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Fair Transition Towards Climate Neutrality

Thematic Review 2023

Synthesis

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Thematic Review 2023: Fair Transition Towards Climate Neutrality

Synthesis Report

European Centre of Expertise (ECE) in the field of labour law, employment and labour market policies

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Key messages

The aim of this Thematic Review is to highlight examples of policies, research and social dialogue practices in EU Member States to ensure a fair green transition. The report examines existing research on the impact of the green transition on the economy to date and also looks at forecasts on future impact.

For the majority of Member States slight or more pronounced positive employment effects are predicted in forecasts and foresight exercises due to decarbonisation investments and the fossil fuel phase out.

Certain sectors, such as construction, manufacturing, green/renewable energy and waste disposal and recycling services, are frequently identified as being positively affected by the green transition. In other sectors, such as the tourism and transport, both positive and negative effects come into play. Regarding job losses and negative employment effects of the green transition, fossil fuel powered energy production will be most affected, as well as energy intensive sectors, agriculture, forestry and fishing.

At the same time, the green transition creates several new occupations (e.g., solar panel installers) and mostly changes the tasks required in existing occupations.

In a number of Member States, research is being undertaken to assess skills levels and skills gaps related to "green jobs". The skills levels of those employed in "green jobs" varies quite significantly by sector and occupation. The report notes that while a broad definition of green jobs at EU level has been proposed by Cedefop and a list of "green skills" can be found in the European Classification of Occupations, Skills, and Competences (ESCO), in practice, most Member States use multiple definitions, alongside international terminology.

There also appears to be an impact on gender equality in the labour market, as men might benefit more from the growth in jobs relevant to the green transition, with a range of Member States reporting higher shares of men in such jobs than women. This is partly because jobs relevant to the transition are often blue collar or STEM jobs, where women are underrepresented.

Job losses in decarbonising or declining sectors with a high carbon footprint could lead to risk of poverty, long-term unemployment and repeated unemployment – especially for low-skilled workers. Therefore, supporting people who are exposed to job losses in their reskilling and job to job transitions is crucial. The possible physical and mental health effects of climate change also need to be considered.

The report also examines policy frameworks supporting a fair green transition. At a strategic level, this thematic review allowed to draw a distinction between those Member States where a dedicated labour market policy formulated to specifically address the challenges of a fair green transition and those Member States where the challenges are tackled by relying on the pre-existing general policy framework. In the first, **smaller group, some Member States have recently developed specific labour market strategic frameworks** addressing a fair green transition. **A much larger group of Member States tend to rely on general labour market policy frameworks and instruments** to also respond to the challenges of a fair green transition, where general active labour market policies (ALMPs) are also applied to support a fair green transition.

Currently, **there is a stronger focus on policy measures aimed at upskilling and reskilling of workers**. A fair green transition requires policy measures in Member States to increase **effective access and participation of vulnerable and underrepresented people in the labour market**, in jobs and occupations that contribute to climate, energy and environmental objectives.

In terms of addressing the needs of the most vulnerable groups, sectors and territories, this review identified that **most Member States provide support towards ensuring a fair green transition via existing general policy frameworks.** This is ensured through applying general restructuring policy, ALMP and upskilling mechanisms, without providing a dedicated policy response targeting the most vulnerable groups in the fair green transition processes.

The second aspect is how these policies **address the needs of the groups, sectors and territories mostly affected by a fair green transition** (e.g., workers in fossil fuel intense industries). In this context, the EU's Just Transition Fund, implemented in all 27 Member States, appears to have provided momentum to develop policies for the most affected sectors and territories. **The territorial approach funded by the Just Transition Fund have also been important to promote multi-faceted and multi-dimensional policy responses**, combining different policy approaches to upskilling, business support, economic redevelopment and energy diversification. Guidance, information, support for job search and training activities are envisaged or already provided to affected workers and other unemployed people in the territories and sectors concerned.

In most Member States, this exercise has shown that the adaptation of the world of work to the adverse impacts of climate change and environmental degradation have been mostly addressed through applying the existing occupational safety and health (OSH) policies and practices at national, sectoral and company level, implementing EU legislation to protect workers' safety and health at work. The existing EU OSH legislation covers aspects related to temperature, heat stress and extreme weather at work.

In terms of **social dialogue agreements and practices for a fair green transition**, the country articles identified the following:

- **At national level**, some limited social dialogue around addressing fair green transition issues exists in Member States where strong institutional frameworks – such as tripartite councils - are in place and used in practice. At regional level, social dialogue has been promoted in regions particularly affected by the transition to build public support and ensure a fair transition.
- **At sectoral level**, social dialogue on a fair green transition, in the cases reported, at least partly fulfils the EU quality framework for anticipating and managing structural change, while falling short on certain dimensions, such as multi-annual plans and the joint exploration of options in cases of restructuring. Sectoral social dialogue and sectoral partnerships are concentrated in those sectors where trade unions are traditionally strong and where a social dialogue culture has existed for some time, as in the coal mining industry.
- **At company level**, only a small number of company-level collective agreements have been identified in the Member States.

1 Introduction

The aim of this ECE Thematic Review is to highlight examples of research, policies and social dialogue practices in European Union Member States to ensure a fair green transition. This synthesis report is based on analyses of available EU-level data and qualitative information collected from unpublished country articles for each Member State, prepared by independent experts from the ECE pool of experts.

The **European Green Deal** ("the Green Deal") sets out the EU's strategy to fight climate change and environmental degradation and to transform the EU into a sustainable, fair and prosperous society. Fairness and solidarity are integral to the Green Deal, which emphasises that **no person and no place should be left behind** in the green transition, paying particular attention to the regions, industries, workers, households, and consumers that face the greatest challenges. **Employment and social policies** - support for upskilling and reskilling, skills intelligence, job search directed to green sectors, labour market access to those out of the labour market as well as transitions of those already in the labour market to green jobs or sectors, adequate social protection and income support - are key to ensuring a fair transition. In this context, the **Just Transition Mechanism (JTM)** provides targeted support to help mobilise EUR 55 billion between 2021 and 2027 in the most affected regions of the EU to alleviate the socio-economic impact of the transition, complementing related actions under the cohesion policy funds. The European Commission's proposal to establish a Social Climate Fund[1] aims to provide funding to Member States to support measures and investments in increased energy efficiency that need to principally benefit vulnerable households, micro-enterprises or transport users.

The green transition also offers **significant opportunities for job creation; at the same time labour and skills shortages** risk creating obstacles to job creation and transitions, not only of those already in the labour market, but also those currently outside the labour market. Estimates show that the transition to climate goals set out by the European Green Deal could create an additional 884 000 jobs by 2030 in the EU subject to the right accompanying policies and with regional differences.[2] Moreover, the demand for workforce due to the greening of economic activity in the EU is expected to be further expanded as new policies, such as the Green Deal Industrial Plan and the Net Zero Industry Act, are introduced to accelerate the implementation of net-zero ambitions on the ground.[3]

The **quality of "green jobs"** and **equal opportunities** are also key to ensuring a fair transition towards a sustainable and more inclusive economy. Labour market policies for the green transition therefore also need to promote a future-proof and fairer world of work.

In this context, on 16 June 2022, the EU's employment and social affairs ministers unanimously adopted the ***Council Recommendation on ensuring a fair transition towards climate neutrality***. This aims to ensure that the EU's transition towards a climate-neutral economy by 2050 is fair and leaves nobody behind, also in the context of the REPowerEU Plan. **Social dialogue** and a whole-of-society approach at all levels is key to delivering fair transition policies inclusively and effectively. The ***EU Quality Framework for anticipation of change and restructuring*** (COM/2013/0882 final) outlines guidance and good practices for relevant actors, including individual employers and employees, their representatives and national and regional authorities.

Scope and structure of this report

[1] European Commission, COM(2021) 568 final.
[2] European Commission, Staff Working Document (2020) 176 final.
[3] The Net Zero Industry Act could create up to 468 000 additional jobs across manufacturing of all the key net-zero technologies only, and 101 000 additional jobs in the deployment of some of these technologies, see the Employment and Social Developments (ESDE) Report 2023 (European Commission, 2023b)

This synthesis report is based on analyses of available EU-level data and qualitative information collected from unpublished country articles for each EU Member State, prepared by independent experts from the ECE pool of experts. The information contained in the country articles and this report covers the period up to 28 February 2023 when experts completed their country articles. The report is structured as follows: Section 2 discusses **data and evidence on a fair green transition**; Section 3 summarises the **policy measures taken by the Member States** to ensure a fair green transition, in line with the ***Council Recommendation of 16 June 2022 on ensuring a fair transition towards climate neutrality***; Section 4 examines the **role of social dialogue in supporting a fair green transition**.

2 Research and evidence on a fair green transition

This section discusses data on the past effects of the green transition on the economy. It looks at the projected future impacts of the green transition, considering existing estimates of EU-level effects.[4] The section takes stock of available data and estimates by Member State, sector or intra-sector labour transition assessments[5] and explores how the definitions of "green skills" and "green jobs" could be improved.

2.1 State of play on a fair green transition

2.1.1 Concepts and scale of "green jobs" and "green skills"

There is no common definition of "green jobs" available at EU level (OECD 2023a). According to a definition provided by the ILO (2015),[6] "green jobs" are 'jobs that reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable'. The sector and occupational delineation of "green jobs" and "green sectors" is not a straightforward task. Greening of the economy means that activities attached to a "green objective" are increasingly becoming transversal. Based on a literature review, the OECD distinguishes between three approaches to identify "green jobs": (i) top-down approaches that identify sectors or industries that are green and consider that all employment in those sectors or industries is green; (ii) bottom-up approaches by looking at occupations; and (iii) macroeconomic approaches (OECD 2023a). The definition of "green jobs" is then based on the skills or tasks different occupations entail and the extent to which those tasks or skills are green. The occupation-based approaches have mainly used the classifications defined by O*NET used in the US. This database can be used to classify occupations based on the greenness of their related task content and applies a relatively broad definition of "green jobs" within 12 sectors that were deemed to be most affected by decarbonisation. On this ground O*NET classifies any job affected by greening as a green job, while differentiating between "green new and emerging"; "green enhanced skills" and "green increased demand" (Valero et al. 2021). Linked to these major differences in defining "green jobs", the share of "green jobs" in EU Member States varies greatly, between 2% as measured by Eurostat in 2022 and 40% (referring to the period 2006-2016, using a task-based approach) (OECD 2023a). Similarly, a study by the European Public Employment Service (PES) Network has shown a great variety of assessments of "green jobs" by sectors and occupations (see Duell et al. 2021 for an overview).

The ECE country articles prepared as background for this report confirm that no common definition is used, and some Member States use multiple definitions, alongside international terminology. This makes it difficult to compare the concepts and the scale of "green jobs" and/or "green skills" across Member States.

In the vast majority of Member States there is no national definition of "green jobs". Table 1 presents commonly used concepts for those Member States in which relevant insights were identified in country articles. Mainly a mix of economy-wide assessment, sector-based approaches and task-based approaches can be observed.

[4] European Commission (2021): The future of jobs is green, Publications Office of the European Union, Luxembourg.
[5] See for an example of the automotive industry: https://www.sciencedirect.com/science/article/pii/S0040162522003274
[6] Based on a definition of ILO and UNEP in 2008, green jobs are defined 'as work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity, reduce energy, materials, and water consumption through high efficiency strategies, de-carbonize the economy, and minimize or altogether avoid generation of all forms of waste and pollution. https://unstats.un.org/unsd/envaccounting/londongroup/meeting18/LG18_28.pdf.

Table 1. Examples of national or commonly used concepts of defining "green jobs" or "green skills"

MS	Concept	Scope and scale	Reference framework
CY	The concepts and definitions of "green jobs" and "green skills" are defined in a standard way in reports and analyses of the government, employer associations and trade unions.	No information on the scale, trends and decomposition of the labour force that would primarily benefit from such jobs and skills is available.	National definition, similarly to the way they are defined in general EU policy documents
DK	The Danish definition of the green economy (Danmarks Statistik, 2017)[7] is in line with the one applied by the International Labour Organisation (ILO).	Broad definition. Work in agriculture, industry, services and administration that contributes to preserving or restoring the quality of the environment (ILO, 2011:4). From 2012 to 2017, the proportion of industry employees who produce green goods and services had increased by two percentage points – from almost 11% to almost 13% (Arbejderbevægelsens Erhvervsråd, 2020a).	ILO
FR	The identification and the measurement of the labour market situation in relation to the green economy relies mainly on a specific definition that distinguishes between *green* jobs and *greening* jobs. *Green* jobs are jobs whose purpose and/or skills deployed contribute to measuring, preventing, controlling and correcting negative impacts and damage to the environment. *Greening* jobs are jobs whose purpose is not environmental, but which integrate new "skill sets" to take into account the environmental dimension of jobs (*gestes métiers*) in a significant and quantifiable way.	Margontier (2021) indicates that between 2013 and 2018 *green* jobs decreased by 4.5% and *greening* jobs increased by 0.7%.	National definition
PL	The official definition of "green jobs" in **Poland** concerns the rules for applying the Labour Fund reserve funds carried out by regional and local labour offices (Public Employment Services) (Ministry of Development, Labour, and Technology, 2021).	No official calculations on the number of "green jobs" available. It is unclear if this definition is commonly used.	Technical document of the Ministry of Development, Labour, and Technology (Ministry of Development, Labour, Technology, 2021).

[7] The "green national accounts" from Statistics Denmark were not the first attempt to gather statistical information about the green economy in Denmark.

Note: The examples included in the table were identified in the country articles. The table is not an exhaustive list.

Source: Author's compilation based on country articles

Different ministries, agencies and research institutes have developed concepts or have been using international frameworks to assess "green jobs" in the economy as a whole or in specific sectors in a number of Member States. Examples include:

- One interesting example for the development of a new methodology to identify and count "green jobs" is the approach of the German research institute IAB, which is linked to the Federal Employment Agency. Janser (2018) developed an index that measures the greenness of jobs ("greenness-of-jobs-index" or goji). The analysis is based on text mining of annual data from the occupational database BERUFENET to identify how the quantity and content of green tasks[8] changed within occupations from 2011-2016. Linking the goji index (the level of greening of jobs) to occupation panel data from 2011 to 2016 shows that the greenness of jobs is positively correlated with employment growth.
- In **Spain**, the Ministry for the Ecologic Transition (MITECO) recently carried out a study that developed an operative definition of a 'green sector', allowing it to quantify "green jobs" in 2015 and 2022. Using the NACE classification of economic activities, it draws on Spanish and EU literature and selects economic activities that can be considered green activities. It then uses Labour Force Survey microdata (at three digit-NACE level) to analyse employment. Focusing on the participation of women in green activities, the study quantifies the number of jobs (salaried and employers/self-employed) within these activities (MITECO, 2023).[9] According to this report, the number of "green jobs" reached 2.3 million in 2022, an upward trend since 2015, when it was 2 million (+15.2%). This demonstrates an employment growth rate above that experienced in all other sectors (+14.5%).
- In **Portugal**, the report on Green Economy and the Labour Market Evolution in **Portugal** ("Economia Verde e a Evolução do Mercado de Trabalho em Portugal") published in November 2022 by the Tripartite Centre for Labour Relations (CRL 2022) is based on a description of macro-trends (green transition and sectoral conversion) and on the delimitation of the concept of "green jobs". It quantifies "green jobs" in **Portugal**, assesses the impact of decarbonisation on employment and qualifications and formulates proposals for action (CRL 2022, p. 4-5). According to the report, the share of "green jobs" in employment is significant, but during the past decade it has declined. In 2019 green employment represented 13.2% of the total salaried workforce outside public administration (some 337 212 jobs).[10]

[8] 'Green tasks are the explicitly environmentally friendly occupational requirements related to the production of output (goods and services) and to any other organisational process. These requirements may relate to all steps along the entire value chain. This includes knowledge areas, technologies and practices to reduce the use of fossil fuels, to decrease pollution and greenhouse gas emissions, to increase the efficiency of energy usage and material usage, to recycle materials, to develop and adopt renewable sources of energy, to protect and promote biodiversity.' (Janser 2018: 21).

[9] MITECO (2023), 'Green entrepreneurship among women and rural entrepreneurship among women', González-Gago, E. and de Cabo, G.(pending publication).

[10] Estimates by the European Commission indicate much lower numbers of green jobs than those in the report of the CRL. The reason is likely a different 'delimitation' of the concept. In this study, it is not possible to elaborate on this point. The figures published by the European Commission can be consulted at: https://ec.europa.eu/environment/enveco/pdf/FACT_SHEET_ii_Green_Growth_Jobs_Social_Impacts.pdf

The scale of "green jobs" and "green skills" is of course dependent on the concept used to measure them. Some national definitions include a broad range of jobs considered as green, others are very narrow.

The European PES Network carried out a study on greening labour markets in 2021. The report compared data to assess the volume of "green jobs" used in different studies across the EU. In some Member States, attempts have been made in differentiating between "green jobs" and "greening jobs" or "hybrid jobs", depending on the contents and tasks description of the job. For example, in **France**, the assessment of the statistical office INSEE indicate 0.5% of "green jobs" as a share in total employment, while "greening jobs" reaches a share of 14% (Duell et al., 2021). In the case of **Italy** estimations of "full green" or "hybrid green" jobs vary considerably by sector: public utilities show employment shares of full green and hybrid "green jobs" of 7.5% and 30% respectively, construction 2% and 44.8%, manufacturing 0.8% and 9.1% and extractive industries 0.4% and 7.6%

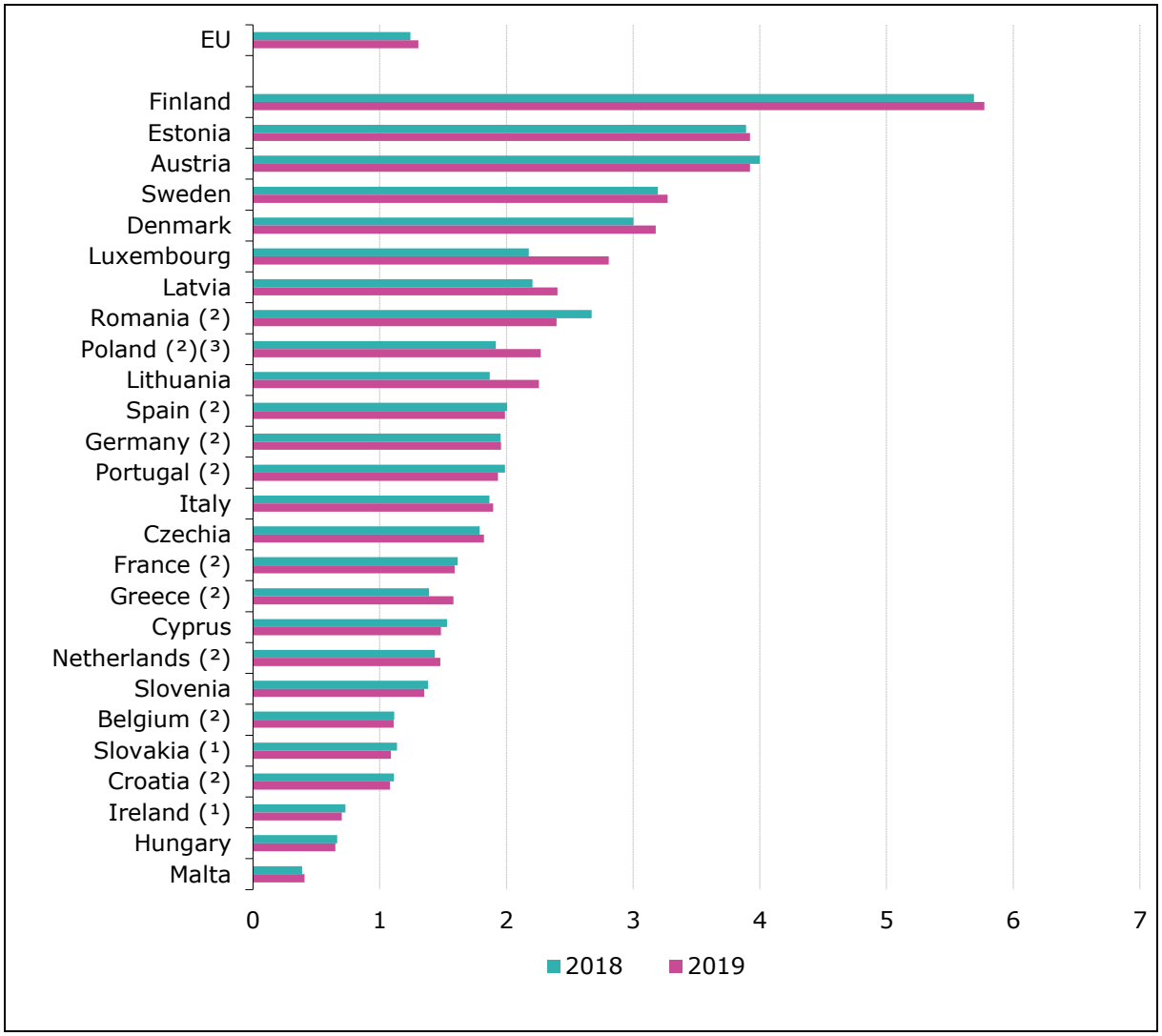
A comparative analysis of "green jobs" taking a task-based approach has been carried out by different organisations. The IMF (2022) has applied the task-based approach and measured the greenness of jobs in 34 countries in the EU, South Africa, Mexico and the US. The study finds a green intensity of jobs ranging between 2 and 3% (OECD 2023b referring to IMF 2022).[11]

To ensure a level of comparability across Member States, Figures 1 and 2 present an overview of the gross value added and employment in the environmental economy, based on Eurostat's indicator measuring the environmental goods and services sector (EGSS).[12] In terms of gross value added from market output of the environmental economy as a share of GDP, in 2019, the share was highest in **Finland**, **Estonia**, **Austria**, **Sweden** and **Denmark** (with shares ranging between 3% and 6% of GDP). Shares were slightly above 1% in **Belgium**, **Slovakia** and **Croatia** and below 1% in **Ireland**, **Hungary** and **Malta** (Figure 1).

