BUSINESSEUROPE

GREENING THE ECONOMY: EMPLOYMENT AND SKILLS ASPECTS

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INTRODUCTION

There are two important transitions currently influencing labour markets: digitalisation, additionally accelerated by the Covid-19 pandemic, and greening of the economy. These transitions are interlinked and mutually reinforcing: digitalisation contributes to more environmentally friendly production processes, service provision and lifestyles, while greening of the economy requires more advanced technologies and digital solutions to accompany structural changes.

Striving for a "green economy" resonates also with a profound societal demand. Significant numbers of citizens across the EU have opted for more environment-centred policy choices. This trend has been confirmed by the recent elections in several EU Member States.

The employment and skills dimensions of a greening economy are common to all profound transformations. Such a transition creates the need to observe, anticipate, raise awareness, adapt the training offer, facilitate transitions, and act locally. But the ecological transition, maybe more than the technology-driven digital transition, takes on a systemic dimension, disrupting modes of production, consumption, travel and work organisation, and is subject, moreover, to a strong influence of regulations.

Greening of the economy already has and will continue to have a profound impact on employment and skills. Over 10 years ago already, in its position paper "Greening the economy – taking on employment and skills challenges" of June 2010, BusinessEurope stressed that the "focus should be on the wider process of greening of jobs and the interdependence between sectors". We have also underlined the importance of upskilling/reskilling to prepare employees for new jobs/tasks within existing occupations, new ways of working as well as flexible labour markets to allow companies adapt, modernise and restructure, when relevant.

BUSINESSEUROPE RECOMMENDATIONS

BusinessEurope proposes a set of recommendations to the European Union, EU Member States, employer organisations and employers on how to address the employment and skills dimension of greening.

To the European Union

1. **Improve the design of the proposed social climate fund** to make sure that the available resources support the green transition by strengthening its political acceptance, focusing on the most vulnerable people and regions to cushion potential negative impacts

2. Promote a **shared understanding of the main opportunities and challenges the green transition poses for people** as workers, consumers, and citizens, and promote well-balanced concrete deliverables for people to contribute to a successful green transition

3. Develop a **set of EU shared priorities for action by Member States** to address the employment and skills dimensions of greening and to monitor progress as part of the European semester process

4. Organise a **regular forum for discussions** on the progress made, with the close involvement of national governments and social partners at cross-industry and sectoral level

To the EU Member States

5. Design **employment strategies**, nvolving public and private employment services and social partners, to boost the job creation potential of greening of the economy, and to be prepared for and make the best of newly emerging jobs and tasks

6. Involve social partners at cross-industry and sectoral levels to **update education and training curricula** to meet changing skills needs in light of greening of production and services

7. **Support enterprises and workers** in sectors and jobs that are impacted negatively by the green transition, and design effective support mechanisms for their transformation and/or retraining

To employer organisations

8. **Inform policy-makers about the real effects of climate mitigation and adaptation policies on enterprises and workers** and contribute to the design of employment strategies and education and training systems that are fit for the green transition

9. **Inform companies about the relevant EU and national policies**, and design effective complementary tools and measures through social dialogue, collective bargaining, or other mechanisms in line with diverse national industrial relations systems at the appropriate level

To companies

10. **Identify strategic objectives supporting adaptation of the company's workforce** to greener production realities and, where appropriate, draw on available public support mechanisms and/or private financing options, such as sustainable finance opportunities, to support progress

11. **Co-invest in the necessary training solutions** to support the realisation of the company's strategic objectives and foster individual worker responsibility to adapt to the changing production conditions

12. **Engage in a regular dialogue with trade unions and/or employee representatives** to monitor the progress made and, where necessary, adjust the strategic objectives to achieve better results for the company and its workers.

POLICY CONTEXT

"The European Green Deal", the overarching political manifesto of the European Commission for the political cycle 2019-2024, was adopted in December 2019. The European Commission has decided to turn an urgent need into an opportunity that aims to "transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use"[1].

The Green Deal aims at protecting, conserving and enhancing the EU's natural capital, and protecting the health and well-being of citizens from environment-related risks and impacts. Its implementation will draw on various EU legislative initiatives, notably those coming under the "Fit for 55" package of July 2021. The European Semester is also being mobilised more than in the past to coordinate actions by Member States in the field of environmental protection. Additionally, the Green Deal has a wider international context, notably the UN 2030 Agenda and the Sustainable Development Goals (SDGs).

As part of the Green Deal-related initiatives, some recognition has been given to the need to ensure just transitions for enterprises and workers. This acknowledges the fact that concrete workers, regions, industries will be impacted by this paradigm shift and calls for multi-stakeholder partnerships to ensure no one is left behind. The EU is rightly pursuing a "Just Transition" approach, to address the socio-economic effects of the transition, focusing on the regions, industries and workers that face the greatest challenges. The Just Transition Fund (JTF) is a key tool to support territories most affected by the transition towards climate neutrality, providing them with tailored support. The fund offers €17.5 billion[2]. The JTF is to support economy diversification and reconversion of the territories, for example through sustainable investment in SMEs, creation of new enterprises, R&I, environmental rehabilitation, clean energy, upskilling/reskilling of workers, active labour market policies to support job-to-job transitions and bring the inactive to the labour market, and transformation of existing carbon-intensive installations.

It is worth noting that the 2015 ILO guidelines pointed out the importance of accompanying all those who can be negatively affected – directly and indirectly - by the green transition. The guidelines also indicate that if managed well, transitions to more sustainable economies may become a strong driver of job creation and job upgrading.This can only be achieved through ongoing social dialogue at all levels, both while designing and implementing relevant policies[3]. The social aspects can also be found in the new European Climate Adaptation Strategy of February 2021. It calls for a climate resilience that is just and fair, and stresses the need for adaptation measures that help individuals adapt to changing climatic conditions by means of reskilling and requalification programmes.

The very first European Climate Law was adopted in May 2021. It establishes binding EU-level targets of net domestic emmission reductions of at least 55% by 2030 and climate neutrality by 2050, as well as the objective of striving for net negative emissions beyond 2050. The recently published "Fit for 55" package puts the first European Climate Law into practice. The "Fit for 55" package includes a proposal to create a new Social Climate Fund to contribute to the transition towards climate neutrality by addressing the social impacts of the inclusion of greenhouse gas emissions from buildings and road transport into the scope of Directive 2003/87/EC (the EU ETS directive). The specific objective of the fund is to support vulnerable households, vulnerable micro-enterprises and vulnerable transport users through temporary direct income support and through measures and investments intended to increase energy efficiency of buildings, decarbonisation of heating and cooling of buildings, including

[1] European Commission (2019), The European Green Deal, COM 2019 (614 final), Brussels, p. 2.
[2] Just Transition Fund: €17.5 billion in 2018 prices (€19.3 billion in current prices) out of which €7.5 billion comes from the EU 2021-2027 budget, while the remaining €10 billion will come from the European Recovery Instrument (available between 2021 and 2023).
[3] ILO (2015), *Guidelines for a just transition towards environmentally sustainable economies and societies for all, Geneva.*

the integration of energy from renewable sources, and granting improved access to zero- and low-emission mobility and transport.

Finally, an important push for climate resilience-oriented actions is the Recovery and Resilience Facility as it stipulates that a minimum 37% of the budgetary allocations of the National Recovery and Resilience Plans should be directed to climate action, covering both mitigation and adaptation-oriented actions. Alongside public investments, the EU sustainable finance agenda aims at a stronger mobilisation of the financial sector in support of financing environmentally friendly economic activities.

Succeeding in the green transition will require major investments, notably to adapt the role of human work in production to new production processes. This is about investing in new company machines or work equipment that improve energy efficiency or reduce CO_2 emissions. This is about training the workforce to upskill or reskill to effectively use these new machines or work equipment and the related production methods. In this context, the potential of sustainable finance opportunities needs to be seized to support companies' and workers' adaptation to greening economies. This should essentially be about providing additional investment opportunities to companies for them to improve human work productivity, competence and adaptability to succeed in the greening transition. Investment certainly can and should support sustainability, including in the social domain, as long as the tools for this respect the different national social systems, national competences and social partner autonomy.

