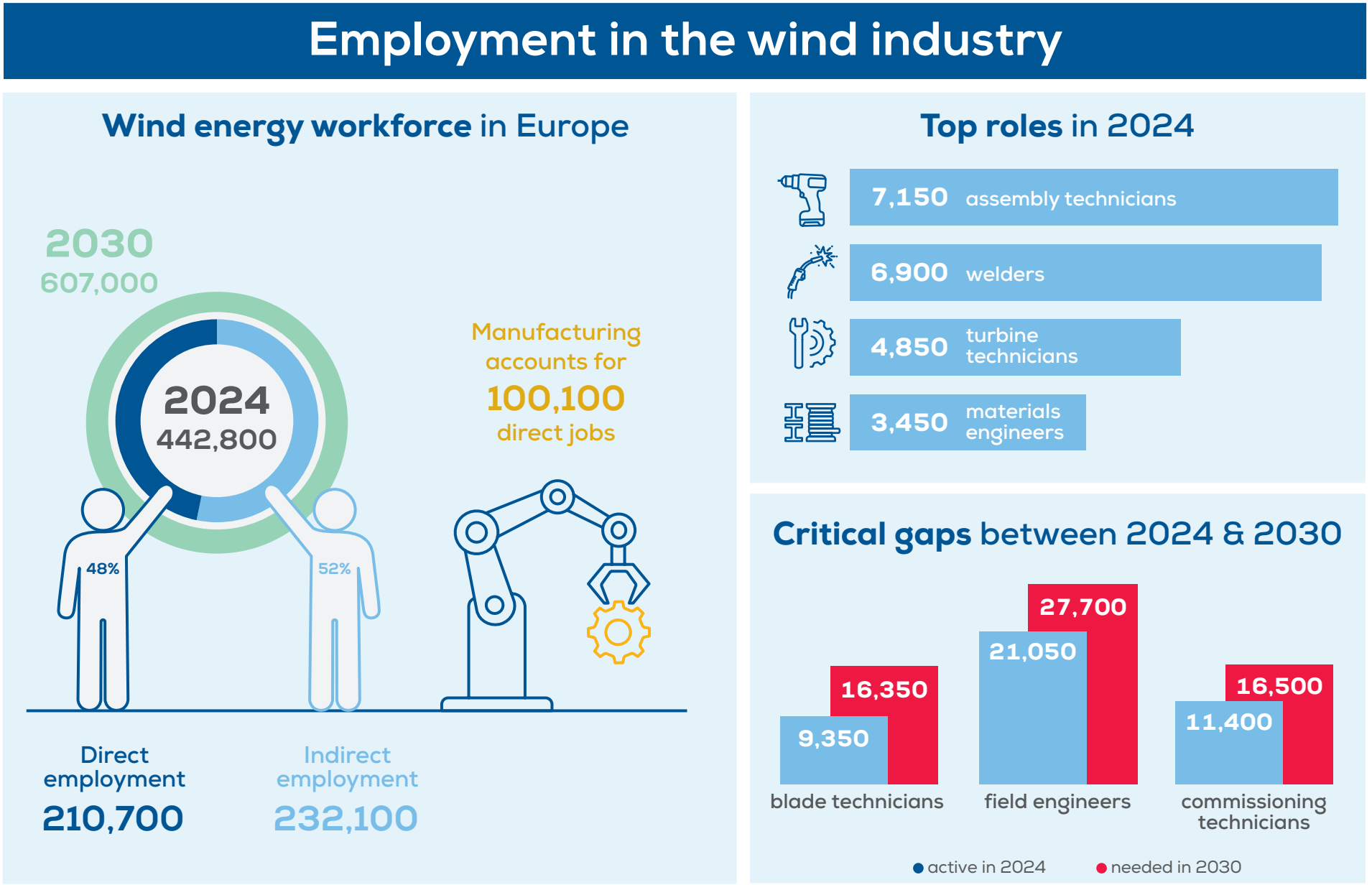
2030 job figures

- By 2030, wind energy employment in Europe is projected to reach 607,000 jobs, including 288,000 direct and 319,000 indirect roles.
- The EU-27 will account for 483,000 jobs, reflecting strong growth in the sector.
- Direct jobs in the EU-27 are expected to reach 223,000 in 2030 with an additional 261,000 indirect.

Critical jobs and gaps

- Key roles today include turbine technicians, electrical technicians, materials engineers, project managers, assembly technicians, welders and grid connection specialists.
- By 2030 critical shortages are expected in blade technicians, field engineers, and pre-assembly support technicians.
- These gaps show that the current workforce cannot meet future demand.
- Filling them will mean targeted recruitment from adjacent sectors and upskilling or retraining the existing workforce.
- European countries must begin strategic workforce planning to direct skills investment where gaps are most acute.
- Scaling training for key roles is essential to avoid worsening these shortages.
- Europe is already facing workforce shortages in 2025, with recruitment difficulties for critical roles. This challenge will intensify over the next five years if no action is taken.

FIGURE A. Infographic



Source: WindEurope

1.

Wind energy employment in 2024

1.1 Introduction

Europe's wind energy sector stands at a major threshold. Based on current trends and the pipeline of projects and auctions, the EU is expected to reach **344 GW of installed wind capacity by 2030**—298 GW onshore and 46 GW offshore. This is a substantial increase from 225 GW today and will mean building an average of **22 GW annually between 2025 and 2030**. However, this still falls short of the EU's 2030 target of 425 GW[3].

Across continental Europe, installations are expected to reach 441 GW by 2030, up from 291 GW today.

This expansion comes with major opportunities for job creation and economic growth. But without a coordinated attempt at workforce planning, the sector could end up becoming under-resourced, with project delays, rising costs, and a lack of tangible socioeconomic benefits. Accurate forecasting of needs is vital—not just to gauge the number of engineers, technicians, electricians, welders, and other specialists we will need, but also to when and where these roles will be needed. This will help us prevent bottlenecks, enable cost-effective deployment, and strengthen Europe's strategic autonomy and economic resilience.

Workforce challenges are not just a future concern. The sector is already facing shortages, with recruiters struggling to fill key positions. With no reliable labour market intelligence, companies cannot plan or hire effectively, exacerbating existing employment gaps.

To tackle these challenges, WindEurope has carried out a comprehensive study assessing labour requirements for both on- and offshore wind—now and through 2030. The analysis covers a wide range of job profiles across the entire wind farm lifecycle, providing us with the level of detail we need to plan effectively.

The aim of this study is to help industry optimise investment, to help educational institutions anticipate demand and adapt curricula if needed, and to support national authorities in designing policies targeting skills development and wind energy investment. By identifying areas of comparative advantage within the wind supply chain, countries can focus efforts where they will have the greatest impact, while working across borders to build a resilient European wind sector.

1.2 Methodology

WindEurope commissioned Deloitte[4] to update the European wind industry's macro-economic indicators from the reports "Local Impact, Global Leadership"[5] published in November 2017 and "Wind energy and economic recovery in Europe[6]" published in October 2020.