In terms of absolute numbers, employment in the environmental industry shows a different concentration of employment in specific sectors of the environmental economy: for example, waste management in **Belgium**, **Bulgaria**, **Czechia**, **Germany** and **Italy**; heat and energy saving and management in **Spain** and **Sweden**, other environmental protection activities in **France** and the **Netherlands**, other resource management activities in **Poland** and **Finland** (Figure 2).

[11] International Monetary Fund (2022), World Economic Outlook: War Sets Back the Global Recovery.
[12] The environmental goods and services sector (EGSS) is defined as that part of a country's economy that is engaged in producing goods and services that are used in environmental protection and resource management activities either domestically or abroad.

Figure 1. Gross value added from market output of the environmental economy, by country, 2018-19 (% share in GDP)



Note: Gross value added deflated to the base year 2010. Bulgarian data not shown due to a considerable break in time series in 2019. EU data based on Eurostat estimates.

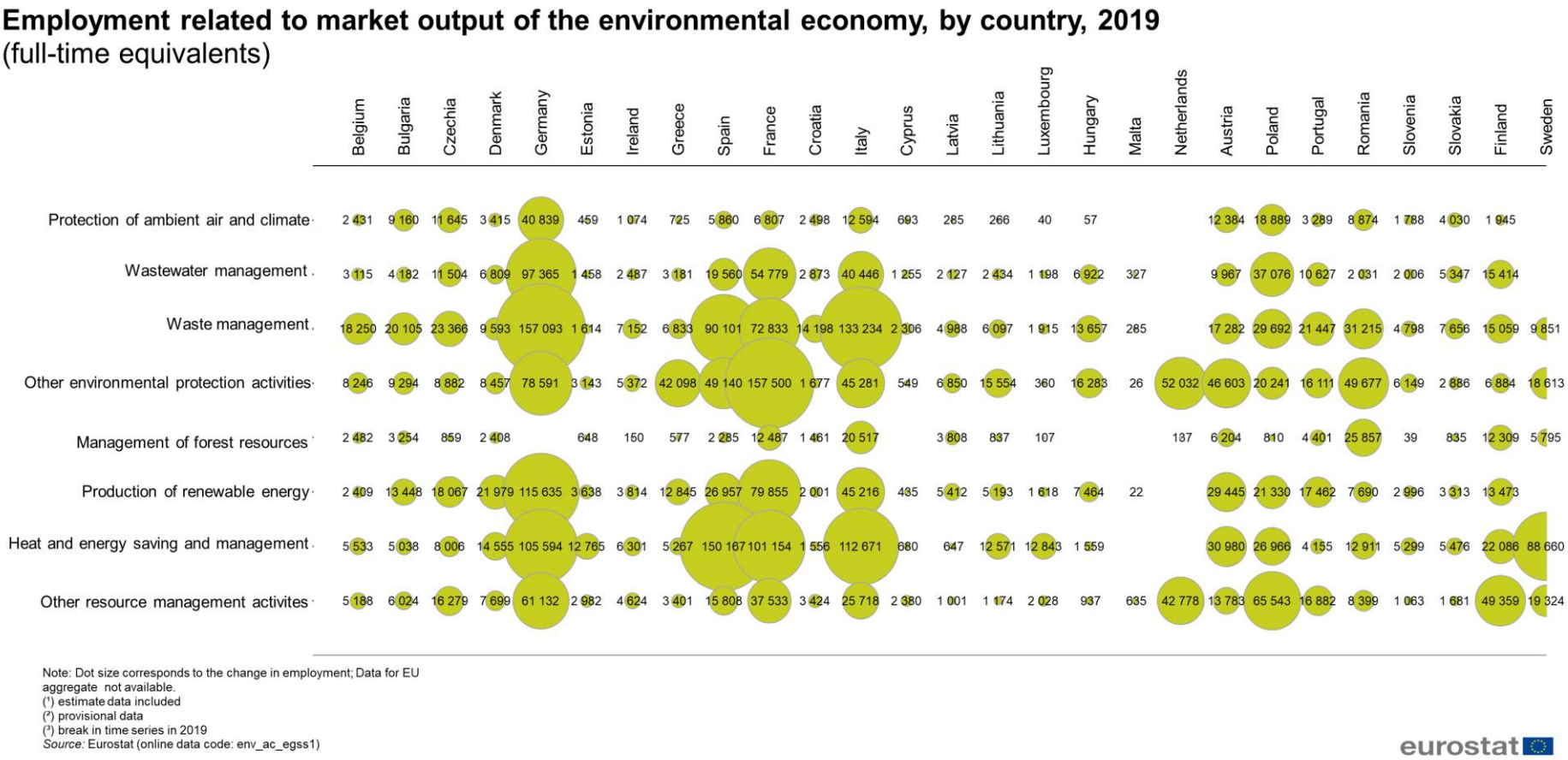
(1) estimate

(2) provisional

(3) break in time series for 2019

Source: Eurostat (online data codes: env_ac_egss2; https://ec.europa.eu/eurostat/statistics-explained/images/9/9d/Environmental_economy_-_statistics_by_MS_-update_2022.xlsx)

Figure 2. Employment in the environmental economy, absolute numbers of full-time equivalents[13]



[13] Source: https://ec.europa.eu/eurostat/statistics-explained/images/9/9d/Environmental_economy_-_statistics_by_MS_-update_2022.xlsx

A broad definition of "green jobs" at EU level has been proposed by Cedefop, whereby "green jobs" are defined as the skills, competences, abilities and knowledge needed to live in, develop and support a society that reduces the impact of human activity on the environment (Cedefop, 2012). A list of "green skills" can be found in the European Classification of Occupations, Skills, and Competences (ESCO). However, as shown above, at Member State level different definitions and measurements are being used in practice. The absence of clear and commonly agreed and shared definitions in practice also represents a challenge within Member States. As reported in **Slovenia**, this lack of common understanding and operationalisation of "green skills" or jobs at the Member State level leaves it to the social partners, such as employers' organisations, to define "green jobs" when discussing these issues (Pršina, Žakelj and Caprirolo, 2023). **Spain** reported that the lack of a clear definition of "green jobs" makes it difficult to estimate accurately their number and evolution. For Public Employment Services the lack of a clear definition may cause problems for implementing active labour market programmes for dealing with the green transition and for providing career guidance related to it.

2.1.2 Current and past impact of the green transition on the economy

2.1.2.1 Impact on sectors

a) Employment growth in "green jobs" due to higher demand for environmentally sustainable goods and services

The green transition has increased demand for environmentally sustainable goods and services in several sectors. In several Member States, the renewable energy sector has been characterised by significant employment growth in recent years. Examples of country-specific findings include:

- **Austria**, where hydropower generates the highest share of jobs in the renewables sector (30 000 jobs in 2021, ILO 2021).
- **Germany**, where employment in the renewable energy sector increased consistently until 2011 to 415,700 workers,[14] mainly due to increased employment in biomass and solar energy production.
- The **Netherlands**, where employment in renewable energy, networks, and energy conservation has risen by approximately 2.4% since 2016 as a result of the climate agreement and the subsequent climate law (BZK, 2020).
- Organic farming may also have contributed to increased employment, not only due to increasing demand for organic products, but also because it is considered more labour intensive than conventional farming (as reported in **Germany**, see Umweltbundesamt, 2019). Data from the Agricultural Structure Survey 2013, shows that labour input per agricultural area is 2.5% higher in organic farming compared to the average. For example, the removal of weeds and pests may not be done with synthetic chemical substances and requires more manual work.
- In **France**, the most favourable dynamic for greening jobs is found in the tourism sector, where employment rose by 15.3% between 2013 and 2018 (Margontier, 2021). Considering that the tourism sector may also be negatively affected by climate change in some regions, the net effect for the sector as a whole is not clear. Quite likely there will be large variations across regions.

b) Employment in sectors directly affected by climate change

[15] The retirement age in hard coal mining is 50 years, in case of working at least 15 years underground and ten years of equivalent activity. Women in hard mining achieve retirement age after 15 years working underground and five years of equivalent activity. In addition, hard coal miners can retire after 25 (men) or 20 years (women) of underground mining experience (Frankowski et al. 2020).

Employment in certain sectors is particularly vulnerable to the direct impact of climate change. In the tourism sector, for example, rising temperatures might negatively affect winter and summer tourism (as reported in **Austria** and **Spain**), but might also make colder countries more attractive to tourists (reported in **Finland** and **Estonia**). A wide range of country articles report that the agricultural and forestry sectors are also negatively affected by extreme weather events such as drought and flooding. Weather extremes might also affect industries related to agriculture and forestry, e.g., the paper and pulp industries (as reported in **Finland**).

c) Sectors in decline or transformation towards climate neutrality

Hard and lignite coal mining sectors are the most obvious examples of declining **sectors with a high carbon footprint related to fossil fuel extraction**. In **Greece**, it is estimated that lignite emissions contributed 34% of all greenhouse gases between 1990-2017 (Georgakopoulos, 2020). In certain Member States, other sectors linked to fossil fuel extraction are also relevant, for example the oil shale industry in **Estonia**. In **Finland**, **Ireland** and **Latvia**, employment in peat production for energy generation and horticultural purposes is expected to decline considerably. In **Sweden**, the five most emission-intensive sectors account for more than 65% of greenhouse gas emissions (agriculture, electricity and district heating, steel and metal industries, air transport, mineral industries, shipping and coal and refined petroleum) but employ 3% of the labour force (Statistics Sweden, 2023; Malmaeus et al., 2022).

As these raw materials are extracted regionally, **some regions are more strongly affected than others**. In **Greece**, for example, although the number of jobs in lignite mines and in lignite-powered electricity plants are negligible nationally (0.16% of all jobs in **Greece**), as many as 74% of respondents in Eordaia and 66% in Megalopoli, both being municipalities in the region of Western Macedonia with significant lignite factories, reported that their incomes depended on lignite to a 'considerable' or a 'great' extent (Doussis et al., 2020, p. 32). In **Romania's** Jiului Valley in southwestern Transylvania, 90% of coal industry workers have lost their jobs since the 1990s, with no alternative industry stepping up to provide alternative opportunities(Burlacu et al., 2019).

Additional relevant findings reported in the ECE country articles are as follows:

- In **Spain**, in the 15 territories identified as affected by the closure of coal mines and coal-fired thermal power plants in the Just Transition Plan, the share of low qualified workers is very high, as well as that of inactive women with no/low previous labour experience in a context of an ageing population, while some regions, also have a high presence of migrants as a vulnerable labour market group.
- In **Estonia**, the oil shale industry makes up about 5% of GDP and about 2.5% of all employment based on estimates from 2010 (Gavrilova et al., 2010). More than half of these declining jobs are among skilled workers and machine operators. There were approximately 16,000 people living in households where at least one member is employed in the oil shale industry (Michelson et al., 2020). Most employees in the sector are men (80%) while the average age is relatively high at 47 years (Ibid).
- In **Ireland**, a substantial number of persons affected by direct job losses in the peat industry had a mean salary of EUR 50 000 per annum, meaning that the Midlands region of **Ireland** has lost reasonably highly paid employment (AARC, 2021a). The Midlands Region has traditionally experienced high rates of unemployment relative to the national average (European Commission, 2020), and alternative employment opportunities in affected local areas are currently

limited, especially for those former Peat Board employees with highly specific and hard to transfer skill-sets (AARC, 2021a, Government of **Ireland**, 2022b). In addition, between 2012 and 2019, jobs growth in "low emitting" sectors in the Midlands Region was below the national average – with less than 70% of new jobs created in the low emitting sector, versus a national average of 85% (NERI, 2019). Low levels of education attainment are also more prevalent in peat dependent communities, with just 36% of the population having completed tertiary education, below the national average of 46% (European Commission, 2020). This partly reflects the age profile of the Peat Board's former workforce, with nearly half of the workers being aged 50 or over at the time of the transition (European Commission, 2020). However, it is also considered a legacy of the peat industry in the Midlands Region, as for a long time it provided relatively well-paid jobs that did not require tertiary education qualifications (AARC, 2021a, Government of **Ireland**, 2022b). Evidence in **Latvia** also suggests that in some of the lower income regions (for example, Latgale) the peat industry was able to pay salaries that exceeded regional averages.

- In the Polish hard coal mining, 97% of miners are employed in the state-led enterprises. The average age of Polish miners is 39 years, which means a high share of workers will reach retirement age in this decade, as they tend to retire early[15] (Frankowski et al., 2020). Before the COVID-19 pandemic in 2019, miners assessed their competencies and declared readiness to change their workplaces (Kiewra et al., 2019). However, in a study conducted two years later, 62% of surveyed miners were concerned about losing their jobs due to decarbonisation (Kantar, 2021). Most would be ready to change their profession but expected similar stability and financial conditions as miners.
- In the **Slovenian** region of Zasavje, the phase out from coal has led to a decline in GDP per capita from 73% of the national average in 2000 to 53% in 2020, making the region one of the poorest in **Slovenia** (AP Zasavje, 2021, pp. 5-6). About 5 000 jobs, i.e. 27% of all mining-related jobs in the region, were lost and most of them were not replaced (TJTP Zasavje, Annex 1, 2022, p. 1), forcing the employed population to look for jobs in other regions, thus increasing the commuting of the employed population by about 10% in the last decade (AP Zasavje, 2021, p. 15). In addition, the region has been affected by severe depopulation, with about 5 140 fewer inhabitants in 2020 than in 2000, representing an 11% decrease in population over the period 2000-2020 (TJTP Zasavje, Annex 1, 2022, p. 1). **In terms of disaggregated labour market effects, workers formerly employed in the coal industry with more than 10 years of service were the most affected** (TJTP Zasavje, Annex 1, 2022, p. 2). The situation is worst among the low-skilled – with about 36% of the unemployed having only primary education, which is significantly higher than the national average (32%), while the share of people with tertiary education in Zasavje is the lowest in **Slovenia** (Employment Service of **Slovenia**, hereafter ZRSZ; data for December 2022). The share of long-term unemployed among all unemployed in the Zasavje region is 55%, above the national average of 47% (ZRSZ 2022) in December 2022. In the Hrastnik ZRSZ office, the majority of the unemployed have more than 10 years of work experience, but existing vacancies in the municipality of Trbovlje are not filled as workers lack the relevant

[15] The retirement age in hard coal mining is 50 years, in case of working at least 15 years underground and ten years of equivalent activity. Women in hard mining achieve retirement age after 15 years working underground and five years of equivalent activity. In addition, hard coal miners can retire after 25 (men) or 20 years (women) of underground mining experience (Frankowski et al. 2020).

qualifications (TJTP Zasavje, Annex 1, 2022, pp. 2-3). This indicates a considerable distance between the tasks required for jobs in sectors in decline or transformation and the tasks required for more environmentally sustainable jobs, which requires targeted training courses, also for the long-term unemployed (TJTP Zasavje, 2022, p. 8).

Employment in energy intensive sub-sectors of manufacturing, e.g., the chemical industry, steel and metal production/processing, cement production and motor vehicle production, are also negatively affected due to several interconnected economic and policy-related factors. Some regions still have the potential to reduce the carbon footprint of their industries. For example, Wagner et al (2020)[16] find that **Finland** and **Sweden** appear to have a lower carbon footprint in manufacturing than central European countries such as **Germany**. The authors assume that at least partially this can be explained by higher carbon taxes that have been in place in **Finland** already long before the European Emissions trading scheme and other policies took effect. Similarly, an inflow of foreign manufacturing companies in the 2000s led to the modernisation of outdated factories or the building of new energy-efficient plants in **Slovakia**. This further contributed to increasing energy efficiency throughout the economy and standards of living, however, it deepened the economic specialisation in manufacturing. In **Germany**, according to a report published by the Federal Environment Agency (Umweltbundesamt, 2022), the automotive industry has nonetheless become greener during the last years. Still, in the last twenty years, efficiency gains that decreased CO2 emissions in the automotive sector were overcompensated by the continuous increase in traffic volume in both passenger and freight transport. Also, the German chemical industry, which is strongly concentrated regionally, is adapting to climate change, resulting in an increased greenness of the jobs in this sector. Although production increased by 63% between 1990 and 2019, power consumption decreased by 19% and greenhouse gas emissions fell by 54% (Vetter, 2022). There is also evidence that the concept of a circular economy (and similar approaches that increase energy efficiency) are increasingly put into action by German chemical companies (Deloitte, 2017).

2.1.2.2 Impact on occupations

The green transition is likely to affect a range of existing occupations and lead to changing tasks within these occupations (e.g., technician occupations in automotive production related to the shift to electric vehicles). It also creates a number of completely new occupations (e.g., solar panel installers), but will mostly change the tasks required in existing occupations (European Commission, 2023).

Different actors in some Member States have carried out studies to identify "green occupations" (as reported in the report of the European Network of Public Employment Services). Approaches mainly try to identify some "greenness" within some occupations or try to identify some "mainly green occupations". One difficulty lies in thoroughly taking stock of the emergence of new occupations or specialisations (offered by Vocational Education and Training (VET) institutions and universities, in main study subjects such as business administration and IT). Examples of research activities and their outcomes include (Duell et al., 2021):

[16] Wagner, Kassem, Gerster, Jaraite-Kazukauske, Klemtsen, Laukkanen, Leisner, Martin, Munch, Muûls, Nielsen, de Preux, Rosendahl, Schussel (2020). Carbon Footprints of European Manufacturing Jobs: Stylized Facts and Implications for Climate Policy. Discussion Paper Series - CRC TR 224, Discussion Paper No. 250.