STATE OF PLAY: LABOUR MARKETS IN GREEN TRANSITION

Analysing employment and skills aspects of green transition is a much more appropriate approach than analysing "green jobs". Firstly, it is not an appropriate policy objective to attempt to come up with a universal definition of green jobs, whereas a greening economy transforms existing jobs in a wide range of sectors. Secondly, the consequences of greening of the economy impact some jobs directly, but many jobs are also touched indirectly. Some Member States (France, Italy) make a difference between "green" jobs and "greening" jobs or "hybrid jobs"[4]. The term "greening occupations" seems to be a more promising concept than that of green jobs to identify the employment and skills policies that are needed to underpin a successful greening transition.

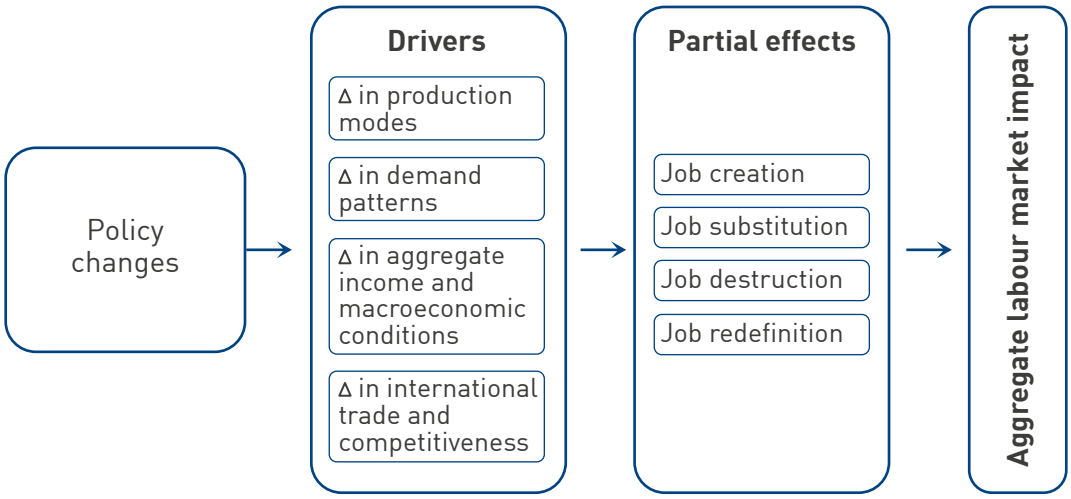
The transition to a green economy requires changes in relevant policies that will bring structural changes on the labour market. These changes include:

- job creation: new jobs emerge to reduce environmental pressures or increase resource efficiency as well as a result of development of circular business models;
- job substitution: shift in economic activity within or across sectors from resource-intensive activities to more circular activities;
- job destruction: job loss with no direct replacement, usually in the sectors with significant negative adverse environmental effect;
- job redefinition: existing jobs change their day-to-day skillset, work methods, and profiles as part of the transition to a more effective and sustainable economy.

All these four processes are interdependent and need to be analysed jointly to assess their aggregated labour market impact.

[4] European PES Network (2021), Greening of the labour market – *impacts for the Public Employment Services*, author: Nicola Duell, Brussels, p. 8.

Figure 1. Flowchart of policy induced changes in labour market



Source: OECD (2020), Labour market consequences of a transition to a circular economy, Environment Working Paper Nr 162, p. 16.

A majority of the available studies show that green transition will not have an overall negative quantitative impact on employment, the impact will be neutral or even slightly positive , even if some sectors might be hardly hit. At the same time, the available sources suggest that profound structural change of the labour market will be the result of greening of the economy and shifts across sectors/ occupations will be significant. It requires rethinking policies for clean energy supply and carbon storage across the economy, industry, production and consumption, large-scale infrastructure, transport, food and agriculture, construction as well as supportive taxation, employment policy measures and social benefits. Information and communication technologies (ICT), modern sensors, big data and artificial intelligence, and the Internet of Things (IoT) are some of the technologies that can innovate the way we use energy and help find solutions for decarbonising our energy systems. In the future, a **stronger focus on the skills needed for energy efficiency is desirable** to achieve progress towards greener production across economic sectors.

Table 1. Green transition: chosen sectors and potential labour market consequences

Sector	Structural changes	Potential labour market consequences
Energy sector • accounts for over 75% of the GHG emissions	• Reducing energy consumption • Phasing out coal and gas decarbonisation • Development of renewable energy sector, i.e. offshore wind production or solar energy • "Smart infrastructure": deployment of innovative technologies and infrastructure (smart grids, hydrogen networks or carbon capture, storage and utilisation, energy storage and enabling sector integration)	• Disappearing jobs in the traditional energy production sectors, i.e. coal mines • New jobs in the renewable energy sector and related services, i.e. production of subparts for wind turbines and their maintenance • Changes in the nature of jobs related to the change of technologies, maintenance and used materials

[5] *Ibidem*, p.21; Cedefop (2013), *Skills for a low carbon economy*, Research Paper 34, Luxembourg, pp. 25-28.

Sector	Structural changes	Potential labour market consequences
Large-scale infrastructure	• Infrastructure for fully integrated, integrated and digitalised European energy sector • Infrastructure for multi-modal transport • Production and deployment of suitable alternative transport fuels • Infrastructure for more efficient waste management	• Likely job creation in supporting infrastructure for electric cars: a safe, circular and sustainable battery value chain (all types of batteries)
Transport • accounts for approx. 25% of the EU GHG emissions • needs to be reduced by 90% to achieve the 2050 goals	• Multimodal transport • Promotion of environmentally-friendly transport options (rail, inland waterways) • Transition to electric vehicles	• Change in the nature of jobs and production processes • Potential job creation in the environmentally friendly transport options • Potential job destruction in subcontracting chains in the automotive sector, if not modernised • Potential job employment cuts in the air and ship transport due to smaller demand induced by increasing prices
Construction • accounts for approx. 40% of the total energy consumption	• Climate-proof building, incl. nature-based solutions • "Smart" homes (digitalised, climate-proof) • Renovation of private houses and public building (energy efficiency, keeping homes adequately warm)	• Potential job creation/boost for the SMEs and local jobs • New skills required by using environmentally friendly materials/ techniques
Food and agriculture	• Use of recourses: land use, forestry, farming, fishing • More sustainable food production - changes across the whole food chain and development of alternative food (seafood alternative to high-carbon food) • Development of precision agriculture, organic farming, agro-ecology, agro-forestry and stricter animal welfare standards • Eco-schemes to reward environmental and climate performance	• Declining employment in traditional farming • Potential job creation in alternative agri-sectors • New jobs in the former farmlands, i.e. organic farming or eco-tourism

Sector	Structural changes	Potential labour market consequences
Recycling and reuse	• Developing and implementing reutilisable and recyclable packaging (bio-degradable and bio-based plastics, secondary raw materials and by-products) • Stricter recycling requirements: mandatory recycled content (packaging, vehicles, construction materials, batteries) • Extending recycling chain: reduction and reuse of materials before recycling	• Potential job creation in the extended recycling chains • New skills required by new materials and technologies
Waste management	• Advanced quality requirements (separate waste collection) • More waste to be processed within the EU as the export of waste will be stopped	• Potential job creation • Changes within existing jobs to embrace new waste management technologies
Digital technologies	• Critical enabler to achieve climate neutrality goals • Development and deployment of sustainable digital technologies (AI, 5G, cloud computing and edge computing, the Internet of Things, distant monitoring of air and water pollution, use of energy or natural resources, support for "take-back" schemes)	• Important potential for job creation (IT jobs, but also complementary professions and maintenance services)
Research and innovation to support changes	• New technologies, new materials	• Important potential for job creation (IT jobs, product, services and processes design etc.)

