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Climate Transition Will Require Major Investment in Skills and Workforce Re-skilling, New Study Finds

A new study commissioned by the European Commission's Directorate-General for Climate Action (DG CLIMA) concludes that achieving climate neutrality will require substantial investment not only in clean technologies but also in the skills of Europe's workforce.

The report examines how the transition to a climate-neutral economy will reshape labour markets across the European Union, identifying the occupations, skills and training needs required to support the deployment of low-carbon technologies.

According to the study, between **150,000 and 500,000 workers** will need to be re-skilled or retrained every year until 2050. While significant, this represents **less than 1% of the EU's working-age population annually**, suggesting that the labour market can successfully adapt if appropriate education and training policies are implemented.

Climate neutrality is transforming labour demand

The transition towards a climate-neutral economy will require profound changes across many sectors of the European economy.

Growing demand for workers will be driven by the expansion of technologies and activities such as:

- Renewable electricity generation
- Wind and solar energy
- Smart electricity grids
- Building renovation
- Heat pump installation
- Electric vehicle manufacturing and deployment
- Clean energy infrastructure

Meeting these objectives will require both significant investment and the continuous adaptation of workforce skills throughout the coming decades.

To assess these impacts, the study used two macroeconomic models capable of analysing labour market developments alongside wider economic effects.

Hundreds of thousands of workers will require new skills

The analysis estimates that between **150,000 and 500,000 workers** across the European Union will need retraining or re-skilling each year between now and 2050.

The greatest demand for new skills is expected in sectors linked to:

- Electric vehicles

- Wind energy
- Solar power

Other low-carbon technologies will also contribute to additional training needs, although to a lesser extent.

The study notes that these workforce adjustments remain relatively modest compared with the size of the overall European labour force, indicating that the transition is achievable with appropriate policy support.

Demand will increase across a wide range of occupations

The climate transition will create employment opportunities across multiple qualification levels rather than benefiting only highly specialised professions.

Occupations expected to experience increased demand include:

Highly qualified professions

- Business managers
- Engineers
- Scientists
- Information technology specialists
- Technical professionals

Medium-skilled occupations

- Electricians
- Machinery operators
- Equipment maintenance technicians
- Industrial technicians

Operational and technical roles

- Manufacturing assemblers
- Plant operators
- Construction workers
- Production workers

The study highlights that both digital competencies and technical skills will become increasingly important across many sectors of the economy.

Training costs remain manageable

Providing the necessary education and training is expected to require annual investments of between **€350 million and €1.4 billion**.

These costs are likely to fall primarily on employers, who will need to support workforce development as technologies evolve.

However, the report concludes that the overall economic impact of these investments is expected to remain limited because training costs represent only a small proportion of total labour costs.

Investing in workforce skills is therefore viewed as a cost-effective way of supporting Europe's long-term competitiveness and climate objectives.

Education systems must adapt more rapidly

The study stresses that ensuring an adequate supply of skilled workers will require closer cooperation between policymakers, employers and education providers.

Key recommendations include:

- Regularly updating educational curricula
- Aligning training programmes with technological developments
- Strengthening digital and technical education
- Improving cooperation between industry and training institutions
- Anticipating future labour market needs

The report emphasises that education systems must become more responsive as clean technologies continue to evolve rapidly.

Lifelong learning will be essential

One of the study's key findings is that participation in job-related education and training remains relatively low in sectors that are expected to play a central role in the climate transition.

To address this challenge, the report recommends strengthening policies under the **Union of Skills** initiative by:

- Increasing awareness of available training opportunities
- Reducing barriers to participation
- Encouraging employers to invest in workforce development
- Supporting lifelong learning throughout working careers
- Providing incentives for workers to update their skills regularly

These measures are expected to improve labour market flexibility while ensuring that businesses have access to the skilled workforce required for decarbonisation.

Ensuring a fair and inclusive transition

The study also highlights the importance of supporting workers moving between sectors and occupations as the economy changes.

Effective labour market policies should facilitate transitions towards occupations experiencing growing demand, particularly in renewable energy, energy efficiency and clean technology industries.

According to the report, addressing both current and future skills shortages will be essential to ensuring that the climate transition remains:

- Economically viable
- Socially fair
- Inclusive
- Competitive

Supporting workers throughout the transition will help maximise employment opportunities while strengthening Europe's resilience and long-term economic performance.

Background

The study, commissioned by the European Commission's Directorate-General for Climate Action (DG CLIMA), evaluates how the transition to climate neutrality will affect skills requirements and labour market dynamics across the European Union.

Using two macroeconomic models, the analysis assesses future workforce needs associated with the deployment of clean technologies and identifies the scale of retraining and re-skilling required to support the EU's objective of achieving climate neutrality by 2050.

The findings indicate that while the transition will require significant investment in education, training and workforce development, the scale of adaptation remains manageable. The report concludes that proactive investment in skills, lifelong learning and cooperation between education providers, employers and policymakers will be critical to ensuring that Europe's climate transition also strengthens employment, competitiveness and social inclusion.

More information: https://climate.ec.europa.eu/news-other-reads/news/how-climate-transition-will-impact-eus-labour-market-re-skilling-and-training-needed-2026-03-27_en