These factors are measured across six indicators: Gross Domestic Product (GDP), employment, exports, tax revenue, innovation and energy dependency. These are evaluated using annual statements from relevant companies in the sector and sub-sectors (wind energy developers, turbine manufacturers, components manufacturers, service providers and offshore wind infrastructures). It also makes use of questionnaires and interviews with relevant EU stakeholders in the wind industry, and publicly available information.

These figures are a snapshot in time, based on company financial reports (direct jobs), or derived from job multipliers using macroeconomic data from Eurostat (indirect jobs). They give us an overview of employment figures during a calendar year, allowing us to analyse trends over time.

WindEurope then commissioned QBIS (Quantifying Business Impacts on Society) - a consultancy specialising in socio-economic impact assessments of investments and day-to-day business activities of private companies[7] - to analyse the hour-by-hour breakdown in each phase of wind farm development, from planning and development through to

3. Based on 2030 REPowerEU wind energy production targets after the compromise target of 42.5% renewable energy by 2030 was reached in 2023.
4. Deloitte UK | Audit, Consulting, Financial, Risk Management, Tax Services
5. Local impact, global leadership – WindEurope
6. Wind energy and economic recovery in Europe – WindEurope
7. https://www.qbis-consulting.com/

decommissioning. QBIS and WindEurope issued an industry-wide call through multiple channels, inviting organisations operating within the European wind sector — both on- and offshore — to send in their detailed workforce data.

The outcome was an annual breakdown of hours per GW of installations across 500+ different jobs identified. This was then combined with WindEurope's forecasted installations[8] to arrive at the number for Full Time Equivalent employees (FTEs) per GW, for each year.

The hours per GW installed each year is useful to understand trends but it is not directly comparable with the actual employment figures estimated by Deloitte. Time spent by employees over a wind farm's lifetime spans many years and is not concentrated only in the year of installation. For example, all 25 years of operation and maintenance hours are included in the 2025 data when looking at the hours per GW by year. In reality, these hours are spread over the next 25 years, 2026 – 2050. The same principle applies to planning and development, manufacturing, installations and decommissioning.

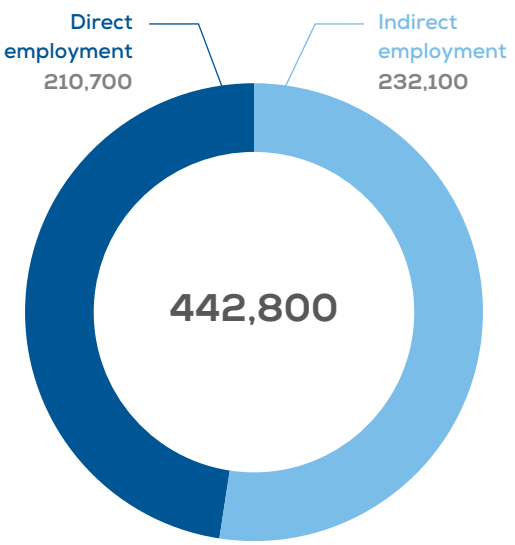
WindEurope converted FTE data into current employment figures by applying assumptions for the lifetime projects and validating these with members. Using a calibrated model of hours for each job role across the wind farm lifecycle, WindEurope projected future workforce needs based on anticipated installation trends across Europe.

1.3 Total number of wind energy jobs in Europe 2024

WindEurope's job analysis covers three regions: the EU-27, EU+UK, and Europe. Previous reports focused on the EU+UK, estimating that around 370,000 people were employed in wind energy in 2024. This study adopts a broader scope—all of Europe[4] — to include countries with significant wind development, such as Norway and Türkiye.

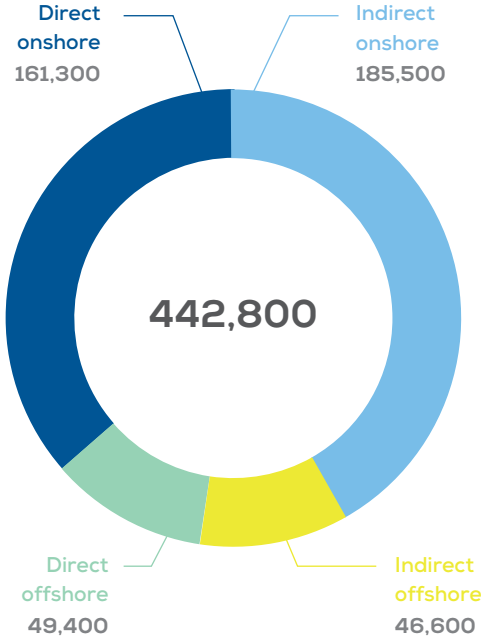
Using this approach, we found that the wind industry employed 442,800 people across Europe in 2024. Of these, 210,700 were directly employed and 232,100 were indirectly employed. The split is almost even, with direct jobs representing 48% and indirect jobs 52% of the total workforce (see Figure 1).

FIGURE 1. Direct and indirect jobs in European wind energy industry, 2024.



Source: Deloitte, WindEurope

FIGURE 2. Onshore and offshore jobs in European wind energy industry, 2024.

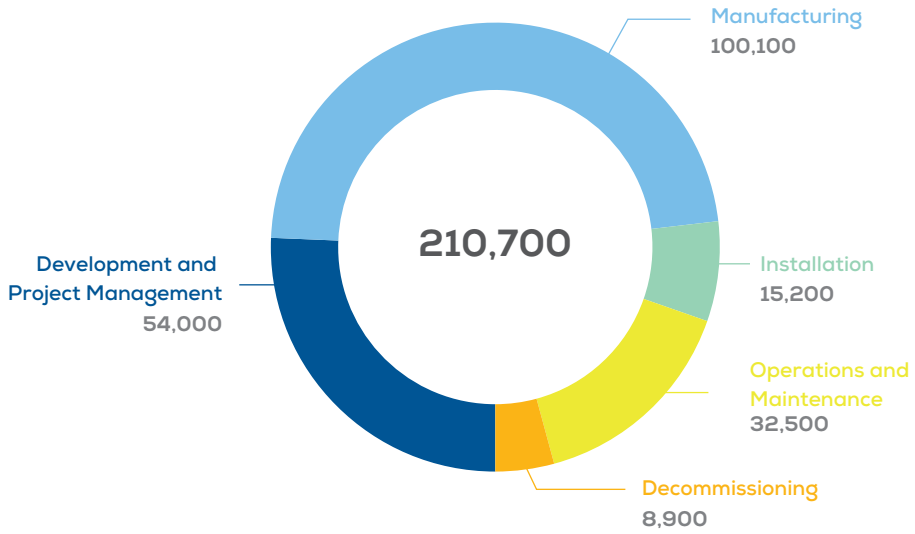


Source: Deloitte, WindEurope

In 2024, onshore wind accounted for 161,300 direct jobs and 185,500 indirect jobs, while offshore wind supported 49,400 direct and 46,600 indirect jobs. This reflects onshore wind's continued dominance as an employer, but also the growing importance of offshore, which now makes up 20% of direct wind energy jobs in Europe. Specifically, offshore wind made up around 23% of all direct wind energy employment (see Figure 2).

