STUDY

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Unionisation and the twin transition

Good practices in collective action and employee involvement

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Good practices in collective action and employee involvement

Abstract

This study overviews the impacts of the twin (digital and green) transition on the labour market and the workplace. It explores the role and presents good practice examples of employee involvement, both via social dialogue and collective bargaining and direct co-decision making, in shaping the transition at the macro and micro levels. Finally, the study summarises the main legislative and policy measures adopted at the EU level to foster employee involvement.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AMICE	Association of Mutual Insurers and Insurance Cooperatives in Europe
ARD	Acquired Rights Directive
BIPAR	European Federation of Insurance Intermediaries
CCOO	Spanish Workers' Commissions
CEE	Central and Eastern Europe
CEEMET	Council of European Employers of the Metal, Engineering and Technology-Based Industries
CEEP	Central Europe Energy Partners
CEO	Chief Executive Officer
CFR	Charter of Fundamental Rights
CGIL	Italian General Confederation of Labour
CGT	Confédération Générale du Travail
CISL	Italian Confederation of Workers' Trade Unions
CJEU	Court of Justice of the European Union
CRL	Centre for Labour Relations
CRM	Customer Relationship Management
CSR	Country-specific Recommendations
DCR	Directives on Collective Redundancies
DI	Confederation of Danish Industry
EBF-BCESA	EBF Banking Committee for European Social Affairs
EC	European Commission
ECEG	European Chemical Employers Group

ECSA	European Community Shipowners' Association
EFFAT	European Federation of Food, Agriculture and Tourism Trade
EPSR	European Pillar for Social Rights
EPSU	European Federation of Public Service Unions
ETF	European Transport Workers' Federation
ETNO	European Telecommunications Network Operators' Association
ETUC	European Trade Union Confederation
ETUF	European Trade Union Federation
ETUI	European Trade Union Institute
ESF+	European Social Fund Plus
EU	European Union
EUROFER	European Steel Association
EWC	European Works Council
FNV	Federation of Dutch Trade Unions
FTJF	Just Transition Fund
FO	Force Ouvrière
GDPR	General Data Protection Regulation
GSEE	General Confederation of Greek Workers
I&C	Information and Consultation
ICFD	Framework Directive 2002/14/ EC on Information and Consultation
ICT	Information and Communication Technology
IDI	Industrial Democracy Index
ILO	International Labour Organisatio
INI	Own-initiative procedure

IoT	Internet of Things
LIGA	Hungarian Democratic Confederation of Free Trade Unions
LKO	Austrian Chamber of Agriculture
MGYOSZ	Confederation of Hungarian Employers and Industrialists
MNC	Multinational Corporations
MS	Member State(s)
NPS	Net Promoter Score
NRRP	National Recovery and Resilience Plan
OECD	Organisation for Economic Cooperation and Development
OSH	Occupational Safety and Health
OS KOVO	Czech Metalworkers' Federation
R&D	Research and Development
RRF	Recovery and Resilience Facility
SCE	European Cooperative Society
SE	Societas Europaea
SEWCs	European Companies Works Councils
SDGs	Sustainable Development Goals
SIP	Social Labour Inspector
SITT	Romanian IT Union
SME	Small and Medium Enterprise
SNB	Special Negotiating Body
TFEU	Treaty on the Functioning of the European Union
UEAPME	European Association of Craft, Small and Medium-Sized Enterprises
UGT	Spanish General Union of Workers

UITP	International Association of Public Transport
UN	United Nations
UNICE	Union of Industrial and Employers Confederations of Europe
UIL	Italian Labour Union
UNCCS	United Nations' Common Cash Statement
UNGC	United Nations' Global Compact
WEF	World Economic Forum

EXECUTIVE SUMMARY

Background

Digitalisation, accelerated by the COVID-19 pandemic, is transforming the EU economy and labour markets. New technologies and new forms of work and employment, facilitated by the digital transition, are affecting the labour market and the workplace, including work content, working conditions, new skills requirements and access to social dialogue. In addition, **climate change and the transition to a climate-neutral economy** are high on the agenda at both Union and Member State levels and will likely transform the EU economy. For workers, its effects are most pronounced in a handful of sectors and regions that must inevitably undergo significant structural changes (such as mining or energy production).

The pathways to green and digital transitions are not predetermined, and the twin transition can affect workers both positively and negatively. How we shape the digital and green transitions depends to a great extent on inclusive and well-thought-out policy-making: for instance, evidence suggests that facilitating **employee involvement** might mediate and mitigate the negative effects of the twin transition. Thinking ahead and involving employee voice at the macro (EU and national), meso (sectoral), and micro (branch and company) levels are fundamental to ensuring successful implementation. However, the twin transition is also challenging the established social dialogue structures, for example, contributing to a decrease in collective bargaining coverage and representation[1]. Furthermore, social partners (trade unions in particular) face significant structural challenges, ranging from unsupportive (and often deteriorating) institutional frameworks to an insufficient internal capacity to manage change; this may in turn reduce their capacity to shape the twin transition in an inclusive manner.

Aim

This study aims to provide the Members of the Committee on Employment and Social Affairs (EMPL) with a broad overview and specific examples of good practices concerning social dialogue, collective bargaining, and employee involvement in the workplace in the twin transition context. It focuses on four key dimensions:

- A synthesis of the existing research on the twin transition impacts on the labour market;
- An update on the state-of-play and specificities of social dialogue in response to the challenges stemming from digitalisation and greening, including good practice examples of national or sectoral initiatives targeted at and delivered by trade unions;
- A case study analysis of establishment-level good practice examples of employee involvement in (digital and/or green) technology adoption processes;
- An overview of the main legislative and policy measures adopted at the EU level to foster employee involvement; and
- The study is based on triangulated results obtained from a literature review (including academic literature, applied research reports, policy documents, collective agreements, social partners' positions, etc.) and primary data collected for this research (8 interviews with EU social partners and 15 interviews with case study representatives).

[1] E.g. by shifting the workforce from historically highly unionised sectors (e.g. mining, manufacturing) to those with much lower unionisation rates (services).

Key findings

The twin transition can have both positive and negative impacts on workers and businesses. The results from the literature review as well as stakeholder interviews suggest that **there is no single predetermined transformation path,** and how the transitions affect employment and workplaces greatly depends on *how* technologies are introduced. Virtually every impact dimension presents both potential benefits and threats to workers, including work organisation (such as worker autonomy vs AI surveillance), work content (a shift to more complex non-repetitive tasks vs a "trap" of precarious low-skilled service jobs, especially in platform economy), skills (upskilling opportunities vs the risk of exclusion due to skills becoming obsolete and insufficient availability of training), and working conditions (easier and safer physical tasks vs psychosocial risks related to permanent connectivity).

Another important takeaway relates to the distribution of gains between firms (i.e. capital) and employees (i.e. labour) and between different categories of workers. In the digitalisation context, companies can achieve gains in productivity (and subsequently, profit) by increasing employee workload or maintaining working conditions that are detrimental to employee health and well-being (including low pay, surveillance, etc.). Alternatively, gains achieved through digitalisation can be shared with or redistributed among the workforce by improving work-life balance and/or allocating some working time for upskilling (e.g. a 4-day work week and a "training Friday"). The twin transition (particularly digitalisation) can also contribute to increasing inequalities and **labour market polarisation**. While highly skilled and mobile workers can reap the benefits of digitalisation more easily, workers with insufficient skills and/or situated in collapsing industries face increasingly precarious working conditions, threats of dismissal, or exclusion from the labour market entirely.

In this context, seeking out worker input can have a positive effect on shaping the digital and green transitions in a sustainable and inclusive manner. Evidence from the company-level case studies show that **where employees were involved, technology adoption led to generally positive outcomes for the company workforce**, including a shift to more complex and interesting tasks, upskilling and higher labour market competitiveness, improved working conditions, and/or better work-life balance. The impact on the companies themselves was also positive, including increased productivity, improved product or service quality, and/or employee satisfaction.

However, conclusions regarding social dialogue in the twin transition context at the macro policy level are somewhat less encouraging. According to interview results as well as other existing evidence, **social partners' involvement in policy-making related to the twin transition is generally seen as insufficient**. This stems from two main challenges that social partners face:

- **Varying (but generally unsupportive) institutional frameworks** (including the lack of legal obligations, at the national or EU level, to involve social dialogue in shaping digital and green transition-related policies): At the macro-level, the **ability for workers and their representatives to be heard vary significantly across the EU Member States**. The differences between countries' industrial relations systems are stark and widening, and can alter the ways in which transitions are managed. In an extreme scenario, Europe could see a bi-polar development with relatively high investments in new technologies, secured employment, and protected and/or improving working conditions in countries with well-represented workforces on the one hand, and increasing precarity, competitiveness based on low labour costs, and insufficient investments in restructuring in Member States with inferior institutional frameworks on the other; and
- **Social partners' insufficient capacity** to adequately engage in debates on the future of work, formulate priorities, and effectively pursue their agendas:

Trade unions face particularly significant challenges, including decreasing membership rates, which in turn impact representativeness (partly owing to a restructuring of sectors with high union density to sectors characterised by low levels (or a lack) of unionisation); others include unsupportive institutional environments, rigid organisational structures (including formal and old-fashioned practices or internal hierarchies that are often inappropriate for the participation of all members, and contribute to the failure to recruit young members; see Föll and Hartmann, 2019), and insufficient access to funding and capacity-building opportunities.

There are a few examples that break the pattern of the correlation between a weak industrial relations system and poor transition-related social dialogue – for example, Spain is a front-runner in collective action in the platform work area. Likewise, there are **good examples of social partners' involvement in policy design and implantation** (e.g. Industry 4.0 commissions established in several EU Member States), trade unions' uptake of innovative practices and digital tools to increase membership rates and facilitate member engagement (e.g. online voting tools), and capacity building activities offered to national-level trade unions (e.g. seminars to exchange good practices) as well as by unions to workers (e.g. union representatives providing training for workers).

In addition to diverse national institutional frameworks, there are also highly pronounced sectoral differences regarding **the preparedness, progress, and needs of different industries in the twin transition context**. While EU- or national-level cross-sectoral agreements and policies can provide overarching principles and guidance for the digital and green transitions, it is the agreements implemented at the sectoral and company levels that directly affect workers. At the same time, sectoral social dialogue (especially in employment-related topics) has been identified as a weak spot in the EU-level social dialogue framework.

Involvement of workers' representatives at the company-level indicates their engagement in four out of ten analysed case studies. Probably the most prominent example included a "compass for digitalisation," developed by IG Metall in Germany and used by workers' councils to guide the digital transition process for the benefit of workers. In most cases, however, **employees primarily tended to voice their concerns in a direct and informal manner with company management**. In the majority of cases, employees were also excluded from broader organisational decisions (especially regarding *whether* or *which* technology should be adopted) and were consulted mostly on issues that affected their work organisation (*how* to adopt technology). However, again, some exceptions emerged. A case study from Poland involved a rare example where the decision to modernise plant machinery was triggered by the trade union's demands and which were aimed specifically at improving workers' physical working conditions (i.e. noise reduction). Another German company introduced a scheme for employees to suggest and design business ventures related to the digital and green transition.

Finally, the analysis shows that both policy-related and legal EU instruments may be important in addressing the challenges of digitalisation and greening. However, existing instruments (such as the European Works Council Directive or the Framework Directive on Information and Consultation) have been found to have a limited effect largely because of their **questionable enforceability**.

INTRODUCTION

This study aims to provide an overview of the impacts of the twin transition on employment and the workplace, particularly in light of the need to reinvigorate social dialogue and involve workers in shaping "the new normal." Situated in the context of the digital and green transitions, it examines the role of employee representation and participation, the state-of-play of social dialogue at the EU, national, sectoral, and company levels, and the provisions of the EU legal framework that support worker involvement in ensuring that such transitions to the workplace benefit both employees and employers. The study provides examples of ways in which workers and trade unions are involved in and successfully contribute to the digital and green transition. The importance of this topic stems from the evidence that the level of worker involvement is one of the determining factors in whether the introduction of technology in the workplace will benefit or harm workers.

The study is largely based on qualitative data resulting from a review of the academic literature, applied research reports, policy documents, collective agreements, and social partners' positions, as well as findings from fieldwork. Primary data was collected via eight interviews with EU social partners (six with trade unions, and two with employer organisations' representatives) to inform the analysis of the state of social dialogue at the macro level. These results were triangulated further with evidence from the literature and past interview panels and surveys; additionally, interview data and written feedback were collected from company management, workers, and/or trade unionists to inform relevant case studies. A total of 14 persons were consulted in developing ten case studies.

Case studies were identified via desk research or suggested by interviewees (EU social partners). The following criteria were applied when selecting the establishments for case studies:

- Individual criteria:
    - The organisation introduced state-of-the-art technology that altered its business model, competitive advantage, or work organisation practices;
    - Employees were involved in the planning and implementation processes (via social partners, work councils, or directly);
    - The practice has shown positive outcomes from the perspectives of both the company and employees or employee representatives. If no outcomes are available, the practice has generated positive expectations from both company and employees or employee representatives; and
    - The practice has not been extensively researched before.
- Group criteria:
    - Establishments come from different EU Member States (MS) or regions.
    - They represent diverse economic sectors and business models; and
    - Case studies include the adoption of different technologies.

The report contains the results of the analysis and is structured into five chapters:

- **Chapter 1** provides an up-to-date overview of existing research on how the digital and green transitions unfold in the labour market and the workplace. It summarises the transitions' various implications on workers and workplaces, including specific impacts on women and vulnerable groups. It introduces the potential of employee involvement and social dialogue to improve working conditions and shape the just twin transition;
- **Chapter 2** presents an update on the particularities of macro-level social dialogue and collective bargaining in Europe in the digital and green transition context. It builds on insights collected through interviews from EU social partners and provides an overview of social partners' strategies and agreements at the EU, national, and sectoral levels;

- **Chapter 3** presents ten company case studies on how employees can be involved in technology adoption at the workplace (micro-level);
- **Chapter 4** reviews EU legal instruments and initiatives to support Member States' efforts to ensure employees are informed of and participate in decision-making at work. Particular focus is placed on discussing the Revision of the European Works Councils Directive and the role of EU funding in strengthening social dialogue; and
- **Chapter 5** presents the main conclusions and policy recommendations emerging from the study.

1. THE TWIN TRANSITION IMPACTS AND THE ROLE OF EMPLOYEE REPRESENTATION

KEY FINDINGS

The impact of the digital transition extends to virtually all sectors and occupations. Digitalisation is having a profound effect on job substitution (i.e. occupation change), as digital technologies are making many low- and middle-skilled jobs obsolete across economic sectors while also creating an unprecedented demand for higher-skilled workers. In comparison, the green transition is having a much narrower, although potentially very significant, effect on workers in just a handful of sectors (e.g. mining), concentrated in just a few regions. These different impacts require different policy responses–while re- and up-skilling is crucial for the job or occupation upgrades deriving from digitalisation, the greening push needs a more comprehensive set of policies to rebuild the competitiveness and the social backbone of the hardly-hit regions.

Digitalisation's impact on the workplace is also significant. Besides the new tasks and skills necessary to implement them, digital technologies change the way work is managed (in the most extreme form via AI-based algorithmic management solutions). Working conditions are also evolving, both in blue collar (e.g. co-working with robots) and white collar (e.g. telework) jobs. Digitalisation also facilitates the push towards the flexibilisation of the workforce, marked by the proliferation of more precarious forms of employment (including platform work).

Older, lower-skilled, and low-income workers are a particularly vulnerable group in the face of the twin transition. While women are generally well-equipped to take on changes required for managing the digital and green transitions, the risks of discriminatory practices (both old and new) remain–most notably, embedding discrimination in algorithms.

The benefits of employee involvement in implementing the digital and green transitions in the workplace are well-recognised. Employees can be involved either indirectly (e.g. via trade unions that voice their concerns through collective bargaining or works councils that negotiate with the employer) or directly (e.g. via board representation, ballots, or simply day-to-day informal interactions with the management). Nevertheless, there are sizeable differences in employee involvement levels across countries, sectors, and sizes of establishment.

Finally, collective action is particularly challenging in sectors most exposed to the (negative) effects of digitalisation (most notably – platform work) and greening (especially mining). Social partners' engagement leaves much room for improvement within these sectors, although good practice examples are emerging.

1.1. Understanding workplace digitalisation: Impacts of technological changes on workers

Eurofound defines digitalisation as "**the ongoing integration of digital technologies and digitised data**"[2]. The literature points to three major drivers of digitalisation (Berghaus and Back, 2017; Osmundsen et al., 2018; Verhoef et al., 2021):

- **The wide entrance of digital technologies**: Ongoing technological progress and the availability of new technologies alone can signal the need for companies to transform their business;
- **Changing competition landscape**: Organisations need to innovate to compete with an expanding range of digital (often non-industry) market entrants; and
- **Evolving customer behaviour and expectations**: Customers are shifting their purchases online, increasingly relying on mobile apps and other technologies. With the help of new search and social media tools, consumers are also becoming more connected, informed, empowered, and active.

These drivers can be amplified by other non-market factors. For example, governments, supra-national and international institutions (including the EU[3], the OECD[4], and the ILO[5]) are supporting business digitalisation to sustain or improve competitiveness and boost economic growth. Furthermore, the Covid-19 pandemic has unexpectedly and rapidly intensified digitalisation, with pronounced impacts on the workforce. In particular, large shares of workers switched to remote work (e.g. Brynjolfsson et al., 2020), while organisations accelerated their efforts to automate "non-teleworkable" tasks in order to compensate for the unavailability of human workers (Amankwah-Amoah et al., 2021; Chernoff and Warman, 2020; Coombs, 2020).

Organisations employ a range of digitalisation strategies (whether these are compelled or proactively implemented) in ways that are fundamentally transforming business models and the workforce more broadly. Eurofound (2018 and 2021c) distinguishes three main impact pathways (or "vectors of change") through which digitalisation affects work and employment patterns:

- **Automation of work** (i.e. the replacement of human labour with machine input): The combination of robots and Artificial Intelligence (AI) allows for algorithmic control of machines, potentially leading to the automation of tasks previously performed by humans;
- **Digitisation of processes** (i.e. the conversion of information from a physical to a digital format): AI-related technologies, cloud computing and Big Data enhance possibilities for the processing, storage, and communication of digital information, and allow for aspects of the digital economy to proliferate to new sectors and industries beyond ICT; and
- **Coordination by platforms** (i.e. the use of digital spaces to coordinate economic transactions): The use of digital labour platforms allows employers to contract workers to deliver tasks, rather than relying on full-time employees.

[2] "Digitalisation", available at: https://www.eurofound.europa.eu/topic/digitalisation.

[3] E.g. Europe's Digital Decade, available at: https://digital-strategy.ec.europa.eu/en/policies/europes-digital-decade.

[4] E.g. Going Digital, available at: https://goingdigital.oecd.org/.

[5] E.g. The Future of Work initiative, available at: https://www.ilo.org/global/topics/future-of-work/lang--en/index.htm.

The incorporation of these changes into the world of work has substantial implications for labour markets and workplace norms[6]. First, digitalisation can lead to **structural employment shifts** (i.e. the destruction, creation, and substitution of jobs). Whereas previous industrial revolutions led to clear welfare gains and more jobs, it is currently unclear whether this will also be the case for the present digitalisation wave (De Groen et al., 2017; High Level Expert Group, 2019). For example, Acemoglu and Restrepo (2019) note that in the last two decades in the US, the loss of jobs due to automation (i.e. the "displacement effect") has been occurring at a relatively faster pace than the creation of new tasks spurred by technological progress (i.e. the "productivity effect"), causing stagnant labour demand and wages (see also Acemoglu and Restrepo, 2018; Autor and Salomons, 2018; Nübler, 2016; WEF, 2020).

Evidence from Europe offers somewhat more optimistic conclusions. Building on Acemoglu and Restrepo's (2018) methodology, Chiacchio et al. (2018) find a lesser displacement effect in Europe than in the US, suggesting that "European labour market policies could possibly cushion the impact of industrial robots, leading to a less severe drop in the employment rate" (p. 23). This may be because of the creation of jobs in the service sector which offset job losses in the manufacturing industry, as Dauth et al. (2017) demonstrate in the German case. . Additionally, employment decline has been driven by fewer entry-level jobs rather than the displacement of work in outmoded factories. Increasing technologisation has also impacted medium-skilled workers most, both in terms of displacement and wage stagnation (Chiacchio et al., 2018; Dauth et al., 2017).

In addition to impacting labour market dynamics, it is also evident that increasing digitalisation in the workplace has a significant impact on job substitution (i.e. occupation change). The World Economic Forum and McKinsey forecast a significant increase in total employment of high-skilled professions, particularly in the health and digital sectors (Lund et al, 2021; WEF, 2020). At the same time, the number of low- and medium-skilled occupations (including many administration and office jobs as well as manual labour) is expected to decrease. Since these "jobs of the future" require substantially different skillsets, such a shift would require a large reskilling effort (Ibid., see also Eurofound, 2021b; WEF and BCG, 2019). Additionally, the disappearance of relatively lower-skilled positions could lead to increased polarisation of the labour market (Eurofound, 2021b).

Apart from shifts in structural employment, **digitalisation impacts the workplace (i.e. the ways in which existing jobs are performed)**. EU social partners have conceptualised four areas in which the impacts of digitalisation materialise in the workplace, summarised in **Table 1** below.

Table 1: Impact areas of digitalisation on the workplace

Work organisation	Work content & skills	Working conditions	Work relations
How is the work and authority distributed?	What are the contents of the job and the skills required to perform it?	What is the working environment (including both physical and mental demands)? What are the employment terms and conditions?	What is the quality of social interactions within the workplace?

Source: Authors, based on European Social Partners Framework Agreement on Digitalisation[7].

[6] Although a range of mediating factors (including work organisation, reconstruction of occupational profiles, skills and learning, human resource management, social dialogue, or economic and social processes of diffusion and adoption of innovations) complicate the collection of empirical data on the impacts of technology on employment; see Valenduc and Vendramin (2017).

[7] European Social Partners Framework Agreement on Digitalisation, available at: https://www.etuc.org/system/files/document/file2020-06/Final%2022%2006%2020_Agreement%20on%20Digitalisation%202020.pdf.

The impact of digitalisation on **work organisation** boils down to a discourse between the benefits of higher worker autonomy versus the risks of algorithmic management of work. On the one hand, it appears that higher degrees of digitalisation also increase managers' propensities to allow employees to work autonomously (Eurofound and Cedefop, 2020; Eurofound, 2021a). The resultant increases in self-leadership and flexibility have been in turn linked to higher worker motivation, engagement, and productivity (Galanti et al., 2021). Furthermore, some forms of non-standard work arrangements can potentially lead to a better work-life balance or greater labour market inclusion (e.g. of parents or other caregivers) (Eurofound, 2021b). Finally, technology can enable the analysis of data to improve work organisation and workflow (Ibid.). On the other hand, automation and digitisation facilitate the uptake of "algorithmic management," understood as "the use of software algorithms to automate organisational functions" (Wood, 2021, p. 1; see also Adams-Prassl, 2019; Aloisi and De Stefano, 2021; De Stefano, 2018; Eurofound, 2020a; Kellogg et al., 2020). Non-human management can degrade workers' well-being, who might experience harmful impacts to their psychosocial wellbeing (e.g. feeling pressured or objectified) due to workplace culture characterised by continuous competition, "point-scoring", and surveillance. Furthermore, the plethora of collected data might deepen power asymmetries between employers and employees, who might find it difficult to contest management decisions (Eurofound, 2021b; Griesbach, et al., 2019; Shapiro, 2018; Veen, et al., 2020; Woodcock, 2020). Finally, there are concerns regarding algorithms' infringement on privacy and data protection rights (Adams-Prassl, 2019) and discrimination (see section 1.3 below; Adams-Prassl, 2020; Hara et al., 2018).

Furthermore, digitalisation transforms **the content and skills necessary to perform their work.** Evidence going back to the 1990s has suggested that work has become increasingly composed of non-routine, analytic, and interactive tasks, while the frequency of routine, manual, and cognitive tasks decreased within the same educational groups (ALM and Spitz-Oener, 2006, cited in Nedelkoska and Quintini, 2018; see also Eurofound, 2021a). These shifts in the kinds of employment tasks performed can reduce job strain and facilitate employee enrichment, as workers move from repetitive, mundane tasks to more creative ones (Eurofound, 2021b; see also Méda, 2016). However, a successful transition to "better" jobs requires new skills. When up- or re-skilling is successful, it can lead to job profile upgrades and provide better career prospects within and outside the company (although this is mostly true for managerial and engineering positions, and less so for lower-skilled and blue-collar workers) (Eurofound, 2021a). Nonetheless, evidence from the OECD suggests that the current levels of up-skilling, especially among groups most affected by automation, are insufficient to meet the requirements of emerging jobs (Nedelkoska and Quintini, 2018). Finally, while some workers experience improvement in career prospects and job quality, others are at risk of de-skilling depending on the nature of the tasks required. This is a sizeable problem in platform work, for example, where many relatively overqualified workers perform physical jobs (e.g. delivery) or simple routine "click-work" microtasks with low skills requirements (e.g. Berg, et al., 2018, Eurofound, 2021b)[8].