Source: own compilation based on BusinessEurope (2010), *Greening the economy – taking on employment and skills challenges;* European Commission (2019), *The European Green Deal*; European PES Network (2021), *Greening of the labour market – impacts for the Public Employment Services*; and members' contributions.

Many cross-cutting specialisations emerge already due to the use of more advanced technologies. A good example of these changes is the construction sector. "Modern" construction workers will need to master more environmentally friendly technologies and materials as well as demonstrate sensitivity towards such issues as energy efficiency. Building "smart home" requires cooperation of **multi-skilled teams of experts** including engineers, architects, builders, etc. It is likely that "side-effect" professions/tasks will emerge, for example a specialised interior designer with knowledge of smart systems.

Construction is not the only sector with a profound structural change, emerging new tasks/occupations and need for reskilling and upskilling. The same goes for all energy-intensive industries (steel, chemicals, cement). They are very important as they supply several key value chains, but will be profoundly impacted by decarbonisation and modernisation processes. These mainly impacted sectors need to identify for themselves, involving the sectoral social partners, what is the best way to pursue a greening strategy that adequately reconciles economic, social and environmental objectives and at the same time consider the related evolutions of labour market and skills needs in their sectors. It is also important to note that the more traditional sector, the more likely is the process of job destruction and an urgent need for reskilling/upskilling. Important changes can also be expected in other resource-intense sectors such as textiles, electronics, and plastics. In this respect, some lessons can be drawn from the past experience of some sectors that already carried out a transformation towards improved environmental footprints, such as the chemical sector's transformation that was conducted in the 1990s.

In parallel to industry-driven adaptation to greening transition, regulatory "side effects" are to be expected. For example, the already largely applied extended producer responsibility has resulted in creating new positions/tasks within companies/existing jobs related to desiging products/services or controlling production processes and related value chains to assess and minimise their negative environmental impact. This realistic expectation of regulatory intervention does not change the fact that the companies and social partners in the various sectors are best placed to design own strategies that are adapted to the challenges met in practice. The role of regulators, rather than prescribing how to deal with the transition to a green economy, should rather focus on facilitating cooperation and mutual learning between countries, regions and sectors, and creating at all approriate levels financial and non-financial incentives to invest resources and reward the efforts put in the transition.

Another interesting trend to point out, that originated in the context of digital transition, is the **emergence of hybrid skills profiles** in certain sectors. For example, IBM has developed a hybrid skills profile for their staff which includes technical skills, data analysis and interpretation and communication skills. There is also evidence of such a hybrid approach in the context of new and emerging occupations prompted by greening objectives. For example, reference to the categorisation of green occupations in Scotland shows that solar system technicians must be able not only to install new technology, but also to determine how this technology can best be used on a specific site.

At the same time, when it comes to developing programmes for new occupations related to green employment or (more commonly) adjusting existing programmes/occupations, evidence suggests that this largely takes place within existing institutional arrangements. Cedefop research covering six EU countries (Denmark, Germany, Spain, Estonia, France and the UK) in 2018 found that there are no specific arrangements for green skills. Specific activities, such as the production of skills anticipation intelligence through sector reports, ultimately feed into these existing arrangements.

Looking ahead, the renewed Skills Agenda that was published in 2020 outlines as one of its priorities the need to support the development of a core green skills set for the labour market to guide training across the economy with a view to creating a generation of climate, environment and health-conscious professionals and green economic operators. Referring to the broader need for up- and re-skilling in view of greening, but also digitalisation and demographic change, it is clear that there is a wider trend towards the adaptation of existing occupational profiles and the emergence of new ones. The challenge is to define an appropriate policy approach to skilling for greening labour market needs with a good articulation between the EU and the national level. To be effective, this approach needs to be well targeted, focusing on improving companies and workers preparedness to seize the opportunities of greening. Skills policies underpinning greening also need to be coherent with

the broader skills policy objectives, including the need to conceive them with a view to supporting greening and digital transitions at the same time in a synergetic way.

Other factors of change include the **circular economy**, which will not only intensify recycling/ reutilisation of goods/materials, but will also contribute to **developing the repair sector**. A stronger focus on repair and longer use of products to better meet sustainable consumption goals will bring consequences for the design of electronics. A more mindful use of resources will also stimulate development of renting and sharing the goods and services. These changes give an opportunity to expand sustainable and job-intensive economic activity as they may lead to a revival of small, specialised repair shops. When searching for solutions, it is important to keep in mind that the **available data is very fragmented and there is no one source that would offer a comprehensive overlook.** A promising initiative is **Cedefop's Skills-OVATE** which is a database of detailed information on the jobs and skills required by employers based on online job advertisements from 28 European countries. These advertisements come from private job portals, public employment services portals, recruitment agencies, online newspapers and corporate websites. Skills-OVATE presents data for the last four available quarters and is updated four times a year.

Skills-OVATE is an interesting tool as its skills inteligence platform offers the possibility to browse data by sector, occupation, country and policy theme. There are two policy themes especially interesting in the context of greening of the economy: Matching Skills and Jobs as well as Future Jobs. "Matching Skills and Jobs" provides information on under-utilisation of skills, under-skilling and skills obsolence. "Future Jobs" describes the demand for people to work in various types of jobs as well as offers information on required skills. It also provides data on employment by occupation, how it has changed over time and is likely to evolve by 2030. Information is also provided about the qualifications people in employment have. A key challenge ahead for Skills-OVATE is to improve its ability-in-design to inform policy-makers and social partners about the relevant labour market trends to inform policy-making and collective bargaining on how to adapt to the challenges of the greening (and digital) transitions.

The Covid-19 crisis has added some more "game changers" important for green transition. A massive use of telework has proven possible and brought positive environmental "side effects". It is clear that in the after-Covid recovery a majority of companies will not come back to a "full-time" office work and will rather opt for "hybrid working" (a combination of office and remote working). ICTs and telematics have enabled organising virtual meetings, seminars and conferences with participants from across the globe. This trend is likely to continue **and there will be fewer physical meetings** that require travelling. The crisis has resulted in rethinking the idea of tourism and leisure travels. Quite a large number of people seem to discover more **sustainable tourism** - local and eco-tourism, as alternative to long-haul flights, especially of a short spell. At the same time, a stronger recourse to telework may well exacerbate the high energy consumption derived from digitalisation, which needs to be better documented and understood to provide a full picture of the pros and cons of telework in light of greening objectives.

Telework has became a widespread phenomenon in the world of work, but it is also important to note that mllions of pupils and students could continue learning during the recent lockdowns thanks to **digital learning solutions**. The questions arise now how tele-education should be played after the pandemic, and which combination of physical courses and virtual ones is optimal. It is quite clear that digital skills have become even more important.

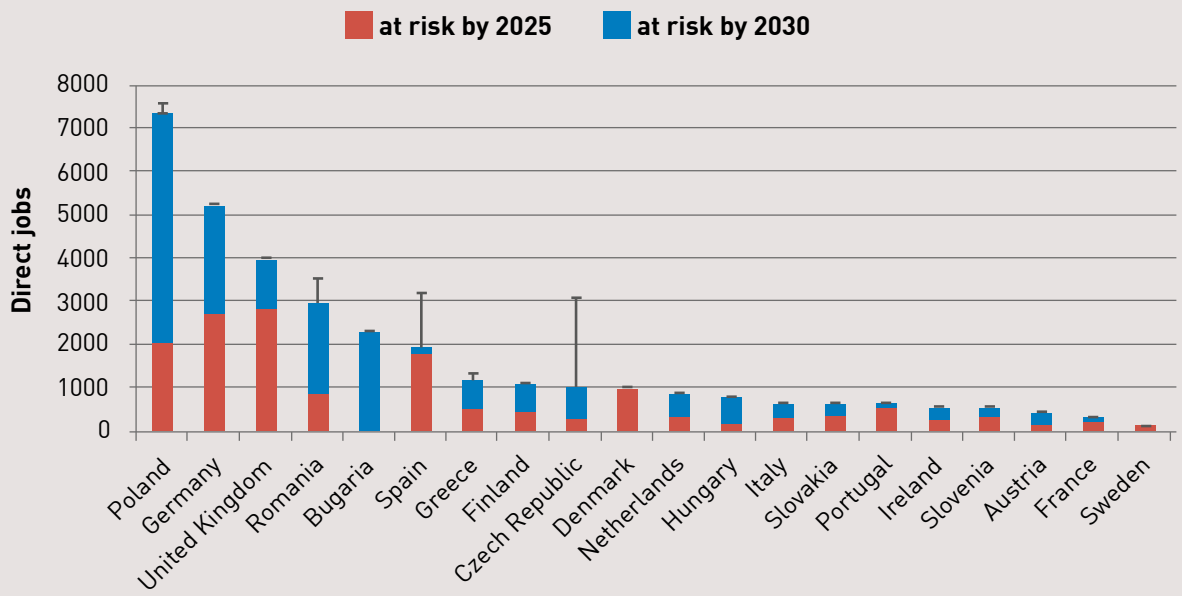
The impact of greening of the economy varies significantly between sectors. There are broadly three main categories of sectors:

- those the operations of which will be significantly reduced/halted (sectors "with no future") - for example coal-fired plants and the coal mining sector;
- those that have to undergo a profound change – for example the automotive sector;
- those with the biggest potential for job creation – for example sectors included in the circular economy.

An overall assessment of direct employment indicates that in the former EU28, coal mining activities provided jobs to about 237,000 people: around 185,000 are employed in coal mining and about 52,000 in coal-fired power plants[6]. The number of jobs varies significantly across countries: in the coal-fired power plants in the EU there are about 100 jobs in Sweden to around 13,500 in Poland. There are also indirect jobs related to coal mining which include power generation, equipment supply, services and R&D.

The expected direct job losses in power plant operation due to coal-fired power plant decommissioning in the coming decade could reach around 34,000 jobs, that is 64% of the estimated current employment in this activity. Approximately half of those (termed as "high risk") may be lost already in the early 2020s. Figure 2 presents the number of jobs at risk across the EU.

Figure 2. Probable impact of power plant decommissioning on jobs at country level



Source: OECD (2020), Labour market consequences of a transition to a circular economy, Environment Working Paper Nr 162, p. 16.

The phase-out of coal fired-power plants will lead to the closure of most lignite mines, in the short to medium term. The sector has already been facing significant employment losses at least since 2010.

Decommissioning power plants and closing coal mines has a very important regional dimension. One region in Poland may lose up to 40,000 jobs (approx. 50% of all the jobs in the region), a further three located in the Czech Republic, Romania and Bulgaria are likely to lose more than 10,000 each. To sum up, some 32% of the total direct employment in these regions is said to be at risk. In addition, the majority of coal regions have a lower regional GDP per capita than the national average and a

[6] Based on Alves Dias, P. et al. (2018), EU coal regions: opportunities and challenges ahead, Publications Office of the European Union, Luxembourg.

quite high unemployment rate. Changes in the widely understood "coal sector" will have an impact on the steel industry, the mining manufacturing industry and will result as well in a reduced demand for coal terminals.

Land reclamation can offer some opportunities for creating employment. However, the successful economic restructuring of a coal region does not necessarily mean full employment among former coal workers. Sector, skills and location (region) are three dimensions along which coal workers have to make decisions to adjust to new economic conditions. Staying in the same sector or seeking employment in other sectors, potential availability of retraining schemes and willingness to move to other regions are factors determining their future employment. Given the characteristics of the population employed in the coal sector, a significant number of (early) retirement should be perceived as natural.

The second group of sectors are those sectors that undergo a profound change as a result of an important shift in demand for their products/services. A good example of such a sector is the **automotive industry**. According to the European Commission, this sector provides direct and indirect jobs to almost 14 million Europeans and accounts for over 6% of total EU employment[7]. Over 2.5 million people work in direct maufacturing of motor vehicles, which stands for 8.5% of total EU employment in manufacturing. Manufacturing indirectly related to automotive industry employs approx. 1 million people, sales and maintenance generates 4.5 million jobs and transport over 5 million jobs. The EU is one of the biggest world's producers of motor vehicles; the automotive sector is the largest private investor in R&D. The turnover generated by the automotive sector accounts for over 7% of the EU GDP and the sector has an important multiplier effect. It is essential for upstream industries (steel, chemicals or textile) and downstream ones (ICT, repair or mobility services).

The automotive sector undergoes profound changes with intense job destruction (closing plants that produce gas engine cars) and job creation (setting up production site for electric vehicles and their components, for example batteries). Jobs are also created in the segment of infrustructure for electric cars, for example building and maintenance of charging stations. These changes call for a mix of upskilling and reskilling of workers so they can continue working in the sector but equipped with the new skills set required by e-mobility projects. Upskilling and/or reskilling many workers at the same time is an organisational challenge. A good example of such an approach is that German automotive supplier that instead of proceeding with a sequential skills transformation (dismissing several thousands of employees with obsolete skills and hiring new ones with the required ones) decided to implement a transformation plan to reskill and redeploy up to 30,000 workers into entirely new jobs. By recognising the potential of their own employees to transition, the company has accelerated the transformation towards e-mobilty in a sustainable and socially responsible way. The state subsidies played an important role in implementing this massive reskilling programme. It is worth noting that prior to the "Fit-for-55" package being published, social partners from the automotive sector as well as other stakeholders were calling for urgent action to guarantee just transition for Europe's auto workers. The support framework is necessary given the number of jobs at stake and the magnitude of the ongoing transformation.

Circular economy is thought to have the biggest potential for job creation - estimated at more than 1 million jobs across the former EU28 by 2030[8]. These jobs are expected as the circular economy is labour and technology-intensive. These jobs are likely to be created in countries in which employment in the waste sector is already strong, namely Germany and the UK (to note that half of these new jobs are expected to be created in Germany and the UK alone) as well as in Italy, France and Spain. There is evidence that some sectors are likely to be negatively impacted in terms of employment volume

[7] European Commission (2021): https://ec.europa.eu/growth/sectors/automotive_en
[8] This paragraph is based on the findings from the final report of the European Social Partners' project on Circular Economy prepared by Trinomics (2021, unpublished).

and competitive position, mainly in the upper section of value chains. At the same time sectors participating in creating material loops aimed at keeping materials longer in the economy are likely to grow. At this stage many questions appear: what opportunities exist in declining sectors? Will they compensate for lost jobs? What will be the impact of automation and technological advancement in different sectors/countries?

It is certain that moving to circular economy will bring important qualitative and quantitative changes as far as employment is concerned. It is therefore crucial to ensure that introducing circularity to companies goes hand-in-hand with strategies to preserve employability, here again through a mix of upskilling and/or reskilling. Mid-level qualifications are expected to increase and the "most wanted" skills are those related to the handling of secondary raw materials, design, and manufacturing of new circular products as well as to working with new, more complex equipment. Integrating the principles of circularity directly into education and training curricula is desirable to prepare grounds for acquiring appropriate knowledge, competences, and attitudes as well as, at a later stage, form the basis for reskilling and/or upskilling. Collective bargaining, including by way of collective negotiations, agreements or other mechanisms are useful tools in this respect, in line with diverse national industrial relations systems.

In conclusion, **structural changes resulting from green transition are complex and impact individual sectors and/or regions differently**. The timeline and depth of these changes also vary significantly depending on each sector and concrete jobs. Regions will be affected differently depending on how diverse their economy is: those with a more traditional industrial base will be impacted more than the ones with a modern and/or "environmentally friendly" economy. Additionally, the "domino effect" of green transition touches upon jobs/tasks not directly linked with environment. Given the dynamic nature of this process and the limited data available, it is important to ensure regular "pulse-taking" in sector/regional/local contexts to anticipate economic changes and their impact on labour market, employment trends and demand for skills. On top of the necessary improved data intelligence, social partners are very well placed to inform policy debates to design tailored support measures for enterprises and workers and facilitate their timely implementation.