8. https://windeurope.org/data/products/latest-wind-energy-data-for-europe-autumn-2025/
9. Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK, Switzerland, Norway, Turkey, Ukraine, Serbia, Bosnia and Herzegovina, Montenegro, Kosovo, North Macedonia, Albania.

FIGURE 3. Direct jobs in European wind energy industry, 2024.



Source: Deloitte, WindEurope

1.4 Direct jobs in the European wind energy industry

WindEurope's job modelling breaks down the 210,700 direct jobs in on- and offshore wind across five key phases of the wind farm lifecycle: development and project management, manufacturing, installation, operation and maintenance, and decommissioning.

As shown in Figure 3, manufacturing accounts for nearly half of all direct jobs—100,100—highlighting its central role in Europe's wind energy economy. Factories producing turbine components are major employment hubs across the continent.

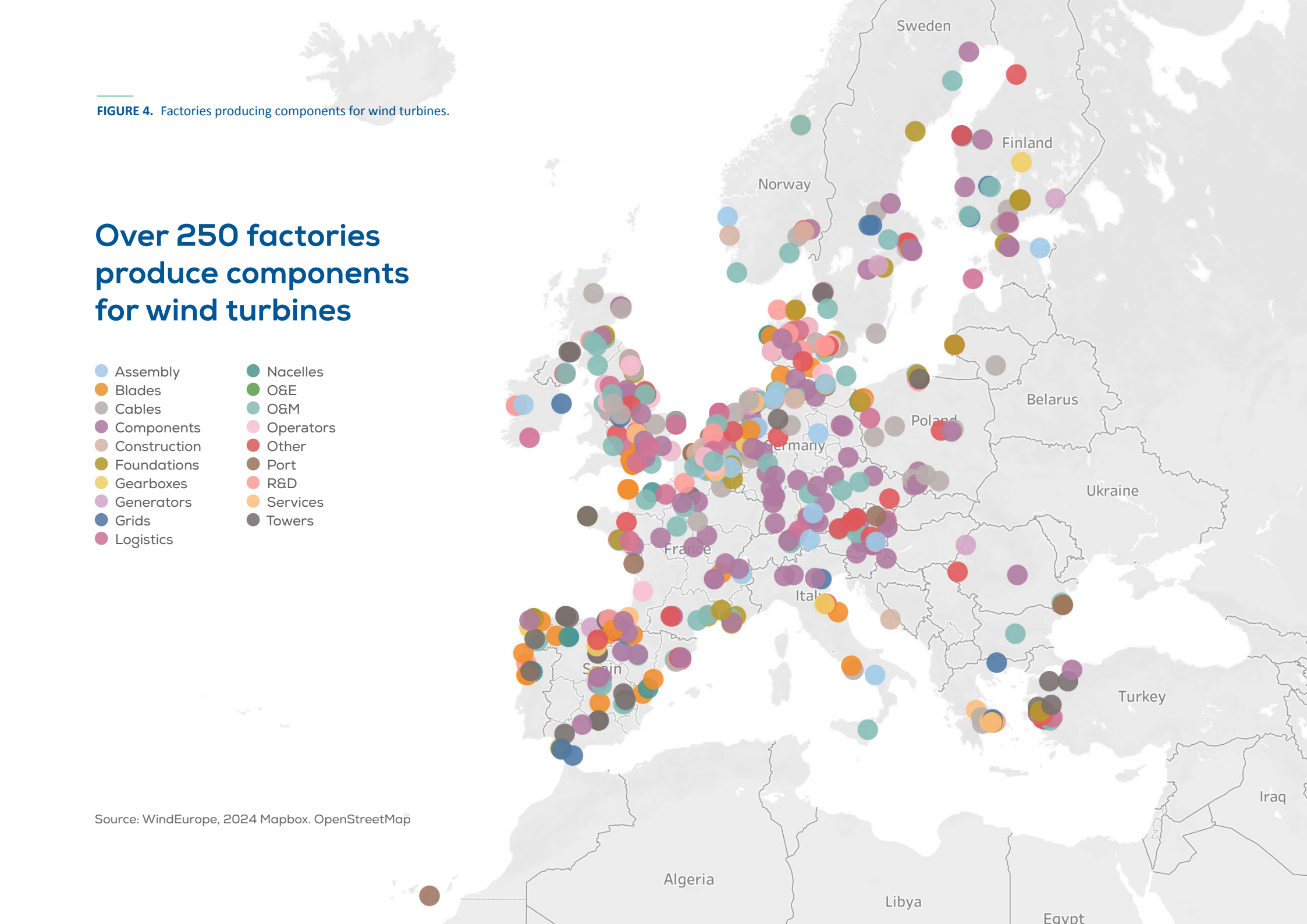
Figure 4 illustrates the scale of this activity: more than 250 factories manufacture wind turbine components in Europe, delivering high-value jobs and underpinning a resilient supply chain.

Most companies develop wind farms on a project-by-project basis, with timelines spanning several years from planning through to operation. The most labour-intensive phases occur during manufacturing and construction, but wind energy employs people before, during, and after projects are completed. Maintaining a strong domestic market is vital to keeping these jobs in Europe. For that reason, we need robust policies to support European manufacturing and to secure these employment opportunities long-term.

FIGURE 4. Factories producing components for wind turbines.

Over 250 factories produce components for wind turbines

- Assembly
- Blades
- Cables
- Components
- Construction
- Foundations
- Gearboxes
- Generators
- Grids
- Logistics
- Nacelles
- O&E
- O&M
- Operators
- Other
- Port
- R&D
- Services
- Towers



Source: WindEurope, 2024 Mapbox. OpenStreetMap

1.5 Gender

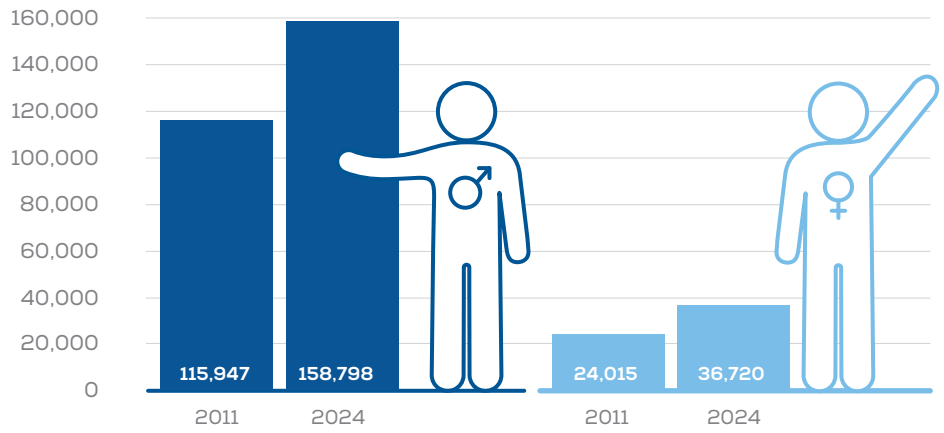
Across the EU and the UK, the wind energy workforce remains predominantly male: around 81% men and 19% women. While female participation has grown by more than 50% since 2011, progress in absolute terms is modest.