Perhaps the most profound effect of digitalisation has been on **working conditions**, both in terms of working environment and employment conditions. First, automation has the potential to relieve workers from some of the unhealthy, hazardous, or physically strenuous tasks they might otherwise have to perform (Pham et al., 2018). However, interactions with robots can also increase occupational safety and health (OSH) risks if rules are not updated and workers are not adequately trained (Badri et al., 2018).

[8] Although it should be noted that platform work also offers medium- and high-skilled tasks such as translation, tutoring, graphic design, software programming, etc.

Furthermore, automation can affect working time – for example, as production hours increase (even to 24/7), workers supervising the technology might also be required to work extreme or irregular shifts (Eurofound, 2021b).

The adoption of new technology, especially in its early stages, has also been linked to work intensification as workers need to adjust to new tasks and responsibilities (Eurofound, 2021a). Secondly, the digitalisation of white-collar jobs has been (especially during the COVID-19 pandemic) increasingly linked to telework. A systematic review of 63 studies on remote work and well-being concludes that despite both positive and negative associations, there is greater consensus that remote work has positive impacts on employees' well-being (including fostering a better work-life balance) (Charalampous et al., 2019). Nevertheless, evidence suggests that certain aspects of remote work pose alarming risks to both physical health (e.g. musculoskeletal disorders due to non-ergonomic workspaces) and mental health (including stress, loneliness, increased work intensity and stress, constant connectivity and blurring of boundaries between private and working time) (Curzi et al., 2020; Davis et al., 2020; Eurofound, 2021b; Molino et al., 2020; Song and Gao, 2020; Spagnoli et al., 2020). Finally, studies also note a relationship between algorithmic management and platform work on greater amounts of unpaid working time (e.g. Pulignano et al., 2021).

Regarding **employment conditions**, increasing flexibility in the workplace has also encouraged the rise of (involuntary) atypical forms of employment, including (bogus) self-employment, short-term contracts, subcontracting and outsourcing (Eurofound, 2021b; De Groen et al., 2021; Huws et al., 2018). This can lead to depriving *de facto* employees from labour rights, including rights to minimum wage, social security, collective bargaining, etc. Platform work is an extreme case, where as many as 5.5 million workers in the EU can be misclassified as self-employed and therefore losing out on the "standard" employment benefits (Barcevičius et al., 2021). This is reinforced by other evidence – for example, the latest ETUI survey concludes that 22% of platform workers were self-employed (compared to 6% of those who have never done internet work), while "many of them lack the independence of the genuinely self-employed" (Piasna et al., 2022, p. 37).

Finally, the impact of digitalisation on **work relations** is ambiguous and context-dependent. On the one hand, more worker autonomy can build worker-manager trust (Eurofound, 2021b). On the other hand, algorithmic management can damage the worker-employer relationship, hinder worker understanding of how organisational decisions influence working conditions and prevent the ability of trade unions and work councils to exercise their right to collect information and seek consultation (ibid.; De Stefano and Taes, 2021). Similarly, while teamwork is more common in highly digitalised establishments (84%) than in those with limited digitalisation (55%) (Eurofound and Cedefop, 2020), the shift to remote work also has the capacity to harm team dynamics. Finally, with regard to external (industrial) relations, it is often difficult for a flexible and dispersed workforce to organise and pursue collective action, thus increasing employer-worker power imbalances (e.g. Johnston and Land-Kazlauskas, 2018).

1.2. Understanding greening of the economy: Structural shifts and changes at the workplace

According to Eurofound, "greening the economy means **producing products and services with less energy, fewer raw materials and with reduced carbon emissions**" (Vitols et al., 2011, p. 3). While the digital transition is a business- or competition-driven process, the green transition involves a high degree of urgency (the present "climate emergency"), and requires much more intervention (Galgoczi, 2020).

Nevertheless, similar forces enable both greening and digitalisation, (Asikainen et al., 2021; Tollefson, 2022), including:

- **Technological progress:** Increasingly cost-effective clean energy sources and electric engines, new energy-saving technologies, or greater capacity to utilise recycled materials due to technological advancement can drive the green transition;
- **Evolving customer behaviour and expectations:** Customers increasingly take into account the environmental costs of their purchases, and shift towards more sustainable consumption patterns – both in terms of what they consume and how they consume, e.g. the shift from buying to sharing;
- **Political commitment and policy action:** EU-level strategies[9] and international commitments[10] encourage the switch to low-carbon solutions;
- **Changing competition landscape:** "Brown" sectors or regions might be losing competitiveness in favour of "clean" ones (not least because of the above-mentioned consumer demands and policy pressures); and
- **External shocks:** For example, the Russian invasion of Ukraine raised questions about the EU's energy autonomy and intensified the debate on rising energy poverty.

There are two main pathways by which the green transition impacts labour markets:

- **Energy transition** (i.e. the shift from fossil-based systems to renewables): This includes shifts in the way energy is produced (from oil, coal, and natural gas to wind, solar, etc.) and how energy is stored and consumed (e.g. from internal combustion engines to electric) (Asikainen et al., 2021); and
- **Resource efficiency and circular economy** (i.e. keeping products, components, and materials in the economy for as long as possible to reduce waste): Moving towards a circular economy model has distributional consequences and may redefine some supply and value chains (Laubinger et al., 2020).

These trends affect labour markets and workplaces. In terms of **employment (or labour market) effects**, the green transition is expected to have a mild positive effect on job quantity in the EU (Asikainen et al., 2021; Cedefop, 2021; see also Montt et al., 2018; van der Ree, 2019). Nonetheless, the distribution of these effects will likely vary across sectors. While digitalisation on the whole drives relatively significant job substitution across a broad range of sectors, the effects of greening are expected to be particularly acute (with minor impacts on most sectors, while necessitating significant transformation in a select few). For example, Cedefop estimates the European Green Deal would have a limited impact on job quantity between 2020 and 2030 in the vast majority of sectors (ranging from -0.6% to +3.8%), but have pronounced impacts in certain sectors adjacent to energy production and efficient resource use. These include substantial negative impacts on mining and quarrying (-11%), coke and refined petroleum (-11.5%), and gas, steam & air conditioning (-20.9%), and substantial positive impacts in electricity generation (+17.2%) and water supply & waste management (+63.2%) (Cedefop, 2021)[11]. Such a distribution leads to uneven geographical impacts, as well – while positive employment impacts are likely to be geographically dispersed, the demise of the fossil fuel sectors will disproportionately impact a few European regions in particular (Ibid.).

[9] Esp. the European Green Deal, available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

[10] Incl. UN's Sustainable Development Goals (SDGs) or the Paris Agreement

[11] Other forecasts offer similar conclusions (see, for example, Asikainen et al., 2021).

This requires not only significant re-skilling efforts, but also broader economic policies targeted at restoring the competitiveness of these regions.

Finally, job duration is also a concern–some job gains may be permanent, but some may be required only for the transition period and thus temporary (Laubinger et al., 2020). For instance, the predicted increase in employment in the waste management may be lost as a more resource-efficient economy produces less waste.

Interestingly, **some sectors that are being completely transformed by the green transition see ambiguous effects on employment levels**. For example, in the German automotive sector, the sharp decline in diesel technology caused a 13% decline in production value between 2015 and 2019 (Falck et al., 2021). However, direct employment in the affected product groups decreased by only 2%, and among those affected by technology change indirectly, there was even a slight increase. Nevertheless, the sustainability of these jobs is, again, questionable. The limited job losses have been attributed to the development of parallel manufacturing, purchasing and organizational processes for "brown" and "green" technologies (Ibid.). Once electronic vehicles become the norm in the more distant future, employment could further decrease (Cedefop, 2021).

Generally, the new jobs created as a result of the greening push are of high quality–as one report put it, "circular economy jobs are good jobs" (Green Alliance, 2016, cited in EPSU, 2017, p. 24; see also Valero et al., 2021).

Nonetheless, the **impacts of greening on the workplace** are much less researched than those of digitalisation, in part because it is likely to be of a much lesser magnitude. **Work content and skills** is one area of impact highlighted by the literature, in the sense that the green transition generally favours technicians and professionals over manual workers (Marin and Vona, 2019). Nonetheless, in most occupations, green jobs generally appear to differ from their non-green counterparts only in a few skill-specific aspects (Bowen et al., 2018). This suggests that greening required upskilling or "topping up" existing skills, which can mostly happen via on-the-job training rather than undergoing complete re-skilling (Ibid.; Laubinger et al., 2020). This upskilling trend can have some positive effects on the workforce – for example, green jobs have been found to generally have higher wages than non-green jobs (Bowen et al., 2018).

The impact on **working conditions** requires further research – for example, the health risks inherent to certain occupations (for instance, in relation to exposure to chemicals, electrical and electronic waste, etc.) are currently under-researched (EPSU, 2017; Laubinger et al., 2020). No evidence has been identified on the green transition impact on **work organisation** and **work relations**.

1.3. The impact of the dual transition on women and vulnerable groups

The twin transition can bring about both benefits and risks for women in the workplace. The impact on availability of jobs (**job quantity)** are not clear cut. The green transition has caused both job creation and job destruction in traditionally male-dominated sectors such as mining, engineering, construction, and energy – thus, the impact on job availability for women is expected to be mild (and likely positive) (Cedefop, 2021; ILO, 2019). Similarly, automation has traditionally been associated with male-dominated sectors overall, such as manufacturing (OECD, 2017). Nonetheless, there is evidence that increasing automation in the workplace also has important impacts on women. For example, the OECD (2017, p. 3; see also Arntz et al., 2016) concludes that "the average risk of automation is similar for men and women," given the high share of women in sectors at high risk of automation such as food and beverage service activities and retail trade. Furthermore, although women-dominated sectors, such as education, social work, and health care are at a lower automation risk, the total number of women who

work in these large sectors and can be displaced is still high. Finally, newer evidence suggests the pandemic may have accelerated the automation of jobs with a higher risk of Covid-19 transmission (i.e. those that require human contact) and therefore put women at a higher automation risk than men (Chernoff and Warman, 2020; see also Brussevich et al., 2019).

The increasing flexibility and platformisation of working arrangements can influence **job accessibility**. The access to remote, flexible, and/or part-time jobs can improve labour market inclusion for women. In a cross-country comparison, the share of women working from home correlates broadly to maternal employment rates (OECD, 2017). Evidence also suggests that flexible work allows mothers to maintain their careers after childbirth (Chung and Van der Horst 2018b) and reduces barriers to mothers' employment in higher-wage jobs (Fuller and Hirsh 2018). Platform work can be another avenue for labour market participation–for instance, evidence from the US shows that the share of female drivers at Uber (14%) is higher than for traditional taxis (8%), the main reasons being the ability to "work part-time or flexible schedules" and "family, education, or health reason" (Hall and Krueger, 2018). Nonetheless, digitalisation can also reproduce inequalities in employment access–currently, the (large) majority of workers engaged in online web-based platforms globally are men (63%) (ILO, 2021).

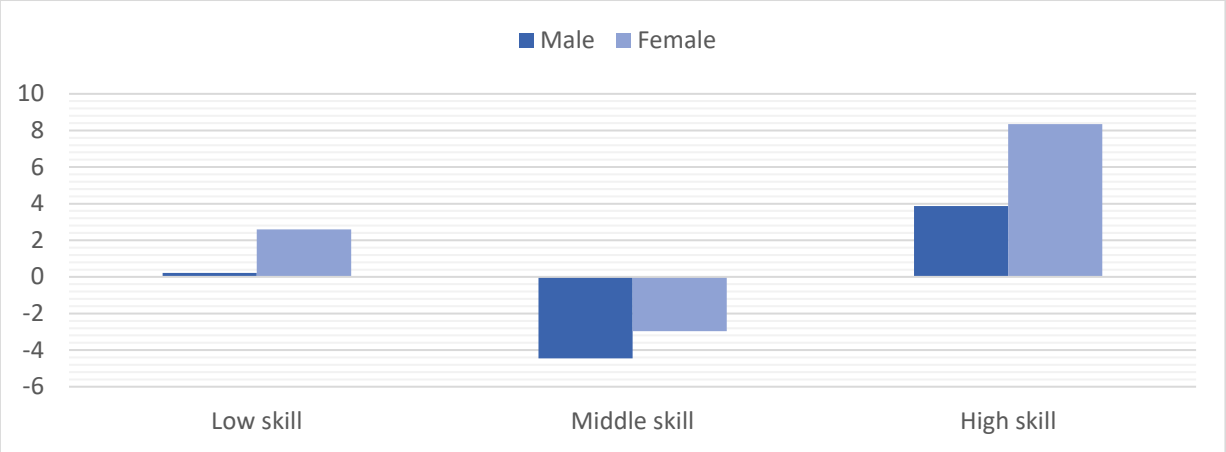
Flexible work may deteriorate women's **working and employment conditions**. First, the relation between flexible working and work-life balance is not evident, and some studies suggest it may in fact exacerbate work–family conflict and blur boundaries between work and non-work responsibilities (and, as a result, negatively impact well-being) (Chung and van der Lippe, 2018).

Furthermore, digitalisation can lead to poorer career development opportunities for women as telework leads to reduced visibility, deviation from the ideal worker image, and results in fewer career development opportunities (Ibid.). Platform work is also associated with poor working and employment conditions (see section 1.1 above). Finally, the impact of digitalisation on the **gender pay gap** is unclear. On the one hand, some studies find that flexible and remote work can diminish wage gaps (Fuller and Hirsh, 2018; Graham et al., 2017; van der Lippe et al., 2018). On the other hand, a significant gender pay gap persists on digital labour platforms (Adams, 2020; Barzilay and Ben-David, 2016; Hara et al., 2018; Kullmann, 2018; Vyas, 2021). Some have concluded that the digital economy has produced a so-called "discrimination 3.0," where discrimination is not a function of formal barriers or implicit biases, but rather results from the calibration of the algorithms[12] (Ibid.).

Finally, adequate **skill levels and skill sets** are crucial for a successful digital transition. The increasing demand for high skills is generally beneficial for women, who are more likely to be tertiary graduates than men (Arntz et al., 2016; OECD, 2017). Therefore, women have historically captured more gains from the availability of high-skilled positions than men. As **Figure 1** demonstrates, OECD data suggests that between 2003 and 2015, women experienced more gains and fewer losses across all skill categories. One point of concern is the skill composition. Although women meet or exceed men's skill levels in most categories, they significantly lag behind in STEM skills (Ibid.; see also Kahn and Ginther, 2017), which some have suggested are essential for an efficient twin transition (Asikainen et al., 2021; Cedefop, 2021).

[12] Biases in AI systems have attributed to the biased data used to train algorithms and the lack of diversity in the teams that develop them. See, for example: https://oecd.ai/en/wonk/ai-national-gender-bias.

Figure 1: Change in employment from 2003 to 2015 by gender and skill level, EU (millions of jobs)



Source: OECD (2017)

Besides the gendered impacts of the twin transition **the literature also identifies populations made vulnerable** by increasing digitalisation. A recent systematic review of vulnerable populations and digital inclusion concludes that most publications identify older people as most vulnerable (33%), followed by the disabled (20%), poor communities, homeless or low-income families (18%), and women (10%) (Pérez-Escolar and Canet, 2022). Similarly, Vasilescu et al. (2020) use cluster analysis to identify "digital vulnerable groups" of EU citizens, which are most likely to be "elderly, with a low level of education, manual workers or not working, with a relatively low level of income and little Internet use" (p. 35).

Additionally, they point out lower-income EU MS (especially Hungary, Greece, Romania, and Bulgaria) as examples of "digital vulnerable countries," where the share of digital vulnerable groups is the highest (Ibid.). In sum, the sources of vulnerability can be boiled down to age, gender, geographical location (i.e. rural vs urban areas; more vs less prosperous countries or regions), poverty, education, and personal limitations (such as physical and cognitive impairments) (Pérez-Escolar and Canet, 2022; Vasilescu et al. 2020). Similar patterns emerge with reference to vulnerability in the face of the green transition, although two elements are particularly important: (1) geographical location (especially the few regions most severely hit by economic restructuring and climate change), and (2) poverty (risk of energy poverty) (e.g. UNCCS, 2018).

The impact of the twin transition on these groups come down to one major risk: **labour market exclusion**. Those that fail to adjust to the rapid changes (especially via up- or re-skilling) are likely to drop out from the labour market, contributing to higher long-term unemployment and structural unemployment rates (Vasilescu et al. 2020). Authors also draw attention to inequalities between the highly skilled and mobile "winners" who can take advantage of the digital transition and the low-income workers and the unemployed, who face disproportionate barriers to achieving their full potential (e.g. Degryse, 2016).

Public policies aimed at alleviating these negative effects focus on bridging the digital divide (digital transition) and supporting vulnerable regions in the process restructuring (i.e. the green transition). Most prevalent policy actions are summarised in **Box 1** below.

Box 1: Policies mitigating the negative effects of the digital and green transition

The three dimensions of digital inclusion policies, most relevant for the EU labour market context, include:

- **Access**, including access to ICT infrastructure, especially in rural areas and supporting the development of ICT that assist people with disabilities in the digital world ;
- **Skills**, including digital skills training and the use of ICT in education; and
- **Awareness and relevance**, e.g. education on the benefits of digitalisation and digital up-skilling.

The key economic policies to tackle the negative effects of the green transition include:

- **Growth, industrial, and enterprise policies** to boost competitiveness of regions in transition;
- **Skills development policies** to equip workers affected by the transition with relevant skills; and
- **Social protection and active labour market policies** to provide security (including extending social safety net beyond already existing unemployment protection and income support measures) and facilitate labour market re-integration with a particular attention to unemployed workers and workers at risk of unemployment.

Source: Authors based on EU digital inclusion policies[13], ILO (2015), OECD (2019), and UN (2021).

1.4. Potential of employee involvement in technology adoption in the context of the twin transition

ILO emphasises that "**social dialogue plays an important role in shaping the future of work**, taking into account particular trends of globalization, technology, demography and climate change[14]" As shown in the sections above, the twin transition impacts on job quality can range from highly favourable to seriously damaging. In this context, worker voices are beneficial in shaping the transitions in a sustainable and inclusive manner.

Employee participation in decision-making can occur at different "depths" and via different methods. First, the literature distinguishes between employee voice (where they can "have a say" without necessarily having an impact), employee involvement (a passive exercise), and employee influence (an active exercise)[15]. Furthermore, employees can participate in decision-making directly (i.e. without the mediation of employee representatives, e.g. via briefings, open-door policies, suggestion schemes, or group or team discussions) or indirectly (via worker representation bodies, including trade unions, works councils, joint consultative committees, or employee representation on boards). **Direct and indirect participation modes can coexist (or conflict) with one another**. Markey and Townsend (2013) note that "[i]n a European context, direct and representative forms of voice usually complement each other, especially in Scandinavia and Germany" (p. 479). In other more liberal market-focused countries, there might be more emphasis on the unilateral management choice of arrangements, and therefore, on direct participation (see below for an overview of cross-country differences).

[13] "Digital inclusion", available at: https://digital-strategy.ec.europa.eu/en/policies/digital-inclusion.

[14] ILO (2018). Resolution concerning the second recurrent discussion on social dialogue and tripartism, p. 2, available at: https://www.ilo.org/ilc/ILCSessions/previous-sessions/107/reports/texts-adopted/WCMS_633143/lang--en/index.htm.

[15] For a discussion, see Markey and Townsend (2013).

Employees can shape company decisions according to two main dimensions (Eurofound, 2020b):

- **Task discretion**: Employees exercise independent initiative, control, or autonomy in carrying out their jobs and tasks; and
- **Organisational participation**: Employees participate in decisions that affect wider organisational issues, including working and employment conditions.

Finally, employee involvement can bring about benefits for both the company and the workers. More specifically, it can impact (Eurofound and Cedefop, 2020):

- **Establishment performance**, including profitability, changes in the production volume, employment levels, or productivity gains; and
- **Workplace well-being**, including working and employment conditions, employee motivation, worker retention, learning opportunities at work, employee well-being, etc.

Particularly in terms of workplace well-being, organisations that highly involve workers[16] were found to offer a better work environment (including less physical risk, lower work intensity and greater job security) (Eurofound, 2020b and 2020c)[17]. The share of employees in these organisations reporting high worker engagement was almost double the share of those working in low-involvement organisations (47% compared to 24%). Finally, workers in high-involvement organisations had better access to formal and informal training, with a smaller difference in opportunities for skills development between high-skilled and lower-skilled employees (Ibid.).

In the context of technology adoption, there are at least two major reasons why employee involvement in technology adoption is crucial. Firstly, **the level of employee involvement is related to how the technology impacts them.** How technology is developed and implemented in a workplace determines whether it will benefit or hurt workers (i.e. the same technology can lead to either gains or losses in terms of efficiency, autonomy, flexibility, job control, occupational safety and health, etc. depending on how it is deployed). The effects of digitalisation are addressed by collective bargaining through arrangements that relate to training, working time, work organisation, work-life balance, management of redundancies, or safety and health at work (Eurofound, 2021d). Therefore, well-functioning mechanisms that allow workers to participate in technology adoption give workers a chance to ensure that their needs and expectations are met, and that technology assists rather than hinders their work or leads to the deterioration of working conditions. Secondly, **employee involvement in technology adoption reduces the risk of worker resistance to digitalisation and change**. As workers are informed and consulted on adopting technologies, they are more likely to have more confidence in using technologies and accept changing work styles (Eurofound, 2021a).

Nevertheless, there are numerous challenges to employee involvement in governing the twin transition, including:

- **Employment fragmentation**: Digitalisation creates "fissured" workplaces, which makes it difficult to mobilise and organise workforces characterised by high turnover and scattered working time schedules (Eurofound, 2021a; Weil, 2011). For example, the prevalence of telework arrangements leads to a more geographically dispersed workforce that is difficult for unions to represent and organise. In an extreme case of platform work, workers have no single workspace, which means worker representatives lack space to reach out to and organise workers;

[16] The involvement level was assessed based on employee responses to questions about their level of task discretion and organisational participation (European Working Conditions Survey, 2015).

[17] The correlation relationship was established based on the responses to the European Working Conditions Survey.

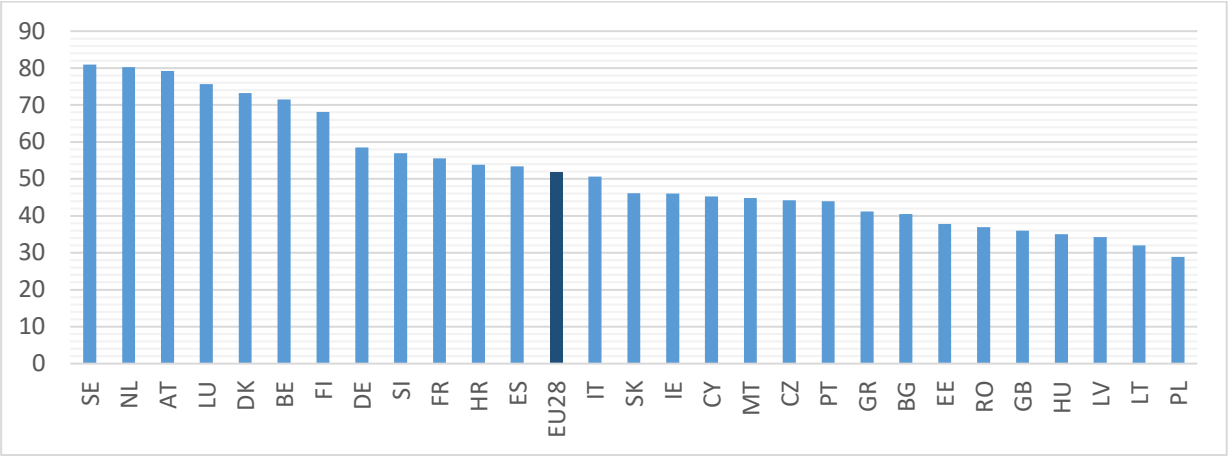
- **Changing workforce structure**: Automation results in job losses in sectors with historically high union density rates, which can disrupt the minimum thresholds required for collective worker representation (see Dauth et al., 2017). In turn, jobs are created for higher-skilled service workers or in low-skilled precarious jobs (e.g. on digital delivery platforms), who are less likely to unionise (Ibid.; Acemoglu and Restrepo, 2019);
- **Worker status**: In many Member States, a restrictive interpretation of antitrust law does not allow self-employed workers to be covered by collective bargaining (Countouris and De Stefano, 2019; Lenaerts et al., 2018). At the same time, the flexibilisation of work results in the increasing shares of ("bogus") self-employed relative to "standard" employees; and
- **The need to adapt trade unions' practices**: For example, the ETUC's survey data shows that an overwhelming majority of trade unions realise the need for a stronger response to the challenges posed by digitalisation and the platform economy. Respondents agreed that trade unions should "more actively address and campaign on the issue of digitalisation and the future of work," in addition to "chang[ing] their organisational structures and recruitment strategies to become more attractive to workers in the digital economy", and "build[ing] new competences and make better use of digital technologies" (Voss and Riede, 2018, pp. 43-44).