- In **France**, the National Observatory for Jobs and Occupations of the Green Economy (Onemev),[17] created in 2010, identified 10 green occupations and about 52 greening occupations based on the PES classification of occupations ROME.[18] In accordance with Onemev, the French PES Pôle emploi provides the following definition of green and greening occupations on its website: (i) green occupations are those contributing to measuring, preventing, controlling and correcting negative impacts and damage to the environment (e.g., maintenance officer of natural areas, forest ranger, technician in charge of the water police, etc.); (ii) greening occupations include occupations whose finality is not environmental, but which integrate new 'skills building blocks' to take into account in a significant and quantifiable way the environmental dimension in the professional act (e.g., architect, thermal insulation installer, logistics manager, gardener, etc.) (see also Table 1 on the distinction between "green" and "greening" jobs).
- In **Italy**, the Work Atlas ("Atlante Lavoro") is a detailed map that describes the work in terms of activities, tasks, products and expected services by the National Institute for Public Policy Analysis (INAPP).[19] It links the skills and competences acquired in education or training contexts, formal or otherwise, with the demands of the world of work. Through the information system of the Work Atlas it was possible to identify all those economic activities that can be defined as core green activities. Subsequently, the occupations operating in the core green activities could be disentangled by dividing them into: "full green", i.e., new professions entirely due to the green economy (energy engineers, planners, landscape architects and specialists in the recovery and conservation of the territory, technicians of energy saving and renewable energies) and "hybrid", that is, pre-existing but updated skills for the green economy (materials engineers, marketing technicians, civil construction technicians). Alongside these, there are professions potentially upgradeable with "green skills" (managers of companies operating in agriculture, fashion designers, travel agents) but where this step has not yet been completed.
- In **Germany**, a total of 31 occupational types on the five-digit level of the classification of occupations, have been identified as 'environmental occupations' by the German PES (Bundesagentur für Arbeit). These occupations have been identified as directly contributing to environmental protection, resource conservation, sustainable use of nature, recycling or similar purposes.
- In **Spain**, the PES (Servicio Público de Empleo Estatal, SEPE) has conducted through its occupational observatory a prospective study on the impact of measures for a circular economy[20] in 2020. It lists over 50 occupations according to national occupational classification code (CNO) and identifies new occupations

[17] https://www.ecologie.gouv.fr/lobservatoire-national-des-emplois-et-metiers-leconomie-verte.
[18] As the PES classification does not allow a quantification of jobs, these occupations were translated into the usual classification. This means that 9 green occupations and around 70 greening occupations have been identified in the national classification system of occupations PCS, https://www.notre-environnement.gouv.fr/site-ree/themes-ree/economie-verte/emplois/les-emplois/article/les-emplois-dans-les-metiers-de-l-economie-verte.
[19] https://inapp.org/it/inapp-comunica/sala-stampa/comunicati-stampa/presentato-l%E2%80%99atlante-lavoro-una-mappa-universale-elaborata-dall%E2%80%99inapp, accessed 12 April 2020.
[20] Estudio Prospectivo de las Actividades Económicas Relacionadas con la Economía Circular en España published on the SEPE website https://www.sepe.es/HomeSepe/que-es-el-sepe/comunicacion-institucional/noticias/detalle-noticia.html?folder=/2020/Noviembre/&detail=estudio-prospectivo-de-las-actividades-economicas-relacionadas-con-la-economia-circular-en-espana.

(SEPE 2020). Adaptations within existing occupations are expected.[21] Some new occupations have been identified such as the 'Circular Economy Manager' occupation.

2.1.2.3 Impact on skills

At European level, in cooperation with international organisations such as the OECD, ILO and UNESCO, a definition of skills for the green transition has been agreed in 2022.[22] These include "skills and competences but also knowledge, abilities, values and attitudes needed to live, work and act in resource-efficient and sustainable economies and societies". In the technical areas, these comprise skills required to adapt or implement standards, processes, services, products and technologies to protect ecosystems and biodiversity, and to reduce energy, materials and water consumption. Technical skills can be occupation-specific or cross-sectoral, and transversal, i.e. linked to sustainable thinking and acting, and relevant to work (in all economic sectors and occupations) and life. Transversal skills that are also relevant for the green transition, comprise skills sets which are labelled as 'sustainability competences', 'life skills', 'soft skills' or 'core skills' (Cedefop et al., 2022). A concept for identifying "green skills" has been adopted in ESCO,[23] combining a manual and a machine learning method.[24] However, in practice, at Member State level, there are still variations by sector on how "green skills" are understood. A few Member States are in the process of developing a national definition of "green skills" (European Commission, 2023).

The European Centre for the Development of Vocational Training (Cedefop) has identified a set of generic "green skills", encompassing soft and technical skills, in the area of cognitive competencies, interpersonal competencies, intrapersonal competencies and technological competencies, and the ESCO classification identifies a number of cross-sectoral, sector-specific, occupation-specific and transversal "green skills" (see above). Research has also identified portable soft and technical skills, acquired in another sector or in polluting industries, that are relevant for the greening of the economy (Cedefop/OECD, 2022).

At Member State level, there is also no commonly used methodology to assess the skills required for "green jobs", nor which "green skills" would be considered as a building block for performing "green jobs". The Member States that have conducted recent studies to identify skills needs for the green transition, for the whole economy or for specific sectors, include **Denmark**, **France**, **Malta**, and **Sweden** (European Commission, 2023).

Research on the greenness of jobs has started mainly by using the task and skills descriptions of occupations in the US database O*Net. This allows to disentangle greenness of jobs by skills levels (see Figure A 2.1 for examples prepared by the OECD). Recent work has been carried out in the EU using the European Classification of Skills,

[21] The research points to increasing demand in some occupations such as industrial engineers, mining engineers (mainly for hazardous waste), design engineers, industrial organisation engineers and management analysts. The report identifies also demand (e.g. by environmental departments) for occupations such as geologists, chemists and chemical engineers, process engineers, biologists, environmental science graduates, environmental technicians, agronomists, quality control technicians, laboratory technicians and chemical plant operators, as well as mechanical and industrial technician occupations, and in a general way, many hospitality and tourism occupations and service occupations. This shows that a range of existing occupations will be in demand for greening the economy.

[22] Inter-Agency Working Group on Work-based Learning: Cedefop, European Commission, European Training Foundation, ILO, OECD, UNESCO, 2022

[23] https://esco.ec.europa.eu/system/files/2023-07/Green%20Skills%20and%20Knowledge%20-%20Labelling%20ESCO.pdf

[24] A total of 571 ESCO skills and knowledge concepts are labelled as green. This includes: 381 skills, 185 knowledge concepts, and 5 transversal skills.

Competences and Occupations (ESCO). ESCO allows identifying knowledge and competences of over 3 000 occupations.[25] For example, Cambridge Econometrics et al. (2018) carried out a profiling of 'key' occupations in terms of required skills based on the ESCO database at a detailed occupational level (up to four-digit level), by mapping the required skills, knowledge and competence associated with detailed occupations in the ESCO classification, and combining this with the qualitative evidence about the impact of a more circular economy on jobs. This in principle allows to analyse how similar profiles of skills are distributed across the economy, combined with qualitative analysis on the skills required, in order to evaluate the potential for cross-sector redeployment. However, there are limitations to using existing classifications as they do not allow identifying skills for new occupations, and as they may not be updated in a timely fashion (Duell et al., 2021). The European Commission distinguishes between 5 different categories of "green jobs", based on work by Bowen and Hancké who use ISCO and O*Net. They basically distinguish between jobs that already exist, but for which demand increases, existing jobs requiring substantial changes in tasks, new "green jobs", and categories of non-green jobs. (European Commission, 2019). At EU level, work is currently ongoing to strengthen this empirical work.[26] Research has also shown that in some sectors, high-skilled jobs in particular, require cross- and multidisciplinary skills (OECD, 2023b).

In a number of Member States, research has been undertaken to assess the skills levels and skills gaps related to "green jobs". The skills levels of those employed in "green jobs" varies quite significantly by sector and occupation. Overall, they have more often a medium level education in a technical field than the average. Some evidence in Member States is reported below (based on the country articles):

- In **France**, differing sectoral skills requirements between jobs in sectors in decline and "green" jobs have been observed. For example, the sanitation and waste treatment sector is a low educated segment of the labour market, whereas environmental protection is a highly educated segment. For "green jobs", in the sector of sanitation and waste treatment, 37% of employees have no baccalaureate (versus 13% in total employment), whereas only 3% have a three-year tertiary degree (versus 28% in total employment). On the contrary, for "green jobs" linked to nature and protection of the environment the level of education is clearly above average: 47% have a three-year tertiary degree or above and 24% have a two-year tertiary degree (versus 15% in the population). "Green jobs" in the production and distribution of water and energy are overrepresented for a baccalaureate level or equivalent (29% versus 20% for the population), and for two-year tertiary degrees (29% versus 20% of the population). For "greening jobs", the education gap across industrial sectors is wider than for "green jobs". Research and Development is a very highly educated segment, whereas drivers or construction workers tend to have lower educational attainments. Also in **France**, the distribution of education levels for "green" and "greening jobs" is not far from the distribution for total employment. However, job seekers in general (not just from jobs in transformation) who are looking for a green occupation are in a less favourable position on the labour market. They tend to have lower education levels, they are older and more often in long-term unemployment (Margontier, 2022).
- In **Italy**, the share of "green jobs" in the industrial sector (67.4%) is substantially higher than in the tertiary sector (22.8%, Unioncamere, 2020). The key

[25] https://ec.europa.eu/esco/portal/home?resetLanguage=true&newLanguage=en
[26] 2024 European Semester: Proposal for a Joint Employment Report (forthcoming)

competences that drive "green jobs" away from other occupations are digital skills. In this example, the most sought-after digital skills are the use of internet technologies and the ability to manage and produce visual and multimedia communication tools (highly important for 25.4% of "green jobs" as opposed to 19.9% of other jobs). Yet, the biggest difference is in the ability to manage innovative solutions by applying digital technologies to enterprise processes (highly important for 15.9% of "green jobs" as opposed to 9.3% for other occupations). Finally, highly important for 20.5% of "green jobs" is the ability to use mathematical and IT languages to organise and analyse qualitative and quantitative data, while for other occupations the share drops to 14.5% (Unioncamere, 2020).

- In the **Netherlands**, a comparison has been made between workers in the climate (energy) sectors and the ICT sector. 35% of the current employees in the climate sectors (energy) have an intermediate vocational education background. In ICT, 42% of employees have a higher vocational or university education. By far the majority of those working in a technical profession have a technical education, which indicates that these professions have limited access to people with a different level of education or only after an intensive retraining programme (Fouarge et al., 2018; ROA, 2022). The age distribution in the energy and digital jobs shows that workers in the ICT sector are relatively young, whereas the energy sector, intrinsically linked to the maturity of the sector, employs more older people.
- In **Belgium**, the King Baudouin Foundation estimates that, in 2017, 262 000 jobs were in the circular economy (covering repair, waste and resource management, second-hand trade, rental, and leasing), which corresponds to 7.5% of the total number of jobs in **Belgium** (Fondation Roi Baudouin, 2019). An analysis of the characteristics of employees working in the circular economy in Flanders shows that in 2017 most employees in the circular economy were low- and medium-skilled workers. Core jobs tend to require manual and technical skills, while enabling jobs tend to require more complex and cognitive skills. Analysis on the skills required for indirect jobs are lacking (Fondation Roi Baudouin, 2019). In 2016, the percentage of low- and medium- skilled workers in the circular economy (65-70%) were higher than in the overall Flemish economy (+/- 50%).
- The Spanish Biodiversity Foundation estimates that the education level requirements of "green jobs" are generally high, although they vary across "green jobs" categories. Category 1 (occupations focused on the conservation of biodiversity) require mostly high qualified jobs, 79% of them needs a university or high VET diploma. In contrast, Category 2 (occupations that have a strong impact on the conservation of biodiversity), or Category 3 jobs (occupations that benefit from biodiversity and ecosystem services) require in 55% and 59% of cases high education, a lower percentage but higher than the average on the labour market.[27]
- Evidence from **Malta** (Marmara, 2022) suggests that there is lower access to "green jobs" among youth as they lack experience; among persons with disabilities as they are perceived to lack the ability to develop the required skills; and older workers as there is resistance in investing in the skilling and reskilling at older age.

[27] Source: Biodiversity Foundation (2019) "Estudio del empleo y la biodiversidad en España".

2.1.2.4 Impact on gender equality in the labour market

A robust finding in the country articles is that men might benefit relatively more from the growth in "green jobs", with a wide range of Member States reporting higher shares of men in "green jobs" than women (e.g., **Austria**, **Spain**, **France**, **Malta**, **Netherlands**, **Portugal**, **Sweden**). This is partly because "green jobs" are often blue collar or STEM jobs, where women are underrepresented (as reported, for example, in **Austria**, **Belgium**, and **France**). For example, in **Spain**, about 85% of "green jobs" in 2022 were held by men, although over the last 7 years the number of women in "green jobs" has grown faster than that of men (+29.8% vs +12.9% - MITECO 2022). In a study in **Malta** (Marmara, 2022), "employer bias" was identified as the main barrier for women to gain employment in "green jobs". An underrepresentation of women in "green jobs" is also confirmed by the OECD (2023a) showing that only 28% of green-task jobs are held by women. This means that they are less likely to benefit from employment gains in green-task jobs. On the other hand, women are also expected to be less affected by the destruction of jobs in polluting industries. **Austria** and **France** also report a wage gap between men and women in "green jobs". In **Austria**, in the waste management sector, the gap is at 7%; in the field of energy provision it is as high as 25% (Lehner and Steininger, 2016, p. 68). For **France** evidence by sector is not available and findings refer to "green jobs" as a whole.

To conclude, the heterogeneity of the regions and sectors affected make it difficult to draw generalisations on the impact on different socio-economic and occupational groups. Also, employment impacts may differ by gender in different sectors (e. g. more employment losses for men in the mining sector, as this sector primarily employs them), while women have less good employment prospects than men in growing sectors that are key to the transition (European Commission, 2023b). Another difficulty, as mentioned, is linked to the variety of definitions of "green jobs" and the green economy used within and between Member States. Further, most studies identified and reviewed in the country articles focus on the future impact of climate change on employment rather than current or past effects (see section 2.2 on forecasts and foresights).

2.1.3 Working conditions in "green jobs"

The assessment of working conditions in "green jobs" is also highly dependent on the definition of which jobs or sectors are considered green. Evidence collected from the ECE country articles show that the assessment of working conditions in green employment has been uneven across the Member States, and a comparison between Member States is not possible. In the following section evidence provided in the country articles on employment conditions and wages as well as on health and safety are given as examples.

Employment conditions

Only little research has been conducted so far on the impact of the green transition on working conditions. A Eurofound study (Eurofound, 2022) finds a much lower share of workers in new and emerging occupations who are in strained jobs[28] than workers in other occupations, while increased-demand occupations fare worst. This reflects the fact that increased-demand occupations are worse than average in terms of both the demands they place on workers and in terms of resources available to the workers. Thus, the impact of the green transition on overall job quality would depend

[28] Eurofound uses the concept of 'job strain' to identify and assess lower levels of job quality that put workers' health and well-being at risk. This comes from demands that jobs place on workers, for example exposure to noise, working at night, working under tight deadlines or experiencing work insecurity.

on the concrete path that the transition would take. Eurofound concludes that if the green transition results in the creation of more jobs of the new and emerging type, this will contribute to an overall improvement in job quality compared with the current situation. This positive evolution of jobs, however, may be dampened if the increased-demand type gains momentum, as jobs of this type demonstrate, at least for the moment, below-average job quality.

Findings on job security linked to "green jobs" are rare. Available evidence from France indicates that the impact is mixed and seems to depend on specific sectors. In some sub-sectors of the green economy, evidence from **France** suggests that "green jobs" are particularly exposed to temporary agency contracts (sanitation and waste treatment) or short-term contracts (tourism or public R&D) (Margontier, 2021). In some other subsectors "green jobs" seem to be more protected as open-ended contracts are frequent, especially in the water and energy sector. Some greening jobs are also particularly exposed to short-term contracts, especially in the sector of tourism and entertainment where this share is 33% but also in public R&D where it amounts to 31%. According to (Margontier, 2021), the level is lower for green areas maintenance (12%), which also has a high share of self-employment (22% versus 12% in total employment).

In **France, there is evidence that green and greening jobs are more often full-time jobs,** except for the sector of tourism and entertainment. Full-time jobs for green and greening jobs represent respectively 93% and 90% (versus 83% for total employment). This pattern is particularly strong for "green jobs" in production and distribution of water and energy (96%). It concerns also most of the greening job sectors, with the exception of the sector of tourism and entertainment where the share or full-time jobs (52%) is clearly below the average of total employment.

Wages

Regarding wage levels in "green jobs" the evidence is ambiguous. In **Denmark**, a significant difference in the wage level between employees in the green sector and other employees was found. In the green sectors, the average wage level in 2010 was 9% higher than the average for all firms (Danmarks Statistik, 2017:110-111). In contrast to this, results from the IAB Establishment Panel 2018[29] (Bellmann and Koch, 2019) in **Germany** show that smaller companies that act in a more ecological sustainable way pay lower wages than companies in which sustainability plays a minor role. Wages are similar between sustainable and non-sustainable larger companies, though. The survey also indicates that companies that attach more importance to ecological sustainability also act in a socially more responsible way – they are, for example, more likely to allow mobile working to make it easier to reconcile family and care, and they are more likely to protect their employees from overwork.

Consequences of climate change for the health and safety of workers

The main consequences of climate change affecting the health and safety of workers include increasing heat and UV radiation. As reported by a number of Member States, outdoor workers, older workers, pregnant women and people with chronic diseases are affected the most. For example, in **Slovenia**, workers in all sectors report poor concentration and health problems during heat waves (Pogačar and Kajfež Bogataj, 2017, p. 128-129). A further, less often mentioned health risk linked to climate change was an increased risk of infections or pathogens.

[29] https://iab.de/en/the-iab/surveys/the-iab-establishment-panel/

These risks are monitored by several organisations, and the social partners. For example, in a survey by the Association of Free Trade Unions of **Slovenia** (2019a), union members reported that workplace temperatures rise during heat waves in some cases even reaching more than 40˚C.

2.1.4 Views and perceptions on fairness

Views and perceptions on fairness vary significantly. While in general the population agrees that actions to reduce climate change effects are needed, there are also concerns around job losses and fairness related to the unequal impact of climate change activities on different groups of the population.

Findings of Eurobarometer[30] on Fairness perceptions of the green transition (Special Eurobarometer 527, May-June 2022) show that the majority of EU citizens – almost nine in ten respondents (88%) – agree that the green transition should not leave anyone behind. National surveys cited in the country articles suggest that there is wide support for environmental protection measures in the Member States.

At the same time, **a negative effect mentioned in almost every country article is increasing energy poverty due to higher energy prices, lately resulting largely from the geopolitical situation and the aggression of Russia against Ukraine** For example, evidence in **Hungary** suggests that lower income households that rely on wood and coal to heat their houses (70% of houses in **Hungary** need renovation) are hit harder by higher energy prices and the effects of environmental transformation. Also, labour market risks that follow the need to decrease carbon emissions (e.g., job losses) are mentioned in a number of Member States.

There are multiple and often conflicting perceptions in the Member States on how the climate crisis should be addressed. Some of these, such as the perception that lower-income families and workers in sectors with a high carbon footprint, as well as some regions, will be unfairly hit by carbon neutrality, might be counterbalanced by the more optimistic take on energy transition that all citizens (not only economic and political elites) will benefit from the green transition. This was revealed for example in a study on Sociotechnical imaginaries[31] of energy transition (Carvalho et al., 2022) in **Portugal**. An **Austrian** report (Hofbauer et al., 2023) suggests that intensive social dialogue becomes a necessity to gain a better understanding of how different approaches to achieve a fair green transition might be in conflict with each other.

2.2 Forecasts and foresight on the fair green transition

2.2.1 Future impact on the labour market and the economy

The large majority of forecasts and foresight exercises carried out throughout Member States predict slight or more pronounced positive net employment effects due to decarbonisation investments and the fossil fuel phase out. Forecasting the effects of the fair green transition on the labour market is nonetheless a complex exercise. Studies usually include a set of assumptions about future developments that often interact with each other, resulting in both positive and negative effects on labour demand and supply. Forecasts also often have to make assumptions on policy directions. They will not include unpredictable labour market shocks, like the COVID-19 pandemic

[30] According to which, the majority of Europeans – almost nine in ten respondents (88%) – agree that the green transition should not leave anyone behind and most (77%) feel a personal responsibility to act.
[31] Sociotechnical imaginaries are "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology." See: https://reader.elsevier.com/reader/sd/pii/S2214629621003467?token=8658F23BED5B8F24C5827241F4D575176FAD882BA3199F6BFD68859B3E623BDCAF61953EE83FF02B2768C448EFCD2C60&originRegion=eu-west-1&originCreation=20230221202356

or Russia's war of aggression against Ukraine. Thus, the results of forecasting exercises always need to be taken with caution, taking into account their underlying assumptions and methodology, as well as path-independent events (like external shocks) that might not be mirrored in the results.