- **2011:** Men ≈ 83%, Women ≈ 17%
- **2024**: Men ≈ 81%, Women ≈ 19%

This represents a gender gap narrowing of less than two percentage points over 13 years. Recent years show a stronger upward trend, with female employment accelerating after 2018.

Although the data presented here is for the EU and the UK, it is reasonable to assume similar patterns across Europe. Despite these gains, gender diversity remains a challenge. We need to see targeted action to address both skills shortages and the gender imbalance. Training, outreach, and inclusion strategies will be key—particularly to increase women's representation in technical and leadership roles, which is critical for meeting the sector's growth targets.

FIGURE 5. Gender divide in European wind energy industry (EU+UK), 2011 and 2024.



Source:Deloitte for WindEurope

2.

Breaking down workforce composition

2.1 Introduction

WindEurope commissioned the previously mentioned study to provide a level of workforce insight that goes well beyond traditional employment estimates. The objective was to deliver unprecedented granularity—moving beyond broad categories to identify and quantify specific job roles underpinning every stage of a wind farm's lifecycle.

The analysis mapped around 235 job profiles across all phases: development and project management, manufacturing, installation, operation and maintenance, and decommissioning. Labour input was calculated for each role across 34 components and activities, using detailed models for both on- and offshore wind farms. Importantly, 64% of estimated hours for onshore and 88% for offshore are based on direct data from industry companies. The remainder are drawn from reliable sector sources including validated estimates and assumptions by industry, technical papers and existing reports.

One of the key challenges was the range of job titles and classifications across companies and borders. Many different titles are used for the same or very similar roles. Notably, "wind turbine technician" is a broad term covering multiple functions—installation and commissioning, operations and maintenance, and major repairs—often requiring different levels of experience and qualification. Breaking down this role into subcategories and identifying the job titles it encompasses will be essential for accurate training and recruitment strategies.

To address this, WindEurope undertook a rigorous crosswalk exercise, aligning all job profiles with major international classification systems: the job functions were bridged to:

- International Labour Organization Statistics - International Standard Classification of Occupations (ISCO-08);
- European Skills, Competences, Qualifications and Occupations (ESCO);
- Standard Occupational Classification (SOC 2010) from the U.S. Bureau of Labor Statistics;
- Job and education frameworks developed by the National Renewable Energy Laboratory (NREL); and when possible
- Aligned with the Global Wind Organisation (GWO) job title from their career pathways.
- Industry segments were also mapped to the European Commission's NACE Rev. 2 codes. This ensures compatibility with policy, education, and industry frameworks, making the data actionable and comparable across borders.

The exercise gave special attention to the decommissioning phase, which is often overlooked due to limited data availability. In cases where direct information was lacking, we analysed comparable installation tasks and changed our estimates to reflect anticipated workloads during decommissioning.

Using this approach, we assigned ISCO-08/ESCO and NACE codes to each job profession in the study. This allows for straightforward crosswalking with other classification systems, provided they are linked to ISCO-08/ESCO and NACE.

We now have a robust dataset that helps us to clearly identify job profiles and to make an informed analysis of labour demand.

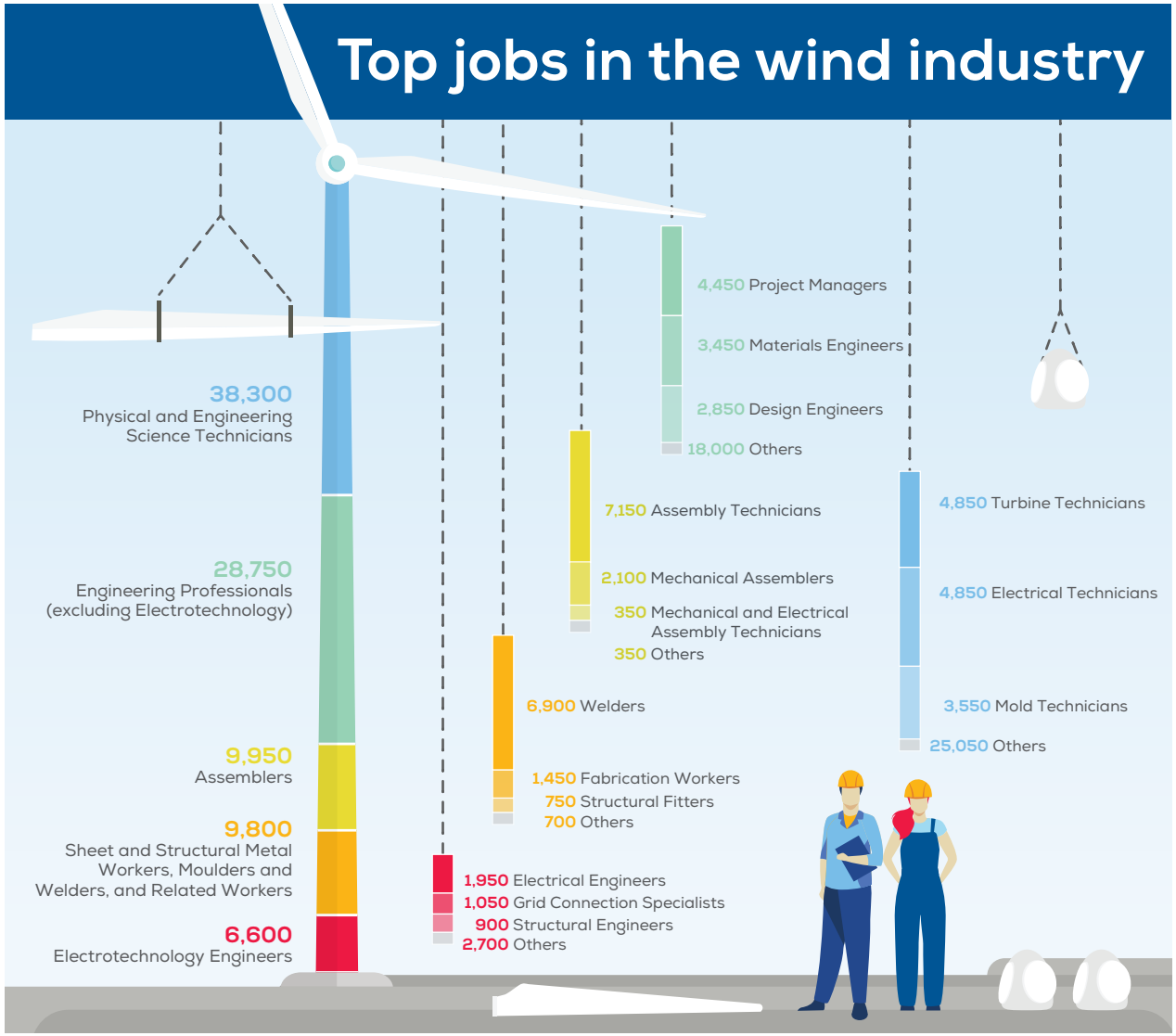
2.2 Critical jobs in 2024

Figure 6 shows the most common job families in the wind energy sector, classified under the International Standard Classification of Occupations (ISCO) at the 3-digit level. ISCO 3-digit codes refer to 'minor groups', which cover broader occupational categories, while 4-digit codes denote 'unit groups', providing a more detailed view of specific roles within those categories.