The evidence suggests that the on-the-ground picture of employee involvement in Europe is highly heterogenous. Several factors shape the differences in the involvement levels across organisations, including (De Spiegelaere and Jagodzinski, 2019; Eurofound, 2016a and 2020):

- **National context**: Sizeable cross-country differences have been identified in the prevalence of high-involvement organisations, from over 40% in Denmark, Malta, the Netherlands, and Finland to less than 20% in Croatia, Portugal, Cyprus, and Greece (see below);
- **Company size**: Larger establishments are more likely to involve employees in decision-making than small and medium-sized ones;
- **Sector**: For example, organisations in the financial and education sectors tend to involve employees more, whereas in agriculture (for instance), involvement tends to be much lower;
- **Occupation**: Professionals and managers are much more likely to exert control over their work and have influence on organisational matters via direct involvement compared to workers in blue-collar and less-skilled jobs; and
- **Digitalisation stage**: Employee representatives are less likely to be involved in the early stages of transformation. For example, in 2018, 22% of European Works Councils (EWCs) and European Companies Works Councils (SEWCs) members indicated they were consulted before a final decision in the company was made. The majority (43.2%) believed they were consulted after the decisions were finalised but before implementation, and 9.7% – post-implementation.

The differences in national contexts and institutional systems are particularly stark. For example, the Eurofound's Industrial Relations Index shows a wide variety in the overall quality of the "collective and individual governance of work and employment" (Eurofound, 2018b, p. 1). Its "industrial democracy" sub-index assesses three dimensions of indirect and direct employee involvement: (1) associational governance (such as trade union and employer organisation density and social partners' engagement in the governance of employment relationships); (2) representation and participation rights at company level via works councils and board representation; and (3) social dialogue at the company level (e.g. worker involvement in decision-making) (Eurofound, 2018a and 2018b). **Figure 2** below shows the Industrial Democracy Index (IDI) scores for the EU27 and the UK.

Figure 2: Industrial Democracy scores across countries (2013-2017)



Source: Eurofound Industrial Relations Index[18]

Based on the IDI scores and additional contextual indicators, Eurofound (2018b) classifies EU MS into six clusters, which share some common characteristics regarding the extent and organisation of industrial democracy. These clusters are summarised in **Table 2** below.

Table 2: Clusters of countries based on IDI scores and collective bargaining systems

Cluster	Countries	IDI score	Key characteristics
#1 Social partnership	Austria, Belgium, Luxembourg, the Netherlands	High	• A high degree of centralisation and coordination, high collective bargaining coverage rates and the routine involvement of social partners in policymaking • The relative weakness of trade unions and strength of employer organisations • Extensive legal rights granted to works councils and board-level employee representation rights • Above-average social dialogue at the company level
#2 Organised corporatism	Germany, Denmark, Finland, Sweden	High	• A two-tier system of centralised-decentralised collective bargaining (at national, sectoral, and company levels) • Strong trade unions • Co-determination rights established by law and extended by national and sectoral agreements • The best performance in terms of social dialogue at company level

[18] Eurofound Industrial Relations Index, available at: https://www.eurofound.europa.eu/data/industrial-relations-index?period=2013-2017&breakdown=d1&mode=all&country=all.

Cluster	Countries	IDI score	Key characteristics
#3 State-centred associational governance	France, Italy, Portugal, Slovenia, Spain, Greece (for 2008–2012)	Medium	• Relatively strong collective bargaining institutions, although quite uncoordinated and dependent on state regulation • Low trade union densities • Limited works councils and board representation • Weak performance in social dialogue at company level
#4 Company-centred governance	Croatia, Hungary, Slovakia	Low	• Decentralised, uncoordinated collective bargaining and low coverage rates of collective agreement • Low trade union density • Comparatively high performance in terms of representation rights at company level (statutory regulation of works council rights) • Low scores for company-level social dialogue
#5 Voluntarist associational governance	Bulgaria, Cyprus, the Czech Republic, Ireland, Latvia, Lithuania, Malta, Romania, Greece (for 2013–2017)	Low	• Stronger associational governance (compared to clusters 4 and 6) • Relatively strong employer organisations • The lowest scores representation rights at company level (voluntary employee participation and no board-level employee representation rights) • Low scores for company-level social dialogue
#6 Market-oriented governance	Estonia, Poland, the UK	Low	• Very low levels of (uncoordinated and decentralised) collective bargaining • Weak social partners • Rights of works councils or employee representation mandated by law, partly because of institutional adaptation in line with Directive 2002/14/EC • Diverse scores for company-level social dialogue (higher in Estonia and the UK, lower in Poland)

Source: Eurofound (2018b)

This cluster analysis suggests a division between the Nordic and continental European countries (clusters 1 and 2), which perform comparatively well on the Industrial Democracy Index, and the southern, liberal, and central and eastern-European (CEE) countries (clusters 3-6), which record much lower scores (Eurofound, 2018b). Eurofound also notes a worrying **downward divergence trend**, whereby the high-performing countries show more stability in IDI scores over time, while social dialogue in the low-performing countries tends to erode, particularly in the associational governance sub-dimension (Ibid.).

2. MACRO-LEVEL SOCIAL DIALOGUE: SOCIAL PARTNERS' RESPONSES TO THE TWIN TRANSITION

KEY FINDINGS

This section summarises the insights from EU social partners on the specificities of macro-level social dialogue in the twin transition context. This analysis is based mainly on interviews and the analysis of social partner strategies and agreements, supported by other existing evidence and good practice examples.

The findings on three key aspects examined show that:

- **Social partners' views on the twin transition** are generally well-aligned, and that social partners tend to recognise similar crucial and pressing needs that the social dialogue should prioritise. Digitalisation has been discussed more in depth, while social dialogue on the green transition is only just getting started;
- **Social partners' involvement in policy design and implementation** varies significantly across Member States. Although good practice examples exist, much remains to be improved, especially in the central and eastern European (CEE) countries; and
- **Enabling conditions for and barriers to social dialogue** include the external environment (a supportive legal and institutional framework) and internal drivers (social partners' capacity to engage in policy debates and collective bargaining). Addressing the internal drivers depends on social partners' **access to knowledge and capacity building** activities, such as funding, awareness raising and training on digital and green topics, and platforms to debate and exchange good practices.

2.1. Social partners' views, positions, and agreements on the twin transition

2.1.1. EU level

First and foremost, European-level social partners share a broad consensus on the key features of the twin transition, including that **the digital and green transitions are inevitable** (interviews, 2022). The question is not whether they should take place or not, but rather *how* they should be pushed forward. Therefore, social partners should proactively shape the transitions rather than ignore or try to oppose them. Nevertheless, some asymmetries and conflicts between transition targets and social (employment) goals cannot be avoided. For example, the question whether one should argue for ambitious decarbonisation targets that result in a "shock therapy", or for more gradual restructuring process that gives time for firms and employees to adapt?.

Furthermore, **the twin transition *can* be beneficial for both companies and employees.** Particularly digitalisation can bring about significant productivity gains, improving competitiveness and, as a result, fostering job creation. Nevertheless, EU social partners point out several pressing needs that must be addressed in order to achieve an efficient and just transition, including (interviews, 2022):

- **Fairly distributing gains and costs:** In the digitalisation context, the productivity gains can be absorbed by firms (profit) by putting more tasks on the worker under poor working conditions (including low pay, surveillance, etc.). Alternatively, they can be shared with the workforce by improving work-life balance and/or allocating some working time for upskilling (e.g. a 4-day work week and a "training Friday");

In the greening context, the (high) costs of the green transition can be incurred by the consumers, firms, and/or governments. A just distribution of these costs matters (e.g. to avoid energy poverty);

- **Actively managing the structural changes:** Job losses are inevitable (e.g. in coal mining), but restructuring needs to be managed via transition plans that include enhanced social security measures (e.g. early retirement, income substitution) and active labour market policies (especially retraining);
- **Ensuring job quality:** Although digitalisation is not a new trend, the current technologies are much more invasive, especially in that they infringe on workers' living space and privacy. Therefore, more regulation is needed to ensure favourable working conditions (e.g. the right to disconnect). Addressing "flexibilisation" is another challenge–if digitalisation creates mostly precarious jobs (e.g. platform work), it can also strengthen social discontent and resistance towards the transitions (on top of the key issue of deterioration of working conditions); and
- **Addressing the "say-do gap":** Some generic solutions offered by experts, policymakers, and social partners (such as "lifelong learning") are adequate in theory, but hard to implement in practice. Therefore, more specific and differentiated solutions tailored to particular workplace contexts are necessary.

EU social partners view **the digital and green transitions as inherently intertwined** (interviews, 2022): that is, they must be seen as two sides of the same coin. In particular, digitalisation is understood to be a crucial driver of greening by providing low-emission technologies and fostering accessibility of emergent green solutions (e.g. shared mobility platforms). They also need to be put in the context of broader trends such as globalisation, liberalisation, labour market flexibilisation, the Covid crisis, the war in Ukraine, etc.

Nevertheless, European social partners acknowledge that the discussion and efforts related to digitalisation are generally more advanced than greening (interviews, 2022). This is likely because digitalisation has been more of a priority over a longer period, and its impacts on workers tend to be broader and more profound. Nevertheless, even **digitalisation-focused social dialogue is still in its infancy, and European social partners find themselves in an "observation phase**." While they have researched key challenges and needs and formulated guidelines for national social partners[19], much work is still necessary to implement them in the process of collective bargaining. In a 2018 ETUC survey, social partners expressed similar concerns–for example, over 95% of trade unions surveyed agreed that they should be more active in addressing digitalisation (Voss and Reide, 2018). Others concluded that "digital transformation as a process has not yet been fully integrated in collective bargaining", and that the challenges arising from it tend to be dealt with on an *ad hoc* and step-by-step basis, rather than strategically and comprehensively (Eurofound, 2021d, n.d.). The green transition debate is at yet an even earlier stage of development, although most of the European social partners interviewed signalled that plans to address green transition challenges were imminent (interviews, 2022). Findings from previous research concluding that "labour unions are remarkably absent from discussions of the transition towards a green economy" seem to remain relevant in this respect (Stevis and Felli, 2015, p. 29).

[19] See European Social Partners Framework Agreement on Digitalisation, available at: https://www.etuc.org/system/files/document/file2020-06/Final%2022%2006%2020_Agreement%20on%20Digitalisation%202020.pdf

A similar discrepancy between digitalisation and greening is visible in EU social partner agreements. Two key cross-sectoral social agreements have been signed on the issue of digitalisation, which have been fundamental in the coordination of social partners' activities at other levels, as summarised in **Box 2** below. In contrast, there is no EU-level cross-sectoral social partner agreement on the green transition.

Box 2: Key EU-level cross-sectoral agreements on the digital transition

Framework Agreement on Telework (ETUC, UNICE, UEAPME, CEEP, 2002) aims at preparing for the transition towards a knowledge-based economy by establishing a framework at the European level around telework and flexible working arrangements. The social partners argue that if Europe wants to make the most of the information society, it is imperative that these new forms of work are encouraged and enhanced. The framework is ground-breaking, as it addresses for the first time issues related to the employment conditions of telework, its voluntary character, concerns about data protection and privacy, the provision of equipment and training, health and safety, and collective rights and the organisation of work. It also sets out implementation and follow-up practices to support signatory Member States and parties on the implementation of the framework.

European social partners' framework agreement on digitalisation (BusinessEurope, SMEUnited, CEEP and ETUC, 2020) has become a milestone in the discourse surrounding digitalisation and social dialogue. The framework explores in depth the multifaceted implications of the digital transition and aims at building awareness and improving understanding of these implications; provides action-oriented guidelines to encourage and assist employers, workers and representatives; encourages a partnership approach between those three groups; and supports the development of a human-oriented approach to integration of new technologies and digital solutions. The framework focuses on four main areas or challenges to address: i) the training and up-skilling of the workforce, with the goal of securing employment; ii) exploring modalities of connecting and disconnecting, building respect for rules governing working time (including teleworking) and preventing isolation at work; iii) guaranteeing that humans are in control of the development and applications of artificial intelligence (AI); and iv) fostering the respect of human dignity with regard to worker surveillance, including the handling of worker-related data and the right to privacy. The framework concludes by depicting follow-up practices to assist the implementation process, including the duty of all signatories to report implementation results.

Source: Authors, based on sources in footnotes[20].

The two agreements also show the evolution of social partners' positions. Both agreements differ substantially in terms of their scope: for example, the 2002 framework agreement focuses solely on telework arrangements, while the 2020 agreement encompasses all changes instigated by the broader digital transition (ranging from telework to the automation and use of other digital tools for facilitating online meetings, administrative tasks, etc.). However, they still largely identify similar issues, mostly addressing areas of health and safety, training, workers' right to privacy, and working arrangements and organisation.

[20] Framework Agreement on Telework, available at: https://resourcecentre.etuc.org/sites/default/files/2020-09/Telework%202002_Framework%20Agreement%20-%20EN.pdf; Framework Agreement on Digitalisation available at: https://www.etuc.org/system/files/document/file2020-06/Final%2022%2006%2020_Agreement%20on%20Digitalisation%202020.pdf.

While the 2002 agreement on telework assumes that flexible working arrangements (mainly in the form of telework) are generally beneficial for the workforce and society overall, the 2020 framework agreement is more cautious in exploring the negative impacts that digital working and constant digital connection may have on workers (i.e. so-called "digital anxiety", resulting from the blurring of lines between personal and professional life). Moreover, the 2020 framework agreement not only explores the challenges that come with the digital transition, but also sets out tangible measures and policy options to address them. These are explored in **Table 3** below.

Table 3: Main challenges and policy responses identified in the European Social Partners Framework Agreement on Digitalisation (2020)

Challenge	Measures to be considered
Identification of skill needs and provision of training	• Routinely assessing workers' existing skillsets to ensure anticipation of skill needs and adequate training • Designing training with a focus on quality, effectiveness and mobility between and within sectors. Internal or external training solutions and other schemes such as reducing working hours to implement additional training hours must be considered • Properly defining conditions for training arrangements (including participation, duration, financial cost and worker commitment). Job-related training linked to the digital transformation of the company must be paid by the employer or in line with the collective agreement or national practice. Where possible, this training must take place during working hours – otherwise, appropriate compensation must be arranged.
Modalities of connecting and disconnecting	• Arranging organisation objectives so that their achievement does not require out-of-hours connection • Providing employers and workers with guidance on respecting working time rules, the risks of being overly connected, and how to properly use digital tools • Encouraging regular exchanges between managers and workers (or their representatives), particularly regarding workload and the work process • Supporting a no-blame company culture to prevent retribution against workers who are not available outside their working hours
Artificial Intelligence and guaranteeing human control	• Ensuring AI systems are deployed in ways that improve human involvement and capacities at work. Risk assessments must be regularly carried out • Following agreed ethical standards and EU fundamental/human rights in the provision of AI, for instance the Data Protection Regulation (GDPR), the guarantee of privacy and dignity of the worker, and other existing regulations • Safeguarding transparency in situations where AI is used for human-resource purposes and ensuring that the involved are provided with all necessary information. Additionally, an affected worker can request human intervention and/or request the testing of AI outcomes
Respect for human dignity and surveillance	• Guaranteeing workers' representatives are able to address issues related to data, privacy protection and surveillance. Hence, they must receive facilities and tools (e.g. digital notice boards), to fulfil these duties. • Linking the collection of data (particularly worker-related data) to a concrete and transparent purpose (as opposed to a potential future or undefined purpose)

Source: European Social Partners Autonomous Framework Agreement on Digitalisation (2020)[21].

[21] European Social Partners Autonomous Framework Agreement on Digitalisation, available at: https://www.etuc.org/system/files/document/file2020-06/Final%2022%2006%2020_Agreement%20on%20Digitalisation%202020.pdf.

Digitalisation has also been further explored through non-binding joint statements, positions or recommendations by social partners, particularly at the sectoral level. They mostly follow the lines of the key cross-sectoral agreements. However, opportunities and challenges are explored through the lens of specific industry needs and priorities. Hence, there is a stronger focus on the issue of ensuring economic competitiveness and, accordingly, training and up-skilling of the workforce. Key texts are summarised in **Box 3**.

Box 3: Key EU-level positions on the digital transition

The **Joint position on social and employment-related aspects of digitalisation (ECEG and IndustriAll; 2016)** prioritises the training of the workforce and the anticipation of changes. The emphasis is on promoting competitiveness, job growth and sound working conditions for the European chemical industry.

The **Joint declaration on the social effects of digitalisation by the European social partners in the insurance sector (AMICE, BIPAR, Insurance Europe and UNI Europa Finance; 2016)** reiterates the importance of updating the skills of workers and the blurring of the line between work and home life. It also addresses the issue of protection of employees' data, and the relevance of social dialogue in such a fast-paced transition.

Digitalisation in shipping: smart digital solutions to alleviate administrative workload on crew and companies (ECSA and ETF; 2017) argues that digitalisation is a necessary tool to alleviate the current lack of harmonisation of the sea shipping industry into a single market.

The **European agreement on guidelines on telework and ICT-mobile work in commerce (EuroCommerce and UNI-Europa; 2018)** sets out guidelines to address the challenges of introducing telework into the workplace, ensuring fair employment conditions, regulating holidays and absence of teleworkers, guaranteeing confidentiality and standards of performance in the work of teleworkers, the setting up of the telework space and equipment, and facilitating involvement in trade union work.

The **Joint declaration on the impact of digitalisation on employment (EBF-BCESA and Uni Europa; 2018)** addresses the issues of data protection and privacy, training and competence development, healthy working conditions and work-life balance, and social dialogue in the finance sector.

The impact of digitalisation on the world of work in the MET industries (CEEMET and IndustriAll; 2020) focuses on the importance of reskilling and continuous training for workers, as well as concerns around human privacy and the use of data.

Digitalisation at the heart of social partners' commitment to keep the lights on (EURELECTRIC, EPSU and IndustriAll; 2020) evaluates psycho-social risks due to the digital transition and the right to disconnect. It proposes the exchange of best national practices for intelligence on employment trends and usage of worker-related data, and advocates for lifelong learning and training.

Source: Authors, based on sources in footnotes[22].

[22] Joint position on social and employment-related aspects of digitalisation, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=fr&agreementId=5476; Joint declaration on the social effects of digitalisation by the European social partners in the insurance sector, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=fr&agreementId=5477; Digitalisation in shipping: smart digital solutions to alleviate administrative workload on crew and companies, available at:

No EU-level cross-sectoral social agreement on the green transition exists. Nevertheless, a joint recommendation has been signed by BusinessEurope, SGI Europe, SMEunited and ETUC on the issue of the circular economy, as summarised in **Table 4**.

Table 4: Key recommendations on the circular economy by European social partners

Area	Recommendations
In the framework of social dialogue	• Disseminating information and promoting awareness (e.g. organising webinars, writing reports, translating academic research); • Encouraging the negotiation (through social dialogue and collective bargaining) of just transition strategies, taking into account socioeconomic impacts; • At the company level, collecting information and developing concrete measures to move towards circular business models; • Mapping and anticipating the skill needs and the corresponding training of workers; promoting continuous lifelong learning and the sharing of good practices; • Identifying and agreeing on ways to prevent informal work in sectors where problems are prevalent and improving working conditions during the transition; • Strengthening the implementation of health and safety measures; • Discussing strategies to ensure the competitiveness of enterprises and paying particular attention to the needs of SMEs; and • Ensuring the shift to circular economies goes hand in hand with improvements in gender equality and labour market inclusiveness.
To policy makers	• Fully integrating the socioeconomic dimension of the transition into those policies related to the circular economy; • Involving social partners in the design and implementation of governance strategies, action plans and policies; • Ensuring the transition supports inclusive and sustainable employment, through the deployment of appropriate education and training systems and labour market regulation; • Guaranteeing sufficient funding for a fair and inclusive transition, supporting quality employment, innovation, reskilling and upskilling. Providing targeted support for SMEs; • Creating and facilitating a well-functioning market for high-quality secondary raw materials through measures in the Second Circular Economy Action Plan; • Reinforcing the competitive position of circular products on the market, ensuring a level playing field and fair competition; and • Providing knowledge-based support, such as information and technical assistance, training centres, formal collaborations and knowledge exchange.

Source: Authors, based on European Social Partners' Recommendations on Circular Economy[23].

https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5570; European agreement on guidelines on telework and ICT-mobile work in commerce, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5551; Joint declaration on the impact of digitalisation on employment, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5557; The impact of digitalisation on the world of work in the MET industries, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5720; Digitalisation at the heart of social partners' commitment to keep the lights on, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5714.

[23] European Social Partners' Recommendations on Circular Economy, available at: https://resourcecentre.etuc.org/sites/default/files/2021-11/Final%20report%20circular%20ecenomy_Recommendations_v3_0.pdf.

Examples of sectoral approaches to the green transition at the EU level are at present limited and diverse, with different industries highlighting different actions aimed at achieving environmental sustainability in ways that best fit their economic interests. Nevertheless, there is consensus across industries on the need to up-skill and train the workforce, as skill gaps are increasingly identified as one of the main obstacles to the green transition. Key texts are summarised in **Box 4**.

Box 4: Key EU-level positions on the green transition

The **Joint statement on just transition (Eurogas, IndustriAll, EPSU; 2020)** warns of the large investments required for the green transition and calls for the development of solidarity mechanisms to support the most affected sectors and regions. The statement demands the implementation of rigorous socioeconomic impact assessments and effective social dialogue to ensure the Green Deal reduces rather than widens social disparities.

The **Joint position paper on the renovation wave strategy (CEI-Bois, EFBWW; 2020)** argues nature-based materials such as wood play a crucial role in the substitution of energy-intensive materials. They highlight the role of social partners and champion the inclusion of key principles such as lifecycle thinking and circularity.

The **Joint Statement for COP26 (UITP and ETF; 2021)** emphasises the key role of public transport for the transition and the importance of directing financial resources towards green investments.

A sustainable and just transition pathway for industry and workers (EUROFER, IndustriAll; 2021) calls for a credible pathway to greening, creating the enabling conditions for decarbonisation while allowing social partners to anticipate and prevent disruption without jeopardising living and working conditions. It argues current proposals do not comply with this need, and identifies the main problems regarding the new Emission Trading System and Carbon Border Adjustment Mechanism.

Source: Authors, based on sources in footnotes[24].

2.1.2. National level

In the national context cross-sectoral social agreements are scarce, and the green and digital transitions are mostly explored through a sectoral lens. The few cross-sectoral agreements identified tend to focus on the issue of knowledge and continuous training – probably the area where there is most convergence in the needs of different industries. However, this section explores sectoral and cross-sectoral social agreements simultaneously.

Social partner agreements on digitalisation at the national level show strong differentiation along regional lines. Countries in the North and South of Europe show a clearer continuation of EU-level concerns (e.g. the right to disconnect, modalities of telework, the right to lifelong vocational training, etc.). However, CEE Member States prioritise the need for EU-level actors and frameworks to promote a fair transition that does not leave any country behind and affirms that these regional differences should be taken into account when drafting agreements or setting up funds.

[24] Joint statement on just transition, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5694; Joint position paper on the renovation wave strategy, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5692; Joint Statement for COP26, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5747; A sustainable and just transition pathway for industry and workers, available at: https://ec.europa.eu/social/main.jsp?catId=521&langId=en&agreementId=5765.

Nevertheless, several recurring themes emerge. Regarding **remote working arrangements**, agreements include provisions on its establishment (and reversibility), the maximum time working remotely relative to on-site working, the provision of necessary means and equipment, or the right to non-discrimination from on-site workers. According to most social partners, the employer has the responsibility to ensure health and safety standards for teleworkers are upheld, as well as guarantee the right to disconnect. In terms of **continuous training and promotion of knowledge,** the agreements emphasise the need for adjustments in the educational systems to better address the new challenges of digitalisation. Finally, partners at the national and sectoral levels emphasise the need for **appropriate monitoring** of macro-level developments during the digital transition to prevent social risks and anticipate change. This monitoring is also essential for the further coordination of industries, countries, social partners and academics, and for these different stakeholders to cooperate and share best practices. **Box 5** summarises examples of national-level (including sectoral) agreements on digitalisation.

Box 5: Examples of national-level agreements on digitalisation

The **Collective agreement for the transport sector (Denmark, 2020)** acknowledges the changes that the sector will experience as a result of automation and the introduction of self-driving vehicles and provides supplementary employee training.

The **Agreement for the professional training of employees (Romania, 2019)** implements an employee training project with a focus on digital technologies, which is available to all bank employees that are members of the Council of Banking Employers in Romania (25,000 employees).

The **National collective bargaining agreement for workers in the electricity sector (Italy, 2019)** establishes a joint national sectoral initiative to assess the sectoral impacts of several transformations, including the emergence of new technologies and increasing digitalisation. The agreement highlights the potential of new technologies to enhance the health and safety of workers and the importance of sharing good practices on this issue.

The **IV National collective agreement for industry, new technologies and services in the metal sector (Spain, 2021)** determines that remote work arrangements will be specified for each employee through an individual contract, and collective agreements will identify the roles and tasks that are eligible, the maximum time teleworking, and any other particularities. The agreement also establishes the right to equal treatment between on-site and remote workers, the right to disconnect, and the guarantee of break periods that must be specified in the individual contracts.