Forecasts that have been carried out by Eurofound (2019) include a so-called "energy scenario", which assumes that necessary policies are implemented to meet the 2°C limit by 2050. The baseline is that of the CEDEFOP skills forecast, which is a scenario without climate action policies.[32] The results show that the EU GDP will grow by 0.5% and employment by 1.1% by 2030. These 1.2 million jobs come on top of the 12 million jobs expected to be created under the baseline scenario which assumes no specific climate actions to be taken (from 2015 to 2030). Based on evidence from the country articles, **the expected positive employment effects (in % difference from the baseline scenario) of keeping the commitments under the Paris Climate Agreement in the EU are expected to be highest in Belgium, Germany and Greece and lowest in Slovenia**. In terms of total employment in 2050, the 1.5°C scenario also points to potential net employment gains of 0.6% to 0.9%, which translates to 1.5 to 2 million additional jobs, compared with the baseline scenario (European Commission, 2019).

There are large variations of employment effects by sector, with construction, agriculture and power generation being the sectors with the largest positive employment impacts by 2050 and with declining employment in the mining sector. Employment in manufacturing industries and in services is predicted to remain stable. Studies on the labour market effects of the green transition also point to large effects in terms of changed tasks and restructuring jobs and labour market transitions (see for example Cambridge Econometrics, 2018 for the EU). This is confirmed by some studies carried out in Member States. For example, in **Austria**, most of the relevant literature suggests that the transformation process will not significantly impact the general level of employment but the composition of employment by education, skills, or sectors (Meinhart et al. 2022, p. 28). In **Slovakia**, two studies (World Bank and IEP, 2019; Globsec, 2021) predict a slight decrease in employment and negative wage level effects related to structural changes in the economy due to decarbonisation efforts. In **Ireland**, a gradual increase in carbon tax (from EUR 20 per tonne in 2020 to EUR 80 per tonne in 2030) is predicted to lead to a slight loss of employment of about 7 300 persons, equivalent to 0.3% of total employment (NESC, 2020).

2.2.2 Projected impact on employment by sectors

The expected labour market impacts of the green transition are mostly positive when considering whole economies, but results vary considerably by sector (see Section 2.1 above).

Some sectors are frequently identified as positively affected by the green transition. The country articles include examples of findings from studies carried out in Member States on the employment effects by sector as follows:

- **The construction sector is identified as a sector of employment growth as a result of the green transition**. This is due to old and energy inefficient buildings requiring renovation and because improving the cooling and heating efficiency of buildings are an important level to reduce CO2 emissions. For example, in **Belgium** the transition could generate more than 26 500 additional jobs until 2030 in the construction sector, making it the sector with the highest

[32] The energy scenario has been developed by Eurofound and Cambridge Econometrics, with inputs from Cedefop and Warwick University https://www.eurofound.europa.eu/observatories/emcc/fome

estimated potential for direct job creation (according to Climact et al., 2016). In **France**, the low carbon strategy[33] is projected to create 200 000 jobs between 2019 and 2030 mainly in the construction sector (DARES[34] & France Stratégie,[35] 2022).

- **Electrical equipment manufacturing** is also identified as a sector that might profit from the green transition, as electrical products are the backbone of the transition from fossil fuels to electrical energy generation (reported in **Belgium**, **Bulgaria**, **Cyprus**, **Czech Republic**, **Germany**, **Ireland**, **Italy**, **Lithuania**, **Malta**, **Spain**, **Sweden**). For example, in **Czechia**, one of the sectors with the largest projected increase in labour demand by 2030 is electrical machinery and equipment manufacturing (ČMKOS, 2022).
- **Green/renewable energy** or **waste disposal/recycling** services could benefit from increasing demand for sustainable products and services. For example in **Ireland**, modelled labour demand for offshore wind, onshore wind and grid-scale solar activities is forecast to grow from approximately 3 500 full-time equivalents (FTEs) annually in 2020 to more than 9 000 FTEs per annum in 2030 (EGFSN, 2021). For **Slovakia**, the transformation of the energy sector to 100% renewables could mean an increase in workplaces by 216% by 2030 compared to 2015 and by 165% by 2050 (Černý et al., 2021).

In other sectors, both positive and negative effects of the green transition as well as the impact of climate change, come into play, leading to ambiguous effects:

- **Employment effects in the tourism sector are ambiguous.** For example, in **Austria**, due to increasing temperatures, winter tourism could be significantly negatively impacted by climate change (Climate Change Center **Austria**, 2018, p. 1). Zachariadis et al. (2022) assumed a potential decrease by 15% in air travel and tourism demand in **Cyprus** due to increased travel costs. However, in colder Member States, employment might increase in the tourism sector, since the tourism period will be longer due to warmer temperatures. As reported in **Estonia**, the severely hot temperatures in southern Europe might also encourage more tourists towards northern European countries.
- In **Spain**, progressing desertification could negatively impact the **agricultural** and cattle sector (but also power generation in hydroelectric plants); changes in water temperatures and floods will also most likely affect the **fishery** sector. As reported in **Finland**, warmer climate could encourage new invasive species and pests that could negatively affect crops and forests. In **forestry**, Sammul et al. (2015) conclude that large changes in outside temperature may also lead to more seasonal employment and, as the temperature changes more regularly, the period suitable for forest work will be reduced. In parallel, changing temperatures may open up new possibilities for agriculture in other regions.
- The **employment effects of the green transition on the transportation sector may vary by type of transportation.** As reported in **France**, employment in the transport sector might decrease mainly because job losses in road freight transport (due to costs resulting from high carbon emissions) would not be compensated by jobs created in railways (and other sustainable transport

[33] For more details see https://energy.ec.europa.eu/system/files/2022-08/fr_final_necp_main_en.pdf
[34] A Statistical administration supervised by the French Labour Ministry.
[35] An Agency supervised by Prime Minister.

services). However, in **Romania**, the green transition is forecast to create new job opportunities in sustainable transportation (Asikainen et al., 2021).

Regarding job losses and negative employment effects of the green transition, fossil-fuel powered energy production is projected to be the most affected:

- For example, **Bulgaria** could be significantly impacted through a **phase-out of coal** (Pavlov, 2022; Vladimirov, Galev & Primova, 2020), while one projection estimates a reduction of approximately 4 000 employees in the oil shale industry in the **Estonian** region of Ida-Virumaa by 2035 (Michelson et al., 2020).
- Further, **energy-intensive sectors** like the chemical industry are projected to experience a decrease in employment. According to a 2021 feasibility study for the Chemical Industry Association, the implementation of the targets of the Green Deal for Europe could result in a loss of 11 000 to 32 000 jobs in the chemical sector in the **Czech Republic** by 2030. Similarly, most studies seem to project a decline in employment in the energy-intensive sector of vehicle construction in **Germany**.

2.2.3 Labour market transitions

While there is consensus in the ECE country articles that the green transition requires re- and up-skilling to train workers with new skills, there are divergent findings on the concrete skills requirements in "green jobs" in different Member States:

- In **Spain**, the Biodiversity Foundation estimates that the education level requirements of "green jobs" are generally high, although varying across "green jobs" categories.[36] According to the **Austrian** PES AMS, there is an increasing demand for skilled workforce in environmental jobs.
- In contrast, a **Danish** Energy Agency survey shows that companies with green production had a slightly lower share of unskilled employees and a slightly higher share of skilled employees than other firms. Further, an analysis of the characteristics of employees working in the circular economy in Flanders (**Belgium**) shows that most of the employees in the circular economy are low- and medium-skilled workers (here covering principally repair, waste and resource management, second-hand trade, rental, and leasing) (Fondation Roi Baudouin, 2019).
- As shown in the Italian report, STEM skills (in particular mathematical and IT skills, such as proficiency in programming languages) are important for 20.5% of "green skills" compared to 14.5% in other occupations (Unioncamere, 2020).

Retraining and overcoming skills mismatches is therefore most relevant for workers in sectors that are or will be particularly affected by the need to decarbonise and the impacts of climate change more broadly. Member States provide some examples of these retraining needs. For example in **Austria**, new strategies are needed to enable a change towards a sustainable tourism industry (Climate Change Center Austria, 2018, p. 10). This also includes retraining the workforce in this sector, e.g., for 'soft tourism' that is more aware of the natural resources. A green skill gap in the tourism sector was also observed in **Bulgaria** (Ivanova et al., 2021). In relation to the reduction of oil shale industry in the **Estonian** region of Ida-Virumaa, it is estimated that about half of the current labour force will need retraining to find employment in new economic sectors as their current skills become obsolete. The other 51% have knowledge and skills that can be used in other

[36] Source: Biodiversity Foundation (2019) 'Estudio del empleo y la biodiversidad en España'.

sectors, but they might need support in finding new jobs if the search takes too long (Michelson et al., 2020). Retraining is specifically important for low-skilled workers and unemployed looking for "green jobs". Evidence from **France** (2020) suggests that the unemployed looking for "green jobs" often have lower education levels, are older and more often in long-term unemployment (Margontier, 2022). In **Sweden**, there is also a need for more comprehensive and up-to-date technical knowledge and capabilities among high-skilled occupations such as engineers and architects (Bjerkesjö et al., 2021).

In many Member States, the green transition is projected to amplify skills shortages. According to a survey conducted on behalf of the Green party in 2021 in **Germany** (Blazejczak and Edler, 2021), the production of capital goods needed for climate neutrality in 2050 will create domestic labour demand of up to 767 200 people in 2035. The authors state that around 40% of this additional workforce required for climate neutrality in 2035 will be working in occupations that the Federal Employment Agency has identified as a shortage occupation in 2019. Increasing skills shortages due to the green transition might affect a wide range of sectors, depending on the national context - e.g., the construction sector (as reported, for example, in **Austria**, **Belgium** and **Germany**), tourism (**Austria**), or green hydrogen production (**Finland**).

A barrier to labour market transition can be the resistance of workers such as in **Poland**, where coal-related workers declare a high **aversion to relocation and commuting**; they also put a premium on job security and the possibility of using their current competencies in a new job (Christiaensen et al., 2022c). In **Slovenia**, projects of re-employing workers with local employers in coal mining regions (TJTP SAŠA, 2022, p. 7) are not well received by workers and their representatives (Sevčnikar, 2023) since jobs in the energy sector are much better paid compared to jobs in the local manufacturing industry.

Low participation in retraining and continuous training measures are also a barrier to upgrading the skills of the workforce. For example, participation in adult vocational education and training has been falling among unskilled and skilled wage earners aged 30-50 in **Denmark** since 2010 (Arbejderbevægelsens Erhvervsråd, 2023). The readiness of **Croatian** businesses for opportunities arising from the green transition was assessed by a survey conducted on behalf of the **Croatian** Chamber of Economy in 2021 (CCE and Apsolon, 2021).[37] The results have shown that more than 60% of businesses do not perceive the green transition as an opportunity. Only 15.7% of businesses created their own strategy aimed at the green transition, while 60% have an intention to create one in the future.

In **Germany**, the Hans-Böckler-Foundation (which is supporting mainly works councils through research and capacity development) prepared a report on challenges for employment and skills in the steel industry posed by the green transformation (Küster Simic, 2022). For hydrogen supply and the steel industry as well as for energy plant construction, the paper analyses key influencing factors and scenario-based effects on employment and qualification requirements in the steel industry. Recommendations for action for industrial skills development and HR policies are drawn. The study expects that for some time it will be necessary to run new and old plants and machineries in parallel, before moving fully to hydrogen technologies by 2036. In addition to changing technologies and linked changed skills requirements, total employment is expected to decline and net employment effects will be negative after 2030 (-30% in 2036 as compared to 2030). In terms of employment impacts, the study suggests a mixed policy

[37] https://www.hgk.hr/documents/apsolonbrosurawebpages618e6f81b5c2b.pdf

approach with early retirement options for older workers and continuing training and skills adaptation for younger and middle-aged ones. In the future, to run hydrogen-based direct-reduction-plants, relevant job descriptions (process technology engineers, industrial mechanics, electronics technicians) must therefore be adapted, also against the background of an increased degree of digitization of the plant. The study also recommends that in cooperation with the Chamber of Industry and Commerce, it would be necessary to design appropriate concepts for specialists and their vocational training, such as an Industrial Specialist Hydrogen Technology. The federal employment agency should be involved, according to the authors of the study. For further training concepts it makes sense to create this in a modular way, for example as part of an add-on qualification hydrogen. At the same time, research institutes and universities, in close cooperation with the companies, need to develop current requirement profiles along the industrial transformation, both in professional training and in higher education.

2.2.4 Social investment needs for the green transition

There appears to be a lack of research on social investment needs for the green transition (as reported in **Ireland**, **Italy**, **Slovakia**, **Slovenia**, **Sweden**, while **Lithuania** reports that this type of analysis is only carried out for the most negatively affected regions).

There are different cost categories that researchers and national agencies consider. Cost considerations refer to the internalisation of external effects (e.g., through emissions trading) or costs of economic restructuring in terms of lost economic dynamics locally, including associated social costs. Climate change itself will also have effects on working conditions, leading to physical and possible mental health costs and decreased labour productivity. Cost in terms of investment in human capital and prevention of poverty and long-term and/or repeated unemployment may arise. At the same time, investments in human capital are a source of growth. This would hold true also for other types of investments to support the green transition.

Costs around coal and other fossil fuel phase-out processes, including in relation to job losses, are often reported. This has called for social investments to mitigate negative employment effects. The Just Transition Strategy ("Estrategia de Transición Justa") in **Spain**, for instance, focuses on 15 territories affected by the closure of coal mines and coal-fired thermal power plants and was initially endowed with EUR 130 million from national funds for 2019-2021, which were thereafter increased to EUR 300 million. The Just Transition Fund has also allocated EUR 869 million for 2021-2027 in **Spain**, bringing the investment in the fair green transition to EUR 1.3 billion.

As reported in **Romania**, investments to achieve a fair green transition relate to additional costs of purchasing new technologies, retraining workers and supporting communities most vulnerable to the impact of climate change (Stefanescu et al., 2022). These investments are associated with future GDP or employment growth. The Spanish National Integrated Energy and Climate Plan ("Plan Nacional Integrado de Energía y Clima") estimates EUR 241 billion investment is needed between 2021 and 2030, which will increase GDP growth by 1.8 percentage points with respect to the tendency (middle ground) scenario. It is not clear if this includes social and skills investments. The Integrated National Energy and Climate Plan of the Republic of **Slovenia** (NEPN) shows that an increase in green investments of EUR 5 billion compared to a baseline scenario has an overall positive impact on household disposable income (2.26% by 2030), which however becomes negative for households in the lowest quintile of the income distribution (-0.59% compared to the baseline scenario) in 2030 (NEPN, 2020, pp. 209-211; Tables 66 and 67). Total employment under this scenario is projected to be about 1.39% higher and the unemployment rate about 7.3% lower in 2030 than under the

baseline scenario (NEPN, 2020, pp. 212-213; Table 69). In **Denmark**, several studies (e.g., Arbejderbevægelses Erhvervsråd, 2020b) showed that significant investments in green technology will potentially increase employment.

In Lithuania, the creation of jobs through attracting foreign and local investors **and retraining local workers in the regions most affected** by the green transition will be supported with **EUR 78.8 million.**[38] To foster the transition to a knowledge-based and higher value-added economy, it is estimated that EUR 44.5 million are needed to develop the skills required for smart specialisation, industrial transition, entrepreneurship and the adaptation of enterprises to change (Programme for the EU Funds, 2022). The Socially Responsible Lithuania priority foresees a need for almost EUR 400 million to increase employment opportunities, improve the quality, inclusiveness, efficiency and labour market relevance of education and training systems, and promote lifelong learning (Objectives 4.1, 4.2 and 4.4) (ibid). The agricultural sector, which is particularly vulnerable to climate change, has a need for additional funding of EUR 12 million for consultancy, training, skills acquisition and development (Lithuanian Rural Development, 2022).

The **Estonian** Employers' Confederation has estimated, together with the Stockholm Environment Institute in Tallinn, that **achieving a carbon neutral economy by 2050 in Estonia will require investments of about EUR 20 billion** (**Estonian** Employers' Confederation, 2022). In relation to the reduction of the oil shale industry in the region of Ida-Virumaa, it has been estimated that about half of the current labour force will need retraining to find employment in new economic sectors as their current skills will become obsolete. The other half has knowledge and skills that can be used in other sectors, but might need support in finding new jobs in case the job search period becomes too long (Michelson et al., 2020).

The physical and mental health effects of climate change also need to be considered among the costs (DGUV/BAuA, 2022:10). These include risks of skin and eye damage and skin cancers due to high levels of UV radiation, dehydration due to high temperatures that might make work accidents more likely, increasing physical risks because of hazardous substances previously diverted from the production process that will now need to be recycled, or psychological effects, specifically on younger workers who might increasingly experience chronic fear and stress from climate anxiety or solastalgia.[39]

Assessing the costs of the green transition also means thinking about the **costs of unchecked climate change**. In **Poland**, **losses due to extreme weather events** such as droughts and flooding are estimated to cost between 0.1-0.4% of GDP annually (Siwiec et al., 2022). Progressing climate change generally might also generate a **loss of labour productivity due to extreme heat.** A study in **Belgium** (Vito et al. 2020) showed that labour productivity losses associated to heat are higher for agriculture and construction (outdoor activities) than for services (indoor activities). The analysis also revealed that warmer winters caused by climate change could compensate, to a certain extent, for productivity losses associated with (extreme) heat, as workers might be less likely to be absent from work (e.g., call in sick).

[38] As identified in the Territorial Just Transition Plan (TJTP).
[39] A form of nostalgia experienced when a person has not moved places, but their environment has changed (https://en.wiktionary.org/wiki/solastalgia)

3 Policies for a fair green transition

This section takes stock of Member States' policy measures ensuring a fair green transition. It analyses key policy measures in line with the Council Recommendation of 16 June 2022 on ensuring a fair transition towards climate neutrality,[40] and reflects how the following policies are supporting a fair green transition:

- policy frameworks,
- labour market and skills policies,
- policies addressing the needs of those most vulnerable and most affected by a fair green transition,
- occupational safety and health (OSH) policies.

The section then discusses the **key factors enabling the development of policies** for a fair green transition.

The section concludes with an overview of **initiatives for improving data, research and monitoring of the labour and social aspects of the green transition**, such as data observatories, information platforms for affected people and involved stakeholders and cooperation networks on data, research and monitoring.

3.1 Current policies addressing the fair green transition challenges

3.1.1 Strategic policy frameworks for ensuring a fair green transition

At a strategic level, this thematic review allowed to draw **a distinction between two groups of Member States. Those Member States where a dedicated labour market policy was formulated to address specifically the challenges of a fair green transition and those Member States where the challenges are tackled by relying on the pre-existing policy framework** (see Table 2 below). In the first, smaller group, Member States, including **Austria** and the **Netherlands**, have recently developed specific labour market strategic frameworks addressing a fair green transition. In **Ireland**, **Portugal**, **Spain** and **Malta**, such a strategic response is included as part of the overall policy response. In this group, employment policies form a distinct strand of the policy framework intended to respond to fair green transition challenges. In comparison, a much larger group of Member States tend to rely on general labour market policy frameworks and instruments to also respond to the challenges of a fair green transition. In this group, general active labour market policies (ALMPs), used to respond to a range of general strategic challenges, are also applied to support a fair green transition.

Table 2. A range of policy frameworks for a fair green transition

Types of policy responses	by Member States
Dedicated labour market policy frameworks for a fair green transition	2 Member States: A dedicated national labour market policy for a fair green transition: **Austria** (Action Plan Just Transition), **Netherlands** (Action Plan for Green and Digital Jobs "Groene en Digitale Banen Plan"). 4 Member States: National policy frameworks where labour market policy responses to fair green transition form a separate pillar: **Spain** (Just Transition Strategy "Estrategia de Transción Justa", Axes E/F), **Ireland** (Just

[40] EUR-Lex - 32022H0627(04) - EN - EUR-Lex (europa.eu)

	Transition Framework), **Malta** (National Employment Policy), **Portugal** (The Basic Law on Climate).
General policy frameworks used to respond to the new strategic challenge for a fair green transition	21 Member States: **Belgium**, **Bulgaria**, **Denmark**, **Estonia**, **Croatia**, **Cyprus**, **Czechia**, **Finland**, **France**, **Germany**, **Greece**, **Hungary**, **Italy**, **Latvia**, **Lithuania**, **Luxembourg**, **Poland**, **Romania**, **Slovenia**, **Slovakia**, **Sweden**.

Source: Author's compilation based on information contained in the country articles.

3.1.2 Labour market and skills policies in a fair green transition

Considering the implementation of concrete ALMPs intended to address the fair green transition challenges, **there is a focus within the current frameworks, albeit different across the EU MS, on measures aimed at upskilling and reskilling of workers** required to respond to the new and changing skills requirements for a fair green transition (see Table 3 below).