We identified a job family for all 235 roles analysed in this study and then selected the five families employing the largest number of people. From there, we went one step further and highlighted the top three jobs within each of these families—those with the highest employment numbers. This approach gives a clear picture of the roles that underpin each category and shows where workforce demand is greatest.

To ensure clarity and sectoral relevance, the job titles used here are widely recognised industry terms. These titles came up consistently during consultations and surveys with WindEurope members. Where appropriate—particularly in operations & maintenance and installation—we align with Global Wind Organisation (GWO) terminology. GWO standards are globally accepted and based on industry consensus.

FIGURE 6. Top job families in European wind energy industry, 2024.



Source: WindEurope, QBIS

Each job title has been mapped to an ISCO-08 code. This ensures consistency and comparability across borders and companies, even where different titles are used for similar roles.

By providing this level of detail, the analysis helps stakeholders not just to understand the wind industry workforce as it is today, but also the skills and professions we will need to achieve Europe's wind ambitions in the coming years. This helps to standardise job titles more clearly, which in turn can support worker mobility across different projects and countries.

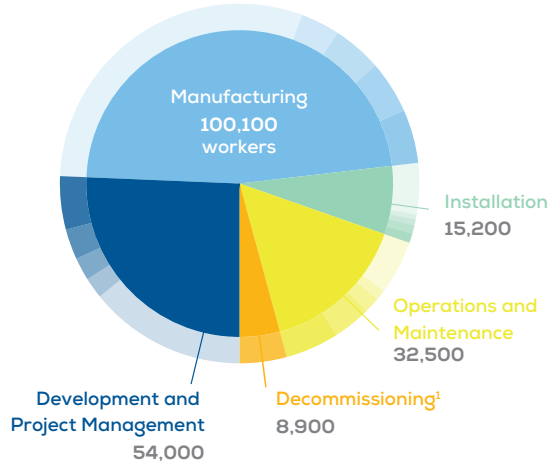
2.3 Critical jobs by project phase

Knowing which job families employ the most people is important—but understanding when and where workforce demand peaks across the wind farm lifecycle is just as critical. Granular analysis shows which positions are most staffed and essential at each stage.

By identifying high-demand roles in development, manufacturing, installation, operations, and decommissioning, we can ensure that resources are used efficiently and that training aligns with industry needs. Mapping these profiles for 2024 also allows us to forecast future demand and target skills investment and policy more effectively.

Figure 7 and table 1 illustrate these dynamics, highlighting key roles across the lifecycle. Transversal profiles—such as field engineers and pre-assembly support technicians—are needed at multiple phases. Prioritising these roles helps us to meet skills gaps and to build long-term workforce resilience

FIGURE 7. / TABLE 1. Top 5 jobs in European wind energy industry by project phase, 2024.



Development and Project Management	Manufacturing	Installation	Operations and Maintenance
Field Engineer 10,100 (2142), (2151), (2144), (2152)*	**Pre-Assembly Support Technician** 10,150 (8211), (9313), (9333)*	**Able Bodied Seamen (ABs)** 1,800 (8350)*	**Assembly Technician** 10,150 (3115)*
Planning Consultant 5,750 (2422)*	**Commissioning Technician** 9,950 (3119), (3114)*	**Crane Operator** 1,600 (8343)*	**Electrical Technician** 7,250 (3113)*
GIS Specialist 4,300 (2165), (2519)*	**Blade Technician** 9,350 (7212), (7213)*	**Field Engineer** 1,100 (2142), (2151), (2144), (2152)*	**Engineering Consultant** 2,900 (2149)*
Geotechnical Engineer 4,000 (2114)*	**Field Engineer** 7,400 (2142), (2152), (2151), (2144)*	**Scaffolder** 950 (7119)*	**Pre-Assembly Support Technician** 1,950 (9333)*

* ISCO-08 code

1 Decommissioning details: N/A

Source: WindEurope, QBIS

3.

Road to 2030

3.1 Wind energy development to 2030

Europe's wind energy sector continues to grow—but faces major challenges. In the first half of 2025, Europe installed 6.8 GW of new wind capacity, including 5.3 GW in the EU-27. Onshore wind made up 89% of these additions, confirming its long-time dominance. Europe's total installed capacity now stands at 291 GW—254 GW onshore and 37 GW offshore. Within the EU, capacity has reached 236 GW (215 GW onshore; 21 GW offshore).

Looking ahead, the EU expects to add 22 GW of new wind farms annually between 2025 and 2030. By the end of the decade, this would bring EU capacity to 344 GW—298 GW onshore and 46 GW offshore. While this is a strong growth trend, it still falls short of the EU's 2030 target of 425 GW. The project pipeline remains healthy, and we expect to see a significant build-out beyond 2030.

But bottlenecks continue to hold us back. We need to prioritise industry electrification, expanding and modernising our grids, investing in port infrastructure, and fully implementing new EU permitting rules. Grid constraints are already delaying projects and driving up costs. Supply chain pressures, limited port capacity, and a shortage of installation vessels are compounding the situation—particularly offshore. Uncertainty around auction schedules and inadequate support schemes could slow deployment even further.

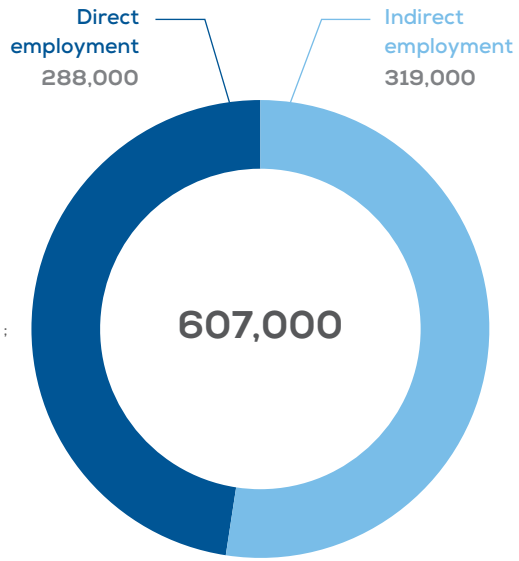
Workforce shortages are also putting pressure on the sector. Without serious workforce planning—on a par with infrastructure and permitting—the sector risks falling behind on its ambitions. Addressing these challenges head-on is vital if we want to unlock the full potential of wind energy in Europe.

3.2 Workforce in 2030

Wind industry employment in Europe continues to grow steadily – and is projected to reach 607,000 jobs by 2030. Figure 8 shows the breakdown of direct and indirect employment, while Figure 9 illustrates the rise in direct jobs across all categories. This represents an increase of nearly 164,000 jobs compared to today's figures—which will mean a workforce expansion of 36%.

Ensuring the right skills are available where and when they are needed will be key to delivering Europe's wind energy ambitions and securing the socioeconomic benefits of the decarbonisation. Skilling up local people is essential. Europe cannot rely solely on bringing in workers from abroad. Promoting domestic expertise will strengthen resilience, reduce bottlenecks, and maximise benefits for local communities.

