THE JOBS OF OUR FUTURE

Being climate neutral by 2050 means transforming fundamentally the way we work today. To accelerate the decarbonisation, energy policies and digitalization have to go hand in hand.

This "twin transition" won't only be about creating completely new jobs - but about **transforming professions that we have known for a long time**. However, our industries and economies realise that they do not have enough skilled labour to meet the demands of the energy and digital transition.

The **shortage of skilled labour** is becoming a more and more **pressing issue**, as this may jeopardise our prosperity in Europe. It also puts our **climate and energy targets at risk**. Now is the moment to **address the changes** needed for the energy and digital transition and the risk of labour shortage.

Policy recommendations:

1. **The transition can only be a Just Transition - which means that it has to be socially fair**. The transformation of the economy should be made as inclusive as possible. Workers will be the drivers of the energy transition when it becomes clear that it is an opportunity for them, not a threat.

2. **Training is key - from school to first jobs, and within a career.**
   - **Lifelong training** on the job should be integrated into all sectors.
   - **Targeted training**: Companies, educational institutions, and labour market organisations should cooperate to prepare more flexible, shorter, and targeted training programs.
   - **Promote a career start in sectors relevant to the transition**: starting a career in the key sectors of the transition should be attractive and accessible to young graduates. First contact with such companies should be made at school. Apprenticeship is also crucial, and it will gain more and more importance.
   - **Pre-employment programs** should offer insights into different sectors so skilled workers can meet the demand of industries.
   - **Young professionals** should benefit from these opportunities. This could help to reduce youth unemployment.

3. **The green and digital transitions should provide opportunities for everyone - no matter the background or social group.** Training and career opportunities should be available to people with low, middle, and high qualifications. This could also help reduce social and economic inequalities. In this context, the development of new branches of industry must include the whole society - existing barriers to the participation of women, migrants, and other marginalised groups must be removed.

ECOLOGICAL & DIGITAL JOBS IN PRACTICE

Roofers are multifaceted. Traditionally, they take care of the construction and sealing of roofs - whether in new buildings or in roof renovation. They play a key role in the **ecological retrofitting of Europe's buildings**. Their **insulation** of roof trusses saves a large amount of heating energy. Moreover, they **install photovoltaic and solar thermal systems**.

ROOFER

Insulates and renovates roofs to save energy

Making roofs green

The roofing industry traditionally produces **heavy roofs** built out of **polluting materials**. The green and digital transformations will **make roofs lighter, built with recycled material, and fit to welcome solar panels**. This will increase energy efficiency and therefore be more economical for consumers. Finally, roofers could collaborate with garden and landscape planners in order to create "**roofscapes**" - gardens on top of buildings. This can help to reduce air pollution, increase biodiversity, and allow the reuse of rainwater. In order to perform these responsibilities and explore this potential, **existing and soon to be roofers have to be trained and skilled**.

WELDER

Operates, maintains and assembles parts of the machines needed for the energy transition

Many individual parts are needed for the energy transition. And it's precisely these that skilled workers in manufacturing produce - such as rotor blades for wind turbines. If machines do much of the work independently, **they need people to operate and maintain them.** And still, for some tasks, skilled workers have to lend a hand themselves: for example, they **weld parts of wind turbines together**.

Before

Shapes, assembles, and maintains the steel parts needed for fossil fuel industries

After

Also assembles and maintains renewable energy systems like wind turbines or solar panels

CHIMNEY SWEEP

Inspects heating systems and provides energy councelling

A chimney sweep still sweeps chimneys, but today they primarily **inspect heating systems**. Moreover, they provide **energy consulting** by measuring exhaust gases and assisting with **heating system replacements**. Digital tools will assist chimney sweepers in their jobs, for example, **smart devices and cameras** will help them to inspect heating systems.