Table 3. Key skills and labour market policy responses for a fair green transition

Types of policy responses	Member States
Examples of **upskilling in the context of ALMPs** supporting directly a fair green transition	Identified in the country articles for 12 Member States: **Austria**, **Cyprus**, **Croatia**, **Denmark**, **Germany**, **Ireland**, **Italy**, **Netherlands**, **Poland**, **Romania**, **Spain**, **Slovenia**
Examples of **other types of ALMPs** supporting directly a fair green transition	Identified in 5 Member States: **Croatia**, **Denmark**, **Poland**, **Sweden**, **Slovenia**

Source: Author's compilation based on information contained in the country articles

Firstly, interesting examples of national upskilling measures supporting a fair green transition have been identified in the country articles for 12 Member States (listed in Table 3 above). They cover a **range of interventions to provide financial support to workers to train, to develop new training programmes, to map the skills requirements and incentivise employers** (see Annex 2, Table A2.1). They show a range of upskilling initiatives, in terms of their geographical scope (from small and local to nationwide programmes), types of upskilling measures (including provision of training courses, development of training infrastructure, changes/new training curricula, financial aid to people and companies to access such training) and their financial size and target groups.

The country articles indicate that **Austria** and the **Netherlands** are currently the 2 Member States where strategic skills policy responses are developed for addressing fair green transition challenges. In **Austria**, the Just Transition Action Plan for Education and Training ("Just Transition: Aktionsplan Aus- und Weiterbildung") includes a range of planned skills measures, including development of new competences, changes to training curricula, training the trainers or provision of skills and consultancy support for companies, jobseekers and workers. In the **Netherlands**, the Green and Digital Jobs Plan ("Groene en Digitale Banen Plan") also has a wide scope, covering actions to increase the number of students at all levels, including vocational training, stimulating new entrants and retention, raising labour productivity, strengthening governance and avoiding fragmentation in programmes and policies. Furthermore, financial support for upskilling initiatives has been provided in **Austria**, **Croatia**, **Cyprus**, **Germany**, **Ireland**, **Italy**, **Netherlands**, **Romania**, **Slovenia** and **Spain**. This ranges from small-

scale local innovative activities in **Austria** to major requalification nationwide programmes in **Italy** and **Germany**. Examples of how training programmes have been developed to support skills required for a fair green transition have been identified in **Denmark** and **Ireland**. Upskilling and reskilling initiatives by specific employers were taken in **Austria** (e.g., providing training in circular economy companies) and **Poland** (e.g., retraining workers in the coal mining sector). Initiatives mapping the skills needed for a fair green transition have been reported in **Germany** (pilot projects) and **Italy** (development of an index based on the ESCO classification).

Secondly, several interesting examples of other types of ALMPs supporting the fair green transition have been highlighted. The focus of the interventions in **Croatia**, **Sweden** and **Slovenia**, for instance, is to **provide incentives, subsidies and grants for employers to hire unemployed people specifically for "green jobs"**.

- The **Croatian** Employment Service launched specific policy measures in 2022 to provide new grants (subsidies) to support employment, self-employment and traineeships in jobs associated with the green and digital transitions. Whilst an official definition of "green jobs" does not exist, concrete examples for "green jobs" which are eligible for the subsidy relate to renewables, water and waste management, but also expert activities related to environmental protection, eco-mobility, green manufacturing and others.[41]
- In **Sweden**, the so-called nature-closed/"green jobs" scheme was implemented in October 2020. The objective is to create subsidised jobs suitable for people with a weak attachment to the labour market, particularly newly arrived migrants and long-term unemployed job-seekers. In addition to regular work tasks, participants receive training to help increase their employability in the labour market. Between 2021 and 2023, the Swedish government will invest SEK 170 million per year (around EUR 17 million) in the scheme.
- In **Slovenia**, policy measures to secure "green jobs" for unemployed groups were introduced in 2021 as incentives for employers with "green jobs". The measure, called "Incentives for Green Jobs", encourages employers to permanently employ vulnerable unemployed people in "green jobs". The programme has a budget of EUR 2.5 million to employ 300 people over 4 years.

Other examples of ALMPs supporting the fair green transition include:

- Active labour market policies play an important role in supporting the employability of vulnerable groups in **Denmark**. In 2019, **Denmark** spent 2% of GDP on active measures (the highest relative expenditure on ALMPs among OECD countries). Information on the share of unemployed undertaking education, traineeships and employment with wage subsidies specifically targeted at the 'green economy' is not available. However, there are examples of local initiatives that explicitly target 'green activation' as part of ALMPs.
- In **Poland**, examples of outplacement projects aimed at workers in sectors particularly affected by the green transition were identified at a regional level. In particular, the project Energy ("ENERGIA") in the Silesian region aims to facilitate the swift reintegration or support the continuous employment of people who have been made redundant, are to be made redundant or are threatened with a

[41] The amount of monthly subsidy for employment in the green and digital sector, depending on the unemployed person's level of education, ranges from EUR 315 to 535, or from EUR 490 to 835 for a person with a disability. Subsidies for traineeships total from EUR 490 to 715 per month, with a trainee also receiving co-financing of transport costs up to EUR 50.

dismissal for reasons not attributable to the employee. Re-employment is related to obtaining appropriate qualifications or competencies. 220 people will participate in the programme until 2023, particularly employees of coal and coal-related companies based in the Silesian Voivodeship.

3.1.3 Policies addressing the needs of the most vulnerable and affected groups, sectors and regions in the context of a fair green transition

Policies relating both to addressing the needs of the most vulnerable and under-represented workers in the context of a fair green transition (e.g., low skilled workers, young people, persons with disabilities, long-term unemployed and older workers) and the needs of the groups, sectors and regions most affected by a fair green transition (e.g., workers in the fossil fuel intense industries) have been identified by the review.

To start with, a fair green transition requires policy measures in Member States to increase **effective access and participation of the most vulnerable and under-represented people in "green jobs"** and occupations that contribute to climate, energy and environmental objectives.

In most Member States, this review identified that support for the most vulnerable groups, sectors and territories in ensuring a fair green transition is provided via existing general policy frameworks. This is done by applying general restructuring policies, ALMPs and upskilling mechanisms, without providing a dedicated policy response targeting the most vulnerable groups during green transition processes.

An illustrative example of such a general approach can be found in **France**, where the Skills Investment Plan (PIC) ("Plan d'investissement dans les compétences") launched in 2018 coordinates various institutions in charge of education and training at the national level. PIC has a budget of EUR 15 billion over 5 years and aims at increasing training for the individuals having specific difficulties in accessing employment (mainly because of a low qualification). The last PIC report indicates that in 2021, 39 000 entries in training linked to green or greening jobs were observed. It corresponds to an increase of 1 000 entries since 2019 (+1.3% yearly). At the same time, this increase in training for green/greening jobs is far below the yearly increase in all training inflows during the same period (+27.1% yearly). This trend seems to remain over time, as from 2019 to 2021, the share of inflows in PIC training linked to green and greening jobs decreased from 2.9% to 1.8% of all PIC training programmes. The experience in **France** hints at the potential difficulties involved in effectively assisting the most vulnerable individuals within existing general policy frameworks.

The country articles identified other Member States that face similar challenges.

In **Austria**, the country article highlighted that more efforts are needed to improve the labour market potential of women in the green economy. The green transition provides a window of opportunity to enhance their labour market participation. However, the framework conditions for this are not yet met, given the limited supply of childcare in **Austria** and the limited participation of women in mathematics, informatics, natural science and technology (MINT) studies and related vocational training.

In **Finland**, new measures aim at improving employment prospects also for vulnerable groups. These measures are not particularly targeted or linked to adverse effects of the green transition but are generally aimed at improving the employment prospects of the unemployed, the young and those having only partial work capabilities. The investment in these measures amounts to EUR 170 million and thus only a small part of a bigger package of over EUR 2 billion.

At the same time, several country articles identified examples of dedicated approaches to address the needs of the most vulnerable in the context of a fair green transition. Such examples have been identified in **Austria**, **Belgium**, **Croatia**, **Malta**, **Slovenia** and **Spain**:

- In Flanders (**Belgium**) the 1 000 Klimaatjobs project was launched in July 2022 to create 1 000 jobs in the social circular economy (e.g., second-hand activities). It specifically targets workers who have difficulty finding a job in the classic economic sectors, such as persons with disabilities. 450 of the 1 000 jobs have already been created.
- A similar project in the context of a circular economy was identified in **Austria**, the Baukarussell initiative. It combines circular economy with the 'urban mining' approach, where long-term unemployed persons are hired via socioeconomic companies and receive training in dismantling buildings and collecting either raw materials or objects that can be re-used.
- In **Croatia**, the Employment Service launched specific policy measures in 2022 to provide new grants (subsidies) to support employment, self-employment and traineeships in jobs associated with the green and digital transitions. The amount of monthly subsidy for employment in the green and digital sector includes a higher subsidy for a person with a disability.
- In **Malta**, one specific initiative implemented by the Public Employment Service (Jobsplus) which focuses on "green jobs" and vulnerable groups is the Intercept project. This programme offers training and 3 months of paid work placements for young job-seekers, 25-29 years old, interested in working in the environmental sector.
- A dedicated programme for vulnerable groups is also planned in **Spain** (in the context of the implementation of the Just Transition Plan). One of the four plans funded by the Recovery and Resilience Mechanism is a Support Plan for vocational training and labour insertion. It is endowed with EUR 20 million and targets 4 000 low qualified workers in the just transition areas. Guidance, information, support to job search and training activities will be provided to affected workers, as well as to other unemployed persons of the territories, preferably women, young people, persons with disabilities, long-term unemployed and workers older than 52 years. In line with the projects promoted by the Just Transition Strategy, training will be related to "green jobs", such as solar energy, wind energy, green infrastructures and energy rehabilitation of buildings.
- In **Slovenia**, a measure, called Incentives for Green Jobs, encourages employers to permanently employ vulnerable unemployed people in "green jobs". The programme has a budget of EUR 2.5 million to employ 300 people over 4 years.

In relation to the type of funding used to **finance policies addressing the needs of the groups, sectors and territories mostly affected by a fair green transition** (e.g., workers in fossil fuel intense industries), the country articles identified several Member States where the EU's Just Transition Fund has provided a major impetus to develop such policies for the most affected (e.g., **Estonia**, **Hungary**) as well as Member States where national funds and initiatives for the most affected are also implemented (e.g., **Germany**).

The EU's Just Transition Fund, implemented in all 27 Member States, appears to have provided a key impetus to develop policies for the most affected

sectors and territories. From a territorial perspective, the Fund is planned to help to identify and support the most affected regions and localities with concrete funding and interventions. The number of regions supported varies from 1 in **Estonia** and **Ireland** to 15 in **Spain**, reflecting the diversity of green transition situations across the EU.

The territorial approaches funded by the Just Transition Fund have also been important to promote multi-faceted and multi-dimensional policy responses, combining the different approaches to upskilling, business support, economic redevelopment and energy diversification. Guidance, information, support around job search and training activities will be provided to affected workers and to other unemployed people in the territories and sectors affected. Examples of such combined policies under the Just Transition Fund have been identified in **Estonia**, **Hungary**, **Romania**, and **Spain**. For **Hungary**, for instance, the Territorial Just Transition Plans implemented in the 3 counties directly impacted by decarbonisation primarily focus on three challenges: facilitating workers' transitions through reskilling, diversifying the energy needs of small and medium sized enterprises (SMEs) by investing in technologies and decreasing energy poverty, and increasing the efficiency of energy use by the local population. A similar multi-faceted approach is followed in **Spain**, involving a multi-dimensional strategy to instigate a virtuous circle by combining heavy 'green investment' and support to local development in green transition areas.

Furthermore, the country articles identified **a number of Member States using their own national funds and approaches to address the most affected:**

- A significant investment approach from **Germany** illustrates the use of national funds to develop such policies. The Structural Strengthening Act ("Strukturstärkungsgesetz"), in force since 2020, supports structural change in coal regions with up to EUR 40 billion by 2038, of which EUR 14 billion is specifically devoted to structural investments in (former) coal regions. Federal States and municipalities decide how these EUR 14 billion are invested. The evaluation of this law and its measures is due for the first time in June 2023. Similarly, in 2021, the German government pledged to provide at least EUR 4.5 billion for structural change in the automotive industry – of which at least EUR 1.5 billion for the Future Investments in the Automotive Industry support programme, EUR 1 billion to extend the innovation premium from 2022, EUR 1 billion for a truck fleet renewal programme, and EUR 1 billion for the Automotive Industry Future Fund. Other interesting examples from **Germany** include support of employees in companies to become a transformation guide ("Transformationslotsen"). The Federal Employment Agency is involved in partnership approaches and alliances to mitigate employment effects in key affected sectors (e.g., in the automotive industry, coal mining).
- An approach involving the social partners has been highlighted in **Poland**, where the government and mining trade unions signed a social agreement with a wide range of supporting measures in the context of a hard coal mine closure scheduled by 2049 (see also section 4.1.4). In 2022, a similar agreement was prepared for the lignite and coal-fuelled energy sectors.
- Other interesting and promising initiatives identified in the country articles include a register of jobs at risk developed in **Belgium**, and the Regional Observatory of Transition Processes ("Regionalne Obserwatorium Procesu Transformacji") in Upper Silesia in **Poland**, where mining-related employees and trade unions conduct studies about their sector.

- An interesting initiative in **Belgium** is an occupational approach whereby a register of 'jobs at risk' in the context of transition towards climate neutrality is being developed. The register is intended to cover such jobs in the sectors of energy production (and, in particular, the dismantling of nuclear power stations), the transport sector (more specifically at the level of the electrification of vehicles), the construction (particularly as regards the promotion of cross-professional qualifications in the field of energy renovation of buildings), and the sectors linked to the use of smart grids and their management.

3.1.4 Occupational health and safety (OSH) policies addressing the fair green transition

Another key challenge is to ensure that **labour laws and policy measures promote the adaptation and resilience of the world of work to the adverse impacts of climate change as well as environmental degradation**. For most Member States the country articles note that such changes have been mostly addressed through applying the existing occupational health and safety(OSH) policies and practices at national, sectoral and company level, implementing EU legislation to protect workers' safety and health at work. The existing EU OSH legislation covers aspects related to temperature, heat stress and extreme weather at work. The central piece of legislation is the Framework Directive 89/391/EEC[42] and its related Directives.[43] In addition, the EU and Member States have published guidance on heat stress at work.[44] The Commission constantly monitors whether EU OSH policies need to be adapted to address specific risks and technological, medical, societal developments including those related to climate change and environmental degradation with a view to protect the health and safety of workers. The EU, Member States and research experts have discussed the OSH challenges of climate change and heat at work at the OSH Stocktaking Summit in May 2023 in Stockholm. There is increased attention to the OSH issues given the extreme heat in the summer of 2022 (e.g., reported in **Poland**, where the trade unions have discussed the issue of the maximum temperature in a workplace due to the high temperatures recorded during the summer of 2022, as well as started a knowledge exchange with other countries and where no specific regulations in case of more intensive and frequent weather events have been developed).

In most Member States, the country articles indicated that existing health and safety regulations for either all workers or workers in particular sectors apply also to risks at work related to climate change, heat and extreme weather events. Dedicated policy approaches and measures to specify particular preventive and protective measures for the health and safety of workers in light of the impact of climate change in the workplace are identified in the country articles for 7 Member States (**Austria**, **Germany**, **Lithuania**, **Malta**, **Romania**, **Spain** and **Slovenia**). This includes adapting OSH legislation to respond to climate change effects in **Lithuania** and **Romania**, updating the national OSH strategy in **Malta**, developing specific OSH programmes in **Germany** and **Slovenia** and developing specific OSH tools in **Lithuania** and **Spain**.

The country articles did not identify many specific actions for sectors with high OSH risks due to climate change (e.g., construction, agriculture, emergency

[42] OJ L 183, 29.6.1989, p.1
[43] In particular the Workplace Directive 89/654/EEC, the Construction Sites Directive 92/57/EEC, the Extractive Industries Directives (92/91/EEC and 92/104/EEC), and the Fishing Vessels Directive 93/103/EC. The ongoing review of the Workplace Directive may also address the issue of temperature at work.
[44] EU Agency for Safety and Health at Work (EU-OSHA) (2023): "Heat at Work - Guidance for Workplaces", https://osha.europa.eu/en/publications/heat-work-guidance-workplaces.

services). Examples of overall OSH measures are mostly applicable across the sectors. Exceptions with sector-specific approaches were identified in **Austria** and **Germany** (for the construction sector), **Lithuania** (for the construction and agricultural sectors) and **Slovenia** (for workers in emergency services). In particular, in **Slovenia**, a warning system was made freely available on a specific platform developed within the research project HEAT-SHIELD (Horizon, 2020), in which Slovenian researchers participated (Pogačar and Kajfež Bogataj, 2020/2021). The platform HEAT-SHIELD is accessible to Slovenian employers and employees and provides site-specific prediction of risks related to heat stress in the manufacturing, construction, transportation, tourism, and agricultural sectors, which can be tailored to the employee's physical characteristics, level of physical activity, protective clothing, working environment and acclimatisation (Pogačar and Kajfež Bogataj, 2020/2021, p. 335).

3.2 Factors enabling good policies for a fair green transition

With respect to the coordination of policymaking**, 7 Member States are reported to have a single dedicated entity, explicitly tasked with inter-ministerial coordination across the different policy areas for a fair green transition**. This is either a ministry with overall responsibility for climate change policy or a special inter-ministerial structure. The former applies to **Austria** (Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology), **Ireland** (Department of the Environment, Climate and Communications), and **Portugal** (Ministry of Environment and Climate Action). The latter exists in **Estonia** (Green policy steering committee), **Finland** (Committee under the Sustainable Growth Plan), **Spain** (Institute for the Just Transition) and **Sweden** (Ministerial Working Group, the so-called Climate College).

In most Member States, policy coordination for a fair green transition between the different ministries remains a challenge. This may be partly driven by historical experience where environmental and employment policies were subject to regulatory silos (reported in **Italy**, for example). As a consequence, the coordination of policymaking for a fair green transition across policy areas is perceived as relatively weak (as found for **Cyprus**, **Czechia**, **Croatia**, **Hungary**, **Italy** and **Poland**). In the **Netherlands**, better consultation and alignment between ministries appears necessary to reflect the complex and multifaceted issue of energy transition and climate change and its implications on employment. However, the only ministries and government departments mentioned in climate and energy policies, besides the Ministry of Economic Affairs and Climate Policy, are those responsible for agriculture, transport and mobility, infrastructure and water. In **Belgium**, the coordination of climate and environment policymaking across the different levels of government remains challenging. This is because decision making within coordination entities requires a consensus among the different government levels and several entities entrusted with the fair green transition agenda.

Only few Member States use employment, social and distributional impact assessments (ex-ante and ex-post) as part of climate, energy and environmental reforms and measures. Recent analyses are reported in the country articles for **Cyprus**, **Lithuania**, **Malta**, **Estonia** and **Slovenia** (in the latter two, as part of the development of national Just Transition Plans under the Just Transition Fund). As an example, ex-ante assessments of the impact of energy and climate policies on employment and income distribution were assessed by the ECE country expert as

systematically performed as part of the **Cyprus** NECP submitted in January 2020.[45] Another example is **Malta's** 2030 National Energy and Climate Plan[46], which considered five dimensions of energy - decarbonisation, energy efficiency, energy security, internal energy market, and research, innovation and competitiveness. The plan involved an impact assessment, where a key social impact considered was energy poverty.

Consequently, there are **few exchanges between social partners, civil society and other stakeholders on the outcomes of evaluations and impact assessments** . The public debate on the challenges associated with a fair green transition has only emerged recently.

Stakeholders outside government circles play an important role in shaping the policies required for a fair green transition. At the same time, **thinking about labour market and climate change policies in an integrated way remains a challenge according to stakeholders**. The country articles identified stakeholder demands and ideas for developing fair green transition policies in several Member States. Such demands cover various issues, including the need for an integrated governance approach to a fair green transition, calls for better and more accessible upskilling measures, reforms of social security systems and updating OSH practices and policies recognising new challenges arising from climate change. Specific country examples illustrate the variety of stakeholder demands in this respect. In **Belgium**, **Estonia** and **Poland**, stakeholders suggest how the governance process could be better organised to support a fair green transition, in terms of adapting existing policy structures and adopting a strategic approach. In **Belgium**, stakeholders request the development of strategic fair transition plans and support for social dialogue policies at every level, underpinned by a national commission and citizen assemblies - reflecting the need for a broad societal consensus to achieve a fair green transition. Similarly in **Estonia**, stakeholders asked the government to develop a strategic roadmap detailing the overall integrated approach to a fair green transition.