Source: Authors, based on sources in footnotes[25].

National level agreements on the green transition strongly focus on the perceived social risks and the need for a fair and just transition. Firstly, provisions around **social security nets** identify the need to protect workers who might be made redundant as the green transition progresses.

[25] Collective agreement for the transport sector, available at: https://www.danskindustri.dk/ok2020/nyhedsarkiv/nyhedsarkiv/2020/2/di-and-3f-transport-enter-into-collective-agreement-for-the-transport-sector/; Agreement for the professional training of employees, available at: https://www.cpbr.ro/stire.php?t=FSAB,%20FinBan%20si%20CPBR%20semneaza%20Acordul%20pentru%20Pregatirea%20Profesionala;%20National%20collective%20bargaining%20agreement%20for%20workers%20in%20the%20electricity%20sector;

National collective bargaining agreement for workers in the electricity sector available at: https://www.gse.it/documenti_site/Documenti%20GSE/Societ%c3%a0%20trasparente/Personale/Contrattazione%20collettiva/Rinnovo%20Contratto%20Collettivo%20Nazionale%20di%20Lavoro%20per%20i%20Lavoratori%20Addetti%20al%20Settore%20Elettrico.pdf; IV national collective agreement for industry, new technologies and services in the metal sector, available at: https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-479.

Recommendations to manage this include working retirement compensations, social security, pre-retirement leave, pay rises or training programmes for quick reincorporation into the workforce (in different sectors). Second, national and sectoral social partners emphasise the need for **EU support**, particularly EU funds, in achieving green transition goals. CEE social partners, in particular, argue that the transition will not be possible without these funds (e.g. Just Transition Fund) and that some of them (e.g. Social Climate Fund) are insufficient to mitigate the social consequences of the transition. Social partners also call for assistance and coordination from the EU in researching and establishing realistic goals, as partners identify that some of the current 2030 targets are over-ambitious, which could have a negative effect and lead to a lack of popular support, damage to the social contract, and loss of economic competitiveness. Examples of agreements are identified in **Box 6**.

Box 6: Examples of national-level agreements on the green transition

The **Renewal of the industry-wide agreement for the electricity sector (Italy, 2019)** provides a single framework for all workers in the sector. The agreement devises a special clause on training to ensure employability and support during the green transition – in particular, it establishes a right to 28 hours of certified training (in addition to health and safety training) which will be monitored by a sectoral joint body. It builds on the previous renewal of the agreement in 2017, where several instruments to address the impact of the green transition were already introduces, including a solidarity fund to support workers that were made redundant or redeployed across companies in the sector.

The **Tripartite just transition agreement (Spain, 2020)** establishes a framework for the closure of coal-fired power plants while aiming to maintain or regenerate employment levels in the most affected regions. The companies involved (Endesa, Iberdrola and Naturgy) agreed to offer solutions such as retraining and priority hiring to workers from ancillary companies.

The **Coal phase-out act (Germany, 2021)** focuses on restructuring the German coal and mining sectors and establishes state compensation for workers that are made redundant and are aged 58 years or older, for a maximum of 5 years and at the level of their pension.

The **National agreement for the shutdown of the Polish mining industry (Poland, 2021)** guarantees work until retirement for those miners who are currently employed, social security benefits of 80% of their salaries, pre-retirement leave, or 120,000 PLN in severance. The mines will be gradually closed by the end of 2049, and the state budget is to subsidise the reduction in their productive capacity until then.

Source: Authors based on sources in footnotes[26].

2.1.3. Digital and green sectors

Social partners face some specific challenges in sectors most exposed to the changes deriving from digitalisation and greening. In the digitalisation realm, **platform work emerges as one of the most challenging areas for trade unions to tackle** (e.g. Prassl, 2019). The need for trade union action in platform work is well-recognised, not least by the platform workers themselves.

[26] Renewal of the industry-wide agreement for the electricity sector, available at: https://www.ipsoa.it/documents/quotidiano/2019/10/11/ccnl-elettricita-siglato-rinnovo; Tripartite just transition agreement, available at: https://www.transicionjusta.gob.es/Convenios_transicion_justa/; Coal phase-out act, available at: https://www.bundesregierung.de/breg-en/news/kohleausstiegsgesetz-1717014; National agreement for the shutdown of the Polish mining industry, available at: https://www.gov.pl/web/aktywa-panstwowe/umowa-spoleczna-dla-gornictwa-podpisana.

For example, the 2018 ETUC survey revealed that not only do workers in platform companies have positive feelings towards collective action, but they also articulate specific and strong expectations from trade union involvement in platform work, from negotiating with platform companies to organising or aiding the self-organisation of workers (Voss and Riede, 2018).

Union action is emerging in the platform economy from both well-established trade unions and grassroots organisations. Several examples of collective action are presented in **Box 7** below. In practice, however, most workers in platform companies are not covered by collective agreements or otherwise organised or represented, nor are they informed or consulted in a systemic way (Hauben et al., 2020; Johnston and Land-Kazlauskas, 2018; Lenaerts et al., 2018).

Box 7: Examples of collective action in the platform economy

In 2017, workers at Foodora's Vienna delivery hub formed a **union-backed works council** ('Betriebsrat') to engage with the employer and represent couriers' interests. Foodora employees in Cologne, Germany, have established a similar works council.

European Federation of Food, Agriculture and Tourism Trade (EFFAT) facilitated a **works council agreement** with the German-based online food-delivery company Delivery Hero in 2018. The agreement created a cross-border works council and guaranteed employee participation in the company's supervisory board of directors.

Negotiations between Riders Union Bologna, the Italian Trade Unions CGIL, CISL, and UIL as well as the Municipality of Bologna and food delivery platforms Mymenu and Sgnam, subsequently followed by Domino's pizza, resulted in the signing the **Bologna Charter** in 2018. It aims to improve working conditions for digital employees in Bologna, regardless of their employment status, including the workers' right to be informed (including the right to fair pay and health and safety), the right to protection (including the right to disconnect), and assistance from the public administration.

Since December 2021, in accordance with the Federation of Dutch Trade Unions (FNV) **collective agreement** for the transportation of products, Deliveroo Netherland drivers have had access to benefits that include a set hourly rate, paid time off and sick pay, as well as compensation for waiting time. Deliveroo employees who are currently working or have previously worked for the company are eligible for a contract of employment under the new collective agreement.

Just Eat Spain, the country's largest delivery platform, along with Spanish unions CCOO and UGT have signed the first-ever **collective agreement** under Spain's new Riders' Law, which defines food delivery couriers as fully employed workers. The collective agreement guaranteed 30 days of annual leave, a maximum working day of nine hours, and health and safety protection for Just Eat platform workers. The agreement also grants workers the right to disconnect and privacy from digital surveillance. It went into effect on January 1st, 2022.

Collectif des Courier-e-s (Couriers Collective) is a **group of bike couriers** in Belgium connecting various food delivery platforms. The main goal of this union is to negotiate better working conditions. Their practices include strikes, meetings, and cooperation with other similar initiatives. Additionally, they have formed a "strike bank," which is used to support striking workers.

Source: Authors, based on sources in footnotes[27].

[27] Further information on Foodora's works council available at: https://www.planetlabor.com/en/industrial-relations-en/national-industrial-relations/austria-the-foodora-platform-sets-up-its-first-works-council/; EFFAT works council agreement, available at: https://effat.org/featured/se-works-council-agreement-signed-at-delivery-hero/; Bologna charter, available at: https://www.eurofound.europa.eu/data/platform-economy/initiatives/riders-union-bologna; FNV collective agreement, available at:

Collective action efforts in sectors most exposed to the potential negative effects of the green transition face a much different set of challenges than other less-impacted sectors. Unlike the emerging digital sectors, the greening sectors (such as energy, manufacturing, or mining) have had historically high trade union density rates (Eurofound, 2021d). Nevertheless, trade unions may at times be inefficient in adapting their practices (Eurofound, 2021d; Mwamadzingo et al., 2021), especially in that:

- They tend to react slowly to structural change and focus their agendas on traditional priorities ("business as usual"); and
- They face a contradiction between their main competences (managing the consequences of change) and broad social consensus spurring these changes. This can lead to a divergence of priorities, e.g. when unions at the national or supra-national level promote ambitious green targets, while unions on the ground (at the sectoral and company level) must confront the direct consequences of policy implementation (including job loss and substitution).

Nevertheless, good examples of compromise between the commitment to achieve green targets and the impulse to ease the transition for workers have emerged, as presented in **Box 8**.

https://www.fnv.nl/nieuwsbericht/sectornieuws/vervoer/2021/12/deliveroo-bezorgers-vallen-ook-in-hoger-beroep-ond; Just Eat Spain collective agreement, available at: https://www.ccoo-servicios.es/html/53652.html; further information on Couriers Collective available at: https://www.eurofound.europa.eu/lt/data/platform-economy/initiatives/collectif-des-courier-e-s-couriers-collective

Box 8: Examples of collective action in the green transition sector

In Sweden, **job security councils** (Trygghetsråd) were set up in the 1970s by the social partners under the so-called Transition Agreements (Omställningsavtal) to administer and deliver services to employees that have been dismissed for economic reasons. The dismissed employees are given additional benefits, for example, economic compensation and support aiming to help them find new employment or start their own business. Currently, these arrangements have been extended to cover almost all the sectors of the labour market and are used to facilitate the green transition.

In Germany, a **Coal Commission** was set up in 2018 to deal with the coal phase out. It comprised of trade unions, NGOs, regional and federal authorities, academics, and other stakeholders. Its work has led to an agreement with several commitments to address the social dimension of the transition (e.g. a package of interconnected social protection, training programmes and new measures to create decent jobs, a phase-out of coal-fired power by 2038, €40 billion investments in infrastructure, research, and new sectors, etc.)

In Spain, a **pact** between social partners and the Spanish government provided €250 million to be invested in mining communities (including retraining and early retirement), as the country's coalmines shut down.

In Denmark, the Confederation of Danish Industry (on behalf of 18 000 employers) and CO-industry (a trade union of around 230 000 workers from the industrial sector) acknowledged the importance of worker participation in the green transition by signing a **collective agreement**. The measures to involve workers in the green transition include the preparation of workers to meet the demands of green transition (through further education), recognising the need to use new technologies to improve the efficiency and development of Danish production, and the systematic work between employers and employees to reach the climate goals.

In Italy, a **collective agreement** was renewed between social partners in the electric power sector and Italian energy companies. The agreement supports the sector through the energy transition phase and includes individuals' right to 28 hours of training, a commitment to combat gender violence, and the possibility for collective bargaining at company level to trial the conversion of workers' performance bonus into days off, allowing them to convert "money into time".

Source: Authors, based on sources in footnotes[28].

[28] Further information on Trygghetsråd available at: https://tuac.org/news/the-swedish-job-security-councils-a-case-study-on-social-partners-led-transitions/; further information on the German Coal Commission available at: https://coaltransitions.org/publications/the-german-coal-commission/; further information on the pact between social partners and the Spanish government available at: https://www.etuc.org/en/spain-guarantees-just-transition-miners; further information on the collective agreement in Denmark, available at: https://greentransitiontogether.com/2021/09/25/danish-industrial-sector-initiates-worker-participation-for-the-green-transition-through-collective-agreement/; further information on the collective agreement between social partners in the electric power sector and Italian energy companies available at: https://www.planetlabor.com/en/industrial-relations-en/national-industrial-relations/italy-collective-agreement-in-power-sector-renewed-with-several-innovations/.

2.2. Social partners' involvement in twin transition-related policy design and implementation

The scope and nature of social partner involvement in policy-making varies greatly across policy levels. The views on EU-level social dialogue have been generally positive, acknowledging the strong role of (cross-sectoral) social partners as co-legislators. Nevertheless, several recurring issues are apparent. Most notably, **there is a discrepancy between content policies and employment policies.** Cross-sectoral EU social partners are heavily consulted on social and labour market policies, and sectoral social partners have a say in sectoral policies. However, there is rarely a link between these two areas– for example, the European AI Act proposal[29] does not address the impact of AI on workers, while decarbonisation plans often omit restructuring challenges. Some interviewees have also voiced a broader need for strengthening sectoral EU-level social dialogue, which lags behind cross-sectoral dialogue (a view reinforced by experts interviewed in a Eurofound study (2021a)). Furthermore, workers are often under-represented in policy debates[30].

The situation at the national level is highly heterogeneous. Virtually all interviewees highlighted significant discrepancies between different national industrial relations systems and the social partners' capacity to engage in policy discourse and collective action. Generally**, the capacity to tackle the twin transition topics mirrors the overall quality of the industrial relations system,** evidenced, for example, by the Eurofound's Industrial Democracy Index (see section 1.4 above). Thus, **the Nordic and continental European countries (such as Germany, Austria, and the Netherlands) have been repeatedly named the best performers in terms of social dialogue in the twin transition context** (interviews, 2022). On the other hand, social partners in CEE countries (especially Poland, Hungary, or Slovakia) are weak, inactive, scattered, and facing an unsupportive legal environment. Broader research reinforces this view. For example, according to the ETUC, trade unions in Western European and Nordic countries were most likely to address digitalisation via information and consultation campaigns or working groups. There have been relatively fewer responses to digitalisation by social partners in southern Member States, while in CEE countries, discourse lagged significantly behind (Voss and Reide, 2018). **Box 9** below presents some **good practice examples of social partner involvement in policy design and implementation** related to Industry 4.0[31].

[29] Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act), available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206.

[30] For example, the high-level expert group on Artificial Intelligence involves only one employee representative from the ETUC (among approx. 50 group members); see: https://digital-strategy.ec.europa.eu/en/policies/expert-group-ai.

[31] The term "industry 4.0" signifies the world's fourth industrial revolution and is applied to "a group of rapid transformations in the design, manufacture, operation and service of manufacturing systems and products". See EPRS (2015). Industry 4.0: Digitalisation for productivity and growth, p. 2.

Box 9: Examples of social partner involvement in policy design and implementation related to Industry 4.0

In Germany, the **Industrie 4.0 Platform** set up a regular dialogue between the social partners to enable transparent identification and discussion of the key advances, problems and potential solutions associated with the implementation of the Industrie 4.0 plan.

Similarly, in Denmark, an **Industry 4.0 Commission** was set up to formulate social partners' recommendations on digitalisation and Industry 4.0. The Commission is involved with broad topics related not only to digitalisation but also investing in future industries (industrial policy), societal issues (esp. education), and legal issues (e.g. data protection or labour law).

In Spain, the initiative **Connected Industry 4.0** was launched to digitalise Spanish industries and increase support to companies. The initiative involves a broad range of stakeholders, including public entities, industrial and technological businesses and associations, research and education centres, social partners and experts in Industry 4.0.

Similarly, in France, the **Industrie de Futur** set up a platform for various stakeholders, including those from industry, academia, and trade unions to help them find common ground and launch networks to support digital transformation.

In Italy, the **Industria 4.0 National Plan** was launched as a top-down initiative to support industrial change. Still, the initiative gave a key role to social partners as members of the Steering Committee overseeing the implementation of the Plan.

Source: Authors, based on sources in footnotes[32].

Nevertheless, **examples that break the pattern of a weak industrial relations system** and poor transition-related social dialogue outcomes are also evident. In southern Member States, particularly in Spain, social partners are pioneering union action and collective agreements in the platform economy (Moniz et al., 2022)[33]. In the UK, despite a relatively poor legal and systemic environment and low involvement of social partners in policy-making, significant progress has been made regarding on-the-ground action. This has been attributed to the high priority the UK social partners gave to digitalisation and greening issues (interviews, 2022).

Finally, it has been widely agreed that **social dialogue at the sectoral and company level brings about the most tangible outcomes for the workers.** Sectors differ greatly in their situation, needs, and preparedness to tackle the digital and green transitions. Therefore, while EU and national level cross-sectoral agreements can provide guidance and a framework for carrying out dialogue, the transition terms need to be negotiated and adapted at lower levels to create sector-specific approaches (interviews, 2022; see also Eurofound, 2021a).

[32] Further information on Industrie 4.0 Platform available at: https://www.din.de/blob/76902/e8cac883f42bf28536e7e8165993f1fd/recommendations-for-implementing-industry-4-0-data.pdf; further information on the Industry 4.0 Commission available at: https://www.eurofound.europa.eu/publications/report/2017/eu-member-states/addressing-digital-and-technological-change-through-social-dialogue; further information on Connected Industry 4.0 available at: http://www.industriaconectada40.gob.es/Paginas/Index.aspx#inicio; further information on Industrie de Future available at: https://ati.ec.europa.eu/sites/default/files/2020-06/DTM_Industrie%20du%20Futur_FR%20v1.pdf; further information on Industria 4.0 National Plan available at: https://ati.ec.europa.eu/sites/default/files/2020-06/DTM_Industria4.0_IT%20v2wm.pdf

[33] For example, in Spain, a tri-party collective agreement led to passing a new legislation (so-called Rider's Law, available at: https://www.eurofound.europa.eu/nl/data/platform-economy/initiatives/riders-law) that recognised the employee status of workers in delivery platforms and opened up the platform algorithms to worker representatives.

Here, the cross-country discrepancies might be even stronger. Nordic and continental EU MS rely less on legislation as they manage most issues via sectoral collective agreements, thanks to very strong sectoral social dialogue. At the same time, CEE MS achieve significantly poorer outcomes in bi-party social dialogue at the sectoral level. This **imbalance can lead to further divergence** - for example, if a company-level deal is struck in German plants that involves a no-job-loss agreement and a commitment to invest in advanced technology, this can translate to job reductions and withholding investments in the company's plants in CEE (interviews, 2022).

2.3. Enabling effective social dialogue in the twin transition context

2.3.1. Enabling conditions for and barriers to social dialogue

European social partners identified three main enablers/barriers to effective social dialogue in the twin transition context (interviews, 2022). Firstly, an appropriate and enabling **institutional framework** needs to be in place. As described above, **the industrial relations systems determine the possibilities of social partner engagement**. According to ILO[34], this involves:

- Respect for the fundamental rights of freedom of association and collective bargaining;
- Political will and commitment to engage in social dialogue on the part of all the parties; and
- Appropriate institutional support

EU social partners stressed that at a fundamental level, it is necessary to have a policy framework that is at the very least not hostile–in other words, that it does not create obstacles to social dialogue and applies the basic principles of ILO and the EU social charter. This was the case (for instance) following the 2008 financial crisis, where policies actively undermined social dialogue structures, and instead facilitated the decentralisation of collective bargaining in some countries where social partner agreements were considered too rigid and protective, in turn preventing structural change (such was the case in Greece or Spain)[35]. Although social dialogue is currently supported at the EU level[36], in some MS, these basic principles are not always respected. Ideally, an institutional framework would go beyond respecting fundamental rights and create structures and procedures for a timely and meaningful consultation process (rather than just checking the "social dialogue" box). For example, the need to consult social partners is currently mentioned in several EU policies such as the Just Transition Fund, the Climate Law, the New Adaptation Strategy, the Circular Economy Action Plan, the Social Climate Fund, and the RRF (Recovery and Resilience Facility) funds (interviews, 2022). However, this is not always effectively implemented on the ground, especially in countries that do not have a strong tradition of social dialogue. Consultations with social partners should also be extended from a narrow focus on employment issues (e.g. salaries and working conditions or company profits) to the broader labour market and sectoral challenges. At present, these broader discussions have only taken place at the expert/consultant level (interviews, 2022). **Box 10** below presents some initiatives aimed at improving an institutional framework for social dialogue in the twin transition context.

[34] ILO, Social dialogue, available at: https://www.ilo.org/ifpdial/areas-of-work/social-dialogue/lang--en/index.htm)%20%20a.

[35] This is evidenced in Greece's fall from cluster #3 to cluster #5, according to IDI (see section 1.5).

[36] See, for example, A new start for social dialogue (available at: https://ec.europa.eu/social/BlobServlet?docId=16099&langId=en). or Strengthening social dialogue in the EU (available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13229-Strengthening-social-dia).

Box 10: Good practice examples of policies empowering social partners in the twin transition context

In Germany, the **Works Councils Modernisation Act**, among other provisions, promotes the co-organisation of remote work with workers and the work councils' right to consult an artificial intelligence (AI) expert if the use of AI is planned in the company.

In France, **Ordinance No. 2022-492** set rules for sectoral-specific social dialogue of self-employed workers in mobility digital labour platforms. This legislation paved the way for official elections of employee representatives in May 2022 and the initiation of collective bargaining at the sectoral level.

In Bulgaria and Latvia, the **National Tripartite Cooperation Councils** serve as platforms to bring together social partners and foster their cooperation at the national level.

In Germany, **Contact and Advisory Centres** were established to support social partners by preparing briefings on relevant legislative documents and organising networking events and conferences.

In the UK, **union environmental (or 'green') reps** can be elected to champion environmental issues and negotiate issues such as energy use, recycling and green travel plans with the employer.

Source: Authors, based on sources in footnotes[37].

Secondly, it is vital to ensure **social partners' capacity** (interviews, 2022)[38]. Several capacity dimensions can be distinguished (Guardiancich and Molina, 2022; Ioannou, 2020; Lévesque and Murray, 2010)[39]:

- **Material and financial capacity**, including access to offices and meeting spaces for its activities, and any other kinds of material resources that permit unions to pursue their mission; access to revenue sources, including public funding;
- **Technical capacity**, especially capable human resources with expertise and knowledge about the labour market and the industry, as well as the capacity to mobilise external technical expertise where required;
- **Strategic capacity**, including having a clear and shared vision, being able to do research, measure progress, and plan strategically, and learn and adapt as an organisation; and
- **Organisational capacity**, including practices, procedures, policies, and programmes to engage, mobilise, recruit and retain members, implement capacity development activities (e.g. training), and build networks and alliances with other stakeholders and communicate externally (e.g. shaping policy discourse).

Social partners noted that generally, larger organisations have greater capacity to conduct research and influence policy in emerging topics (i.e. requiring organisational capacity) (interviews, 2022).

[37] Works Councils Modernisation Act, available at: https://www.bmas.de/DE/Service/Gesetze-und-Gesetzesvorhaben/betriebsraetemodernisierungsgesetz.html; Ordinance No. 2022-492, available at: https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000045522912; further information on the National Tripartite Cooperation Councils in Bulgaria and Latvia available at: https://en.bia-bg.com/advocacy/view/21410/ and https://lddk.lv/en/national-tripartite-cooperation-council/ respectively; further information on Contact and Advisory Centres available at: https://resourcecentre.etuc.org/sites/default/files/2019-12/ESF%20Final%20Conference%2009.03.18%20-%20Presentation%20for%20Brussels%20final%20conference%209%20March.pdf.

[38] See also ILO, Social dialogue, available at: https://www.ilo.org/ifpdial/areas-of-work/social-dialogue/lang--en/index.htm)%20%20a.

[39] See also the Trade Union Organisational Capacity Tool, available at: https://www.ituc-csi.org/IMG/pdf/tuoc_guidelines.pdf.

Furthermore, social partners require specific expertise – as technologies become more complex (e.g. through the use of AI algorithms), high-level expert knowledge is needed to understand the topic, identify challenges, and formulate a position (i.e. requiring technical capacity). Social partners also need to be more proactive, actively engaging in broader critical debates on the future of work, and not limiting their initiatives to the narrow goals of protecting workers' incomes (i.e. involving strategic capacity).

Another related challenge flagged by EU social partners was **representation and social mandate** (interviews, 2022; see also Guardiancich and Molina, 2022). This issue has two strands:

- Social partners might sometimes compete and argue, resulting in a fragmented and weaker influence. It is important for social partners to discuss issues and agree on a common position to strengthen their voice. In particular, there is room for cooperation between trade unions and employer organisations. Often, they were able to reach a consensus and formulate a shared position on broader transition topics (ensuring the long-term competitiveness and fairness of the sector) rather than engaging in narrower "fights" between negotiating over higher corporate profits versus salaries; and
- Trade union density is declining, not least because sectors with high trade union density tend to shrink while sectors not covered by social dialogue tend to grow. This leads to both decreasing financial capacity of unions (due to fewer contributions from members) and the erosion of employee power. As one interviewee put it, "social dialogue in its current form is a bit of a dinosaur", as it is designed to represent large shares of coherent workforces and for this reason is unsuited for fragmented, flexible, and dynamic labour markets.

As a result, trade unions also need to adapt practices to include currently non-unionised workers and digitalise themselves to keep up with the changing demands of the modernising workforce. Thus, new solutions are needed to make it more attractive, dynamic, and fit for the future of work. **Box 11** below provides a few examples of such solutions.

Box 11: Examples of innovative trade union actions

- The Czech Metalworkers' Federation (OS KOVO) launched an anonymous membership scheme to boost union membership by ensuring no repression by employers.
- The Romanian IT Union (SITT) uses EasyVote – a digital tool that integrates electronic voting in the consultation processes.
- The Austrian Chamber of Agriculture (LKO) offers online demos for farmers via its website, as well as practical resources such as a weather warning planning service.
- The Confederation of Hungarian Employers and Industrialists (MGYOSZ) introduced "online cafés" during the Covid-19 lockdowns as a space to increase the sense of togetherness and solidarity among members in times of isolation.
- The General Confederation of Greek Workers (GSEE) launched an electronic information and support network for workers to provide guidance on employment rights and collect complaints from workers during the pandemic. Subsequently, feedback was forwarded to the competent public authorities.