FIGURE 8. Direct and indirect jobs in European wind energy industry, 2030.

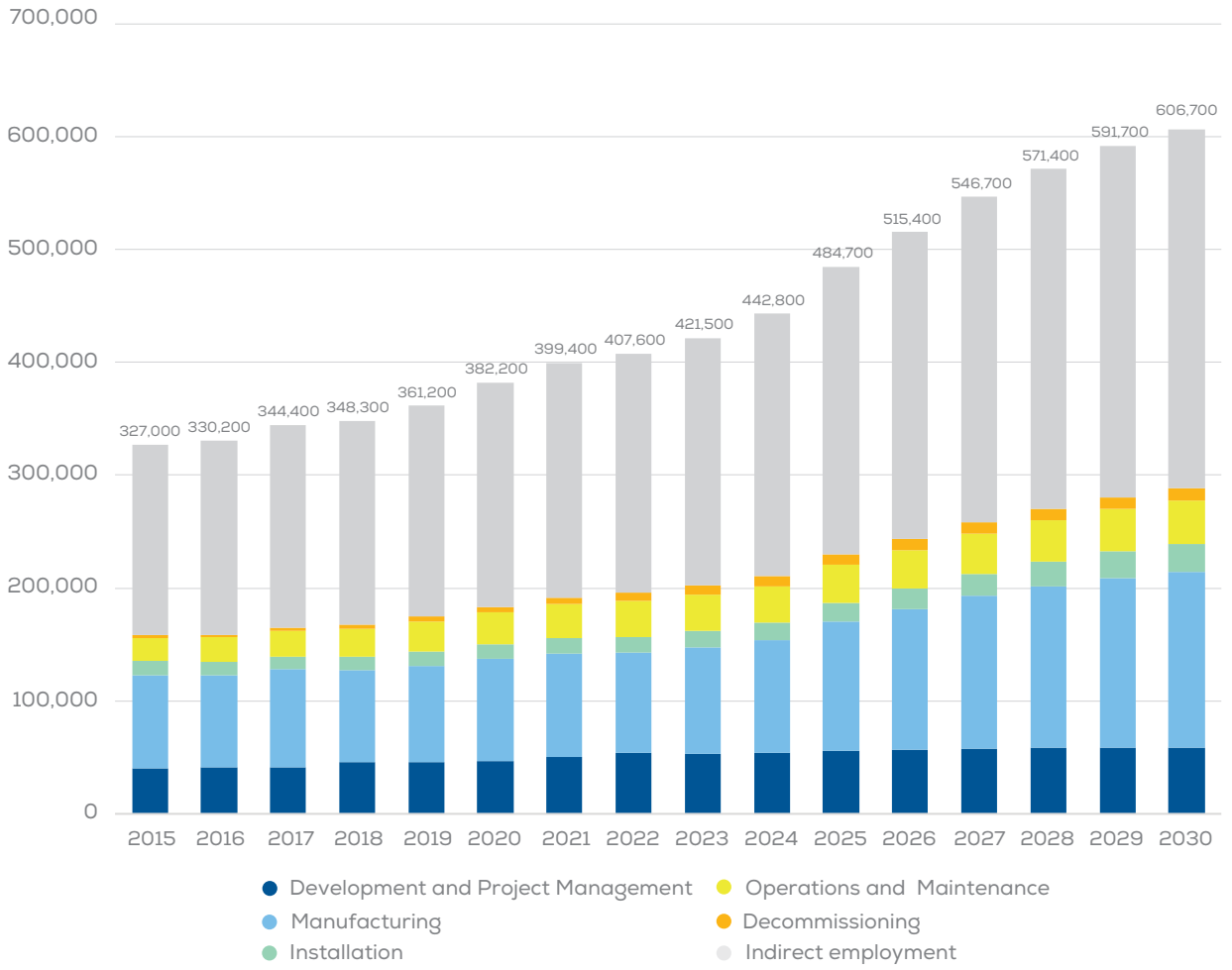


Source: WindEurope

It is vital that we compare workforce growth over time to help with strategic planning and investment. Monitoring how employment evolves across segments and phases helps to identify where future investment may have the greatest impact, and where skills gaps are likely to emerge. This helps policymakers, industry, and education providers to target specific regions and specialisations with new training centres and focused upskilling initiatives—keeping workforce development aligned with sectoral growth.

To support this, WindEurope will soon launch a dedicated workforce development tool on the WindEurope Intelligence Platform. This resource will allow users to filter workforce data by country, lifecycle phase, job family, and specific job profiles, providing clear projections of workforce needs by 2030. With insights available at both European and national levels, the tool will help decision-makers to anticipate training requirements, channel investment strategically, and establish training centres where they are most needed.

FIGURE 9. Direct and indirect jobs in European wind energy industry, 2015-2030.



Source: WindEurope

4.