The masters of energy and heat

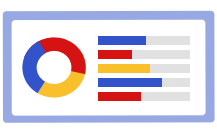
Chimney sweepers play a key role in the energy transition. Although many buildings nowadays do not use chimneys anymore but rather district heating or electric heat pumps, chimney sweepers are likely to specialise in **energy and ventilation technologies**. Moreover, they could also look after the installation and monitoring of **heat pumps**.

Ideally, a building does not consume any energy and produces an energy surplus. Indeed, **saving energy and using renewable energy is much cheaper**. The knowledge of the **latest technologies** is fundamental to building sustainable buildings. The long-term protection of the environment and climate is one of the most urgent goals of modern and sustainable architecture.

ARCHITECT

Designs modern and sustainable buildings that save and produce energy

How can technology help architecture deliver the energy transition?



House energy managers: Central dashboard to monitor energy consumption of the building. This can help rationalise the distribution and consumption of electricity in the building. This device can be connected to an app that informs people about their energy consumption.

Smart heating and hot water supply: Smart system to regulate heating, ventilation, and air conditioning systems according to the needs of the building. This helps to save energy and is therefore also economical.

BANKER

Finances, invests, and incentivises the energy and digital transition

The energy transition needs money - and people who know about it. **Financing the energy transition is paramount to its success**: after all, every company wanting to build a wind turbine or a solar field needs it to be **economically viable**. The green and digital transition are changing the role and function of banks, especially their products and services. Bankers as well as people working on finance projects bring to the table the necessary knowledge to deliver these objectives.

Green projects financed by the European Investment Bank

280 million euros of funding for research and innovation supporting the steel company ArcelorMittal's **decarbonisation** objectives. This project includes capital expenditure in several EU countries: France, Belgium, Luxembourg, and Spain. The loan is backed by a guarantee from the European Fund for Strategic Investments.

190 million euros to the Duch public company Evides to improve and maintain its **water distribution network** beyond 2024, making it more climate-resilient.

Traditionally, farmers produce plants and animal products for sale. Today, they are a major actor of sustainable development. To decarbonise the agriculture sector, farmers can be active in **sustainable and carbon farming**. For example, this means storing carbon in soils and wetlands. They can even produce and sell their own energy by using **bioenergy and agriphotovoltaics.** Digital tools can be integrated into these practices.

FARMER

Farms sustainably and produces energy

LOGISTICIAN

Has better working conditions due to smart devices

Sustainability has become a major issue in the transport and logistics industry due to high CO2 emissions. Therefore, **increasing energy efficiency** and **driving eco-friendly** can reduce environmental and financial costs. This is also where **digitalisation** comes into play: digital apps can not only help drivers improve their driving style and dispatch runs better to avoid downtime or empty runs, but also reduce their stress, ultimately improving working conditions.

Re-thinking logistics with the green and energy transition

Environmentally friendly means of transportation

Decrease in the number of vehicles used and the number of kilometers traveled

Efficient and convenient rides for the driver, reducing stress

The consequences of climate change must be taken into account when planning and developing **urban districts**. The switch to **sustainable transportation and construction sectors** is essential to reduce our emissions. Urban planners adapt our cities to extreme weather events such as storms and heavy rains, and adapt our urban environments to climate change. They also deal with the issues of **urban density** and building renovations. They incorporate **technologies** into our urban infrastructures to reduce our emissions and energy consumption, but also to increase our quality of life.

URBAN PLANNER

Designs sustainable and smart cities

The green and digital skills needed for urban planning

Develop urban spaces that include shared gardens, rainwater and waste management

Promote smart mobility, including smart traffic management

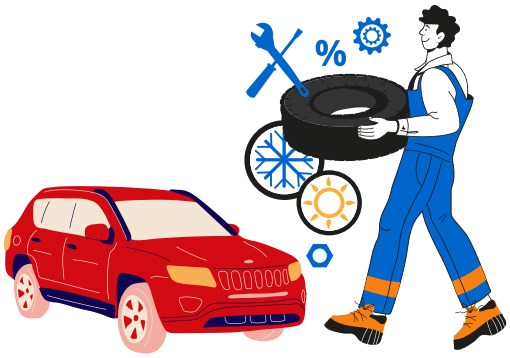
MECHANICS ENGINEER

Builds, assembles, and maintains renewable energy machines and systems

They build the mechanic, electric, and electronic components of a machine, assemble them into complex systems, install control software, and maintain the systems. In the renewable energy sector, mechanic engineers - and technicians - are essential in the **production of individual components** such as photovoltaic modules, solar thermal collectors, generators for wind turbines, etc.