The Germany country article also specifically identified policy ideas by stakeholders for dedicated policy instruments. Here, one stakeholder **requested the setting up of a structural fund** to mitigate the employment impacts of transformation for the workers most affected (in general, and not only by the green transition). **The development of a transformation short-time work scheme** ("Transformationskurzarbeitergeld") was also proposed. The idea behind the transformation short-time work scheme ("Transformationskurzarbeitergeld") proposed by the IG Metall trade union is to retrain employees according to changes in skills needs that emerge due to digitalisation and climate change (and climate change regulations) in order to keep them employed in their current company.

- **Stakeholders in several Member States have also asked specifically to improve efforts to provide workers with the skills required in the context of a fair green transition**. This has been raised as a key issue in debates in **Germany**, **Lithuania**, **Sweden** and **Slovenia**, with more details on some of these below: In **Germany**, according to the trade union IG Metall, the possibilities of the Qualification Opportunities Act (as a key upskilling policy

[45] Republic of Cyprus (2020), *Cyprus' Integrated National Energy and Climate Plan*, Nicosia, Cyprus. Available at https://energy.ec.europa.eu/system/files/2020-01/cy_final_necp_main_en_0.pdf; Taliotis, C., Giannakis, E., Karmellos, M., Fylaktos, N. and Zachariadis, T., Estimating the economy-wide impacts of energy policies in Cyprus. *Energy Strategy Reviews* 29 (2020), 100495. https://doi.org/10.1016/j.esr.2020.100495

[46] Energy and Water Agency. 2019. Malta's 2030 National Energy and Climate Plan. Malta: Energy and Water Energy. https://energywateragency.gov.mt/wp-content/uploads/2021/10/MT-NECP-FINAL-2020-10-05_Corrigendum.pdf

instrument) will not be sufficient or effective for ensuring a rapid green transition because it does not focus on whole sectors or companies, but on continuous training of the individual. The criticism from the employer side is different. According to the German employers' organisation, the BDA, the general problem for companies is not a lack of policy measures promoting the green transition, but rather a lack of easy access to those measures as well as a limited overview of the wide range of policy support measures available to companies.

- An interesting proposal, in terms of its wide reach and holistic approach, was identified in the **Sweden** country article. In its 2022 annual report, the Climate Policy Council recommended that the Government implements a broad knowledge lift and upskilling initiative for climate transition. More specifically, the Council recommended to enhance the skills and capacity of Government agencies and ministries; develop a dialogue with higher education institutions around supplying skills for the climate transition; increase opportunities and resources for vocational education and training and continuing professional development in areas critical to the transition; and better use public education and other resources to improve knowledge about the climate transition on a broad front.

Reforms to social security systems to reflect the need for a fair green transition have also been raised by stakeholders in **Belgium** and **Slovenia**. The ideas put forward in **Belgium** relate to the development of a social security system that recognises ecological transitions and environmental degradation as social risks that need to be mutualised. Improved social security systems could, for example, offer workers affected by the green transition sufficient time to retrain and to find a job at the same level of quality and salary.

Finally, a common theme of stakeholder demands is to improve the OSH conditions of workers affected by climate change, as identified for instance in **Spain** and **Slovenia** (measures are requested around more training, prevention plans, guidelines, alert systems). The Spanish trade union CCOO demanded measures to increase the safety of workers towards climate change risks, such as to strengthen collective bargaining, provide training to workers and trade union representatives, or develop prevention plans in companies. For example, companies should reschedule work to avoid riskier hours, provide enough water, adequate clothes, and tools to reduce the physical effort of workers. More recently, in 2019 CCOO published a note with proposals to improve the health and safety of workers affected by the adverse impacts of climate change. The union demands that the public health surveillance system pays attention to the impact of high temperatures on the health of workers. It also demands other measures from the government, such as the development of guidelines for companies, the provision of training to public servants, workers and managers.

Monitoring and research initiatives can also inform and feed into policies for a fair green transition. Several institutions, including statistical offices, ministries, public employment services, chambers of commerce and industry, research institutes and in some cases social partners are involved in classifying and analysing "green skills" and jobs and conducting labour market and skills forecasts and foresight studies. Some social partners have conducted their own studies or have been included in the monitoring and research activities of government agencies. In some cases, they have not been involved, but monitoring information and research is publicly available and relevant to them. In some Member States, social partners have only or mainly been involved in developing programmes and plans to obtain EU financial support (e.g., for TJTP, ESF+ and other programmes). Research institutions are also conducting their own

research or have been commissioned by stakeholders to do so. Thus far, research on "green jobs" and skills has been carried out in 19 of 27 Member States. Other aspects around fairness of the green transition are only rarely investigated.

4 The role of Social Dialogue for a fair green transition

4.1 Introduction

This section considers **examples of social dialogue agreements and practices in the context of the green transition.** Social partners include single employers, employers' organisations, trade unions and employee representatives at company level. Social dialogue mainly exists as a tripartite process (consisting of the social partners and the government institutions) or as a bipartite process (employer or employer organisations and trade unions and/or workplace employee representatives). Formalisation may also vary and encompasses information-sharing, consultation and binding negotiation and collective bargaining at supra-national, national, regional, sectoral and enterprise level. There are substantial differences in union density figures across the Member States. Union density also varies by type of green sector.[47] Often, trade union representation in new emerging sectors and companies is lower than in traditional sectors (e.g., as mentioned in **Germany**). The power of social partners varies from one sector to another. The institutional and legal framework for regulating labour markets (for example the praxis of legally extending collective agreement outcomes) has an important impact on power relationships and the format in which social dialogue takes place.

This section summarises social partners' actions to anticipate changes or undergoing restructuring processes linked to the green transition, such as the decommissioning of carbon-intensive activities and facilities, efforts to decarbonise economic activities and reduce pollution (e.g., air, water, soil) from industrial processes, or the adoption of low-emission technologies and sustainable business models. Mainly regional and sectoral approaches have been identified, while national approaches are less frequent. A few practices and agreements were identified at company level. Agreements and practices are examined vis-à-vis the **criteria defined in the *EU Quality Framework for anticipation of change and restructuring,***[48] evaluating which of the criteria have been implemented in the examined examples and their features and outcomes.

Country experts have identified examples of company, sector, community or regional social dialogue through desk research and interviews with individual companies, sectoral social partner organisations and regional authorities. The main method, in 24 out of 27 country articles, was to conduct interviews with social partners and a few companies, because many initiatives are rather recent and not well documented in publicly available sources. A total of 29 interviews were conducted with trade unions and 12 with employer organisations, as well as 4 interviews with Chambers and sector organisations (among 15 interviewees among various stakeholders, including research institutions, Ministries, and training institutions). Single agreements and practices have been identified through these interviews and desk research, more in some countries than in others. This is linked to the type of social dialogue practices in the countries and the visibility of items linked to greening. The collective agreements and practices highlighted give insights into how the impact of the green transition can be addressed. However, they do not represent a full stocktake of all agreements and practices.

[47] https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/trade-union-density

[48] Communication from the Commission of 13 December 2013 on 'EU Quality Framework for anticipation of change and restructuring', COM(2013) 882 final.

4.2 Positions of trade unions and employers on a fair green transition and collective bargaining issues

The positioning of social partners on a fair green transition varies, also depending on the level of involvement, with conflicting views that may emerge at national, regional, local levels. In some cases, trade unions may support the green transition at top level but resist transformation at sector and company level (coal exit). At sectoral and company level, compensation and early retirement packages are at the centre stage to cases of (mass) dismissal. In some Member States and sectors, trade unions perceive skill development as key to anticipating and managing restructuring. Employer organisations may also adopt green transition objectives into their general opinions (see for example in **Estonia**). The interests of employers pursued in social dialogue are in some cases driven by labour shortages, regarded as a challenge to the 'greening' of production processes, as well as the costs of restructuring.

There is often a common interest in skill development to mitigate employment losses and support the green transition. This is already a longstanding practice for managing economic restructuring. For example in **Sweden**, so-called Job Security / Transitional Agreements are examples of negotiated flexicurity approaches strongly focusing on qualification measures. Internal and external job-to-job transitions may nevertheless be hampered by other factors, such as wage differences. Therefore, a few trade unions have proposed a specific fund for compensating income loss (see IG Metall in **Germany** and **Slovakia**). Cooperation with other partners becomes necessary in the area of skills development and local economic development.

Apart from job losses and compensation, discussions around equity relate to increasing energy prices and the social impact on households. These arguments relate to the speed of the energy transition and the argument on the lack of comprehensive strategies.

4.3 Social dialogue at national level

In Member States where tripartite councils exist, there is limited social dialogue around addressing fair green transition issues, and no concrete or binding resolutions have been made (as reported in some country articles e.g., in **Belgium**, **Cyprus**, **Croatia**, **Latvia**, **Malta**, **Portugal**). In some Member States, specific councils for the green transition have generally been established more recently and involve social partners in different Councils and Committees concerned with sustainable development and ecological transition.[49] However, according to the ECE country articles, these councils have not yet or only partly touched on fair green transition topics. In a few Member States undergoing green transition, councils have been established targeting and involving a wide audience from civil society, and may include the social partners (e.g., Climate Council in **Austria**) or not (e.g., Climate Council in **Denmark**, National Dialogue on Climate Action in **Ireland**).

A few examples do exist where specific green transition strategies have been presented and discussed within well-established tripartite councils (e.g., **Malta's** Sustainable Development Strategy for 2050; in **Romania**, the National Strategy for Green Jobs 2018-2025 "Strategia Națională pentru Locuri de Muncă Verzi 2018 – 2025"). Also, in **Denmark** several bi- and tripartite councils and committees are

[49] These are for instance: the Environmental Council in Austria; the General Assembly for Just Transition set up in 2022 in Belgium; the Environmental Economic Council established in 2007 in Denmark; the Monitoring Committee of the Fair Development Transition Programme in Greece; the Economic, social and environmental Council CESE and the National Council for Ecological Transition CNTE in France; the National Energy and Climate Council established in 2019 in Latvia; the National Council for Environment and Sustainable Development and the Energy National Council in Portugal.

involved in designing and developing vocational education, including lifelong learning. They typically involve social partners representatives and would include qualification issues linked to the green transition. The same is true for other Member States where social partners are involved in steering vocational education and training (e.g., **Germany**). In **France**, where tripartite negotiations are well developed and where the extension of collective agreements through legislation plays an important role, one example for national social dialogue for a fair green transition was identified (see Box 4.1).

Box 4.1. Tripartite negotiation on fair green transition issues in France

Two rounds of national negotiations on environmental issues were ongoing in **France** at the time of writing (early 2023). One concerned the national plan on decarbonisation and the other the sector with high emissions of greenhouse gases. From the unions' perspective, the main objective was to introduce elements around working conditions and job quality and to make them compulsory by national agreement (ANI-Accord national interprofessionnel) that could transform into law.

*Source: Country article **France***

Social dialogue also exists around developing and coordinating plans and programmes for accessing European Funds. Examples include developing JTTPs in **Bulgaria** and work on the National Development Plan for 2021-2027 in **Latvia**, in the context of ESF and ERDF funding.

In some Member States, the social partners (particularly trade unions) do **not feel sufficiently informed and involved in tripartite consultation** (**Austria**, **Belgium**, **Finland**, **Croatia**, **Romania**, as mentioned in interviews conducted for this study).

There are few examples of bi-partite collective bargaining with agreements relevant to a fair green transition. In **Sweden**, such national agreements were concluded recently, focusing on skills development in a context of economic transition, which would include the green transition (see Box 4.2).

Box 4.2 National agreements on 'education support for fair transition' in Sweden

Two national agreements were signed on 22 June 2022 between the Confederation of blue-collar workers (Landorganisation, LO-SE), the Council of negotiation PTK for white-collar workers and the Confederation of Swedish Employers (Svenskt Näringslivet). These agreements on 'education support for fair transition' give workers, employed or in-between jobs, the right to financial support for shorter or longer training courses to develop their skills. This new transitional study state support may be granted for applicants aged 27 to 62 years who have worked at least 8 years over a 14-year framework period (eligibility condition). Self-employed persons can also apply for the new transitional study grant.

These two agreements will facilitate job-to-job transitions, improve the skills and job security of workers already in employment, promote lifelong learning and ensure that the green transition will imply the development of decent "green jobs". The non-profit organisations run by social partners, the Job Security Foundations ("Trygghetsstiftelser"), will assist employees covered by the collective agreements with training, reskilling, and upskilling. According to the collective agreements, financial compensation will be higher for employees working in a company covered

by the collective agreements, compared to employees not covered by those but eligible to the Transitional Education State support ("Omställningstudiestöd").

Source: Country article Sweden

4.4 Regional-level social dialogue and partnerships

In some cases, social dialogue at regional level is institutionalised in the governance structure. For example, in **Belgium**, these are the Central Economic Council (CCE/CRB) at the federal level, and the Economic, Social and Environmental Council of Wallonia (CESE), Brupartners in Brussels-Capital Region and the Socio-Economic Council of Flanders (SERV). **Social dialogue, including social partners and other key stakeholders such as regional authorities and education institutions, have also been created in regions particularly affected by the downsizing and closure of production plants linked to the green transition**. Thus, regional and sectoral social dialogue and partnership approaches may overlap. Promising approaches and good practices of social dialogue, also involving other relevant actors, are illustrated below:[50]

- In **Czechia**, from 2018, social partners in the Moravian-Silesian region are involved in regional and European projects aimed at implementing an ecosystem to identify future needs of the sector (European Skills Alliance ESSA project) or for currently needed retraining (TRAUTOM project). Dialogue at wider regional level helps to resolve conflicting interests in the sector, with pressure from a section of the industry (car manufacturers) for cheap steel imports and efforts of steel producers to maintain import tariffs on steel.
- In **Estonia**, the green transition platform in Ida-Virumaa was established in 2020. 47 members are listed among other companies involved in the oil shale industry and energy production, sectoral employer organisations, and trade union organisations. The steering committee mainly focuses on monitoring the green transition process at regional level and making proposals to adjust the process where necessary. The committee is also a platform to involve a wider group of stakeholders in anticipating the transition needs, implementing a green transition plan and supporting smooth transitions for employees and local communities. As a result, the platform suggests proposals to the green transition steering committee on implementing the green transition plan in **Estonia**.
- In **Germany,** the Transformation Council ("Transformationsrat") was formed in 2019. It involves social partners, the Federal State of Rhineland-Palatinate, Chambers of Craft, Chambers of Industry and Commerce, and the Federal Employment Agency. This body discusses necessary measures to maintain and expand industrial value creation and to qualify and train employees. In September 2020, this Council decided on an initial package of measures focusing on employment, qualification and further training; vocational education; research and investment funding, renewable energies and hydrogen strategy. The various stakeholders have committed to implement concrete measures in these areas.
- In **Ireland,** in 2018 the Midlands Regional Transition Team (MRTT) and the Just Transition Commissioner were created in the context of ending peat extraction and peat-fuelled power generation in the region. Stakeholders include social partners, education bodies and regional and local agencies. The remit of the MRTT is to pursue funding opportunities and actions to mitigate the impact of peat industry job losses in the local and regional economy, and to position the region

[50] Source: country articles

to develop alternative forms of employment, attract new investment and maximise existing employment opportunities and resources (AARC, 2021). A significant number of affected workers have been reskilled or redeployed and funding is being rolled out to generate new enterprises, particularly in sustainable economic activities.

- In **Italy**, a partnership was established in 2020 between the Saras refinery at the industrial site of Sarroch in Sardinia, Enel Green Power, Cagliari Municipality, the University of Trento, and the employer organisation Confindustria Sardegna Meridionale. The objective was to anticipate change and manage the restructuring of the refinery alongside the green transition. Particularly through the involvement of Confindustria Sardegna Meridionale, these actors are working to establish dialogue with national institutions to offer propositions to the JTF Territorial Plan for Recovery and Resilience. Thanks to thematic roundtables, scenario analyses and field research, those involved have identified several areas of intervention to be prioritised: sustainable mobility, professional competencies, health and safety, circular economy, environmental sustainability, partnership creation and inclusion.
- In **Bulgaria**, the social partners do not feel sufficiently involved and express their concerns in the process of establishing Just Transition Territorial Plans (TJTPs). According to the proposed TJTP for Stara Zagora, the plan was developed through the joint efforts of national and regional institutional authorities and a range of stakeholders by conducting public consultations. This included the Stara Zagora Regional Economic Development Agency, the municipalities in the region, NGOs, and others. In the other regions, Pernik and Kyustendil, the process took place in a similar way. During the phase of the public consultation, the largest trade union confederation, CITUB, expressed the opinion that the analysis included in the TJTPs is not realistic. Moreover, while the TJTPs mainly address compensatory measures for job losses, the confederation stressed that the lack of a comprehensive approach and measures for system development will also have a negative effect on the electricity supply, which will have a broader national impact. The trade union considered that "Adopting overly ambitious energy transition targets for the 2030 timeframe, especially in the absence of an energy strategy, and without consensus decisions on coal phase-out, is premature. It in no way reflects the current energy crisis and the obvious need for coal as a secure national resource". This concern was shared by the other largest trade union, the Confederation of Labour ("Podkrepa"), as well as by the employees in the concerned region. The trade union also states that the process of laying off employees in coal regions should be preceded by significant preparation of people, but also of industrial alternatives, for which the period until 2026 is too short.

In addition, a few local partnerships, including social partners and a wider range of local stakeholders, have been established at the level of municipalities. In some sectors territorial dialogue is taking place, however not leading to collective agreements. In **Spain**, a territorial dialogue between renewable energy communities (RECs) and the agrifood economic sector has been ongoing since 2019. This example differs from the practices led by mainstream social partners in that it thus far involved dialogue in territories between small energy companies, agriculture and farming representatives and local municipalities, including civil society in some cases. However, there is no evidence of labour agreements.

There are also examples identified in the country articles where a social dialogue structure has been set up but failed to agree and implement concrete activities or has demonstrated limited effects (for example in **Romania**, and in a coal mining region in **Slovakia**).

4.5 Sectoral social dialogue

Sectoral social dialogue and sectoral partnerships are concentrated in those sectors where trade unions are traditionally strong and where a social dialogue culture has existed for some time, as in the coal mining industry. Even in countries with a comparatively weak social dialogue structure, social dialogue has been established around coal mining (except in **Romania**, where social dialogue is too weak to generate agreement).

Table 4. Sectors with social dialogue on fair green transition across the Member States

Automotive	Steel	Chemical	Manufacturing	Construction	Coal mining	Other Energy	Peat extraction	Forestry	Agri-food	Transportation
AT, DE	CZ, LU	CZ, DE, FI	DK, SK	AT, CZ, DE, DK	BG, DE, ES, FR, PL, PT, RO, SI, SK	BG, ES, IT, LT	IE, LV	LT	ES	FR

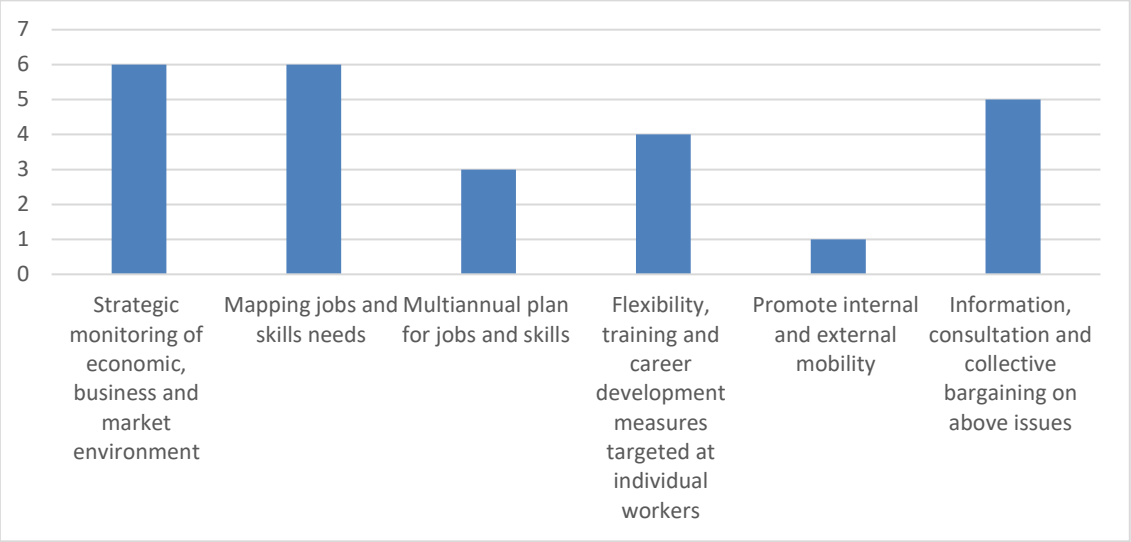
Source: Own elaboration based on information contained in the country articles

For a fair green transition, as for any other major economic restructuring process, beyond the employment and social objectives, anticipation and well-managed restructuring are preconditions of economic success and better working conditions. The EU Quality Framework for anticipating change and restructuring[51] sets out several areas of activities and principles that would constitute good practice. Anticipating human capital needs and managing restructuring concern a multitude of actors (companies, workers' representatives, social partners, public employment services, public administration and authorities, etc.) at different levels (European, national, regional, sectoral and organisational). Coherence and synergies between the actions of all the different stakeholders and properly coordinated planning and actions for anticipation and restructuring are crucial to ensure efficiency and sustainable solutions.