Supporting job creation as part of green transitions

According to the analysis and forecasts, green transition has a strong potential for job creation, provided all stakeholders get involved and take their responsibilities seriously. There is an urgent need for concrete and well-coordinated actions at EU, national and regional levels. The change process is likely to accelerate between 2030 and 2050 as the cuts in greenhouse gas (GHG) emissions will be required at a level twice as deep as the ones Europe is likely to achieve between 1990 and 2030[9]. And the challenge of adapting employment to greening will be made more compelling as Europe will need at the same time to manage the consequences of ageing, with a growing share of dependent older people in our societies. According to Eurostat projections, the number of people aged 65 years or more will reach 129.8 million by 2050 in the EU, an expected increase of 43.4% from 90.5 million in 2019. Given these projections it is important to formulate relevant policies and design appropriate measures well from the very start as we need to prepare good strategic frameworks for initiatives that will be useful and adaptable in the long term, as they are likely to become even more important in the next 10-15 years.

In line with this, in a recent report, The Adecco Group rightly indicates that governments, employers and individuals have an important role to play[10].

[9] ETUI (2019), Towards a just transition: coal, cars and the world of work, author: B. Galgoczi (ed.), p. 7.
[10] The Adecco Group (2021), Skills for the Green Economy, pp. 19-21.

Governments need to take into account that changes are likely to occur in different locations at different times. Job losses may be immediate, while job creation will take more time. It is important to note that jobs will not appear in the same industries that have experienced job losses. In this situation the right approach is to **give workers opportunities to find a new job**. Restructuring and modernisation processes will become widespread. In order to accompany these processes, it is crucial to maintain **labour market mobility and flexibility** as well as support effective job-to-job transitions to sustainable employment/professional activity. Labour mobility has a special importance in the current context as green transition will lead to decreasing certain industries, for example related to extraction and processing of fossil, which tend to be concentrated in specific regions. As a result, local labour markets may experience a sudden increase of unemployment, while a majority of job seekers will have the same, often obsolete, skills profile. Governments should support employers in job creation, adapting business models to the changing environment and promote entrepreneurship. To this effect, national governments have the main responsibility to elaborate **comprehensive national development plans and targeted policies**. The initiatives of the Czech government are good examples of such a targeted approach.

Czech Republic: Environmental education: a key component of the strategy for education policy 2030+

In August 2020 the Czech government adopted a new framework of the employment policy 2030. In 2030 the Czech labour market based on a cooperative and effective public employment service should be able to react on global trends and ensure both a decent work for the citizens and sufficient labour force matching needs of the economy.

This new Framework for Employment is **closely linked with the new Strategy for education policy 2030+**. One of the key objectives is to change the content of education and equip people with new competences (skills, knowledge, attitudes) linked to a socially **and environmentally responsible** behaviour and to adapt them to new trends connected with the digital and **green transitions**.

The purpose of environmental education is to encourage the population to act and think in line with the sustainable development principles, to be aware of their responsibility for the maintenance of the quality of environment and to respect life in all its forms. The principal task of education is systemic work with the young generation (including pre-school children) so they adopt values and patterns of behaviour required for environmental protection and management. The tasks of awareness raising are largely informative and focus on the adult population and the public in general.

Both strategic documents on employment and education are framed by the strategic framework "**Czech Republic 2030**" indicating the direction the development of the country and society should take in the decades to come, and pointing it towards sustainable development in terms of social, economic and environmental aspects. The social partners were consulted and involved in the process.

Accurate data and forecasts are crucial to effectively implement national strategies for job creation as well as upskilling/reskilling initiatives. The two French observatories OPMQ and *Onemev* are interesting examples of approaches to forecasting jobs and occupations. OPMQ are sectoral observatories that enable social partners to define appropriate training policies. Sectoral observatories of trades and qualifications (OPMQ) have served as a blueprint to set up *Onemev*, a government-run observatory for jobs and occupations in the context of greening the economy.

France: OPMQ and *Onemev* – the French approach for forecasting jobs and occupations

▶ The sectoral observatories of trades and qualifications (OPMQ)

Within the professional branches, the Prospective Observatory of Trades and Qualifications produces information enabling the social partners to define their training policies.
The National Joint Employment Commission (CPNE) very often ensures the steering committee of the branch observatory, defines its orientations and/or its work programme in order to allow each professional branch to adapt its training policy to the basis of quantitative and qualitative studies on the trades and on the training offer.
The statistical data of the observatory provides a global panorama of changes in employment and professions which, associated with the detailed knowledge of the social partners of their branch, allows questions to emerge for further study. These issues are at the crossroads of feedback from the field carried by the social partners and the national vision of the observatory.
Studies on the development of occupations and skills are all resources that the social partners use directly to initiate the revision of branch classifications.
The study by an OPMQ on the diplomas held by the different categories of personnel in its branch for instance prompted the revision of its classification system. Likewise, the job descriptions developed within an observatory and their comparison with those of related branches fuel inter-branch reflections on retraining, attractiveness or even the opportunity to create inter-branch certifications.
Business studies, focused on identifying skills needs and emerging activities, make it possible to build training policies.
The main subjects identified are: inter- and intra-branch bridges, mobility, pathways, etc.; skills and identification of needs in this area; professions (mapping, development, recruitment needs, attractiveness, etc.); CQP (*certificat de qualification profesionnelle*) and certification; major digital and ecological transitions. These subjects illustrate the willingness and ability of the OPMQs to feed the challenges of mobility and professional development at scale with regard to the more global impacts of technological developments, digitalisation of the economy and the ecological transition.

▶ French National Observatory for Jobs and Occupations of the Green Economy (*Onemev*)

Onemev was established in 2010 with an objective to analyse changes in employment related to green transition. The observatory provides forecast and statistics on changing jobs/tasks and education needs due to greening of the economy; regional context is always taken into account. *Onemev* also identifies required competences and appropriate reskilling/upskilling programmes to meet employers' needs and accompany individuals impacted by these changes.

The sbservatory members include representatives from the Ministry of Ecology Environment (*le Commissariat général au développement durable*), the National Statistics Office (*Insee*), public employment services, research units and institutions (for example *Dares* or *Céreq*), a few public institutions in charge of adult education as well as representatives of the regional observatories on employment and training (for example *Carif-Oref).*

Another important area for governmental activity is to **encourage employers to anticipate changes** and put in place the necessary incentives to prepare their businesses and workers accordingly. A favourable framework should also be created **to encourage investment in employee development**. Training, upskilling/reskilling and development expenses should not be considered as a cost, they should be made amortisable as any investment the company makes. Human capital development strategies and plans to re- and upskill should become an integral part of the national/regional strategies towards achieving the Paris Agreement.

OSKA: the Estonian skills anticipation practice[11]

The OSKA system is designed to analyse and forecast (over a 5-10 year horizon) the labour market needs, both in quantitative (how many employees are needed in key occupations sector-wise) and qualitative terms (what are the expected competence profiles in key occupations), and to recommend necessary adjustments in the education and training offer, active labour market policies etc. The OSKA system is an amendment to the Estonian occupational qualifications system. OSKA combines statistics and registry data with expert knowledge.

The policy instrument comprehensively addresses the issue of better matching the needs of the labour market with the provided education and training. The policy goal is to improve and tighten the linkages between the world of learning and the quantitative and qualitative needs and expectations of the labour market. The rationale for the intervention is the creation and implementation of a systematic process to engage all relevant stakeholders, so that they can provide input into skills anticipation and give recommendations to upgrade competency standards, provide relevant training and courses, also retraining possibilities. The general aim of OSKA is to teach and learn about the right skills relevant in the society. The OSKA system creates a cooperation platform, which enables the exchange of information between employers and training providers and educational institutions to comprehensively analyse the growth potential of different economic sectors and their needs, and to facilitate the planning of education provision at different levels of education and by types of school, as well as in the fields of retraining and in-service training.