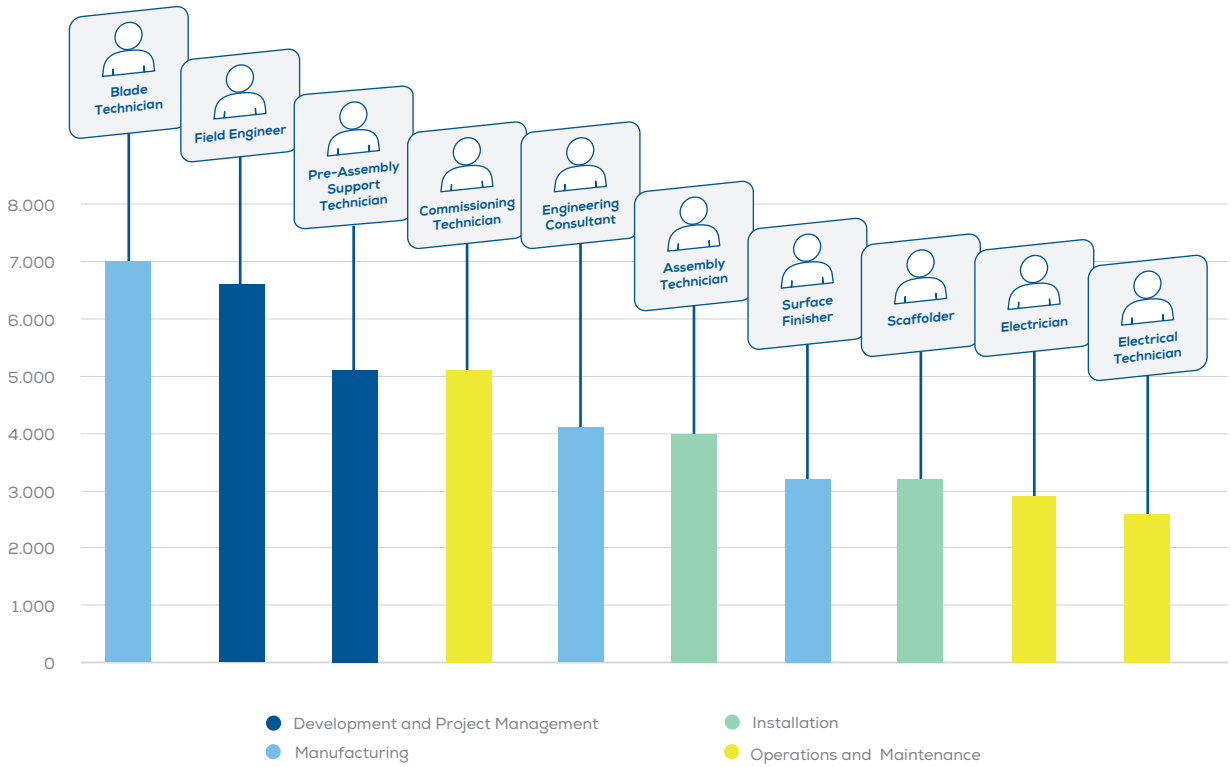
Labour and skills shortages

4.1 Job gaps

By comparing current workforce data with projected requirements based on the on- and offshore pipeline, this section identifies critical skills gaps for the next five years and beyond. These gaps highlight areas where the existing labour force cannot meet anticipated demand. Addressing them will require targeted recruitment from adjacent sectors and upskilling or retraining the current workforce.

A detailed analysis by job role shows the occupations with the largest deficits. The top 10 roles with the greatest shortages closely mirror those identified in future workforce projections, reflecting continued demand in key technical and managerial areas.

FIGURE 10. Jobs gaps in European wind energy industry, 2024-2030.



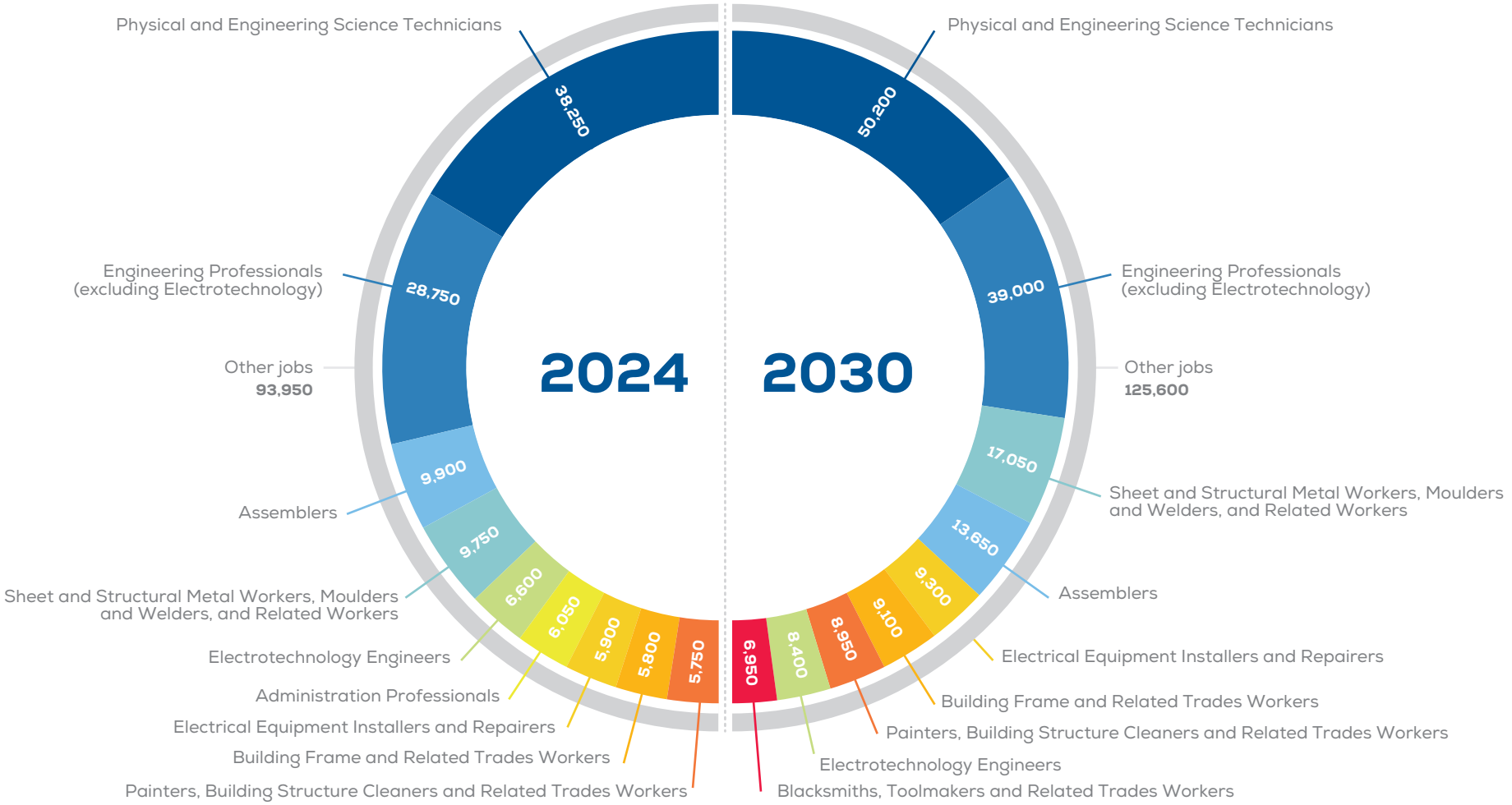
Source: WindEurope

TABLE 2. Top 5 jobs gaps in European wind energy industry, 2024-2030.

Job role	ISCO code	ISCO code summary	2024	2030
Blade Technician	721	Sheet and Structural Metal Workers, Moulders and Welders, and Related Workers	9,350	16,350
Field Engineer	214, 215	Engineering Professionals (excluding Electrotechnology), Electrotechnology Engineers	21,050	27,700
Pre-Assembly Support Technician	821, 933, 931	Assemblers, Transport and Storage Labourers, Mining and Construction Labourers	13,650	18,750
Commissioning Technician	311	Physical and Engineering Science Technicians	11,400	16,500
Engineering Consultant	214	Engineering Professionals (excluding Electrotechnology)	10,200	14,300

Source: WindEurope

FIGURE 11. Top 10 job families in European wind energy industry, 2024 and 2030.



Source: WindEurope

5.

Recommendations

5.1 Overview

5.2 Summary

Europe's wind energy sector is vital to achieving the EU's 2030 climate and energy targets. But skills shortages are one of the biggest barriers to scaling up deployment. The European Commission has taken important steps through its Union of Skills Strategy—creating a High-Level Skills Board, launching the European Skills Intelligence Observatory, bringing forward the Skills Portability Initiative, and strengthening the Pact for Skills under the European Skills Agenda. These initiatives are a key step forward, but they do not yet meet the scale of Europe's challenge.

Global competitors are investing heavily in vocational education and training. Europe still lacks the scale, dedicated funding, and integrated frameworks needed to deliver the workforce for a net-zero economy. Without immediate action, skills shortages will hold up wind deployment and threaten Europe's energy security.