Source: Authors, based on Bernaciak and Kahancová (2017) and Eurofound (2021e).

2.3.2. Access to knowledge and capacity building

Interviewees stressed the importance of the EU-level legislation that would support and strengthen national-level social partners and exert pressure on under-performing MS to set up better structures for social dialogue (or at the very least, remove obstacles). This is an essential prerequisite for enabling more effective channels for social dialogue – without these structures, even high-capacity organisations will not be heard (interviews, 2022).

Additionally, three main types of support schemes have been repeatedly mentioned as the most beneficial for social partners, mirroring the recommendations of the EC's special advisor on strengthening social dialogue in Europe (interviews, 2022; Nahles, 2021):

- **EU funding**: The levels of EU funding for European social partners have been generally praised. However, EU funding for national organisations is more problematic (see section 4.3 for more details). Most importantly, there is a "chicken and egg" problem in the sense that social partners with little capacity face significant constraints in applying for project-based funding (i.e. they lack the capacity to apply). Broader-based funding, such as the partnership clause in the current ESF+[40], has been considered positive, although some have voiced concerns about how these funds will be used. Additional and targeted support for national social partners is necessary to build their technical, strategic, and organisational capacity;
- **Awareness-raising, training, and exchange of good practices**: This is usually led by European social partners, who organise activities for their members. Seminars, trainings, awareness-raising events, and toolkits are delivered to provide guidance on relevant digitalisation and greening topics. Spaces (platforms) and events (workshops) are organised to facilitate peer learning and the exchange of good practices between organisations; and
- **More dialogue on future-oriented subjects**: Social partners should hold debates on the broader issues surrounding future of work more often. They could benefit from improved structures for holding broader discussions (involving a broad range of social partners at sectoral and cross-sectoral levels).

Box 12 below presents some initiatives of governments and EU-level trade union federations aimed at building national trade unions' capacity.

[40] The clause requires Member States for which capacity building of social partners and civil society organisations is identified by a relevant country-specific recommendation to allocate at least 0.25% of ESF+ resources for that purpose. The amount has been decreased from the originally proposed 2%.

Box 12: Examples of capacity building initiatives for national trade unions

In Czechia, a project funded from the ESF under the initiative "**Strengthening social dialogue and building the capacity of social partners**" involved, among other things, training of social partner staff in the fields of employment legislation, collective bargaining, corporate economics and occupational health and safety issues.

In Portugal, the **Centre for Labour Relations (CRL)** was established, operating under the Ministry of Labour, Solidarity and Social Security, aimed at supporting collective bargaining and monitoring developments in employment and professional training.

ETUC hosts the **European Social Dialogue Academy** that brings up to 20 trade union representatives from across the EU to promote their capacities to engage in social dialogue. The event provides a comprehensive overview of European social dialogue and features skill-building sessions and meetings with various stakeholders.

ETUI delivered an online course on **Green Social Dialogue**. The training explored the role of collective bargaining and social dialogue in response to climate change and sustainable development.

UNI Europa's project "**Shaping the future of work in a digitalised services industry through social dialogue**" looked in-depth at specific topics related to the future of work, and in particular as regards the impact on social dialogue and collective bargaining at national and European level on three main topics: 1) self-employment; 2) skills; and 3) restructuring processes.

EPSU developed a toolkit for trade unions "**Responding to the challenges of digitalisation**", which sets out some of the main issues that trade unions have to address in tackling digitalisation-induced changes. It also includes examples from European and national levels of how trade unions have used social dialogue and collective bargaining to regulate the transformation of work and working conditions.

Source: Authors, based on sources in footnotes[41].

Support *by* trade unions is also provided **directly for workers and workers representatives (work councils at the company level)**, including:

- **Training initiatives** aim to provide workers with transferable skills that encourage mobility within and between sectors. The goal is to create a workforce that is easier to relocate, hence building resilience against shocks to the labour market;
- **Guidance and support materials** which aimed at garnering insight into the challenges of the transitions and guidelines, the steps necessary for implementation, approaches to collective bargaining and social dialogue, and measures to mitigate potential negative effects;

[41] Further information on the initiative in Czechia available at: https://www.eurofound.europa.eu/publications/report/2017/eu-member-states/national-capacity-building-initiatives-for-social-partners-experiences-in-five-eu-member-states; further information on the initiative in Portugal available at: https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef20002en.pdf; further information on the European Social Dialogue Academy available at: https://www.aranagenzia.it/attachments/article/10775/Capacity%20building%20for%20effective%20social.pdf; ETUI Green Social Dialogue course available at: https://www.etui.org/training/green-social-dialogue; UNI Europa's project, available at: https://www.uni-europa.org/news/trade-union-responses-to-digitalisation-in-the-services-sector/; toolkit "Responding to the challenges of digitalisation" available at: https://www.epsu.org/sites/default/files/article/files/Toolkit%20January%202021.pdf; further information on the initiative in the UK available at: https://www.tuc.org.uk/resource/go-green-work-union-effect.

- Spaces and initiatives that encourage the **exchange of best practices** aim to ease communication between all parties involved (i.e. employees, representatives and employers), and promote collective discussion and solution design; and
- **Funding initiatives** include financial assistance for multiple purposes, such as compensation in the event of job or salary cuts or incentives for voluntary departure.

Box 13 below lists some examples.

Box 13: Examples of capacity building for workers by trade unions

TRANSCO (France) is an initiative, co-constructed by the government and social partners, which offered workers training to prepare them for roles in higher regional demand. During the training period (up to 24 months) employment contracts were suspended, yet workers continued to receive their salaries (financed by the state and sectoral funds).

Targeted online courses (Denmark) were offered by Denmark's trade union 3F and employer federation from the hospitality sector HORESTA to avoid dismissals.

DIGI-O (Digitization for New Types of Work in the Austro-Hungarian Border Region' project) was a regional initiative that gathered over 400 actors to discuss their concerns around the issues of digitalisation. The goal was to exchange views from different stakeholders (i.e. companies, employees, and representatives) and to develop and test different strategies to tackle the main challenges emerging from increasing digitalisation.

TransForm Work Project (Bulgaria) was implemented by the Confederation of Independent Trade Unions in collaboration with Cyprus, Estonia, Ireland, Malta, Romania and Sweden. The project was designed to explore the impact of digitalisation on social dialogue at the national level and promote the sharing of good practices between countries. The project included various research activities, study visits, round tables and information days, including a final conference on the results of the initiative. The findings were also widely disseminated through publications and the project's website.

Compass for digitalisation (Germany) is a tool developed by IG Metall to help workers and work councils to evaluate and shape digitalisation in workers' interests (for an example of its application at the company level, see the case of "Miele" in section 3.5).

Source: Authors, based on sources in footnotes[42].

[42] Further information on TRANSCO available at: https://www.economie.gouv.fr/plan-de-relance/mesures/transitions-collectives-transco; further information on Targeted online courses available at: https://fho.dk/blog/2020/04/28/danish-response-to-mitigate-the-financial-impact-of-the-covid-19-pandemic/; further information on DIGI-O available at: https://interreg-athu.eu/hu/digio/; further information on TransForm Work Project available at: https://transformwork.eu/the-project/; further information on Compass for digitalisation available at: https://socialeurope.eu/designing-work-in-a-digitalising-world.

3. MICRO-LEVEL SOCIAL DIALOGUE: CASE STUDIES OF EMPLOYEE INVOLVEMENT IN TECHNOLOGY ADOPTION

KEY FINDINGS

This section examines ten case studies of employee involvement in technology adoption at the establishment level and is mostly based on interviews with organisation representatives and complementary desk research (sources for each case study are indicated in the footnotes).

The case studies have been identified via desk research or suggested by interviewees (EU social partners), and selected based on a set of qualitative criteria related to the kind of technology introduced, level of employee involvement, positive outcomes, and geographical and sectoral diversity (see introduction for detailed criteria).

Each case study is structured into the following four parts:

- Introduction of the organisation's profile and the nature of technological change implemented;
- Description of the employee involvement and technology adoption process;
- The results of (inclusive) technology adoption for the company and the workforce; and
- Challenges, enabling conditions for employee involvement, and lessons learned.

This analysis suggests the positive impacts of employee involvement in company decision-making processes. First, where employees were involved, technology adoption led to generally beneficial outcomes for the company workforce, enabling a shift to more complex and interesting tasks, upskilling and higher labour market competitiveness, improved working conditions, and/or better work-life balance. The impact on companies was also positive, including increased productivity, improved the quality of the service or product, and/or improved employee satisfaction.

Employees were more likely to be involved in adapting the technology to their workplace and normalising new work processes (task discretion) than to engage in the discussions on technology's broader impact on the company (organisational participation). Furthermore, employees were mostly involved directly (e.g. via information-sharing and consultation activities, formal and informal meetings, iterative feedback mechanisms, and training). Worker representatives were involved in several cases to a varying extent, ranging from establishing a framework for negotiations and analysis of the impacts of new technologies to even initiating technology adoption efforts themselves.

3.1. BORGinsole: A shift to fully-robotised production[43]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Belgium	Healthcare/ manufacturing	Small	3D scanning and printing	Consultation and training

3.1.1. Introduction

BORGinsole is a family company dedicated to the design and production of their patented podiatry insoles. They run a podiatry lab and a podiatry centre, where their specialists attend to patients and advise them on the appropriate podiatry insoles to meet their requirements. BORGinsole has also founded an education centre, where they organise conferences and workshops for podiatrists and other healthcare practitioners.

In 2010, they started their first innovation programme and developed their own 3D foot scanner. In 2015, their second innovation programme involved the development of a 3D design program for the design of their insoles. Accordingly, they transformed the whole chain of production, replacing their previous manual production with a fully-robotised process. Alongside these transformation projects, BORGinsole has also developed their own CRM (Customer Relationship Management) software, PodoCloud, an administrative program where their clients can directly access their scanner or design program. Quality and time were the main motives behind the company's transformation.

3.1.2. Process: Employee involvement in technology adoption

According to the management, communication is a key element of BORGinsole's organisational structure. For those in management, weekly structural meetings are held, and informal meetings are arranged between the CEOs and every worker on a regular basis. Once a year, the CEOs organise individual lunches with every employee, where they are encouraged to share any concerns. Social activities are often organised and attended with high participation.

Every worker was involved in the digital transformation of the company. For example, administrative workers engaged in the decision-making process to make the line of production leaner and more efficient. Similarly, podiatrists were encouraged to test every new technology with their patients and to discuss their advantages and disadvantages.

The company also made sure to offer training and flexibility for their workers so that they could keep pace with the transformative change. First, they offered in-company training (which is still ongoing) together with another company that was developing a robotisation chain alongside them. Every week, BORGinsole employees would receive training from the external company. Additional intensive training is also offered during the months of August and September, which is run by an external training centre. Employees are also encouraged to attend national or international conferences, for which they are remunerated. Changes in work organisation were also made throughout the entire adaptation process. For example, if podiatrists were previously expected to see three patients before noon, this was reduced to two patients when new digital tools were implemented to provide dedicated time for familiarising themselves with and understanding the new technologies.

A posteriori, workers have also been involved in the evaluation and assessment of new practices via dedicated quarterly meetings and informal exchanges (lunches, daily meetings, etc.).

[43] Based on an interview with a company management representative.

3.1.3. Results: The impact on the workforce and business

The first key impact has been improved satisfaction of workers, both because of their inclusion in the transformation process and because their workload is now easier and more fulfilling. Under the new framework, employees have fewer administrative or tedious tasks, and work hours can be dedicated to more sophisticated responsibilities such as patient consultation, communication with suppliers, and research (e.g. looking for new materials, or finding techniques to quicken production). On the other hand, the digitalisation process resulted in the loss of two technicians, who after an adaptation period were not able to fit the new skills requirements.

Work organisation also changed and became more straightforward. For example, before there were two different teams–a podiatrist's group which would see patients, and a developing team which would produce the insoles. Now, podiatrists can design the insoles themselves directly after consultation as part of an integrated process, which makes following up with patients easier.

The company has grown a lot due to these innovation projects, something that has been reflected in their financial capabilities. Since their digital transformation, every employee salary has been raised, allowing the increased profitability to be shared across the workforce.

3.1.4. Challenges, enabling conditions and lessons learned

The increased workload due to increasing digitalisation presented the biggest challenge to BORGinsole. For two years, the company worked on their daily production as normal, alongside the implementation of their new project. This workload was distributed between everyone in the company, from employees to CEOs, putting pressure on everyone to continuously adapt to new changes. According to the company, the key factors that allowed them to overcome these challenges were the base structure (in this case, a friendly and communicative environment) and the leadership style. BORGinsole facilitated a company-wide environment of support, determination and continuous progress which aided their goal of robotisation.

3.2. Helmes: Employee-led experiment to establish best hybrid work practices[44]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Estonia	ICT	Large	Hybrid work	Co-designing an experiment to test best practices

3.2.1. Introduction

Helmes is a digital innovation services company with headquarters in Tallin, Estonia. In March 2020, the pandemic forced the company to shut its offices and switch to remote work almost overnight. Initially, it had an adverse effect on employee well-being, including increased stress, anxiety, exhaustion, work and meeting overload, difficulty in managing work-life balance, and increased feelings of insecurity. Accordingly, the company was prompted to re-design its work organisation practices in response to the crisis and in pursuit of alleviating workers' discontent.

3.2.2. Process: Employee involvement in technology/ practice adoption

During the transformation process, employees have been involved at all stages. Low trade union density and collective bargaining coverage in the country implies that is not common for formal structures or bodies to be active at the company-level (such as with trade unions or work councils). This is the case for Helmes, which operates in a historically non-unionised sector and has no formal employee representation bodies. Instead, employees' voices "travel" up the company hierarchy from team members to team leaders to management, where the identification of issues occurs, and down the hierarchy at which stage consultation or co-creation of solutions occurs.

The initial harm to employee well-being was noticed by team leaders following one-on-one meetings with team members and other indicative signals (e.g. overloaded calendars, messages received after working time, etc.). These problems were then discussed at team leaders' meetings. Once the problem was clearly identified, a "task force" was created at the management level to find the best solutions. In cooperation with external consultants and a scientific expert, the task force designed an experiment to identify the best practices in remote/hybrid work (in the absence of such evidence at the time). Based on the evidence gathered, the company partners (at the executive level) approved the experiment and assigned an additional budget.

The experiment lasted for six months and involved eight teams that tested more than ten hybrid work models and five teams as a control group (approximately 100 employees were involved in total). Team leaders were able to co-design the practices they introduced in their teams, and as a result had a hand in the final outcomes.

Employee well-being in different groups was measured during the experiment, and best practices introduced by different teams were identified. Some of these have been adopted as company-wide practices, including a bi-annual well-being survey, a weekly newsletter to streamline communication, the provision of two ergonomic workstations for every worker (one at the office and one at home with the possibility to order all equipment via an internal system), full health insurance (including psychologist consultations if needed), and regular well-being seminars.

[44] Based on a group interview with two company management representatives and an employee, and a presentation introducing the results of Helmes' experiment, available at https://www.youtube.com/watch?v=IGRjb51BWt4.

Furthermore, the teams are free to adopt other solutions depending on their working style and needs, which are always determined based on rolling discussions with other team members. These can include, for example, a selection of digital tools for communication and coordination or longer and/ or more frequent team meetings that include informal chats on top of work-related matters.

3.2.3. Results: The impact on the workforce and business

The adapted solutions helped improve employee well-being. For example, the experiment results showed the majority of employees (85%) felt at least as productive at home as working from the office. Furthermore, in groups where mental well-being was the main leadership focus, a gradual improvement in psychological safety was observed throughout the experiment.

The positive impacts, continuously reinforced with the newly adopted practices, appear to be sustainable. A year after the experiment, the survey results showed positive and improved engagement and well-being levels as well as a favourable approach to telework. Helmes also won the "Dream Employer of the Year in the Private Sector" award in 2022[45]. Employees have emphasised the benefits of having greater freedom to manage their time (e.g. less commuting, the possibility to work from anywhere including while travelling, and more flexibility to pursue hobbies or spend time with family). However, many have also indicated they missed the social interactions and struggled with loneliness when working from home for longer periods.

Regarding business performance, Helmes recorded a slight and temporary slowdown in 2020, mostly due to withheld or terminated projects in industries heavily hit by the pandemic (e.g. aviation). However, the company has been since "doing better than ever" both financially (an increase in turnover from 48 million in 2020 to 64 million in 2021) and in terms of customer satisfaction (with the NPS[46] score up from 58 in 2020 to 61 in 2021).

3.2.4. Challenges, enabling conditions, and lessons learned

Despite the overall success of the newly introduced practices, several challenges remain. Most notably, the company representatives emphasised that even though the majority might be (very) satisfied with the changes, it is important to identify the "outliers" who might struggle with the new working model and act on improving their situation. Furthermore, the company continues to work on alleviating some of the prevailing negative effects (the lack of or lower quality of social interactions), for example, by re-designing the offices to incorporate more spaces for group work and socialising.

Among the key enabling conditions, interviewees mentioned the pro-active involvement of the staff combined with the buy-in and support from the top management, the general value- and people-based company culture, and highly autonomous teams that can quickly respond to emerging issues specific to each team. The company profile (ICT) also facilitated the transition as the necessary digital tools and skills were already in place.

[45] Further information on the "Dream Employer of the Year in the Private Sector"available at: https://www.linkedin.com/posts/helmes-as_wellbeing-health-work-activity-6895067251729424384-yxrl/.

[46] Net Promoter Score – the industry average stands at approx. 30 (according to the interviewees).

3.3. Køge Gymnasium: Digital training for teachers[47]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Denmark	Public education	Small/ medium	Digital training for teachers	Consultation and training

3.3.1. Introduction

Køge Gymnasium is a school in Denmark which highly prioritised providing both students and teachers with digital skills. The Danish education system allows teachers to choose the materials and methods they use in their classroom as they see fit. This gives teachers great independence to adapt to the circumstances of their class, but it also implies that the learning experience of students is increasingly dependent on their teachers' own development. Accordingly, Køge Gymnasium opted for starting a pilot project to train teachers in digital skills and new technologies, so that they can better transfer these abilities to students and make the best use of digital tools in the school. The initiative has received attention from a wider audience in Denmark, and has been featured in presentations and festivals, such as the Learning Festival 2020 (Læringsfestival 2020).

The project has not only been a success in regard to digital training, but it has also prompted the opening up of social dialogue within the school. As the rationale of the campaign was to provide teachers with the training they needed and wanted the most, it also encouraged more systematic dialogue practices within the broader organisation, where teachers were often consulted or would gather in focus groups to discuss their experiences and recommendations.

3.3.2. Process: Employee involvement in technology adoption

The project was initially designed by the Danish Ministry of Education, one of the partners with whom Køge Gymnasium developed the initiative. In order to tailor the project to their organisational context, the school leadership established focus groups with volunteer teachers to discuss what particular skills or aspects of digitalisation they wanted to explore, hence shaping the actual contents of the training. Moreover, teachers were in charge of carrying out and assessing the implementation of the new digital tools and practices within the classroom. The Southern University of Denmark (another collaborator) also assisted in this implementation and in the monitoring stage.

The focus groups started with five volunteer teachers and a project coordinator, who defined the vision and strategy for the school. Meetings occurred most frequently during this stage as it involved a high degree of planning, particularly in applying the general guidelines by the Ministry of Education to the specific context of the school. The group was expanded first to twelve teachers, and then to twenty, with the aim of gradually involving every teacher in the school in this project. Every participant in the group would identify the skills they wanted to improve upon, receive appropriate training, given the opportunity to implement changes in their teaching content and/or methods, and report and discuss their experiences. Volunteers were paid for these activities and received time off from their usual responsibilities in order to dedicate time to the project. When class schedules were designed at the start of the academic year, teachers participating in the pilot would receive less teaching hours so that their work-life balance would not be altered by participation in the project.

[47] Based on an interview with a school representative.

3.3.3. Results: The impact on the workforce and business

The project was initiated before the COVID-19 pandemic. Hence, when the pandemic and lockdown began, the school benefitted from having already trained the teachers in new technological and digital skills, easing the transition into online learning. During this period, the school was also trying to take care of social relationships between teachers and other employees, for which the digital training was also very useful.

Since this project, teachers not only have a better understanding of how digital tools work, but they also feel more confident using them for learning approaches that better suit the predominant Danish education methodology (i.e. extensively based in group work and discussion). Using online and digital tools, students can still cooperate and work in groups, even when they are not in the classroom. The Danish education system also allows for up to 20% of education to take place online, hence the training in digitalisation also helped the school to be able to offer this to their students and teaching staff. The school has now installed a new classroom specifically dedicated to online learning, where all the new technology is at their disposal and students can follow online classes from the school's premises if they so choose.

3.3.4. Challenges, enabling conditions and lessons learned

The main enabling condition for this change was the realisation amongst both teachers and management that this training was becoming more and more necessary. With Danish pre-schools making increasing use of digital tools, primary and secondary schools needed to ensure they were keeping pace with these new skill expectations.

The main challenge was teachers' initial scepticism towards the training. As well-established professionals with subject specific knowledge, some teachers felt reluctant to receive new training or felt insecure about the management of digital tools. Nevertheless, the fact that they were closely involved in the designing stages of the project (and that they were able to choose which digital skills they wanted to focus on and what training they wanted to receive) helped to overcome these challenges. Teachers also receive significant support from both the school and the University, facilitating the communication and resolution of any problems that may arise.

3.4. La Fageda: Machines easing workloads of disabled workers[48]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Spain	Agriculture (non-profit)	Medium	Automation of heavy tasks	Consultation and training

3.4.1. Introduction

La Fageda is a non-profit foundation that makes dairy products. It provides work for people with disabilities and empowers workers to feel part of the project through their inclusion in the whole process–from stockbreeding to preparing, packing, and dispatching the product.

[48] Based on an interview with a company representative and the information available at La Fageda's blog and website (available at: https://www.fageda.com/es/).

La Fageda has received several distinctions for its social work, such as the National Alares Award for Excellence in Social Inclusivity (Madrid, 2021)[49], and has been recognised for its contribution to achieving the UN Sustainable Development Goals[50]. Recently, the company started to introduce some automation technologies to ease the workload of strenuous tasks, contributing to improved well-being for both the workers and the animals.

3.4.2. Process: Employee involvement in technology adoption

La Fageda does not have a trade union or works council. However, the company first started as a cooperative and represents a culture of participation and inclusivity. All workers were also partners in the company and participated in every decision. After 33 years, the partners decided that the company's growth made this consensus-decision making approach unsustainable in the long run, and voted to turn the initiative into a foundation. Despite these changes, the inclusive culture remained. Although decisions are ultimately implemented by the Assembly (the foundation's executive body, composed of nine partners), employee participation is ensured through conferences, such as "La Fageda 2020," where employees discuss what they expect from the initiative in the future–this feedback in turn informs executive decisions. The company's culture revolves around the principles of respect, empathy and care for human relationships, which translates into employee involvement in everyday decisions.

Regarding the automation process, La Fageda adopted technology to increase the ease of some of the most difficult tasks for workers to perform. After observing that some tasks showed high levels of rotation, the Assembly decided to automate these processes. So far, robots have been used for milking the cows and for packaging and (un)loading (heavy) boxes. In both cases, the transition was made in a way that no workers would have to be made redundant. For instance, the company introduced one automatised packaging line, but kept two manual ones to maintain the same workforce.

The robots and technologies implemented were designed in consideration of the effects on working conditions and satisfaction, so that every worker (whether technicians or employees that required extra support (i.e. employee with a disability)) could manage them. While employees are not always part of the designing process, workforce satisfaction is always assessed after introducing changes.

Workers also receive frequent training, including on digital skills both for the workplace and in a personal context. While the former aims at ensuring every worker can handle the new technologies, the latter promotes awareness of digital risks and safety, particularly related to Internet use.

3.4.3. Results: The impact on the workforce and business

The impact on the workforce has been very positive. Firstly, physical well-being has been greatly improved, and workers no longer need to carry heavy boxes for long hours (which also meant that not every worker was able to perform these tasks). Moreover, automation has improved working schedules. Workers dedicated to milking cows, for instance, used to have a poor work-life balance because cows needed to be milked at 6 am and 6 pm.

According to the interviewee, the new skills they developed have also had a positive impact on workers' self-esteem and their mental well-being. For supported workers, being given new responsibilities and obtaining more sophisticated, digital skills has resulted in greater satisfaction and self-assurance in the workplace.

[49] La Fageda – Awards and distinctions, available at: https://www.fageda.com/es/premios-y-reconocimientos/.
[50] Ibid.

For the company, these changes have also generated some productivity gains. The number of times each cow is milked daily, for example, has increased, and the one automatised packaging line can work at a much faster pace than the two manual ones.