Effective job-to-job transitions through tailored active labour market policies (ALMPs) are crucial to ensure labour markets can absorb changes. To this objective, actors providing ALMPs should become proactive and public and private employment services should better reach out to the inactive and unemployed as per their core mission to activate jobseekers. They should also propose solutions to people in employment whose jobs are expected to disappear or transform. Inclusive social protection systems also have a role to play. They should provide the security and flexibility needed to move to growing sectors and offer social protection to all diverse forms of work so much needed during transitions and trying out new professional options.

Proactivity should also characterise **employers' approach**. They need to analyse the current situation of their businesses and their future perspectives, taking into account the limited means and need for advice and support of SMEs. The analysis should embrace direct (i.e. use of new materials or technologies) and indirect effects of green transition (i.e. the need to limit energy consumption). Detailed analysis of the organisational structure and work organisation should be conducted. The multi-expert team including HR people, "core" business people and sector experts is the best

[11] More informtiuon can be found here

placed to conduct such a study to grasp the magnitude of changes and their consequences for work organisation. This would also provide information on disappearing and emerging jobs as well as likely fluctuations in employment/expected employment levels. If possible, such an analysis could also include suppliers and subcontractors.

In the case of declining sectors/disappearing jobs, employers should have access to measures supporting effective job-to-job transitions. One example of a very effective measure supporting job-to-job transitions that accompany structural change is the French social partners measure, TRANSCO.

France: TRANSCO – the French scheme to promote anticipation of employment transitions

TRANSCO is a scheme designed by social partners with a view to facilitating effective job-to-job transitions through strategic professional reskilling. The scheme complements various tools aimed at supporting economic changes faced by enterprises and their employees. TRANSCO is implemented in partnership consisting of the Ministry of Labour, social partners, local administration and training institutions and making use of already existing (or to be created) multistakeholder "Territorial support platforms for professional transitions".

The objective of the scheme is to help those workers whose jobs are threatened to define sustainable future employment and train them accordingly. Both the current and the future employers are involved in this transition process. The basic condition for TRANSCO is concluding job and career management agreement (*accord de gestion des emplois et des parcours professionnels*) that identifies jobs at risk. There are some eligibility conditions for employees to be able to participate in TRANSCO, for example the type of employment contract, seniority or have employers' authorisation for the professional transition leave.

Retraining under the TRANSCO scheme is rather a medium- to long-term initiative. It is important to note that employees can test one or more potential job(s) through supervised professional immersion programme. During training, the employment contract of a trainee is suspended. His/her remuneration as well as social security contributions are paid by his/her employer and reimbursed by the relevant body (*Transitions Pro*). While the training is concluded, the employee is looking for a new job on the local labour market/the same area. He can also return to his employer to be transferred to a new job. TRANSCO is funded via the National Employment-Training Fund (*Fonds National pour l'Emploi-Formation/FNE-Formation*) and the available funds were estimated at up to €500 million in 2021. There are different conditions for reimbursement of remuneration and training cost depending on the size of the company[12].

Individuals, employees and the self-employed alike are responsible **for maintaining their employability** by taking ownership of their own skillset and upskill/reskill on a regular basis. Skills increasingly have an "expiration date", and only regular "career review" and participation in lifelong learning, accompanied by career advice and guidance, ensures that the individual's skillset corresponds to the labour market needs. Entrepreneurship also needs to be encouraged in education and in society as it has potential to create opportunities and jobs for all those who desire to create their own business activity based on a particular project and/or skill. **Entrepreneurship** is especially interesting in the context of green transition, when many new jobs/services emerge. Self-employment

[12] The conditions are the following: reimbursement of 100% of training costs for all enterprises and reimbursement of the remuneration costs (100% for enterprises with up to 300 employees, 75% of remuneration for enterprises employing between 300 and 999 employees and 40% for enterprises employing more than 1000 employees).

can be an interesting option to test new professional options, for example in the field of after-sales service or maintenance and repair; in these areas job opportunities are expected to increase. Moving between different statuses on the labour market and different contractual arrangements should be seamless, while social protection systems should follow these developments to ensure the acquired rights are preserved and satisfactory options are there for people to continue contributing to their social protection in a new job or activity.

It is important to note that the **potential for job creation varies among different sectors**. There is a significant potential for job creation in such sectors as renewable energy, digital technologies, waste management, recycling or eco-tourism. In these sectors, new jobs have already started to appear and will continue appearing[13]. Some sectors, for example the automotive or energy industry, are less "predictable". The potential for job creation in these sectors is linked with green and digital transformation, which is a condition of job creation, for example in factories producing electric cars or batteries. Finally, there is a group of sectors with a potential for job creation that is conditioned by the development of these sectors themselves. This potential is also influenced by changes in consumer behaviours and new consumer needs/expectations. For example, the demand for organic agriculture or sustainable seafood will be shaped by the citizens' uptake of more environmentally friendly nutrition options and a growing awareness in society of environmental impacts of meat, fish and, more generally, food consumption. Alike, the potential for job creation in repair/reuse-related businesses will depend on citizens adopting more sustainable consumption patterns.

It is important to note that the **change in consumer behaviour and lifestyles in general will be brought by appropriate education and awareness-raising campaigns**, which require a long-term approach. In this context we welcome the EU public consultation on the proposal for a Council recommendation on education for environmental sustainability for learners of all ages and at all levels of education, planned for the end of 2021. This is the very first attempt to support Member States to develop stronger policies on education for environmental sustainability, climate education, biodiversity etc., to exchange good practices and strengthen cooperation[14].

Finland: sustainable development included in the core curriculum for basic education[15]

The national core curriculum for basic education has been reformed. The work at the national level was led by the Finnish National Board of Education in an open process involving all relevant stakeholders. This is an important document as it defines the objectives of the learning environment and principles for guidance, support and assessment. The national core curriculum serves as a basis to draw up local curricula and annual plans by public and private education providers as well as municipalities.

The curricular reform reflects the global changes and their effect on children and young people, education and learning practice as well as their impact on required skills. The school is supposed to take a proactive role in defining the future and contribute to creating it. Pupils, among others, are guided towards a sustainable way of life and understanding the importance of sustainable development. The knowledge, skills, values, attitudes and motivation crucial for this approach are the

[13]See, for example OECD (2020), *Labour market consequences of a transition to a circular economy*, Environment Working Paper Nr 162, pp. 18-21; Rutkowska M., Sulich A. (2020), Green Jobs on the background of Industry 4.0, Procedia Computer Science 176, p. 1237 (the article can be found here).
[14]More on education and training for green transition can be found below under *Adapting skills training offer to changing labour market needs due to greening.*
[15]More information can be found here.

leitmotiv of the curriculum. The new curriculum changes tradition school into learning community, which takes responsibility for the environment and focuses on sustainable future.

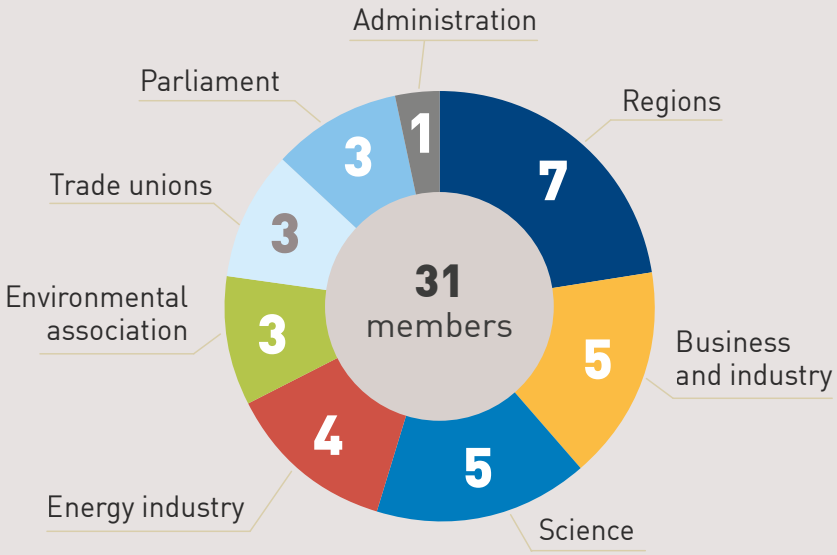
The interdisciplinary approach in learning is promoted to help pupils to understand the relationship and interdependencies between different learning contents as well as to enable them to combine the knowledge and skills provided by different subjects to form meaningful syntheses. The interdisciplinary approach requires transversal competencies; one of them is participation, involvement and building sustainable future. It is worth noting that the municipalities and schools have the freedom to plan the modules according to the local needs and interests.