In the **solar energy industry**, mechanics research, design, develop, and optimise every piece within a solar energy system.

In the **hydropower industry**, they help power plants to make energy out of water. They research, design, and develop essential machines and hardware, such as turbines, generators, and hydro-pressure.



AUTOMOTIVE MECHANIC AND TECHNICIAN

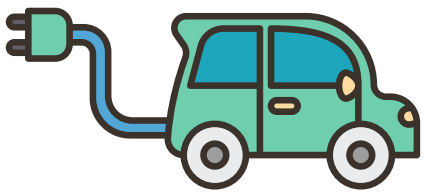
Equips and maintains hybrid & electric vehicles

They test vehicle technology systems, carry out repairs and equip vehicles. They will be essential in the **operation and maintenance of electric vehicles**, which will rely more and more on technology. Our transport sector will only become more sustainable with highly skilled mechanics and technicians.

Before

Maintain and repair combustion engine cars (change of oil etc.)

After

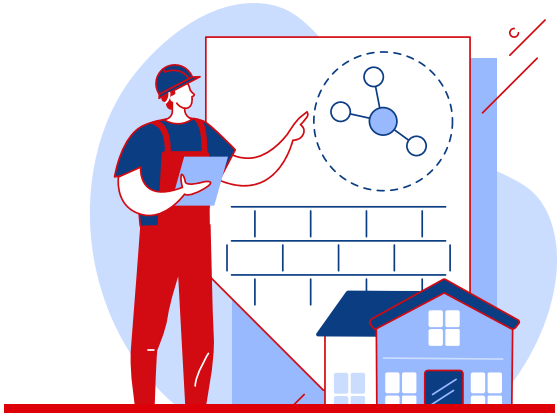


Hybrid & electric vehicle maintenance with knowledge of IT and computer systems

SMART HOME ENGINEER

Installs and maintains smart home systems

Smart home engineers **install and maintain home automation systems** (heating, ventilation, air conditioning, lighting, solar shading, irrigation, security, safety, connected devices, etc). To perform these duties, they need skills in **designing electronic systems**, but also in **smart grid systems** and **energy-saving concepts**.



MATERIALS ENGINEER

Research and design new or improved construction materials

Materials engineers **research and design new or improved materials** for a diverse number of applications. They analyse and advise companies on the composition of materials, conduct experiments, and develop new materials for industry-specific use that can range from rubber to textiles, glass, metals, and chemicals. With the energy and digital transition, they will research and design **sustainable building material** - which minimises the negative impact of the building on the external environment, throughout their whole life cycle.

Calculating "embodied" carbon emissions from buildings to measure the decarbonisation of the sector

Buildings account for 40% of the EU energy consumption and represent 36% of its greenhouse gas emissions. Cement and steel are the most used materials in construction, and have a high carbon footprint - in 2014, they represented 40% of all industrial emissions. Experts are pushing the EU to take into consideration the "embodied" carbon emissions from a building - which represents all the emissions from the whole life cycle of the building - including raw materials, construction, and demolition. Material engineers have an important role to play to reduce emissions coming from the building sector.

FES JUST CLIMATE

FES Just Climate acts as a **think tank** about current and coming trends, and a **policy advisor** in ongoing debates. We support FES offices and their partners in **shaping the industrial revolution of our times**. We focus on **energy, industrial, structural, and labor policies**, as well as the **European Green Deal**.

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