3.4.4. Challenges, enabling conditions and lessons learned

One of the main challenges is the magnitude of investment needed to sustain the foundation and its digital transition. This year will mark seven years of regular investment by the company in new technologies and their appropriate structures, which are all the more expensive due to the farm's location, which is inside a natural park to promote the well-being of workers. As a non-profit foundation, the company often struggles to find the resources to finance its innovative projects. A solution to this has often been to seek assistance from private companies, which can offer financial help to foundations working on reintegrating marginalised groups.

Another problem has been the illiteracy rates and lack of formal education of many workers. The company has provided training for all workers who were available to receive it. For those with more severe disabilities, they have established an occupational workshop where they are included as workers but given tasks that better match their abilities.

3.5. Miele: A "compass for digitalisation"[51]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Germany	Manufacturing	Large	Digital assistance system for the assembly line	Works council

3.5.1. Introduction

Miele is a manufacturer of high-end domestic appliances and commercial equipment. It was founded in 1899 and is headquartered in Gütersloh, Ostwestfalen-Lippe. It has over 20,000 employees worldwide.

In 2021 and 2022, an innovative tool–the compass for digitalisation–was tested by a works council at a Miele factory near Hannover to evaluate the state of digitalisation within the company. The compass is a diagnostic tool that allows them to, among other things, identify weak and strong points throughout various company processes that related to digitalisation, and might be used by anyone interested in enhancing the company's transition to an increasingly digital future.

The tool was developed as part of the project commissioned by the Future of Work Department at the Executive Board of IG Metall, the largest trade union in Germany and Europe. For this purpose, IG Metall partnered with Dortmund University's Institute for Research and Transfer and the Social Research Centre. The compass consists of two modules: the first module is dedicated to the estimation of the status of digitalisation within the company, while the second module overviews concrete projects/processes and assesses possible consequences of concrete digitalisation projects for employees.

[51] Based on an interview with a trade union representative (IG Metall) and desk research ("KOMPASS DIGITALISIERUNG. Eine Gestaltungshilfe für gute digitale Arbeit", ZUKUNFT DER ARBEIT IG METALL, 2019; D. Gerst, "Kompass Digitalisierung. Ein Instrument für die Evaluation und Gestaltung betrieblicher Digitalisierungsvorhaben, ZUKUNFT DER ARBEIT IG METALL, 2020; "Digitalisierung im Interesse der Beschäftigten gestalten", interview with Ch. Pawlowski (Workers Council, Business Unit Professional, Miele), direct 5, Nr. 5, 20 April 2021, p. 2.)

Module 1 is divided into three areas: 1) corporate strategy on digitalisation, 2) design of the digitalisation process, and 3) socio-technical interfaces (assessment of interactions on three planes: human–organisation, technology–organisation, and human–technology).

Within Module 2, the compass estimates whether digitisation creates new jobs or replaces existing ones (quantitative effects of digitalisation on employment), assesses how concrete activities are changing with digitalisation, and determines what qualifications are required (i.e. qualitative effects of digitalisation on employment). Use of the compass involves working on site and registering results with the use of a tablet. Findings from the assessment using the compass can be used for planning and design of digitalisation projects.

Miele represents a good practice example of using the compass for digitalisation for capacity building of workers' representatives in the works council. At Miele, the compass has been used by the works council to assess the functioning of an assembly line for laundry dryers where an assistance system was to be introduced to help workers assemble different versions for different export countries' requirements. In particular, this case study provides an example of an initiative taken up by a works council as part of exercising its formal co-decision rights, as well as an example of a digital tool empowering the workers to shape digitalisation processes to represent their interests.

3.5.2. Process: Employee involvement in technology/ practice adoption

The application of the compass involves employees and their representatives directly. An assessment team that is involved in the evaluation conducted with the use of the compass should consist of representatives of works council(s), employees (other than those from works council(s)) and employer representatives. This is to gather opinions from different angles and to provide room for different perspectives. The team working with the compass is thus in constant dialogue–team members first agree on the interpretation of the initial situation, and later on the specific and goals and processes required for further development.

The specific digitalisation project introduced in Miele – the above-mentioned assistance system – was introduced by the employer. With the use of the compass, the works council that led the evaluation process in this case wanted to obtain more information about the system both from the business perspective and the employee perspective. The first round of the compass testing at Miele was disrupted by consecutive lockdowns related to COVID-19 pandemic and was in large part executed remotely. The second round, taking place in 2022, has been executed on site.

3.5.3. Results: The impact on the workforce and business

Thanks to the use of the compass, the works council was able to specify the workers' qualification needs and affirm that the new system introduced at Miele could not be used to control workers' behaviour or performance. The works council has also found out that there was an increased need for improving digital skills for the employees working on the assembly line for laundry dryers to be able to use tablets to help them to choose the proper parts to assemble. Still, to date, the results of the testing indicate that the process on the assembly line for laundry dryers has been designed properly and does not require any major corrections. In short, the compass helped to amplify already-existing factors that ensured the efficient design and structure of working processes. This has given an orientation for further projects to design digitalised work.

In general terms, the works council can use the results of work with the compass as an opportunity to reach out to the employer and discuss potential avenues of improvement with them, such as possible corrections in organisation of work or providing training to employees. A works council can also use the compass to find out what digitalisation strategy the company is currently pursuing and how the

digitalisation strategy could be taken further. The compass might also be useful to determine whether employees and managers are sufficiently prepared for changes in the workplace brought about through digitalisation.

Additionally, when a new project is to be implemented within a company, the compass might be used to make a comprehensive assessment of future workloads, associated skills requirements and learning opportunities, etc.

3.5.4. Challenges, enabling conditions, and lessons learned

The compass allows for a broad scope of analysis. A works council may freely choose which module to use, but each requires distinct fields of expertise. Thus, it is important for the assessment team that at least one member has a basic knowledge of occupational science and relevant technical knowledge. If this is not available, team member(s) should be trained and take part in a one or two-day training course dedicated to using the tool.

The compass might bring specific benefits to employers in terms of proper organisation of work in the digital transition, ensuring good working conditions and providing necessary training to employees. In general, at the company level, the introduction of new technologies should be understood as a holistic process in which people, technology, and the organisation are of equal importance. This balance is central to the assessments executed with the use of the compass, and its application by both employees and employers might help them to adjust the scope of digitalisation that best fits the company.

3.6. PGNiG: Modernisation to eliminate worker distress and reduce emissions[52]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Poland	Energy	Large	Machinery modernisation	Mediation of a trade union representative

3.6.1. Introduction

The Odolanów branch[53] of Polskie Górnictwo Naftowe i Gazownictwo (PGNiG)[54] in Wielkopolskie Voivodship (western Poland) is a production and R&D centre which produces high-methane gas. The subject of the case study is workers' participation in mitigating the harmful impact of gas production on both workers and environment. In particular, the analysis focuses on the social labour inspector's (SIP) role in improving working conditions (i.e. noise reduction) through modernisation of machinery. Although the case study is not directly related to the green transition (understood as a transition to low-emission technologies), it is an interesting example of how employees can initiate technology adoption for their benefit. Therefore, similar approaches could be deployed in the green and digital transition contexts.

[52] Based on interviews with a company representative and the chairman of the NSZZ „Solidarność" in PGNiG company.

[53] Further information on PGNiG Odolanów available at: https://pgnig.pl/odolanow/o-odolanow.

[54] Further information on PGNiG available at: https://pgnig.pl/.

3.6.2. Process: Employee involvement in technology/ practice adoption

One of the most tangible results of the company-level social dialogue at PGNiG is the development and joint implementation of the "**Programme of organisational and technical actions aimed at reducing the exposure of employees to noise at the Odolanów Branch**" adopted in 2021. The programme includes a multidimensional reduction of noise through numerous changes in the scope of machinery modernisation (like noise insulation and digital solutions) and changes to work organisation, including rotation of noise-prone workstations, reduction of working time in noisy conditions, rearrangement of workplaces in order to reduce negative impact of noise on workers.

The programme was driven primarily by the workers. In Odolanów, there is a company-level trade union (NSZZ "Solidarność") chaired by a person also holding the social labour inspector (SIP) position and therefore having wide powers regarding improving working conditions. In this case, the process consisted of reporting comments from the workers to the SIP about excessive noise or ways to reduce it. The comments were submitted directly to SIP during direct conversations or through e-mails by the workers from various parts of the plant. The social labour inspector, in turn, presented the comments to the employer. As a result, the programme on reducing noise was adopted in the company in order to structure the process in consultation with SIP and the trade union at company level. At present, the implementation of the improvements is being carried out by the thematic departments–especially the health & safety department and the technical department – in close cooperation with the social labour inspector and the trade union which both monitor the results of the implementation process and collect feedback from workers.

3.6.3. Results: The impact on the workforce and business

The result of the adopted action programme was a reduction in noise, a decrease in incidences of headaches, and a decrease in sickness absence, which shows significant improvements in working conditions in the plant.

From the perspective of the company, implementation of the programme accelerated the modernisation of technology, which allowed for better data monitoring (digitalisation) of noise reduction as well as a more highly performing workforce (e.g. higher motivation and reduced sickness absence). These two factors appear to have contributed to a more open and inclusive culture in the company. In terms of social dialogue, openness to suggestions for improvements has increased from the perspective of both the workers and the employer.

3.6.4. Challenges, enabling conditions, and lessons learned

This form of cooperation between the trade union and the company has also been exercised with regard to other initiatives at PGNiG Odolanów, and created a mechanism allowing for the management of possible further changes in the company emerging from both the digital and green transitions. Other initiatives include reducing the impact of harmful substances on employees[55] and on the immediate environment of the company, increasing energy and resource efficiency of production in the factory[56], introducing photovoltaics to produce electricity, and digitising the production process and control rooms (which also have the added impacts of increasing safety and decarbonising production).

[55] For example, the risk from chemicals used in the water demineralisation process (hydrochloric acid and sodium hydroxide) has been reduced through the use of modern technical solutions: installations that automatically dispense corrosive substances and showers for washing eyes at the chemical stations.

[56] For instance, replacement of inverters which control the production machines, replacement of main engines in the factory with energy efficient ones, electricity and water saving practices (like energy saving lightning, heating economisers, etc.).

Continuity of management and employee representation are two fundamental features of initiatives aimed at improving working conditions at PGNiG Odolanów Branch, and are facilitated by stable and institutionalised social dialogue. Both parties conduct frequent, in-depth and goal-oriented dialogue, which results in concrete examples of improvements.

This longstanding cooperation has helped to foster a sense of mutual trust, responsibility and a sense of partnership among employees. Another important factor in this regard is enhanced cooperation with the individual technical offices at the operational level. In a country with low representation of workers in companies (according to the IDI index shown in Figure 2) this can be considered as a good practice example which might be a role model for further changes in companies in the context of the digital and green transition.

3.7. Renault: Re-Factory employee involvement in introducing the hydrogen battery[57]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
France	Car industry	Large	Second hand car recycling – hydrogen battery implementation	Consultation and training

3.7.1. Introduction

Renault is a leading French car manufacturer, with 170,000 employees all over the world and around 47,000 in France (27,2% of Renault total employment). In France, Renault is a leader in electric cars production (ZOE model), with a 22,1% market share. The firm has a long-standing involvement in the second-hand market, starting in 1949 in Choisy-Le-Roy, and has been refurbishing a very large number of cars every year since then.

In 2021, the company decided to open a new factory, called Re-Factory in Flins (Île de France region), where Renault aims to recondition 45,000 cars per year. Re-Factory is composed of four main components: Re-trofit (extending the life of vehicles); Re-energy (production, storage & management of green energies); Re-cycle (optimising resource management); and Re-start ("innovation made accessible for all"). 2500 employees are working in the Flins factory, and FO (Force Ouvrière) and CGT (Confédération Générale du Travail) are the two dominant trade unions at Flins.

EU regulations and French government financing during the COVID-19 pandemic motivated the project. The five billion euros in loans guaranteed by the State must therefore be accompanied by Renault's legal obligation to have a binding transformation plan compatible with the objectives set by the Paris Agreement (*i.e.* a roadmap to end the production and sale of vehicles running on diesel or petrol by 2030 at the latest). "Nowadays, [because] three times as many second-hand vehicles are sold as new ones, the Re-Factory is the only way to save our jobs[58], stated a FO representative. This case study provides an example of employee involvement in the deployment of a new technology–the hydrogen battery–introduced to green the car industry. As the car industry is moving away from the use of internal combustion engines, the Renault strategic plan is to use the experiences of the Flins factory as a roadmap for the transformation of the whole company.

[57] Based on interviews with trade union representatives (FO & CGT) and expert assessments from ETUC (European Trade Union Confederation.

[58] Re-Factory is part of the 3 year-long Renault social dialogue "Accord Re-Nouveau 2025" agreement signed in December 2021, which offers guarantees to trade unions that five new electric car models are going to be produced in France.

3.7.2. Process: Employee involvement in technology/ practice adoption

Renault is creating capacities for recovering and upgrading engines. This activity was partly carried out in Choisy-Le-Roy, where 300 employees will eventually be relocated (if selected) to Flins by 2030.

The most innovative aspect of this part of the Re-Factory is the implementation of a hydrogen battery within vehicles. A joint-venture, Hyvia, was created between Renault Group and Plug Power, a world leader in hydrogen solutions. Even though the technology is already available (in the US), its adoption requires large investments, new line of production and substantial employee trainings. The hydrogen batteries are already implemented in few dozen light commercial vehicles (Renault Kangoo Z.E. Hydrogen, Renault Master City Bus H2-TECH & Renault Master Van H2-TECH). Renault aims to be able to produce 30% of the light commercial vehicles market. The main employee involvement is in designing the new line of production i.e. drawing up the production process standards.

In the case of hydrogen batteries, employee training is crucial for the line of production because employees have to learn a new job tasks; this training represents the first point of employee involvement. Every worker will also need to adapt to particularities of each car model in terms of specific new hydrogen battery implementation within commercial vehicles. At this initial stage of the project, hydrogen battery technology requires exceptional levels of direct employee involvement in the production process elaboration. In effect, employees are writing the new standard of work, i.e. the construction of the new line of production. Every single employee task has to be described and located in the production line. The new hydrogen battery vehicles production lines require an extraordinary level of employee involvement and effort in learning, adapting and creating production standards. In sum, employees are directly and heavily involved in the management of the technology innovation process.

3.7.3. Results: The impact on the workforce and business

The Flins Re-Energy component is at a very preliminary stage; currently, employees are essentially involved in the elaboration of the standardisation of a new production line. The manner of work organisation is not yet fully established and agreed upon. Specific technical skills connected to the hydrogen battery technology are disseminated through trainings in France and in the US. This training aims to create the expertise needed to assemble and test a fuel cell. Due to the inclusion of employee initiative at every stage of production the work is no longer repetitive, improving working conditions for employees.

The FO representative underlines that working conditions are improving due to reduction of repetitive tasks[59], more space for employee autonomy and innovations at work, and more complex tasks (i.e. each new vehicles requires employees to bring in different specific knowledge).

3.7.4. Challenges, enabling conditions, and lessons learned

At the Re-Factory in Flins, specific competences are also necessary to adapt to changes in technical processes. In the context of swift and substantial technological changes in the car industry, the Re-Factory can be a very effective and a profit-generating business model. Renault's management is focused on creating profit centres, rather than moving to a genuine circular economy model. Employees are selected by the management to work at the Re-Factory, meaning that not all employees are afforded this opportunity; rather or the moment, only top skilled and trained workers are involved in the Re-Energy component.

[59] As the FO representative stated "we are going out of the traditional Taylorism".

One of the conditions enabling successful social dialogue (including the role of access to knowledge and capacity-building of trade unions/employee representatives) is that Renault needs specific skills to introduce hydrogen battery technology–therefore, employees are very much involved in the process of technology introduction.

One of the main issues for all four components of the Re-Factory is the vertical and hierarchical decision-making, planning, and management. The entire project is managed from the top management level. The main challenge is that CGT, the historical dominant trade union, is not fully convinced by the potential of the project. Broadly, there is a need for many more discussions and greater flexibility from the management to bring CGT on board.

3.8. Rold: Retraining and tackling resistance to change[60]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Italy	Manufacturing	Medium	IoT platform, automation	Consultation and training; trade union negotiations

3.8.1. Introduction

Rold is a manufacturing company dedicated to the production of technological components for household and professional appliances. While the company started as a family business, their transformation has been so successful that today they are the only 100% Italian SME included in the Global Lighthouse Network of Advanced Manufacturers[61].

In 2012, the company started laying the foundations for its digitalisation and automation processes, implementing a platform called SmartFab, which enables them to monitor the progress of production in real-time. The involvement of their workers and workers' trade union ensured the transition incorporated employees' priorities and that their initial concerns were addressed.

3.8.2. Process: Employee involvement in technology adoption

After introducing the Internet of Things (IoT) platform, known as SmartFab, the company designed several educational activities to ensure workers could keep pace with the company's ongoing digital transformation. A large part of the Rold workforce are operators who had not received specific training before. Hence, the training activities covered a broad range of abilities, from soft skills such as communication and adapting to fast-paced change to more technical skills in managing new technologies. Other educational activities were also provided to help workers understand concepts such as Industry 4.0 and the IoT, as well as their application within and outside the workplace.

[60] Based on an interview with a company representative and written responses by two plant operators, as well as information available at Rold's website (available at: https://www.rold.com/).

[61] The Global Lighthouse Network of Advanced Manufacturers is a "community of manufacturers show[ing] leadership in using Fourth Industrial Revolution technologies to transform factories, value chains and business models, for compelling financial and operational returns" (GLN, 2022). The project is part of the World Economic Forum's initiative "Shaping the Future of Advanced Manufacturing and Value Chains platform", and so far has identified 103 manufacturing lighthouses. For more information, see: https://www.weforum.org/projects/global_lighthouse_network.

In addition to workforce training, the company deployed other measures, such as Kaizen meetings[62] involving all workers, where they were encouraged to share their experience or make any proposals regarding the new technologies and work organisation.

All this information was gathered and analysed, and workers were provided with feedback on their suggestions, whether these become implemented or not. These inputs have, for instance, guided the recent update of SmartFab's interface to make it more user-friendly and has been the basis of Rold's new goal–to use SmartFab to monitor production-related CO_2 emissions.

Besides informal activities, the dialogue is held at Rold via the "joint committee," which includes the board, elected employee representatives, and a company-level trade union representative[63]. In the digitalisation process, for example, the issue of performance monitoring was raised by the trade union representative and discussed within the committee. The board ensured that monitoring of employees was never the intention and would not be carried out (although no formal agreement has been signed).

Finally, to ease communication flows and facilitate access to assistance for workers, Rold introduced a new intermediary and communicative role between the operators and the person in charge of each plant: the Team Assembly Leader. These leaders received training in coaching and mentoring, as well as strategies and processes related to the digital transition, so that they might assist workers with any immediate concerns they may have.

3.8.3. Results: The impact on the workforce and business

At the beginning of the transition, workers were concerned about the risk of being constantly monitored. However, they were assured that this was never the company's intention, and that worker-related data would not be monitored. Interviewed workers now claim that the impact on the workforce has been very positive and they are confident that the platform works to their benefit. Now, it is possible for workers to access all the relevant information regarding production processes in real-time and from their workstation. Before the digital transition started, this information was stored in different systems, and workers needed to wait at least one day (or usually longer) to gain access to the latest version. Access to real-time information has allowed for opportunities to immediately address any problems that may arise. Overall, this has eased work and made it more enjoyable for workers. The digital transition has also positively impacted workers' skills and attractiveness to the market. In fact, while no worker left the company during the transition (because of the very gradual adoption process and training), some have now moved to bigger companies due to the increase in demand for their skills.

Performance-wise, the digital transition has helped Rold remain competitive in an industry dominated by larger enterprises and has helped to increase its credibility with clients.

3.8.4. Challenges, enabling conditions and lessons learned

The main challenge identified was the initial resistance to technology adoption, which was solved by improving communication across all levels of the company. Additionally, the company took on the added risk and cost of employee retraining, who were later "poached" by bigger companies due to their new advanced skills.

The main enabling factor behind this successful transition was the prior knowledge about the manufacturing process, which helped shape the transition in a manner that was compatible with the

[62] A Kaizen meeting is a short brainstorming and implementation session intended to evaluate and improve existing processes.

[63] The representative is not a Rold employee, but an external position set up by union(s), which are signatories to the sectoral collective agreement covering the company concerned. They act as facilitators in employer-employees negotiations.

company's habits. Another factor was the company's culture, where there is frequent and informal contact between workers at all organisation levels.

For example, once a year, the CEO gathers a meeting to report on the macro-performance of the company to workers. However, it is usual for the Board to also talk to workers in an informal setting about any concerns they may have or check up on their work.

3.9. SEB: Automating repetitive customer service tasks[64]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Sweden/Lithuania	Banking	Large	AI supporting customer service	Consultation and co-creation of the practice introduced

3.9.1. Introduction

Swedish bank SEB[65] has introduced a pilot application called Aida[66] based on AI technology to support its customer service branch located in Vilnius, Lithuania. The application was developed as an experimental venture capital project in partnership with New York-based IT company iPsoft, which also involved workers at the stage of its development and implementation. In 2017, the SEB bank was granted the Supernova Award[67] for the way the bank uses artificial intelligence in its digital customer service.

3.9.2. Process: Employee involvement in technology/ practice adoption

Customer service at the SEB bank struggled with numerous problems, for example, obsolete processes to reset passwords or using old security questions the customer had forgotten. These simple tasks involved long processes, which could create disappointment among customers (for example, a password reset could take up to 20 minutes); this also could result in misinformation or lack of compliance with customer service standards. The bank aimed to provide 24/7 access on multiple communication channels, without requiring overnight shifts among workers or offshoring outside of Europe. Performing routine tasks (like resetting customer passwords) led to low motivation among workers and to a feeling of a lack of development opportunities in the workplace.

Since 2016, SEB has been in the process of integrating Aida within its customer service unit, which allowed not only for automated communication with clients but also for coupling with the back-office data centre; in time, this allowed employees to not only answer customer queries, but also to recognise and solve the most recurrent customer service problems.

The development of Aida explicitly involved the direct participation of trade unions and workers, and was led by the iPsoft programmers. However, the ICT suppliers took on more of a consultancy role, and

[64] Based on Shapiro (2018), available at: https://www.researchgate.net/profile/Hanne-Shapiro-3/publication/327633896_Case_studies_on_employee_involving_implementation_of_digital_technologies_in_four_case_study_companies_in_DKSWeden-_contribution_to_the_national_Commission_on_AI_The_study_contributes_to_a_discussion_/links/5b9ac33b299bf13e602c5703/Case-studies-on-employee-involving-implementation-of-digital-technologies-in-four-case-study-companies-in-DK-SWeden-contribution-to-the-national-Commission-on-AI-The-study-contributes-to-a-discussion.pdf?origin=publication_detail.

[65] Further information about SEB available at: https://sebgroup.com/.

[66] The application was created on be basis of intelligent virtual agent Amelia developed by IPsoft.

[67] Further information about the Supernova Award available at: https://sebgroup.com/press/news/2017/seb-awarded-for-innovative-use-of-ai-technology.

did not arrive with a ready-made solution but rather facilitated dialogue about how Aida might be effectively implemented. In this sense, the design and implementation process itself can be characterised as agile, meaning that it has been developed through an iterative process involving management and employees. The successive versions of the software (developed by the programmers) were shown to managers and employees, and comments were made on how they fit with employee needs and business objectives. This feedback and revision loop was repeated several times until the company was satisfied with the result.

The goal of this consultative process was to foster a view of Aida as an opportunity for workers to develop AI skills, which are still rare on the labour market, rather than as a threat of imminent job loss. Aida was first implemented in the internal service department in Vilnius, and resulted in increased workers' satisfaction since it had the potential to lead to more meaningful job functions. The Centre of Excellence for Aida in the SEB Group, which was created in the second step, has affiliated six employees with cross-disciplinary expertise in AI and financial services. The Centre is in charge of the implementation and training of Aida along with the software developer and supplier, iPsoft from the US.

3.9.3. Results: The impact on the workforce and business

As a result of deploying Aida at the SEB, bank workers have been freed from the most monotonous functions of their jobs and have also acquired new competences that are attractive in the labour market. The saved time at work could also be spent on more complex customer service and improving the quality of the service with more timely reactions and personal approaches. These conclusions are based on the understanding that once most routine tasks have been eliminated, customer service becomes a more psychologically gratifying task, allowing workers to focus their potential on resolving customer issues through personal connection. SEB bank sees the value of Aida to a greater degree as related to scalability and consistency of service, rather than being a question of cutting wage costs due to automation; nor does it regard these investments as a question of increased efficiency.

3.9.4. Challenges, enabling conditions, and lessons learned

The main challenge in implementing Aida was its novelty and the need to move on unfamiliar ground for all stakeholders (the company, IT developers and the workers). Therefore, the strategy was to develop the technology in a gradual and participative way, which allowed for the ongoing solicitation of feedback and the testing of solutions. The participative process was also a formula that allowed the employees to acquire new professional competences.