Sectoral social dialogue on a fair green transition, in most cases, at least partly fulfils the EU quality framework for anticipating and managing structural change. However, sectoral dialogue on green transition issues does not exist in all Member States and current examples only cover a few sectors. Some examples are presented below to inspire good practices (in addition to practices presented in Section 4.1.3 that had a strong regional focus). Most social dialogue initiatives are very recent and it is too early to assess their impact. In particular, Figure 3 presents an overview of six examples of sectoral social dialogue, mainly involving social partners and, in some cases, additional partners (such as PES, municipalities and regional authorities), meeting several of the criteria of the good quality framework for social dialogue in the context of anticipating structural change. Figure 4 on managing restructuring, shows that in 5 out of the 6 cases internal consensus was fostered through joint diagnosis. However, in only half of the cases all possible options before contemplating redundancies are reported as having been explored, and individual and personalised support for redundant workers was organised.

[51] COM/2013/0882 final

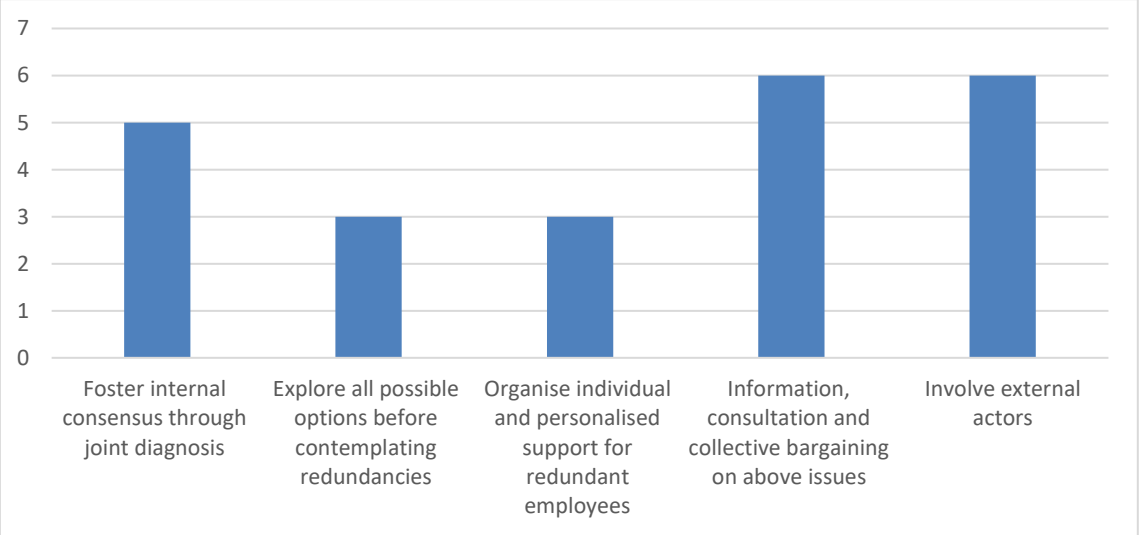
Figure 3. Anticipation of change at sector level (in line with the EU quality framework) in six cases



Note: The six examples include social dialogue in Germany (chemical industry), Spain (coal mining), Poland (coal mining), Italy (energy and oil), Italy (electricity) and Lithuania (electricity).
Information compiled in the country articles and assessments made on the basis of country expert's knowledge

Source: ECE country articles, own elaboration

Figure 4. Managing restructuring at sector level (in line with the EU quality framework) in six cases



Note: The six examples include social dialogue in Germany (chemical industry), Spain (coal mining), Poland (coal mining), Italy (energy and oil), Italy (electricity) and Lithuania (electricity).
Information compiled in the ECE country articles and assessments made on the basis country expert's knowledge

Source: ECE country articles, own elaboration

Some further examples of different sectors are presented in more detail below. The social dialogue initiatives focus on skills development, compensation packages, and in some cases on exploiting other employment opportunities and the potential to promote "green jobs".

Box 4.3 Examples of sectoral social dialogue and partnerships in the automotive industry

The **Automotive Skills Alliance,**[52] linked to the Pact for Skills,[53] brings together stakeholders involved in the automotive ecosystem to ensure continuous, pragmatic and sustainable cooperation around the skills agenda in the ecosystem, collaborating at European, national and regional level. Such skills alliances are being developed in certain Members States, largely prompted by the Pact for Skills. This is a very recent, new initiative in **Czechia** for example, with a strong regional focus.

In **Germany,** the social partners are members of the 'strategy platform on the transformation of the automotive industry', created by the Ministry of the Economy and Climate Protection in June 2022.[54] Regional dialogues were held among others on the subject of continuous training and qualification. It was agreed that companies should identify the need for new skills to adapt VET or introduce new VET profiles, and to identify needs for CET and portable skills for occupational and sectoral mobility. Financial instruments of the National Skills Strategy ("Nationale Weiterbildungsstrategie") can be used.[55]

Source: ECE country articles

Box 4.4 Examples of sectoral social dialogue and partnerships in the chemical industry

In **Germany,** the Alliance Chemie[3] was created in 2013 by the social partners in the chemical industry. The objectives and action framework include 12 items, with among others: securing quality work and social partnership; protection of the environment and biodiversity; sustainable operational processes, energy efficiency and supporting climate protection.[56] Activities pursued by the initiative include a series of webinars on sustainability, practice and expert exchanges and events, developing guides for SMEs, and a sustainability check. This helps companies aiming to increase their sustainability identify areas where improvement is most needed. The initiative also produces a sustainability report, collecting data on 40 sustainability progress indicators, and various surveys are conducted on employment and skills by each of the social partners. Success factors include the joint commitment to share knowledge and insights on advancing towards the shared sustainability objective.

Also in **Germany**, social partners in the sector and the Federal Employment Agency signed the Chemical Qualification Offensive in 2021. Essential outcomes of the qualification offensive are the Future Skills Report Chemistry published in 2021 and the IT tool Pythia for determining further training needs and comprehensive qualification advice, provided by the Federal Employment Agency, among others. Joint projects include a qualification model for unskilled employees, professional qualifications and further training for employees to become transformation pilots to shape technological change from within the company. Other activities include transfer

[52] https://automotive-skills-alliance.eu/
[53] Pact for Skills is a flagship action of the European Skills Agenda https://pact-for-skills.ec.europa.eu/index_en
[54] https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2022/06/20220628-expertenkreis-transformation-der-automobilwirtschaft-nimmt-die-arbeit-auf.html
[55] https://www.bmwk.de/Redaktion/DE/Downloads/S-T/transformationsdialog-automobilindustrie-bericht.pdf?__blob=publicationFile&v=4
[56] https://www.chemiehoch3.de/

models 'from work to work' where excess staff from one company are transferred to other companies in need, plus joint dialogue forums were organised.

Source: Germany country article

Box 4.5 Examples of sectoral social dialogue and partnerships in the construction industry

In **Germany,** the construction sector trade union IG BAU negotiated a collective agreement aimed at employees who work outdoors, offering more occupational safety around climate change. This includes coverage for weather-related absences from work (e.g., in the event of heat or cold). In the cement industry, an initiative from IG BAU was a vocational training plan around the topic of nature and climate protection.

Source: Germany country article

Box 4.6 Examples of sectoral social dialogue and partnerships in the energy production sector

In **Italy**, in October 2019, the renewal of the industry-wide agreement for the Italian electricity sector provided a single framework for all workers in the sector, including the renewable energy industry and commercial and sales roles. Among other objectives, the agreement includes a special provision on training to ensure employability and support during the energy transition. The agreement provides a right to 28-hours of certified training (in addition to health and safety training). A sectoral joint body is meant to monitor training initiatives in the sector and to propose specific programmes to support industrial relations on the impacts of the energy transition. At the time of the previous renewal in January 2017, the parties had already agreed to introduce various measures to address the challenges posed by the energy transition and support sectoral enterprises and workers facing critical situations, in relation to reorganisation processes in particular. These measures included establishing a solidarity fund to integrate income support measures available to industry workers and a system for the redeployment of redundant workers across companies in the sector (Planet Labor, 2019).

Source: Italy country article

4.6 Company-level social dialogue

Only a small number of relevant company-level collective agreements have been identified in the Member States. According to a survey among trade unions and employees in **Finland**, only around 15% of surveyed union representatives reported that employee representatives are involved in discussions around actions towards slowing down climate change. In **France**, only two collective agreements addressing the green transition are identified (Teraga and Total). Certain Corporate Social Responsibility (CSR) agreements have been identified in some large companies. Some collective agreements identified in the country articles focus on severance payments in the first instance, leaving training and placement measures aside (for example, in **Slovakia**, a collective agreement signed in 2023 at the Heat production plant TEKO in

Košice and an incentive programme for voluntary exit from the company U.S Steel in Košice).[57]

Table 5. Examples for company level social dialogue to manage fair industrial restructuring

MS	Name / type of social dialogue initiative	Companies concerned	Contents
DE	Future-oriented collective agreements ("Zukunftstarifvertrag")	Various companies	The agreements aim to secure locations and jobs and can deviate from the regional (sector-based) collective agreement. Recently, continuous training supported by companies has been an element in the negotiation about measures to safeguard locations.
DE	'Future Funds for structural change in Germany' ("Zukunftsfonds für Strukturwandel"), signed between the company and the general works council in 2018	Siemens	This fund is endowed with EUR 100 million until the end of 2022, to be spent in addition to the regular budget for VET and CET of EUR 500 million. The works council and the company decide jointly on how to spend the fund. Incidentally, the future fund is part of the Future Pact ("Zukunftspakt") that the group management workers general works council and IG Metall agreed in May 2018 to support continuous training. It involves the financing of training by the company as well as commitment of workers to participate in company-financed training also in their free time in addition to training during working time.
DE	Collective agreement	Plant for combustion engines	In the context of the planned closure of the plant, a qualification strategy was developed and qualification matrices established. On that basis continuous education and retraining measures were implemented.
FR	Negotiation on restructuring in energy production	Coal-fired power plant of EDF of Cordemais	Since the government decreed the closure of coal-fired power plants, negotiations were launched by the owners of the plant (EDF). A dedicated commission in the French Senate then organised the follow up. The main issue at stake for unions is to negotiate a long-term policy intervention to maintain direct and indirect employment in the local area. In September 2021, the unions at company level developed and negotiated a project based on green technological choices. This will involve implementing production units of green hydrogen and combined cycles of hydrogen to replace employment lost due to the closure of the Cordemais coal-fired power plant.
MT	Process of information and consultation on adapting to new greener production processes	Playmobil	Information and consultation between the company, the trade union and employees who worked together to facilitate the workers' 'internal mobility'. The trade union supported the employer in how best to select workers to undergo change with the least disruption. It also decided with workers how employee training on new machines would be implemented.

[57] While formulation to avoid mass redundancies was already included in the old collective agreements through disposable benefits, a new incentive programme for voluntary exit represents an innovative mechanism regulating mass redundancies arising from structural changes happening in the company. The agreement stipulates that, if redundancies are necessary, the employee should have the opportunity to voluntarily terminate the contract by an agreement with the employer and trade union in return for increased severance pay.

PL	Agreement on offering training to redundant workers	Węglokoks Kraj (coal mining)	The company organised labour market support for the Piekary coal miners, which closed in 2020. In addition to reallocation and early retirement, the company offered training for miners to gain electric and welding certificates, machine operators' certification and truck driving licenses. The outcomes have been positive (Frankowski et al., 2021).
SE	Social dialogue practices at company level (without formal agreements)	SSAB (Steel), Volvo (car), Scania (Trucks, Tetra Pack (food packaging)	Active role of the local union regarding the anticipation of change, management of the restructuring processes and the impact on working conditions (retraining and upskilling needs etc.).
SE	Job Security/ Transitional Agreements	Various companies	In cases of collective redundancy due to restructuring or individual notice due to a shortage of work, the Swedish social partners have, since the early 1970s, negotiated security / adjustment agreements to help displaced workers to find new jobs quickly, by way of adjustment measures and financial support. This practice is highly relevant for managing a fair green transition (if no concrete agreements mentioning the green transition have been concluded yet).
SE	Social dialogue on introducing new technologies for the green transition	Various companies	Union representatives of SSAB (Steel Industry), Volvo (car), Scania (Trucks and Buses) and Tetra Pack (food packaging) reported examples concerned the active role of the local union regarding the anticipation of changes, the management of restructuring processes and consequences for the workers' working conditions (needs of retraining, upskilling etc.). More precisely, these examples illustrate the role of the social dialogue at the company level regarding the introduction of new production processes and new technologies related to the transition towards a fossil free industry. This involved the electrification of cars and trucks for Volvo and Scania, new fossil free steel production (Hybrit for SSAB), and support to the development of a circular economy via sustainable packaging (Tetra Pack).

Source: Author's compilation on the basis of the ECE country articles

4.7 Initiatives and activities of the social partners

Social partner initiatives for anticipating and managing fair green transition mainly include three types of activities - research, awareness raising and training provision:

1) **Research** carried out by employer organisations and/or trade unions (for example in **Austria**, **Bulgaria**, **Germany**, **Italy**, **Romania**, **Sweden**, **Slovenia** according to the ECE country articles): these activities help the social partners to prepare their approaches in anticipating and managing a fair green transformation.

2) **Awareness raising activities and information provision**: these activities may be targeted to own members or a wider audience.

   - **Activities of trade unions**: for example, in **Finland**, the central organisation for labour unions is trying to activate its member unions to highlight the

opinion of employees in plans for the green transition. In **France**, trade unions have established units dealing with green transition at national level, but at local level, trade union members seem less sensitive to the green transition than to other employment issues. Therefore, the French trade unions have implemented awareness programmes for their members about the green transition and present 'green toolkits' at regional and local levels. A project of the European Trade Union Institute ETUI co-funded by the European Union, the JusTRA project,[58] is preparing a common toolkit with guidelines to a fair transition. Trade unions from **Belgium**, **Bulgaria**, **France** and **Italy** are participating in the project (French country report). In **Denmark**, the trade union 3f, which mainly represents unskilled workers, has a dedicated website focusing on "green jobs".

- **Activities of employer organisations** include the organisation of competitions and awards. For example, the French Employer association MEDEF launched an initiative called French Business Climate Pledge. It aims at identifying companies with a successful transition to a low carbon economy and innovation by developing low carbon solutions, technologies, products and services. However, collected company initiatives rarely include employment relevant issues.

3) **Providing training to anticipate and manage the green transition**. In some Member States, social partners and Chambers run their own training organisations. Employers have an interest in focusing on upskilling and skills adaptation, particularly when they face skills shortages, and trade unions may pursue policies to improve workers' employability. The training institution WIFI of the Chambers of Commerce in **Austria** is one example of activities that include developing "green skills" in their training programmes.[59] In **Finland**, the chemical industry is part of the Responsible Care, initiative, an international programme of around 30 years' standing, monitoring resource consumption in the industry. The industry also provides education for employees (partly) on new skills and information related to the green transition.

Box 4.7 provides examples of cooperation between training institutions for developing new training formats and introducing relevant training for "green skills".

Box 4.7 Cooperation between companies and training institutions on "green skills" development in the construction sector and manufacturing industry

The BUILD UP skills **Bulgaria** 2030[60] by **Bulgaria's** Construction Chamber project aims to expand the knowledge and skills of construction professionals and workers to construct zero-carbon buildings. The project has 18 months to conduct a national mapping, prepare an in-depth analysis of working conditions and skills needs and find the overall best green practices to endorse.

In **Denmark**, the project Green transformation of the entire company combines the efforts of vocational training providers with private employers. Micro-learning modules will be developed in an IT-supported format for 18 companies within the construction and manufacturing industry. It was inspired by a number of partnerships

[58] JusTRA - Just Transition: supporting trade unions in taking steps towards a sustainable future at company/sectoral level through social dialogue.
[59] Based on information provided in the country articles.
[60] https://ksb.bg/build-up-skills-bulgaria-2030/

established in 2022 for education in sustainability including VET.[61] The project will run from 2023 until 2025, funded by the Ministry of Education.

Source: ECE country articles

There are also examples of companies that cooperate to promote job-to-job transitions. Placing workers into new jobs within the company (internal mobility) or at another company (external mobility) is a key element of managing a fair green transition. Box 4.8 offers an example of cooperation between companies to facilitate job-to-job transitions and thus foster the external mobility of workers.

Box 4.8 Alliance for chances in Germany

In **Germany**, the Alliance for Chances ("Allianz der Chancen") is a cooperation network of a range of German companies (representing around 46 companies with 2.6 million employees in January 2023). By initiating cooperation projects across sectors and companies and promoting continuous training, the network aims to increase the employability of the workforce and an exchange of workers who face job cuts in one company but might be needed in another. For example, Continental established an internal labour market to place workers threatened with unemployment internally and with local companies. According to the German employers' organisation BDA, cooperation between companies located in the same region to keep workers employed is not unusual in the light of skilled workers shortages – for example, in the Rhine region, BASF employed workers previously affected by job cuts at Ford.

Source: Germany Country article

Specific requests and policy recommendations from social partners include:

- Creating a **Just Transition institution** or Secretariate/Agency (as claimed by the **Austrian** Chamber of Labour and the trade union confederation ÖGB), or creating **a specific structural fund** and financial compensation mechanisms for workers directly affected by the green transition to mitigate employment impacts (e.g., in **Germany**, as suggested by the large trade union IG Metall). The German trade union IG Metall also proposes the introduction of a transformation short-time work scheme ("Transformationskurzarbeitergeld") to provide support for redundant workers in high wage industries affected by the green transition with the objective that they accept lower paid jobs. Similar claims have been made by **Slovenia's** trade unions around the coal mining exit.
- Introducing **financial compensation to mitigate the potential adverse social impact of climate measures** has been suggested by the trade unions OGBL in **Luxembourg**. Enhancing financial support and incentives to companies and low-income families investing in energy efficiency solutions (employer organisation FEDIL and Chamber of Commerce in **Luxembourg**) has requested stronger public support for the green transition.

[61] See https://www.verdensmaal.org/handleplan-for-uddannelse

5 Conclusions and recommendations

The green transition offers opportunities for job creation, but labour and skills shortages are to be addressed and supporting up- and reskilling appropriately provided. Equal opportunities and the quality of green employment are key to ensuring a fair transition towards a sustainable and more inclusive economy. Skills development is central, including for people in vulnerable situations. Social dialogue and a whole-society approach at all levels is key to delivering fair transition policies inclusively and effectively. This report has highlighted examples of research, policies and social dialogue practices identified across EU Member States for ensuring a fair green transition.

This report is based on analyses of available EU-level data and qualitative, non-exhaustive information collected from unpublished country articles for each Member State, prepared by independent experts from the ECE pool of experts. In terms of the forecasted future effects of the fair green transition on the labour market presented in this report, the results need to be taken with caution, taking into account their underlying assumptions and methodology, as well as the possibility for path-independent events (like external shocks) that cannot be mirrored in the results. While keeping this caveat in mind, the majority of forecasts and foresight exercises carried out in the Member States predict slight or more pronounced positive net employment effects due to decarbonisation investments and the fossil fuel phase out.