In order to well prepare the process of such profound changes some countries have decided to set up **multi-stakeholder cooperation**. The German Commission on Growth, Structural Change and Employment and the French ecological transition contracts programme (ETCs) are interesting examples of such cooperation.

- Germany: the Commission on Growth, Structural Change and Employment[16]

As an important building block for shaping structural change in the lignite regions, the Federal Government appointed the Commission «Growth, Structural Change and Employment» with high-ranking experts on 6 June 2018. The Commission had 4 chairs and 27 members, among them environmental associations, trade unions and business associations (employers and industry), energy and environment experts, representatives from the energy sector, regional and local officials and members of the coalition parties. The Commission was supported by the Federal Ministry of Economy and Energy as well as the State Secretaries Committee set up for this purpose. The figure below presents the Commission's composition.

Figure 3. The Commission on Growth, Structural Change and Employment – Germany (2018)



Source: P. LItz, Germany's long goodbye from coal [in:] ETUI (2019), Towards a just transition: coal, cars and the world of work, Galgoczi, B. (ed.), p. 69

[16] Based on P. LItz, *Germany's long goodbye from coal* [in:] ETUI (2019), Towards a just transition: coal, cars and the world of work, Galgoczi, B. (ed.), pp. 69-76.

The aim of the Commission was to establish a broad social consensus on how to shape the structural change in Germany based on energy and climate policy. The mandate of the Commission included, among others, developing a concrete perspective for new, future-proof jobs in the affected regions. It was to be done in cooperation between the Federal Government, the Länder, local authorities and economic actors. The Commission was also charged with proposing a set of instruments that combined economic development, structural change, social compatibility, social cohesion and climate mitigation. Examining opportunities of necessary investments in the regions and economic sectors affected by structural change through existing federal and EU funding was also in the remit of the Commission. The final report from the Commission's proceedings was submitted to the Federal Government in January 2019.

One of the Commission's recommendations was to soften potential negative effects of green transition on workers and regions caused by a phase-out of coal-fired power plants by 2038. A package of support and compensation measures was proposed to mitigate the negative effect of phasing-out coal-fired power plants. It was important to ensure that the phasing out process is socially acceptable and supports the structural change in the regions. Extensive labour market policy measures have been proposed along with training measures and targeted re-employment, within and outside lignite companies. For workers over 58 years old, early retirement is foreseen with the assistance of a compensation fund to avoid any financial losses. Another potentially affected group are energy consumers: they are to be protected against a possible increase in retail prices by lowering transmission grid charges. Plant operators will be affected by early closure of capacities and are to be compensated for this by means of a call for tenders for closure.

BDA has always emphasised that the reduction and cessation of coal-fired power plants, which is necessary for successful climate protection, can only succeed and set an example if some important conditions are fulfilled. They include: preservation and creation of new, sustainable jobs in the affected regions that are covered by collective agreements, guaranteeing secure and affordable supply of electricity and heat as well as ensuring further development of the coalfields into regions that remain attractive to live, work and visit. The report of the Commission provided concrete policy recommendations to the Federal Government. Some of these recommendations were translated into political measures.

- France: the ecological transition contracts programme (ECTs)[17]

The ecological transition contracts (ETCs) programme was created in 2018 to accelerate the transition towards the low-carbon economy at regional level and make it more attractive. The ETCs are binding agreements, drafted for and by regional authorities and companies, which are committed to implementing the economic and social transition to a low-carbon economy. They are based on local low-carbon development initiatives and take into account specificities of the area for which they are developed. These initiatives may be linked to developing renewable energies, realising energy efficiency projects or implementing circular energy loops. Examples of the main measures under ETCs are presented in the table below.

[17] Based on Jakubowski, A., Phasing out coal in the French energy sector [in:] ETUI (2019), Towards a just transition: coal, cars and the world of work, Galgoczi, B. (ed.), pp. 98-103.

Table 2. Main measures under ETC framework

Field	Type of measures - examples
Renewable energies	Use if industrial buildings for the production of renewable energy (e.g. the large-scale deployment of solar panels on the roofs buildings) and the creation of economic activity around the operation/maintenance of these panels. Construction of hydrogen production units coupled with electricity production - training/retraining programmes for employees whose activity is adversely affected by the transition. Widespread development of renewable energies in an area, correlated with the establishment of energy production cooperatives.
Energy efficiency	Implementation within an industry of an energy use optimisation plan - training of employees. Energy efficiency renovation plan targeting public administration buildings (or social housing) - creation of local SMEs and the hiring of long-term unemployed people.
Circular Economy	Development of activities linked to recycling and re-use (for example of construction materials). Collection and storage of unsold food products - development of a canning industry.
Construction/ urbanism	Creation of virtuous economic zones and:or areas. Building renovation programmes

Source: French Ministry of the Ecological Transition.

Environmental gains (for example green energy produced, carbon emissions avoided) are defined in the ETCs. The ETCs also include information on specific actions and investment projects, define the role of different stakeholders and a monitoring procedure.

ETCs are based on a voluntary approach and primarily designed for public bodies and companies; however, involvement of as many local stakeholders as possible is desirable. To support potential partnerships, the French government has set up a country-wide communication plan targeting different local stakeholders.

ETCs include tools and measures to address social aspects of the transition. An important element is territorial analysis to identify jobs that may be at risk, likely new jobs and skills profiles. The analysis is conducted at the local level, with participation of companies, and may lead to elaborating action plans. Financing is also available through the EDEC system (a specific fund for employment and skills management plans). Another interesting tool to mitigate social aspects of the transition is provision of free human resources consulting services for businesses, for example schemes encouraging intra-sectoral mobility, facilitating exchanges of employees between companies and supporting

geographical mobility. Additionally, support for training is also available, at the company level or at the national level (through the National Employment Fund/FNE and the French National Recovery Plan since September 2020) as well as adaptation of local educational and vocational systems or development of the certification system relevant for skills required by the green transition.

Last but not least, **public employment services (PES) have an important role to play to raise awareness of the employment consequences of various options of greening policies, and adapt to the adopted greening policies in a way that is employment-friendly**. According to the European PES Network the main challenges for PES are the following[18]:

- grasping the structural changes associated with the green transition;
- identifying skills needs as well as transferability of skills across sectors/occupations;
- mitigating negative employment effects especially for sectors/areas with high risk of skills mismatches;
- designing tailored solutions for older workers who are overrepresented in the polluting industries and concentrated in certain geographical locations;
- ensuring green transition is embraced by all, also women who are under represented in new sustainable jobs as well as regarding advanced digital and technical skills;
- endowing low-skilled workers with technical and generic skills relevant for the green economy;
- providing vocational guidance for adults, with a special support for SMEs.