Shapiro (2018) identified a number of success factors of worker participation in developing and adapting AI solution at SEB bank. The management played a large role in establishing and implementing a vision of improved customer service outcomes enabled by targeted digital solutions, made possible through the involvement of both workers and IT suppliers from the very beginning of the process; accordingly, they also enabled internal organisational changes to accomplish these goals. The digital development was perceived by workers as an opportunity to improve their skills and employability, which was the key driving force for the workers. The process assumed a range of approaches to competence development–hands-on trials, peer support, and short practice-oriented courses with a focus on knowledge transfer. Employees could also openly express their doubts. This allowed for the development of more resilient solutions to potentially problematic issues, and created a balance between top-down and bottom-up approaches, which in turn benefitted to the workers.

3.10. Siemens Energy AG: worker-led innovation for sustainable business practices[68]

Country	Economic sector	Company size	Technology/ practice introduced	Employee involvement
Germany	Energy	Large	Shift to more sustainable practices	Suggestion scheme

3.10.1. Introduction

Siemens Energy AG is an energy company with headquarters in Munich, Germany, and was created in 2020 by spinning off from Siemens AG. Following this event, the European Works Council was established at Siemens Energy. The company has more than 91,000 employees in more than 90 countries, including United Kingdom, Brazil, China, and the United States. An estimated one-sixth of the world's power generation is based on technologies from Siemens Energy. The company's portfolio includes products to support the energy transition, such as hybrid power plants and gas turbines that can run on hydrogen. Siemens Energy is a major player in the wind energy market and is also investing in the hydrogen economy.

The company has committed to becoming carbon neutral by 2030; in 2022, more than 50% of Siemens Energy's portfolio has already been decarbonised. The company is committed to the United Nations Sustainable Development Goals (SDGs) and sets itself stringent targets in the areas of employee health and safety. Other central themes of the sustainability strategy of Siemens Energy are inclusion and diversity.

Among other aspects of restructuring related to digitalisation processes and the transformation of energy markets, Siemens Energy plans to cut 7,800 jobs worldwide by 2025, and has already made some cuts. This move has prompted IG Metall (the largest trade union in the company) along with the works council to engage in dialogue with the Siemens Energy management in order to save as many jobs as possible[69] and to hold the company accountable to its ambitious green and digital targets[70]. This case study provides an example of how employees can be involved in green and digital transitions indirectly–via works councils–and directly via special programmes aimed at employee engagement.

3.10.2. Process: Employee involvement in technology/practice adoption

As stated in public company documents, Siemens Energy supports employee involvement in green and digital transitions, ownership, and a "speak up culture" in various ways, including through dialogue channelled by the works council and programmes such as Siemens Energy Ventures (SEV).

In terms of indirect worker involvement, works councils' members try to engage in dialogue with Siemens Energy management on an equal footing. Relevant ideas and specialist knowledge are sourced by works council members (and discussed further with the hierarchy.

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[68] Based on desk research: "Promote innovation today for tomorrow's markets", available at: https://www.dialog-igmetall.de/fileadmin/user/Downloads/Infomaterial/Gute-Arbeit_englisch.pdf; https://www.afrik21.africa/en/senegal-supported-by-siemens-africa-greentecs-solar-impactsite-lands-in-ndiob/; https://www.siemens-energy.com/global/en/news/key-topics/connect2evolve.html; https://www.reliableplant.com/Read/26923/Years-idea-management-Siemens.

[69] See: the "Future Agreement 2030" concluded between Siemens Energy, the General Works Council and IG Metall in January 2021 (https://press.siemens-energy.com/global/en/pressrelease/siemens-energy-and-employee-representatives-sign-future-agreement-2030); http://www.aktiencheck.de/news/Artikel-Gewerkschaft_und_Betriebsrat_Siemens_soll_nicht_weiter_schrumpfen-14683094.

[70] See for example: https://www.igmetall-berlin.de/aktuelles/meldung/nur-mit-industrieller-fertigung-gibt-es-innovationen/.

At Siemens Energy, there is an innovation fund that provides funding for the development and testing of new technologies, including those proposed for adoption by employees themselves.

There will also be funds allocated in the future to support structural transformation, a part of which is dedicated to skills development of Siemens Energy employees in relation to the digital and green transformations taking place at the company. The role of works councils' representatives is to ensure that employees' ideas reach the management, and that enough funding is available via this fund in response to the training needs expressed by employees[71].

In addition, current law in Germany requires Siemens Energy to inform the works councils about their intention to use AI in the business establishment with regard to work procedures and processes in any German location at an early stage and in a comprehensive manner; if AI should be used in connection with selection guidelines, works councils must be involved as well. Moreover, if mobile work should be implemented, the works council have an explicit right of co-determination on how mobile work should look[72].

Siemens Energy Ventures (SEV)[73] is an example of direct employee involvement in technology development at Siemens Energy. Founded in 2020, SEV is open to all employees and supports transformative venture teams to grow into businesses that provide sustainable, reliable and affordable energy. One of the examples of an employee-led project supported by SEV is connect2evlove, which used blockchain technology to finance the installation of the solar mini-grid in Ndiob, Senegal. The starting points for the SEV innovation framework are employee ideas, which are further developed through the Let's Innovate SE! movement. The aim of the programme is to unleash the potential of employees to generate and take ownership of the future of energy.

3.10.3. Results: The impact on the workforce and business

The channels for employee engagement described above have also contributed to the creation of a more inclusive working environment. Specifically, they have the potential to strengthen the employees' sense of agency at work and thus positively impact employees' motivations and well-being. This is especially important in the face of the restructuring process that the company is now undergoing.

According to information made available by Siemens Energy (see footnotes 68 and 73), since November 2020, over 5000 employees have joined the SEV's "Let's Innovate SE!'s" events to learn, connect and innovate. Over 350 employees have taken ownership of their ideas in the Venture Building Channel. Siemens Energy provided the tools, resources and network for all employees to define, refine, validate, and develop their ideas, many of which have grown into business ventures or generated customer interest.

[71] Based on an interview with Jens Rotthäuser, chairman of the works council at Siemens Energy in Mülheim an der Ruhr: "Betriebsrat Jens Rotthäuser: "Wir bekommen die Energiewende hautnah zu spüren", https://www.dgb.de/betriebsratswahl/++co++aade5c92-93c9-11ec-b197-001a4a160123.

[72] Information about Works Council Modernisation Act available at: https://www.bmas.de/DE/Service/Gesetze-und-Gesetzesvorhaben/betriebsraetemodernisierungsgesetz.html.

[73] Further information on Siemens Energy Ventures available at: https://www.siemens-energy.com/global/en/company/siemens-energy-ventures.html.

3.10.4. Challenges, enabling conditions, and lessons learned

In order for the practices described above to work, employees must be informed about possibilities of engagement with the works councils and the management and be encouraged to get involved as soon as they start employment. It is also necessary for the employer to follow up on employees' ideas and implement those which can be beneficial for all involved actors.

A genuine commitment to such initiatives from the side of the employer is here the most important challenge. In the context of this case study such commitment is supported by the long-standing practice of employee involvement by works councils within the German industrial relations model. Another challenge would be employees' lack of trust in the employer – should there not be a partnership relationship between employees and employers, similar initiatives could not be efficient.

3.11. Summary and lessons learned

In the ten analysed case studies, employees were more likely to be involved in adapting the technology to their workplace and normalising new work processes (task discretion) than to engage in the discussions on technology's broader impact on the company (organisational participation). For example, in virtually all cases, employees were consulted on *how* to adopt the technology to make the new processes as efficient and employee-friendly as possible. However, in most cases, the decision *whether* and *what* technology to adopt was made unilaterally by the employer and often driven by external factors such as the Covid lockdown, availability of public funding for decarbonisation, or competitive pressures. However, two notable exceptions have emerged. At PGNiG (Poland), the decision to modernise the plant machinery was triggered by the trade union's demand and aimed specifically at improving workers' physical working conditions. Similarly, Siemens Energy (Germany) introduced a scheme for employees to suggest and design business ventures related to the digital and green transition.

Furthermore, employees were mostly involved directly. The most common practices of worker involvement included information-sharing and consultation activities, formal and informal meetings, and iterative feedback mechanisms. Training of workers also accompanied technology adoption in almost all cases. Worker representatives were involved in several cases, though to a varying extent:

- At PGNiG (Poland) and Rold (Italy), trade unions representatives provided an effective company-level framework for negotiations, fostering communication between employees and employers. Furthermore, in the Rold case, the digitalisation process was implemented mostly based on direct employee participation (including consultations and training), but the trade union representative facilitated the discussions on issues going beyond task discretion, such as privacy and surveillance, effectively ensuring that new technology would not be used to monitor employees; and
- At Miele and Siemens Energy (Germany), the role of work councils was crucial in ensuring the technologies and changes are implemented with no harm for employees. Additionally, the Miele work council relied on a tool developed by IG Metall ("Compass for Digitalisation"), which guided the work council and the workforce through the digital change.

These examples also provide some anecdotal evidence that corresponds with the existing research on macro conditions for worker involvement (see section 1.4), especially in two respects. First, **larger companies were more likely to involve employees in decision-making**: in all three SMEs (BORGinsole, La Fageda, and Køge) analysed within this study, organisations merely consulted and trained employees to make most of the digital change.

At the same time, large companies were more likely to have better established channels of involving employees, both formal and informal, direct and indirect (via worker representation bodies). Second, **national context seems to have mattered**. Instances of employee involvement in technology adoption have been identified in both the highest performers in Eurofound's Industrial Relations Index (i.e. Denmark, Germany) and the lowest scorers (i.e. Estonia, Poland). Nevertheless, Germany stands out as the only country (based on the case studies in focus) with well-established tools and mechanisms to involve workers via a combination of involvement models (direct and indirect) and at different levels (including supportive federal legislation, a guiding tool developed by a sectoral trade union, and involvement of works councils at the company level). In comparison, the involvement of worker representatives in other countries was less structured and largely informal (Rold, Italy), highly company-specific and based largely on one person's initiative with no institutional underpinning (PGNiG, Poland), or non-existent, despite relatively high levels of direct involvement of employees (Helmes, Estonia).

Key impacts of technology adoption in the analysed case studies included the following:

- Improved physical working conditions;
- Improved job satisfaction, including due to a shift to less repetitive and more autonomous and complex tasks;
- Improved skills and employability;
- Improved company performance, competitiveness, and/or service quality; and
- Job loss due to automation (noted in two establishments).

Among the key enablers for an inclusive technology adoption process were the following:

- Inclusive, high-involvement company culture, particularly in terms of making the technology worker-friendly;
- Skills, especially digital skills;
- Tools and evidence on good practices of (worker-friendly) technology adoption;
- Effective and early measures taken to address the initial worker resistance; and
- Formal co-decision rights of works councils

4. EU POLICY AND LEGAL INSTRUMENTS

KEY FINDINGS

This analysis shows that EU instruments, both policy-related and legal, may be important in addressing the challenges of digitalisation and greening of the economy. However, when referring to their practical application, the following circumstances should be considered:

- There is a need for more empirical research on the practice of works councils. Works councils are an essential channel of information exchange and consultation and can potentially play a role in the process of technological change, digitalisation and greening of the economy. The development of EU standards for employee participation faces serious obstacles, as evidenced by the fact that the main legal basis in this area (Article 153(1) f TFEU) has not been used in practice so far;
- European Works Councils (EWCs) can play an important role in the processes of information exchange and consultation regarding issues related to the digitalisation or greening of the economy. Trade unions' views and relevant literature indicate that it is crucial to strengthen EWCs' right to an effective judicial path for resolving disputes. Another important issue is the necessity of a legal instrument that ensures that all EWCs are subject to the same legal standard. However, the demand to eliminate pre-Directive agreements (so-called Article 13 agreements) is not supported in the 'Radtke' report, which provides recommendations to the Commission on the revision of the European Works Council Directive (2019/2183 (INL)); and
- Digital and green targets are included in all national recovery and resilience plans (NRRPs) presented so far to the European Commission. However, digitalisation and greening targets connected to such issues as unionisation or employee voice are scarce. The "Do no harm principle" is referred to in all NRRPs, and is treated as an important frame of reference. However, it remains to be seen to what extent the principle will be actually observed once the public policy measures envisaged in the NRRPs are implemented.

4.1. EU legal instruments and initiatives supporting MS efforts to strengthen employee involvement

The EU has a number of legal instruments relating to what is broadly understood as worker participation, in particular information and consultation rights, which can be used to involve workers in change management processes in relation to digitalisation and the greening of the economy. The key legal instruments can be divided into three categories:

- The so-called restructuring directives[74] are as follows:
    - Council Directive 98/59/EC of 20 July 1998 on the approximation of the laws of the Member States relating to collective redundancies;
    - Council Directive 2008/94/EC of 22 October 2008 on the protection of employees in the event of the insolvency of their employer; and

[74] So-called because their original versions were adopted to support the social dimension of the restructuring of the European economy as a result of the oil crisis of the 1970s.

- Council Directive 2001/23/EC of 12 March 2001 on the approximation of the laws of the Member States relating to the protection of workers' rights in the event of transfer of undertakings, plants or parts of undertakings or plants

- The tools for information and consultation at the European level are:
  - Directive 2009/38/EC of 6 May 2009 on the establishment of a European Works Council or the procedure for informing and consulting employees within enterprises or groups of enterprises with a community scope (recast);
  - Directive 2001/86/EC supplementing the European Company Statute with regard to employee participation; and
  - Directive 2003/72/EC supplementing the statute for a European cooperative society with regard to employee involvement

- The tool for information and consultation at the national level is:
  - Directive 2002/14/EC of the European Parliament and of the Council of 11 March 2002 establishing a general framework for informing and consulting employees in the European Community.

4.1.1. Information and consultation (I&C) – an overview

Information and consultation (I&C) rights are highly relevant to the broader theme of worker involvement in company decision-making processes; this is particularly clear when looking at the guarantees of the EU Charter of Fundamental Rights (CFR) and the **Framework Directive 2002/14/EC on Information and Consultation (ICFD)**. As the provisions of the ICFD leave broad room for interpretation, it is important to keep both economic and human rights perspectives in mind (Hall et al., 2013). I&C rights are implemented at various levels of the EU law, but lack a common definition. The most important examples are Article 27 CFR, the ICFD, and such directives as the Acquired Rights Directive (ARD)[75] and Directives on Collective Redundancies (DCR)[76], which grant employees' rights to participate in different processes at the plant, company or group level.

In April 2015 the Commission initiated a social partner consultation[77] under Article 154(2) of the Treaty on the Functioning of the European Union (TFEU) on the consolidation of the EU directives on information and consultation of workers. In the consultation paper, the Commission asserted that recasting the three directives into a single piece of legislation (with the addition of specific provisions defining the concepts "information" and "consultation") would enhance legal clarity and awareness. However, it also warned that "care should be taken to avoid that the alignment of the definitions brings about an unjustified regression of workers' protection."

[75] Council Directive 2001/23/EC of 12 March 2001 on the approximation of the laws of the Member States relating to the safeguarding of employees' rights in the event of transfers of undertakings, businesses or parts of undertakings or businesses.

[76] Council Directive 98/59/EC of 20 July 1998 on the approximation of the laws of the Member States relating to collective redundancies.

[77] Further information on worker information and consultation initiative available at: http://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=2192&furtherNews=yes.

In response, the main European employers' representatives firmly opposed a revision or recast of the directives[78], arguing that the directives worked well for both employers and workers, and that each directive concerned different issues.

Workers' representatives generally favour inclusion of the public sector in the scope of the directives, with a preference for a framework agreement under the sectoral dialogue[79]. Only in the absence of such an agreement are workers' representatives in favour of extending the scope of the three directives to the public sector, although by means of a separate revision of the directives rather than a recast (Eurofound, 2016b).

At present, the idea of consolidating the directives on the right to information and consultation seems outmoded. In this respect, it is also important to be aware of the overlap between the areas of the right to information and consultation and the issue of employee participation.

The restructuring directives. Both in the case of collective redundancy and in the case of transfer of the undertaking, a process of consultation with employee representatives takes place. In the case of collective redundancies, the first objective of the consultation process is to reduce the scale of layoffs (only subsequent phases refer to the necessity to consult criteria for the selection of employees affected and to implement protective measures). Activities related to the training and retraining of workers (including in the area of training related to the greening of the economy or digitalisation) may also appear in this first phase of the consultation process. However, there are no studies that analyse collective redundancy agreements across Member States in the particular context of greening and digitalisation measures.

Regarding agreements related to the transfer of undertakings, there is also room for consultation activities in the areas of greening and digitalisation. Article 7 of Directive 23/2001 does not provide for exceptions to the information sharing process, but the consultation process is only mandatory when the transferor or the transferee envisions the application of measures relating to change of working conditions in relation to his or her employees[80]. For example, from a Polish perspective, there is generally no consultation process in place because the transferee and transferor inform workers' representatives that they do not intend to envisage such measures in relation to their employees. Transfer agreements may also contain training provisions related to digitalisation or greening of the economy. It seems that, however, such provisions occur more frequently in agreements concerning collective redundancies than in transfer agreements.

I&C at the European level. The EWC Directive is practically applicable to around 1,200 multinationals operating in the European Economic Area. The practical application of the other two directives (concerning European Company and European cooperative society) is limited. Further possibilities of strengthening I&C rights at the European level and in the context of digitalisation and greening of the economy are discussed in section 4.2.

I&C at the national level. While many continental Member States had enshrined I&C rights and obligations in their legal systems prior to the adoption of the ICFD, Ireland and most of the Central and

[78] The Confederation of European Business – BusinessEurope, UEAPME – representing SMEs (now SMEunited, CEEP – representing public employers (now SGI Europe), and CEEMET (The Council of European Employers of the Metal, Engineering and Technology-Based Industries).

[79] These are the European trade Union Confederation -ETUC, the European Confederation of Independent Trade Unions - CESI and the European Public Service Union – EPSU.

[80] Article 7. 2 of Directive 2001/23/ EC states: Where the transferor or the transferee envisages measures in relation to his employees, he shall consult the representatives of this employees in good time on such measures with a view to reaching an agreement.

Eastern European Member States (CEE MS) did not. As a result, full implementation of this particular EU instrument in those countries may face complications.

4.1.2. The actual usability of Information and Consultation tools

In relation to the right to information and consultation (I&C), some fundamental legal questions arise, such as:

- does the ICFD provides for an individual and/or a collective right to I&C?;
- is there a need for a mechanism if employees do not establish the required representational body?; and/or
- under what conditions is a consultation deemed to be "real" and substantial?.

First, it is unclear if I&C must or can be provided to the individual employee and/or to the employees collectively via an employee representational body (the former is referred to as "direct" I&C, and the latter as "indirect" I&C). The question that follows is whether Member States must provide some kind of mechanism for the creation of a representational body, in the event that employees themselves do not establish one.

The Court of Justice of the European Union (CJEU) held that if the protection provided for by EU law depends on the I&C of employees via their representatives, a Member State is in breach of EU law if there is no possibility for workers' representatives to be designated[81]. In other words, such designation is necessary for the I&C mechanism to be effective. In some countries (e.g. Belgium, France, and Luxembourg) the establishment of employee representational bodies by an employer is mandatory by law. In other countries, this is regulated by collective agreements (e.g. Czech Republic, Denmark, Sweden). In other countries, the law sets thresholds, such as a minimum number of employees required to launch the procedure leading to the establishment of a representation body. The question then arises as to whether the voluntary representation rights that are currently predominant in the Member States are adequate to achieve the aim of the ICFD (European Commission, 2012).

One of the most important provisions in the Framework Directive 2002/14/EC on Information and Consultation is Article 4(4) c, according to which a "decision likely to lead to substantial changes in work organisation or in contractual relations (…) consultation shall take place 'with a view to reaching an agreement'". The CJEU stated that it appears that the Directive on Collective Redundancies (DCR)'s parallel provision to Article 4 (4) c ICFD imposes an obligation to negotiate[82]. In another ruling, CJEU ruled that national rules "which merely require a transferor or transferee (…) to consult the representatives of trade unions recognised by him, to take into consideration any representations made by them, to reply to those representations and, if he rejects them, to provide reasons" fail to correctly transpose the Acquired Rights Directive's parallel provision[83]. Despite these judgments, it is still difficult to explain what the phrase "with a view to reaching an agreement" might mean in practice. One can argue that it implies carrying out social dialogue in a good faith, which begs the question: what does "good faith" in the relationship between the employer and employee representation mean?

Participation can also be understood in terms of the legal provisions that exist to facilitate social partner dialogue. Any co-determination right would have to be derived from Article 153 (1) f TFEU, which requires unanimous voting by the Council in a legislative procedure.

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[81] ECJ 8 June 1994, Case C-382/92 Commission v UK and Northern Ireland.

[82] ECJ 27 January 2005, Case C-188/03 Irmtraud Junk v Wolfgang Kühnel, para 43.

[83] ECJ 8 June 1994, Case C-382/92 Commission v UK and North Ireland.

The ICFD is based on Article 153 91) e TFEU, which merely requires majority voting by the Council. It is very difficult, if not impossible, to achieve unanimity in the Council. As a result, for the foreseeable future, strengthening the right to information and consultation in such a way that it will resemble co-determination rights is unlikely. In addition, the current provisions of the Directive appear not to have been effectively implemented in a number of Member States, especially those from Central and Eastern Europe. In Poland, the number of works councils is systematically decreasing instead of increasing.

A "fitness check" assessment of the right to information and consultation should be carried out in those Member States where there had not been any form of worker representation other than trade union representation prior to the entry into force of the Framework Directive 2002/14/EC on Information and Consultation. An assessment should be made as to the number of works councils in operation and, if possible, of their capacity to negotiate with the employer on the details of their functioning. Conducting such research would allow for the ability to monitor works councils and could serve as a useful tool in the processes of digitising jobs and creating protective measures related to the just transition. There is no up-to-date research on the operations of works councils in those Member States in which research from 2012 (European Commission, 2012) revealed problems with the effective implementation of the ICFD.

TFEU offers several competencies to legislate on the issue of board-level participation; these include, for example, Article 153 (1) f, which is a part of the social policy title of the TFEU (while this competence has not been utilised yet, it may not be necessary to instigating board-level participation; that is, it is possible to refer to the general competence norms of the TFEU). For instance, the European Company Statute including a supplementary directive was based on Article 352 TFEU, because it not only deals with board-level participation but also with the company law aspects of the Societas Europea (SE).

In the context of the European Cooperative Society (SCE), it was (and continues to remain) controversial as to whether Article 352 TFEU (former 308 TEC) or 114 TFEU (former 95 TEC) were the correct legal bases for the statute, since the SCE's aim was to set up a new legal form rather than just harmonizing national rules[84]. Additionally, board-level participation rules could only be based on internal market competencies as long as they supplement company law regulations; such was the case with the Cross-Border Merger Directive.

As far as employee participation is concerned, the key issue is the lack of consensus among the Member States. It is necessary to focus on identifying where (in which Member States and/or which sectors of the economy) the institution of works councils perform poorly in order to define the necessary changes (either in terms of law or practice). **As the conducted analysis on EU competence shows, the EU has very limited capacity to instigate new developments in the area of worker participation**. It seems reasonable to investigate whether the existing basic mechanism (ICFD) is correctly and effectively implemented. In conclusion, we cannot pin undue hopes on the participation of works councils in the process of greening the economy and digitalisation in those countries where their number is small and the implementation of the existing Directive leaves much to be desired.

[84] ECJ 2 May 2006, Case C-436/03 European Parliament v Council of the European Union.

4.2. Overview of the Revision of the European Works Council Directive (2019/2183 INL)

European Works Councils (EWCs) are standing bodies representing the interests of employees of multinational companies (MNCs) vis-à-vis central management. They are composed of national representatives designated by workers from Member States where an MNC conducts operations. The EWC Directive (94/45/EC) was adopted in 1994 and came into force on 22/09/1996. The Directive was modified by a Recast Directive 2009/38/EC. The EWC Directive demonstrated the added value of the EU to workers, and thus made a decisive and constructive contribution to the Europeanisation of industrial relations.

While the 2009 Recast Directive (2009/38/EC) has brought about positive changes, significant loopholes remain and can be utilised easily by large multinational companies to circumvent workers' involvement on important topics. As discussed in numerous studies, as well as the Bischoff (Bischoff, 2021) and Radtke reports (Radtke, 2022) and trade unions' demands, there are a number of issues to be addressed in this respect (please see the list of proposed changes below). It is important to stress, however, that the attitude of the European employers' community towards EWCs is still invariably defined by a firm BusinessEurope position (BusinessEurope, 2017) that more time is needed to assess the full impact of the Recast Directive and that the current legal framework is sufficient for the time being.

The following list of possible areas for change in the Recast Directive is based not only on the above-mentioned sources but also on research of the available literature analysing practical aspects of the functioning of EWCs.