Ensuring a fair green transition in EU labour markets has two facets:

- Firstly, **responding to the effects of the transition** itself, such as the increased demand for sustainable products and "green skills".
- Secondly, **responding to the impacts of climate change**, such as its negative effects on the health and safety of workers due to higher temperatures, or the negative economic effects on the agricultural sector due to droughts and floods.

In terms of **sectors affected** by the green transition, some benefit from increased labour demand due to higher demand for environmentally sustainable goods and services (e.g., the renewable energy sector, the construction sector, waste management and circularity etc.). Sectors that will be affected in ambiguous ways, mostly due to climate change, include tourism and transport. The sectors most negatively affected from past and expected employment decline are those with a high carbon footprint (such as fossil fuel extraction and power generation based on fossil fuels) and energy-intensive sectors (such as the chemical industry and other sub-sectors of manufacturing).

The green transition and climate change are expected to **affect regions** (and therefore workers and Member States) differently. This is either due to the economic (or sectoral) structure of a region, and/or because some regions are more affected by climate change than others. The affected workers will have to find new work opportunities or will have to adapt to remain employable. Providing retraining and continuous training opportunities will be central to ensuring a fair green transition in affected regions and sectors, but also for avoiding further increases in skills mismatches and shortages in the Member States.

In terms of **impact on occupations**, the green transition is likely to affect a range of existing occupations, as it leads to changing tasks within these occupations (e.g., technician occupations in automotive production related to the shift to electric vehicles). It also creates a number of completely new occupations (e.g. solar panel installers), but is expected to mostly change the tasks required in existing occupations.

In terms of **impact on skills**, research is being undertaken in a number of Member States to assess skills levels and gaps related to "green jobs". The skills levels of those

employed in "green jobs" varies quite significantly by sector and occupation. Overall, they have more often a medium level education in a technical field than the average.

There also appears to be an impact **on gender equality** in the labour market, as men might benefit more from the growth in "green jobs", with a range of Member States reporting higher shares of men in "green jobs" than women. This is partly because "green jobs" are often blue collar or STEM jobs, where women are underrepresented.

Turning to the policy frameworks being used to ensure a fair green transition, this thematic review allowed to draw a **distinction between those Member States where a dedicated labour market policy was formulated to address specifically the challenges of a fair green transition and those where the challenges are tackled by relying on the pre-existing policy framework**. The latter includes ALMPs which have been used to respond to a range of general strategic challenges. The ALMPs addressing fair green transition challenges focus mostly on measures for the upskilling and reskilling of workers. A range of initiatives has been identified in terms of their geographical scope (from small and local to nationwide programmes), their type (provision of training courses, development of training infrastructure, changes to or new training curricula, financial aid to people and companies to access such training) and their financial size and target groups. ALMPs providing subsidies and grants for employers to hire unemployed people specifically for "green jobs" were also identified.

Policies are assessed relating to addressing the needs of under-represented or most vulnerable workers in the context of a fair green transition (e.g., low skilled workers, women, young people, persons with disabilities, long-term unemployed and older workers) and the needs of the groups, sectors and regions most affected by a fair green transition (e.g., workers in the fossil fuel intense industries), as identified by the review. Here, the use of EU's Just Transition Fund (JTF) is particularly important to support relevant actions in the Member States.

A related green transition challenge is to ensure that **labour and occupational health and safety (OSH) laws and policy measures promote the adaptation and resilience of the world of work to the adverse impacts of climate change as well as environmental degradation**. The country articles for most Member States note that such changes have been mostly addressed through applying the existing general OSH policies and practices at national, sectoral and company level, rather than developing dedicated approaches in the context of a fair green transition. Implementing EU OSH legislation to protect workers' safety and health at work covers aspects related to temperature, heat stress and extreme weather at work. The European Commission constantly monitors whether EU OSH policies need to be adapted to address specific risks and technological, medical, societal developments, including those related to climate change and environmental degradation, with a view to protecting the health and safety of workers.

This report also explored **the role of social dialogue for a fair green transition.** As Member States vary significantly regarding their social dialogue traditions, advancements in social dialogue for a fair green transition have been varied across Member States. Tripartite consultation has only rarely adopted topics around a fair green transition and has seldom discussed comprehensive strategies.

Collective bargaining has focused on specific sectors affected by job losses and changing skills requirement in the context of the green transition. This has mainly included the coal mining sector, other energy production sectors, energy intensive industries such as the steel processing industry, the construction sector, the chemical sector and the automotive industry. Most examples collected in the country

articles refer to sectoral social dialogue, which is often conducted for specific regions. Regional partnerships, also including other actors in addition to the social partners, have been found to be crucial for anticipating and managing a fair green transition, making use of synergies, and combining the resources of the different partners.

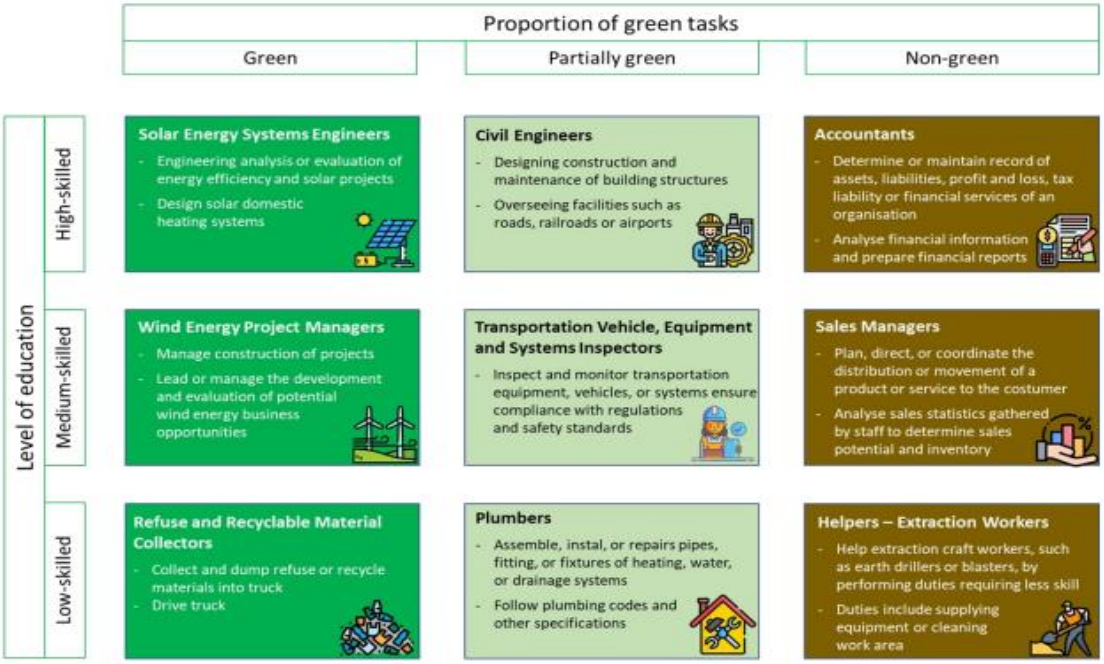
Particularly in coal mining regions, there have been attempts to implement more comprehensive social dialogue approaches, including an analysis of the skills, the economic development potential of local areas and retraining in addition to financial compensation and early retirement schemes. It appears that creating JTTPs has fostered social dialogue particularly in those Member States with a weak social dialogue practice. In Member States with a well-developed social dialogue structure, focus has been on qualification measures and on managing the internal and external flexibility of workers. In these Member States, social dialogue and the social partners' own activities have set a focus on skills development for anticipating change and addressing skills and labour shortages as important drivers for anticipative strategies.

Lastly, this exercise has identified knowledge gaps, which should be addressed to further support a fair green transition in EU labour markets. Namely, while a broad definition of "green jobs" at EU level has been proposed by Cedefop and while a list of "green skills" can be found in the European Classification of Occupations, Skills, and Competences (ESCO), in practice, Member States use multiple definitions, alongside international terminology. This absence of common definitions makes it difficult to compare the concepts and the scale of "green jobs" and "green skills" across Member States. Nevertheless, this report summarises concepts used in those Member States where relevant insights have been identified in the ECE country articles. This exercise also noted a lack of research on social investment needs for the green transition. This aspect should be addressed by targeted research to ensure that the green transition will be implemented in a fair manner.

The coordination of policymaking across different policy areas for a fair green transition could also be further strengthened, as it is currently perceived as relatively weak in some Member States. Different approaches were reported across Member States with some relying on one ministry being overall responsible for climate change policy and others having a special inter-ministerial structure in place. Integrated approaches to policy-making are key to ensuring a successful fair green transition. This calls for strong and effective coordination mechanisms among all the relevant institutional actors.

6 Annexes

Figure A1.1 Proportion of green tasks across the economy and skills spectrum



Note: The greenness of occupations is based on their task content and whether those tasks are green or not. The greenness score of an occupation ranges from 1 (all tasks are green) to 0 (all tasks are non-green). The classification of high-, medium-, and low-skilled occupations follows ISCO.
Source: OECD elaboration based on O*NET's Green Tasks Data.

Source: OECD 2023b, Job creation and local economic Development

Table A2.1: Overview of skills policy responses for a fair green transition

Approaches	Member States (examples)
Strategic action plans on skills for a fair green transition	**Austria:** an action plan for just transition in the field of education, including re- and upskilling was developed in 2023 (this is a national level initiative separate to the territorial just transition plans developed under the EU's Just Transition Fund in **Austria**). The Action Plan comprises four main fields related to the education sector; enterprises, employees, jobseekers; framework conditions and reconciliation of private and professional life and communication. These four aspects are addressed by a total of 35 policy actions, the implementation of which should start in early 2023. The first group of actions in the Action Plan deals with education and new skills. This encompasses new competences related to renewable energy, integration of climate-relevant content into curricula and the development of new educational formats. **Netherlands:** the Action plan for green and digital jobs 2023 has four pillars: 1) increase the number of students in STEM at all levels, including vocational training 2) stimulate starters to enter the tech sector and keep existing tech workers in the sector 3) stimulate labour productivity and the number of working hours 4) strengthen governance and avoid fragmentation in programmes and policies. This plan contains measures to address the shortage of the labour market in sectors with jobs that are important for the climate and digital transition.
Financial support to upskilling	**Austria**: In Lower **Austria** in the municipality of Sigmundsherberg, the PES will establish a centre for training in climate protection in conjunction with various stakeholders. The centre will train around 400 people per year. **Croatia**: the reform of adult education entails introducing vouchers for upskilling that also focus on green and digital skills. **Cyprus**: a specific training measure is to provide training to bolster "green skills" of the employed and the unemployed population. More than 25 000 people are scheduled for training in green, digital and blue economy skills, among which skills related to energy renovation will constitute a major element. It is supported under the NRRP, Priority Axis 5 of the Plan, Component 5.1 ('Educational System Modernisation, Upskilling and Retraining'). **Germany**: The government is covering the costs for up- and reskilling activities for employees whose professional activities can be replaced by digital technologies and who are otherwise threatened by structural change, to various degrees depending upon the company size, the age of the employee and whether an employee lives with a severe disability. For companies smaller than 250 employees, costs for such training measures for employees aged 45 and above and for persons with severe disabilities are covered fully. No information is available on their funding/number of jobs supported. **Ireland**: The Human Capital Initiative (HCI), which aims to increase capacity in higher education to meet priority skills needs. The Springboard+ Initiative, which provides free or heavily subsidised places on upskilling and reskilling higher education courses in identified areas of skills needs. Skillnet Ireland, the national agency responsible for promoting and facilitating workforce learning in **Ireland**, which funds learning networks that provide subsidised training to companies and employees (and free training to jobseekers), including leadership and skills support to enterprises through its Climate Ready Programme.

	Italy: the Fund for New Skills aims to enable workers to access training and learn new skills. The first round (2021-2022) was financed with EUR 2.3 billion. In the second edition of the fund, special attention was paid to enterprises facing changes linked to the digital and green transitions and willing to invest in the acquisition of new competences to respond to the growing needs of the labour market. The New Competences Plan ("Piano Nuove Competenze") - launched in 2021 within the National Recovery and Resilience Plan (RRP) - aims to reorganise training of workers in transition and the unemployed, by reinforcing the professional training systems and defining quality standards for upskilling and reskilling workers. For the second edition of the fund,[62] special attention was paid to the needs of enterprises facing changes linked to the digital and green transition, willing to invest in acquiring new competences to respond to growing needs of the labour market. No results available yet. The Guarantee for the Employability of Workers has earmarked EUR 4.4 billion for 2021-2025. Its objectives are to reintroduce workers into the labour market, upskill workers, reskill workers and place into new jobs workers impacted by enterprise crises. The aim is to support 3 million beneficiaries by 2025. **Netherlands**: The National government has invested EUR 393 million in the National Lifelong Learning Catalyst ("National Lifelong Learning Catalysator") programme, to stimulate tailored transition for the labour force to enter "green jobs" in the energy transition. Another incentive for individual citizens to finance their lifelong learning ambition is the STEP (STAP) budget. This is a small grant of EUR 1 000 per year that individuals can use for training and personal development. An annual budget of EUR 125 million is allocated. **Romania**: RES-SKILL aims to strengthen the supply of vocational education and training in the energy sector, targeting coal workers to access jobs in the renewable energy sources (RES) sector, to increase their re-employment opportunities and meet the demand for skills in this sector. **Slovenia**: Education, training and lifelong learning policies for upskilling and reskilling are implemented at national level through the Climate Change Fund. These measures are currently included in programmes aimed at green transition in general (with no specific focus on fair green transition) and are funded by the Climate Change Fund (Ministry of the Environment and Spatial Planning). **Spain**: One of the four singular plans funded by the Recovery and Resilience Mechanism is a Support Plan for vocational training and labour insertion. This plan is targeted to 4 000 low-qualified workers within the fair green transition areas, with EUR 20 million support.
Support to /by employers	**Austria**: The Foundation for the Environment ("Umweltstiftung") is considered an innovative approach by many experts, since it addresses the skills mismatch with a very future-oriented programme. The programme provides funding to the companies to offer training on the job. The **Austrian** government has provided EUR 4 million for this experimental work foundation, with the **Austrian** PES committing another EUR 6 million. This is combined with EUR 7.5 million funding by the companies that participate in the programme by providing training on the job. **Poland**: Generally, most companies prefer soft instruments, such as freezing new recruitments, allowing workers to retire early or reallocating the crew

[62] Launched in 2022 with EUR 1 billion funding for 2022-2023.

	between industrial plants, as in the case of hard coal mining. We found limited numbers of upskilling and reskilling initiatives in the following companies. ZEPAK (**Poland**): The most known examples are retraining lignite workers affected by collective dismissals in 2020 (Christiaensen et al., 2022c). The Regional Development Agency built a RES Training Centre for certified PV installations in Konin, Greater **Poland**, prioritising former lignite and energy sector workers. Węglokoks Kraj (**Poland**): The company organised labour market support for the Piekary coal miners, which was closed in 2020. Complementary to reallocations and early retirement, the company offered training, where miners could obtain electric and welding certificates, machine operators' certification, and truck driving licenses.
Developing training programmes	**Denmark** For VET Sector: An examination of the latest development plans for 2023 indicates that almost all of the trade committees have competences related to energy-saving and the transition to a green economy high on the list of qualifications to be promoted. In **Ireland**, the Action Plan for Apprenticeships 2021-2025 identifies skills for the low carbon economy as a strategic area of skills development. Under this plan, the apprenticeship system will seek to ensure that new crafts persons have the skills they need to support the green transition.
Mapping skills requirements	**Germany**: The BiBB (Federal institute for Vocational Education and Training) implemented several pilot projects aimed at developing training and qualification concepts for sustainability-oriented training. In this context, in **Italy**, the Annex on the abilities and competences for a green transition published alongside the Fund for New Skills constitutes a novelty. Based on ESCO classification, it provides a clear understanding of the skills and competences needed for "green jobs".

Source: Author's compilation based on information contained in the ECE country articles

Table A2.2 Examples of fair transitioning monitoring and research relevant for a fair green transition and work of the social partners

MS	Main actor(s)	Skills analysis	Fore-casts	Further details
AT	PES and others	x	x	Fair transition Working Group
BE	PES and others	x	x	Research group JUSTES (https://justesfnrs.wordpress.com/)
BG	Construction Chamber	x		National Centre of Public Health and Analyses (NCPHA) recently published guidelines for the health sector about climate change.
DE	(1) Trade union IG Metall; (2) PES and other government agencies	x	x	(1) The transformation atlas of the trade union IG Metall was created in 2019 based on data collected from almost 2 000 companies; (2) the government decided to set up a working group 'Concepts of qualification for technological and ecological transformation'.
DK	Ministry of Finance		x	The Ministry of Finance in cooperation with researchers from University of Copenhagen is developing the model GreenREFORM ("GrønREFORM"), which models the total economic activity in **Denmark** with a particular focus on environmental and climate-economic aspects, including looking in detail at the distribution of the increased demand by sector, geography and skills
EE	Estonian Qualification authority, representatives of government ministries, Bank of Estonia, Unemployment Insurance Fund, employer and trade union organisations on national level	x	x	OSKA relies on the involvement of important actors at national level as well as sectoral level stakeholders which enables the provision of input based on knowledge at sectoral level. The skills need assessment of OSKA is used as an input to plan training needs by the Unemployment Insurance Fund as well as Ministry of Education and Research. https://oska.kutsekoda.ee/en/
ES	World Business Council for Sustainable Development, called Forética,[63] made of more than 200 partners			Regularly analyses the situation around "green jobs" in Spanish companies and also promotes the commitment of companies with green fair jobs.
FI	Government analysis, assessment and research	x		The ongoing project VISIOS aims to analyse the changes in skills and education occurring due to green transition.[64]

[63] https://foretica.org/sobre-foretica/
[64] VISIOS: https://tietokayttoon.fi/-/vihrean-siirtyman-koulutus-ja-osaamistarpeet-visios-

	activities (is funding the VISIOS project)			
FR	(1) OMENEV Observatory on "green jobs" and skills; (2) Trade union CFDT and others	x		(1) Produces the definition and identification of green and greening jobs that help monitor labour market issues related to the green transition; (2) reports on the evolution of the automotive industry sector.
HR	Croatian Chamber of Industry, trade unions, World Bank			Ad-hoc studies and planned studies on "green jobs" and skills and social impact of green transition.
IT	(1) Statistical Office and others, (2) Chambers Union-camere and others	x		(1) Green jobs and skills; (2) Excelsior project aims to monitor employment prospects in companies and the related request for professional profiles.
LT	Lithuanian Energy Institute			Energy poverty.
LU	Trade union			Report in 2020 addressing social justice as a driving force of the green transitions.
NL	Ministry of Economic Affairs	x		A Platform Talent voor Technologie has been established, involving the Ministry of Education, Culture and Science; Ministry of Social Affairs; Vocational training schools, Applied-science universities, labour market organisations.
PL	Stakeholders in coal mining regions	x		This includes: Regional Development Agency in Konin[65] [ARR Transformacja]: a rich collection of reports and publications regarding the green transition in Eastern Greater **Poland**; Marshal Office of Silesia Region[66] [Urząd Marszałkowski Województwa Śląskiego]: good practices, various sets of reports prepared by the institutions researching the coal regions, the set of good practices, and the regional strategic documents. The website also hosts the Regional Observatory of Transition in Silesia; Polish Green Network[67] [Polska Zielona Sieć]: knowledge repository of articles and papers about coal regions, good practices from Central Eastern Europe, special government representatives, and social partners since 2019, prepared mainly by the Polish Green Network. These materials are for stakeholders in Upper Silesia, Eastern Greater **Poland**, Bełchatów Area, and Lower Silesia. Polish Green Network are members of EU-funded programmes' Regional Monitoring Committees, where they can obtain

[65] ARR Transformacja website: https://arrtransformacja.org.pl/
[66] Marshal Office of Silesia Region website: https://transformacja.slaskie.pl/
[67] Polish Green Network website: https://zielonasiec.pl/publikacje/

				information, mainstream the knowledge and advocate for e.g., job forecasting for "green jobs".
RO	Statistical Office			Set of 103 indicators for monitoring the National Strategy for the Sustainable Development of **Romania** 2030 (NSSDR). The National Institute of Statistics update regularly, the set of national indicators, structured on the objectives of the (NSSDR) (Section G and H from Tempo online platform).
SE	Government agencies			Monitoring and evaluating environmental climate policies.

Source: Author's compilation based on the ECE country articles

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