In conclusion, any structural changes, including green transition, take place in a real workplace and concern real people, employers and workers. It also impacts local communities. It is natural that there are differences of opinions on transition processes, their scope and management. Involving different stakeholders enables designing effective transition strategies, tailored programmes to cushion the social impact of transition and support for businesses undergoing changes. There are different good practices depending on the region, sector and company, however there are some elements relevant for a wide range of contexts:

- green transition is a global paradigm shift, however its implementation will be local – it would be advisable to set up, where they do not exist already, regional fora to discuss green transition and its implications for labour market and skills; this is especially important in the case of regions with heavy concentration of traditional industrial and energy production as these regions will be in need of mitigation strategies, developing/creating replacement industries and jobs as well as upskilling/reskilling options and support for labour mobility, if appropriate;

- workers' commitment to change is a prerequisite of a smooth transition – open and genuine social dialogue based on mutual trust is crucial for creating workers' engagement and understanding of the transition; a specific and action-oriented social dialogue, in particular at company or sectoral level, is most effective to create workers' commitment; moreover, worker involvement can help identify innovative solutions to support greening and employment objectives, stemming from the current work reality;

- 95% of job-related training in the EU is funded by employers, which demonstrates the importance that employers place on helping to provide their workers with the training that will enable them to maintain and update their skills set while helping companies to be productive and innovative. Increasingly such training opportunities are likely to involve skills associated with the green and digital transitions. In parallel, it is important that workers are sufficiently motivated to take up lifelong learning opportunities.

[18] Based on presentation of Nicola Duell, PES Network Management Board Meeting, 24 June 2021.

Adapting skills training offer to changing labour market needs due to greening

All the current climate-related actions, such as progressing to a low-carbon economy by reducing CO_2 emissions, phasing out fossil fuels, implementing climate-friendly business practices, accelerating digitalisation and automation or introducing new work models, require individuals with appropriate skills and mindset. It is estimated that without appropriate upskilling and reskilling initiatives 71 million jobs can disappear from the global economy as a result of its move towards becoming circular. On the other hand, appropriate actions in the area of employee development could reverse the process. For example, the job creation in the energy sector itself is estimated at a net growth of 18 million jobs[19].

Already in 2010, BusinessEurope was indicating that the major restructuring deriving from the transition towards a low-carbon economy would lead to job destruction and creation. But above all, it will mean that new skills will be required within one and the same occupation. The mechanics at car manufacturing companies will still be building engines. But the engines will be different, as will the skills demand for the job. Energy conservation programmes in the chemical and pharmaceutical industries will have consequences for how employees carry out their work, ranging from how technicians handle laboratory emissions to how employees in factories cope with new production processes. Yet another example is the service sector, where new skills will be necessary for the sale, use and installation of new technologies, etc. The greening of jobs clearly affects the skills required among a broad range of sectors, not just the so-called "green sectors"[20]. Additionally, change in the demand for skills will apply to jobs of all levels[21].

Because of the diverse needs of different sectors, the skills solutions to greening objectives will to a large extent need to be devised sector by sector. European policy debates on skills for greening need to take into account the useful work done by UNESCO's international centre for vocational and technical education and training UNEVOC[22].

In the energy sector, key environmental issues are reducing greenhouse gas emissions, land use changes, pollution of air, soil, and water during the construction and operation phases of energy projects; waste production is among the key environmental challenges. In this sector, important priorities are to train workers to develop their technical knowledge for application of energy-efficiency measures and for application of renewable energy technologies; as well as upgrade their skills for emergent energy markets.

In the manufacturing sector, key environmental issues are ways of obtaining raw materials and resources; resource and waste management; product design with low value. A trained workforce is needed with the knowledge and skills required to enforce the highest environmental standards and practices throughout the value chain, including: raw material collection; pre-processing; production; distribution; trade (marketing); sustainable crafts/business and product development.

In the construction sector, key environmental issues are reducing greenhouse gas emissions; high consumption of raw materials and resource depletion; land use changes; waste production and pollution. A trained workforce is needed with the knowledge and skills required to enforce the highest environmental standards and practices throughout the sustainable construction process, including: sustainable building design; sustainable building technologies and construction materials; water supply and sanitation; decentralised electricity generation and the integration of renewable energy generation methods into buildings; energy efficiency in buildings; solid waste treatment; reuse of materials and controlled demolitions.

[19] ILO (2019), Skills for a Greener Future. *A Global View*, Geneva, p.23.
[20] BusinessEurope (2010), *Greening the economy - taking on employment and skills challenges*, position paper, Brussels, p. 4.
[21] ICF GHK (2014), *Skills needs in greening economies*, final report of the joint European Social Partners' project, Brussels.
[22] See: UNESCO (2017), Greening Technical and Vocational Education and Training - A practical guide for institutions, (https://unevoc.unesco.org/up/gtg.pdf)

In the agricultural sector, key environmental issues are inefficient energy consumption; land use change and expansion of agricultural frontiers; lack of technical, financial and political instruments so that emission reductions targets are reached; pollution of the environment partially caused by fertilisers as well as an inefficient water use. Trained individuals in the field of agricultural production should provide technical knowledge for new practices, such as organic farming and agroforestry; technical knowledge for the application of energy-efficient technologies in the agriculture sector; efficient use of water and irrigation technologies; use of information and communication technology (ICT) in agriculture, including satellite and pression farming technologies.

Once the priorities for skills training to support greening objectives are clear, it is important not only to provide for appropriate upskilling/reskilling opportunities, but also to **raise awareness and stimulate worker interest and motivation to engage in the necessary skills upgrade**. Trainers, mentors, managers have an important role at various levels in society and in companies in explaining change processes, its consequences for skills and jobs, and the reasons why some solutions towards upskilling or reskilling the workforce have been preferred. The table below summarises responsibilities of governments, employers and individuals as regards skills and training.

Table 3. Skills and training: roles of various stakeholders

Type of stakeholder	Role
Government	• Incentivise reskilling of workforce across the economy by removing accounting obstacles and making workforce investment amortisable. Provide a framework for skills development for all individuals, for example through relevant training funds. • Partner with experts across the public and private sector, as well as the training industry, recognising the magnitude of the challenge at hand. In doing so, ensure that experts in skilling and career transitioning are included in the design and implementation of the solutions.
Employers	• Make sustainable employment and skills investment their brand advantage to attract the right talent and retain the right skills for future success. • Make use of apprenticeships, vocational education and training, and other forms of work-based learning to build their own talent pool.
Individuals	• Embrace the need for lifelong learning and flexibility as permanent features of the modern world of work. • Conduct regular assessment - in cooperation with employer - of changes in the performed job/tasks and the required skills. • Be willing and motivated to reskill and upskill.

Source: own compilation based on The Adecco Group (2021), Skills for the Green Economy, pp.19-21.

CONCLUSIONS

In the years to come, a key challenge is to ensure that the green transition succeeds in generating a new growth model that has a lower carbon footprint than at present. Labour markets across the EU undergo profound changes as the green transition takes shape. Restructuring processes in the post-Covid recovery as well as the green and digital transitions are shaping modern labour markets and define skills requirements. The green and digital transitions are interlinked and mutually reinforcing. **The challenge is to ensure a positive impact of greening policies on employment, and that better performing education and training systems and improved employment policies actually support the greening transition by ensuring a good match between skills and jobs throughout the green transition**. It is crucial to ensure that the green and social dimensions of Europe are creating positive synergies and contribute to successful enterprises, sustainable employment opportunities for workers and well-being of all citizens.

Social partners have an important role in this process. They can support the green transition by contributing to developing education and training curricula and/or improving training provision, in line with changing labour market needs and diverse national industrial relations practices. Social partners can also design effective solutions as part of their collective bargaining at the sectoral/regional and/or company level or other mechanisms in line with diverse national industrial relations systems.

Lastly, it is very important to warn against a narrow focus on "green jobs" in renewables and/or other low CO_2 emitting sectors, which would overlook the fact that jobs, most notably across industrial sectors and occupations, will undergo a deep transformation to adapt to greener production processes and methods. The situation of services sectors also needs to be accounted for, even though the green transition may have less impact on the way services are delivered, in particular personal services. For some occupations the change is immediate, for some it will be a longer-term evolution which will take place gradually. Policy-makers should avoid classifying jobs as "green (good) jobs" and "not green (bad) jobs". This polarisation is misleading and can have very negative policy implications. Existing jobs and the ones that will be created in the future need to be sustainable, which will essentially depend on their economic viability as the green transition will unfold in coming years. The truth is that the green transition will succeed if it is economically viable.

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