To close this gap, WindEurope sets out five priority actions. This builds on progress we have seen so far, identifying what we still need, and outlining practical measures for the European Commission, Member States, industry, and education providers to ensure Europe's wind workforce is ready for the transition to net-zero..

1 Align workforce planning with EU net-zero goals and real-time data

Europe needs a coordinated approach to wind energy workforce planning, aligning national strategies with EU objectives. Member States should develop wind-specific workforce plans for on- and offshore projects, backed up by scenario-based planning and real-time data on employment, skills, and deployment.

Collaboration with employment agencies will be the key to understanding talent supply, identifying gaps, and directing investment to train the right people. Workforce intelligence must be at the heart of decision-making—not just an afterthought. The European Skills Intelligence Observatory should work closely with the wind industry to leverage sectoral data, monitor labour supply and demand, and guide policy in real time.

2 Scale training for key roles and retrain adjacent sector workers

Shortages in high-demand roles—wind turbine technicians, engineers, and project managers—require immediate action. Training programmes should prioritise these occupations and create fast-track retraining pathways for workers from adjacent sectors such as oil and gas, maritime, and construction. Regional training hubs in coastal and high-deployment regions will be critical, complemented by new vocational learning pathways where they do not yet exist.

Industry should also strengthen attraction, recruitment, and retention—offering competitive career packages, expanding apprenticeships, and engaging those not currently in education, employment, or training. The European Commission and Member States should fund skills programmes at scale, incentivise employers and training providers, and support joint public–private investment. Net-zero academies can speed up delivery of programmes tailored to the sector's needs.

3 Boost the visibility and appeal of careers in renewable energy

The switch to net-zero hinges on a strong pipeline of science, technology, engineering, and mathematical (STEM) talent. But vocational pathways are still undervalued and often invisible in schools and universities. The European Strategy for Vocational Education and Training should include a dedicated chapter on careers in renewable energy, supported by EU-wide promotional campaigns and clear entry pathways for students and jobseekers. The Stem Education Strategic Plan can help raise awareness early and support exploration and promotion of technical pathways.

Member States and industry should actively promote technical careers, emphasising their crucial role in achieving decarbonisation, energy security, and long-term employability. Eight out of ten jobs with the largest skills gaps are technician roles—the backbone of the sector. Without the right talent in these positions, we face significant delays. Targeted campaigns should focus on engaging under-represented groups and workers looking to reskill.

4 Promote and extend industry–government–education partnerships

Human capital must be treated as a strategic priority for Europe's wind energy sector. Delivering net-zero will require a coordinated approach between industry, governments, and education providers to build and retain the workforce needed for growth. Workforce development should be recognised as essential infrastructure—just as important as wind turbines, grids, and ports.

Companies should work closely with vocational and higher education institutes to co-design curricula, host internships and apprenticeships, and co-fund training programmes. Governments can strengthen this collaboration by embedding workforce development into project tender requirements and rewarding companies that invest in training and skills. Education providers, in turn, should ensure their programmes reflect real industry needs and provide clear pathways to employment.

5 Harmonise certifications and support EU-wide skills mobility

Europe's Single Market for Energy must also function as a Single Market for Energy Skills. Workers should be able to move freely across borders, with qualifications recognised seamlessly across the EU. Today, the lack of mutual recognition for technical certifications in renewable installation and electrical services creates inefficiencies and delays. The European Commission should accelerate the harmonisation of certification standards and recognise qualifications under the Skills Portability Initiative to ensure smooth mobility and deployment.

Skills mobility must come with a strong focus on lifelong learning and workforce reconversion. Many workers from transition-affected sectors such as oil and gas, the maritime, and heavy industry have skills that are highly transferable to wind energy—particularly in offshore operations, project management, and safety. These should be recognised and leveraged to support a just transition where no one is left behind. Public–private partnerships will be essential to fund large-scale retraining and upskilling programmes, supported by EU instruments such as the Skills Guarantee and General Block Exemption Regulation.

6.

Best practices in the wind energy sector

Building a skilled and resilient workforce is critical to delivering Europe's wind energy ambitions. While policy frameworks and funding are vital, practical solutions are also key. Across Europe, pioneering organisations are leading innovative approaches to training, career progression, and reskilling—setting benchmarks for the sector and creating pathways that attract and retain talent. Below are four stand-out best practices shaping the industry today:

1. Apprenticeships: Building a future-ready workforce

Putting apprenticeships at the heart of the wind energy sector is a proven best practice. Apprenticeships offer hands-on experience and structured learning, ensuring new entrants are job-ready and equipped with practical skills.

- NetZero's Covenant: NetZero launched a dedicated covenant to improve the quality and reach of apprenticeships in wind energy. This covenant sets out clear commitments to raise training standards, expand opportunities, and support the transition to a greener workforce. It has now been converted into a practical blueprint that other organisations can adopt.
- WindEurope's Sectoral Pledge: WindEurope has signed a sectoral pledge—under the European Alliance for Apprenticeships (EAFA)—to improve apprenticeships across the wind industry. This collective commitment is enshrining vocational careers and expanding the talent pool for the future of wind energy.

2. Microcredentials: Rapid upskilling for a dynamic sector

Microcredentials are transforming how the wind sector addresses urgent skills needs. Programmes like GreenTech Skillnet and the Offshore Wind Academy in Ireland offer short, targeted training modules that allow workers to quickly upskill or reskill.

- These microcredentials are designed in close collaboration with industry, ensuring that training is relevant and immediately applicable.
- They help fill critical gaps in the workforce, enabling rapid response to technological advances and changing project requirements.

3. Career pathways: GWO's Roadmap for lifelong progression

The Global Wind Organisation (GWO) has created a clear, structured roadmap for career progression in wind energy. Their standards and resources, such as the Propel Job Roles Guide, outline the journey from entry-level technician to leadership roles.

- The guide details the skills, certifications, and hands-on experience needed at every stage, making the pathway accessible and transparent.
- GWO-certified training is widely recognised and often a prerequisite for employers, ensuring that workers are prepared for current and future roles in the sector.

4. Reskilling: Empowering transitions with the Energy Skills Passport

Reskilling is essential to supporting workers moving from fossil fuels to renewables. RenewUK's Energy Skills Passport is a prime example, acting as a digital record of existing skills and mapping out clear pathways for reskilling.

- The Skills Passport helps experienced professionals from the oil and gas sector to identify what additional training they need and connect them with relevant opportunities.
- This approach empowers individuals to take control of their career move and supports the sector's need for a diverse and flexible workforce.

Why these practices matter

These initiatives share common principles: industry-led design, alignment with recognised standards, and accessibility for diverse groups. Not only do they address immediate skills shortages, but they also create sustainable career pathways, ensuring Europe's wind workforce continues to be adaptable and competitive.

WindEurope is the voice of the wind industry, actively promoting wind power in Europe and worldwide. It has over 600+ members with headquarters in more than 35 countries, including the leading wind turbine manufacturers, component suppliers, research institutes, national wind energy associations, developers, contractors, electricity providers, financial institutions, insurance companies and consultants. This combined strength makes WindEurope Europe's largest and most powerful wind energy network.

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