1) Enforce what is in the Directive. The main issue raised is effective enforcement of the rights arising from the Directive. This must happen through effective and dissuasive sanctions, including the temporary suspension of a company decision. Expert studies commissioned by the European Commission and the European Parliament show the need to strengthen the provisions of the EWC Directive, including sanctions in the event of infringements (EWC, 2021). The need for legislative improvement is also indicated in the Bischoff report and the Radtke report; the latter, however, is still awaiting the decision of the European Parliament's Employment and Social Affairs Committee. Necessary changes have also been described in the European Trade Union Confederation position. Broadly speaking, trade unions would like to strengthen labour representation vis-à-vis MNCs, and are generally positive about the development of EU legal instruments concerning the social sphere. The draft Radtke report notes that participation rights play a key role in the functioning of the social market economy and that Directive 2009/38/EC has led to improvements in the scope and functioning of EWCs. However, those bodies still face serious difficulties in enforcing their rights, especially in terms of providing timely access to information and consultation. In the vast majority of EWCs, there is no information about actions planned by the central management (i.e. the information is given after the decision is made) and the consultations required by law or the agreement establishing the EWC are not undertaken (De Spigelaere, 2016; De Spigelaere, 2017; De Spigelaere et al., 2022). Definitions of information and consultation were, in most cases, transposed into national legislation literally (that is, copy-pasted), and rarely provided essential supplementary details. It may be noted that the Radtke report proposes to amend the definition of consultation (Article 2(g) of the Directive) to emphasise that it must be of a nature to allow *a priori* consultation. The report also proposes a new Article 11a on penalties.

2) Ensure access to justice. EWCs face legal uncertainties and unpredictability when envisaging litigation; enforcement frameworks do not guarantee universal access to justice. EWCs often have no capacity to act in courts of law, have no means to seek legal counsel, and their sanctions are generally not "effective, proportionate and dissuasive" (Jagodzinski, 2015). Access to justice is, among other things, determined by:

- Access to judicial and legal capacity to act in courts;
- Costs and time of legal proceedings;
- Competence of courts; and
- Category of breach and possible sanctions.

Given the diverse forms of possible legal redress across the EU Member States, the ETUC calls for the specification of legal status of EWCs and Special Negotiating Bodies (SNBs) as legal actors, as well as a definition of legal means to launch litigation. Access to justice is also recognised in the Radtke report which proposes changes to Article 11 of the Directive and strengthens the need to guarantee an effective right to a court (i.e. certain national solutions would be developed in the process of implementation of the Directive). The proposed concept of "temporary suspension of decision" is also noteworthy.

3) Define a "transnational character of a matter." The concept of "transnational character of a matter" (recitals 12 and 16) should be consolidated and incorporated into the main body of the Directive (Senatori and Rauseo, 2021). The EWC must have an enforceable, comprehensive right to be informed and consulted throughout the decision-making process. In this regard, attention may be drawn to the proposal to add paragraph 7a in Article 1 of the Directive in the Radtke report, which says: *In order to determine the transnational character of a matter, the scope of its possible effects must be taken into account. This includes matters which, irrespective of the number of Member States involved, are of concern to European workers in terms of the scope of their potential impact, as well as matters which involve the transfer of activities between Member States.*

4) Better define "controlling undertaking." A comprehensive definition of "controlling undertaking" needs to include contract management, franchise systems and joint ventures. Objective criteria to determine the location of the "representative agent" and "central management" must be laid down to avoid regime shopping and the use of letterbox companies.

5) Ensure more efficient coordination between local, national and European levels. EWCs are prevented from playing an effective role when different levels of information and consultation work independently. Yet, EWC members continue to face difficulties in ensuring regular communication and coordination between local, national and European levels.

6) Include all EWC agreements within the scope of the Directive. After 30 years since the adoption of the original Directive, exempting old, so-called voluntary (Pre-Directive, "Article 13") agreements should no longer be justified. Ending double standards can be accomplished by bringing such agreements into the scope of the Directive. To ensure a level playing field and greater legal clarity, all provisions laid out in the Directive must apply to all agreements (either automatically or through renegotiation based on clear fall-back provisions embedded in transitional rules) in order to ensure continuity for the duration of renegotiations. It is interesting to note, however, that this demand is not included in the Radtke report. It seems clear that the lack of a uniform standard is not appropriate and potentially undermines EWC's role in the digital and green transitions.

7) Prevent abuse of confidentiality. EWC practice reveals that management sometimes abuse the confidentiality clause, and in doing so, hinder the flow of information both to ordinary employees and

to external experts assisting the EWC (for example, trade union experts) (Jagodziński and Stoop, 2021). Cases of such conduct on the part of central management are extremely difficult to litigate on the grounds of Article 9 of the Directive – namely, the obligation to work in a spirit of cooperation with due regard to the reciprocal rights and obligations of the parties. It can be argued that the abuse of the confidentiality clause in extreme cases can be refuted by appealing to labour courts on the basis of, for example, Article 9 of the Directive.

The Directive should clarify more precisely on what grounds, under what circumstances, and for what duration a company may withhold information; further, greater clarification is necessary and what grounds EWC members' right to share information with stakeholders (particularly employee representatives) can be restricted.

8) Strengthen the subsidiary requirements. If no agreement is signed within three years following a request to establish an EWC (for example, due to a conflict or divergence of views of the negotiating parties), so-called "subsidiary requirements" come into force. Subsidiary requirements are provisions laid down by the legislation of a Member State (i.e. transposition law) which must be in line with the Annex to Directive 2009/38/EC. These provisions have been designed to avoid a situation in which obstruction by one party during the negotiations leads to a deadlock in the process of establishing an EWC. Thus, they set minimum standards which stipulate basic principles governing the functioning of an EWC. In practice, most countries' legislation does not provide clear provisions that would allow for a determination of the procedure for applying Subsidiary Requirements in the case of management's refusal to commence negotiations, or if negotiations should fail after a period of three years. Accordingly, the Directive should strengthen the subsidiary requirements to improve the practical functioning of the EWC.

Unless the institution of EWC is strengthened, it may become a tool used mainly by central management to pursue a unitary model of employment relations (no truly independent employee representation) within a company. Research shows that the EWC is perceived by managers as a viable instrument for implementing internal policies (Waddington et al., 2016; Pulignano and Waddington, 2020), which is contradictory to the intentions of the original Directive.

Additionally, there are still 285 so-called "pre-directive" EWCs (ETUI, 2022), which means that they do not have to comply with any standards under the Directive. As such, the amendment indicated in point 6 is crucial in order to craft the right to information and consultation in the spirit of transnational collaboration, rather than just an empty slogan. It is also noteworthy that wherever a "pre-directive" body for information and consultation has already been established, the establishment of a new subsidiary in further Member States does not necessitate renegotiation.

Finally, the activity of employee representatives and central management within the EWC should be based on mutual trust and willingness to cooperate to bring about fruitful outcomes (Vitols, 2009). Equally important is that employee representatives represented in an EWC have recourse to legal action in case of violation of the law or the agreement establishing the EWC. However, this is highly unlikely at the moment.

To conclude, it is important to stress the added value of the Radtke report because the transformation of its recommendations into legislative action (such as those leading to amendments to the EWC Directive) would be an important step forward, as it would strengthen the EWC institution and allow for its greater inclusion in dialogue around issues related to the green and digital transition.

4.3. Role of EU funding, RRF digital and green targets, and the "do no harm principle"

The European Social Fund Plus (**ESF+**) finances (along with other EU funds) the implementation of the European Pillar for Social Rights (EPSR). The **capacity of social partners and civil society** is one of the areas where resources under shared management are to be allocated, and all Member States should allocate an appropriate amount to the capacity building of social partners and civil society. Wherever European Semester country-specific recommendations (CSR) cover this area, the respective MS should allocate at least 0.25% of its ESF+ resources to it.

In general, **experiences of trade unions with EU funding channelled into capacity-building practices are positive** (Kahancova, 2015; Bernaciak and Kahancova, 2017), although there is also some criticism pointing to the risk of trade unions (especially from the CEE MS) becoming **overdependent on external, European funding**, hampering the ability of fund recipients to efficiently generate income from other sources (Bernaciak and Kahancova, 2017).

The Recovery and Resilience Facility (RRF) has been established in response to COVID-19 and its detrimental effects to the economy and society across the EU. At the same time, RRF's aim is to "make European economies and societies more sustainable, resilient and better prepared for the challenges and opportunities of the green and digital transitions". **Social partners were involved in the course of drafting national recovery and resilience plans (NRRP),** but in general, **their involvement**, as far as environmental sustainability is regarded, **was limited to consultation and information** (only in Slovakia did social partners on both sides hold negotiations on the measures subject to consultation) (Eurofound, 2022: 21). When it comes to digital goals, Slovakian social partners on both sides also reported negotiations (although the involvement of trade unions was more limited than that of employers), as did Danish and, to some extent, Swedish trade unions (Eurofound, 2022: 18).

Digital and green targets are included in all NRRPs that have been presented so far to the Commission (the Netherlands has not delivered theirs). **However, digitalisation and greening targets connected to such issues as unionisation/employee voice are scarce**. Reviewing the national plans reveals that in most of the countries that have submitted NRRPs, social partners and trade unions in particular are seldom mentioned. Even rarer are the cases when trade unions (or other channels for employee communication and feedback) appear in the context of digital and green targets. Finally, there are hardly any forms of union involvement that could be linked directly to the issues of unionisation, although in some cases the indirect impact of such involvement can be expected to take place.

There are several exceptions that have been identified, yet their significance is debatable. In Denmark, the government launched 13 climate partnerships in late 2019. These partnerships, consisting of enterprises and trade unions, were expected to "deliver recommendations on how to deal with climate change and realise a green transition"[85]. Furthermore, eight green restart teams were established in August 2020 with the purpose of providing recommendations on ensuring a green restart of Danish exports after the COVID-19 pandemic. The teams were led by CEOs and chairs of large companies, and were comprised of representatives from enterprises and trade unions. The teams delivered their recommendations in September 2020[86]. The recommendations were taken into account when the Danish NRRP was drafted, and this document includes initiatives recommended by the restart

[85] Danish Ministry of Climate, Energy and Utilities, 2019, Regeringens klimapartnerskaber, available at: https://kefm.dk/klima-og-vejr/regeringens-klimapartnerskaber-og-groent-erhvervsforum.

[86] Danish Ministry of Industry, Business and Financial Affairs, 2020, Genstartsteams for eksporten er klar med anbefalinger, available at: https://em.dk/ministeriet/arbejdsomraader/samfundsoekonomi-konkurrenceevne-og-digitalisering/genstart-af-danmark/.

teams, such as investments in green transition and digital transformation as well as tax deductions for research and development.

In Cyprus, the plan "Reform 5: e-Skills Action Plan Implementation of Specific Actions" includes a provision for training and the strengthening of digital skills, targeted at people aged 55 and over who are both employed and unemployed. Additionally, it promotes entrepreneurship training for unemployed people, with special emphasis on unemployed women. These initiatives are intended to be achieved through subsidy schemes targeting training providers, which in turn are to be developed in consultation with social partners and other stakeholders[87].

In Spain (under Component 10 of the NRRP, the Strategy for Just Transition), trade unions are mentioned among other stakeholders whose participation is expected in the implementation of Covenants/Conventions for the energy transition. The Just Transition Pacts/Covenants are framed as an important part of the Spanish Territorial Plan of the Just Transition Fund (FTJF), and serves as a participatory governance tool that makes possible the identification and implementation of new changes within outmoded energy sectors[88]. Furthermore, under Component 10, trade unions are also explicitly named as actors that must be involved in the active labour market programme (i.e. the plan for professional re-qualification and labour market integration of workers and other segments of the population affected by the energy transition). This programme is particularly aimed at creating opportunities for unemployed people who have lost their jobs in particular sectors as a result of economic and greening transitions, such as mining and thermal power plants workers. Trade unions (as well as enterprises) are identified as parties to prospective framework agreements which are designed to provide a foundation for a personalised support programme for the reintegration of these two groups into the labour market[89]. The target groups can become a potential source of union recruitment, should the actions taken be successful.

A promising example of involving trade unions in such initiatives is the New Skills Fund, which was established in Italy in 2020 on an experimental basis, and allows companies to change working hours and to promote training activities on the basis of detailed collective agreements with trade unions. The New Skills Fund in part finances training required in a specific company, sector or territory[90]. Similarly, in Poland, trade unions are named among other stakeholders that might be involved in the consultation process of the planned Programme for Digital Competences Development[91]. In this context, social partners must be consulted in the process of drafting the reform of the digital base for the system of education.

The **"do no harm" principle is referred to in all national plans delivered** (although the use of different wording is noticeable), as it is obligatory for all actions financed by the RRF to respect the principle. However, it remains to be seen to what extent the principle will be actually observed once the public policy measures envisaged in the NRRPs are implemented.

Similarly, the **European trade union movement has employed the notion of "do no harm" in its documents and treats it as an important frame of reference**.

[87] Cyprus Recovery and Resilience Plan 2021-2026, 2021, available at: http://www.cyprus-tomorrow.gov.cy/cypresidency/kyprostoavrio.nsf/all/B37B4D3AC1DB73B6C22586DA00421E05/$file/Cyprus%20RRP%20For%20Upload%2020052021.pdf?openelement, p. 476.

[88] Plan de Recuperación, Transformación y resiliencia, Estrategia de Transición Justa, Componente 10, 2021, available at: https://www.lamoncloa.gob.es/temas/fondos-recuperacion/Documents/16062021-Componente10.pdf, p. 12.

[89] Ibid., p. 19.

[90] Italia Domani, 2021, available at: https://italiadomani.gov.it/content/dam/sogei-ng/documenti/PNRR%20Aggiornato.pdf, p. 205.

[91] Krajowy Plan Odbudowy, 2021, available at: https://www.gov.pl/attachment/2572ae63-c981-4ea9-a734-689c429985cf, p. 224.

In February 2021, the ETUC published their "Position on the assessment of the Regulation establishing the Recovery and Resilience Facility: the first step toward a people's recovery," where they pledged to continue "exerting pressure on the Commission to monitor and, where relevant, facilitate trade union consultations on the NRRP, both at European and national levels." In October, the ETUC followed up with the Resolution for Recovery and Social Progress 2022 (ETUC, 2022a) which argues that "the implementation of the RRF should give greater impulse to social partners' involvement in the EU Semester and in the implementation of NRRPs."

In March 2022, the ETUC issued the position for an EU Social Taxonomy of Sustainable Investment (ETUC, 2022b), reiterating the need to follow the principle in making investments. In particular, the ETUC also asserts that "EU Taxonomy should prevent any form of green, social or rainbow washing and can never be considered a means to replace public investments with private ones," but that "on the contrary, the EU Taxonomy should favour a better allocation of resources to activities and entities that engage in the objectives of the Green Deal and of the European Pillar of Social Rights with the final aim to create jobs and boost upward convergence of living and working conditions in Europe." These declarations are likely to enhance the image of the trade union movement as a responsible stakeholder in the debate. However, whether this might translate into an increase in union density or any form of empowerment of the employee or their representatives remains an open question.

Nevertheless, as far as environmental goals are concerned, trade unions from specific MS are somewhat less enthusiastic. For instance, Polish trade unions expressed reservations towards decarbonisation objectives and proposed means of achieving them, while major unions from leading European economies such as Germany and the UK[92] – IG Metall and Unite – stressed employment concerns and argued for incremental change, without questioning the general need to suppress the level of emissions in the transport sector (Thomas and Doerflinger, 2020). **The greening of the economy can thus be approached from the angle of restructuring and the anticipation of change** (in which social partners should have a say) in line with the recommendations formulated by the Cercas Report (2012)[93]. Arguably relevant are the recommendations no. 8 to 11 which refer to the minimalisation of internal social costs through a social plan, agreements on managing restructuring processes, the minimalisation of external economic, social, and environmental impacts, and public support of these measures.

In conclusion, social partners' influence on NRRPs is limited to the extent that their consultation in the process of drafting the national plans is construed (which varies greatly, due to the lack of specific legal obligation). Very few instances of trade unions' engagement in carrying out the reforms outlined in NNRPs have been identified, particularly those forms that would at least offer a promise of translating into higher union density or a stronger collective voice (this is particularly relevant in the case of Spain). It is quite obvious that digital and environmental strategic objectives of the EU are endorsed by the European trade union movement, yet not by all national-level confederations and federations (this is particularly true in sectors that are shrinking due to economic transitioning). It is also striking that ETUC warns against the risk of "green, social or rainbow washing" on the part of businesses, which suggests a possibility that public financing channelled into the MS economies by RRF and other structural funds might be misused (i.e. public losses-private gains).

[92] Before the finalisation of Brexit.

[93] European Parliament resolution of 15 January 2013 with recommendations to the Commission on information and consultation of workers, anticipation and management of restructuring, known as the Cercas Report, after the rapporteur Alejandro Cercas, a member of the European Parliament from 1999 to 2014.

It seems reasonable to continue **the debate as to whether there should be greater involvement of social partners in public policy programming and implementation as far as EU funding is concerned**. In the long run, this might produce some observable results in employee representation empowerment, as well as quantitative results (such as potential increases in union density), but it is too early to determine the likelihood of this outcome.

5. CONCLUSIONS AND RECOMMENDATIONS

It is important to note that the scope of this study is extremely broad, comprising several large thematic fields (including digitalisation, greening, and social dialogue), and crosscutting different levels of analysis (from labour market impacts to changes at the workplace, and through varying levels of social dialogue). Additionally, this study highlights and analyses various elements of the institutional framework (such as EU and national policy, collective bargaining agreements and other social partner action, and company-level case studies). Nevertheless, several key themes emerge from the analysis that can inform future policy-making aimed at achieving a just and sustainable twin transition.

First, the twin transition has the potential to increase inequality and labour market polarisation. EU-level social partners interviewed for this study strongly emphasised the challenge of ensuring fair distribution in terms of the benefits gained through digitalisation, as well as the just imposition of new costs arising from the twin transition. For example, while highly skilled and mobile workers can benefit from digitalisation, workers with insufficient skills and/or situated in collapsing industries increasingly face risks of precarious working conditions, dismissals, or labour market exclusion. Therefore, the situation of the most vulnerable (especially low-skilled and elderly) workers must be high on the policy agenda.

Recommendation #1: Step up efforts aimed at mitigating the negative effects of the digital (i.e. digital inclusion policies) and the green transition (e.g. tackling energy poverty) on vulnerable groups.

Furthermore, the twin transition can have both positive and negative impact on workers and businesses. The evidence gathered in this study strongly implies there is no single predetermined transformation path, and how the transitions affect employment and workplace culture greatly depends on *how* technologies are introduced. In this context, workers' voices are important elements in ensuring the twin transition is implemented in a sustainable and inclusive manner. **The case study analysis (albeit limited in scope) clearly shows that where employees were involved, technology adoption led to generally positive outcomes for the workforce**, including:

- Improved physical working conditions;
- Improved job satisfaction, including due to a shift to less repetitive and more autonomous and complex tasks;
- Improved skills and employability; and
- Improved company performance, competitiveness, and/or service quality.

However, the ability of workers and worker representatives to be heard varies significantly between EU MS contexts. Significant and increasing differences between countries' industrial relations systems can alter the ways in which transitions are managed. Interview results have reaffirmed these discrepancies, evidenced, for example, by the Eurofound Industrial Relations Index. While the Nordic and continental European countries (such as Germany, Austria, and the Netherlands) have been repeatedly named as the best performers in terms of social dialogue in the twin transition context, social partners in CEE countries (especially Poland, Hungary, or Slovakia) are weak, inactive, scattered, and facing an unsupportive legal environment.

There are some examples of strong social partner dialogue occurring despite a context of historically weak industrial relations. For example, Spain is a frontrunner in addressing platform workers' precarious working conditions via sectoral collective bargaining. Likewise, good practice case studies of employee involvement in technology adoption have been identified in both the highest performers in Eurofound's Industrial Relations Index (Denmark, Germany) and the lowest scorers alike (Estonia,

Poland)[94]. Finally, this study highlights some examples of policies conducive to fostering transition-related social dialogue. For example, the German Works Councils Modernisation Act grants a series of rights to work councils in cases where the use of AI is planned in a company (this was also explored in the Siemens and Miele case studies).

Nevertheless, social partners' involvement in policy-making at the macro level has generally been limited and insufficient. For example, social partners' influence on drafting the NRRPs has been limited mostly because no such obligation existed; a review of all NRRPs uncovered very few instances of trade unions' engagement in carrying out reforms as outlined in the plans.

Recommendation #2: Embed legal mechanisms at the EU level to push underperforming MS to improve institutional conditions for social dialogue. In the twin transition context, this could include, for example:

- Requiring MS to involve social partners in **setting strategic priorities** related to restructuring, and in monitoring and evaluating main changes (e.g. within the Just Transition Mechanism); and
- Requiring MS to create a **specific mandate(s)** within the national social dialogue framework for consultation on the digital and green transitions

There are key differences between sectors in terms of overall preparedness for and progress in implementing the transitions, as different industries have different needs and face different challenges. While EU- or national- level cross-sectoral agreements and policies can provide overarching principles and guidance, it is primarily what happens at the sectoral and company levels that directly affects workers. At the same time, the quality of sectoral social dialogue (especially in employment-related topics) has been identified as a weak spot at the EU level. Finally, there is a disconnect between content and employment policies–for example, the AI Act proposal does not yet address the effects of AI on employment and the workplace.

Recommendation #3.1: Step up EU-level sectoral social dialogue and extend it beyond content (i.e. industrial) policies to discuss sector-specific social outcomes (especially on employment).

Recommendation #3.2: Consider including social (labour market) goals in sectoral policies. For example, the proposed AI act should address the impact of AI on workers by (for example) putting in place solutions to ensure the fair and transparent use of AI in worker surveillance.

Social partner agreements in the twin transition context are still scarce, both at the EU and national levels (although more examples emerge at the sectoral level). The 2020 agreement on digitalisation concluded by the European cross-sectoral social partners is a good example of an autonomous agreement to be implemented by national social partners (provided that they have the right environment and capacity to implement it). More agreements are necessary that establish principles and targeted guidance on more specific topics. At present, no framework agreement exists in the green transition sphere.

Furthermore, interviewees emphasised the "say-do" gap between what is agreed at the EU level and implemented on the ground. The digital and environmental strategic objectives of the EU are endorsed

[94] Although the "high-scorers" (particularly Germany) exhibit more mature institutional frameworks that support company-level transitions, while companies in low-scoring countries are more likely to act in an "institutional vacuum" and without formal representation or with only "accidental" representation (i.e. born out of a specific company context and not easily replicable). Furthermore, thanks to this institutional framework, it is likely that there are simply more high-involvement companies (as a percentage share) in "high-scorers" than "low-scorers" (as evidence in section 1.4 shows).

by the European social partners, yet not by all national-level confederations and federations, which have varying capacities to address them.

Recommendation #4.1: Address important policy gaps (such as the AI impact on employment and workplace) via EU-level sectoral and cross-sectoral agreements.

Recommendation #4.2: Improve vertical coordination between EU and national social partners.

Interview results suggest social partners often lack the capacity to adequately engage in debates on the future of work, formulate priorities, and effectively pursue their agenda. Trade unions face particularly significant challenges, including decreasing membership rates and thus representativeness (partly due to restructuring from sectors with high union density to sectors with low or lacking unionisation), unsupportive institutional environment, sometimes old-fashioned practices and inflexible internal structures (preventing the inclusion of new members), and insufficient access to funding and capacity building. While EU-level social partners produce many awareness raising campaigns and deliver training courses to their national members, there is room for greater policy action in other areas.

Recommendation #5: Provide more direct funding and support to social partners (particularly trade unions), including:

- **Funding for research, training, and expertise building**: As technologies become more complex, trade unions need to build high-level technical knowledge to correctly identify challenges stemming from them and propose adequate solutions;
- **Incentive schemes to develop innovative practices**: Social partners need to step into the digital age more firmly and harness the potential of technology to their advantage;
- **Infrastructure for good practice and knowledge exchange**: Innovative practices already exist, but need to be better disseminated and adopted on a broader scale; and
- **Platforms for dialogue on future-oriented subjects**: Social partners could benefit from better structures to hold broader discussions surrounding the future of work (particularly between trade unions and employer organisations).

Additionally, while EU and national policy can provide minimum standards for a just transition and inclusive procedures, social partners could be more engaged in implementing the transition at the sectoral or company level, addressing context-specific challenges more thoroughly. **The analysis of company-level practices of employee involvement indicates positive outcomes for both employers and employees**. However, the involvement of workers and worker representatives could be further strengthened. For example, employees were more likely to be involved in adapting the technology to their workplace and normalising new work processes (i.e. task discretion), but were often disconnected from the discussions on technology's broader impact on the company (organisational participation). In most cases, employees were excluded from decisions about whether and what technology to adopt, which were mostly made unilaterally by the employer and often driven by external factors such as the Covid-19 lockdown, availability of public funding for decarbonisation, or other competitive pressures. Exceptions include the PGNiG case study, where the decision to modernise was driven primarily by worker request (and subsequent negotiations of company-level trade union representatives) and related directly to improving their physical working conditions, as well as the Siemens case study, where workers were encouraged to suggest new projects and ventures related to the green and digital transitions.

Furthermore, workers were more likely to get involved in technology adoption directly rather than indirectly (i.e. via representative bodies).

Where worker representatives were involved, they were more likely to flag and negotiate issues beyond workers' task discretion such as privacy and surveillance. For example, in the Rold case (Italy), the digitalisation process was implemented mostly based on direct employee participation (including consultations and training), but trade union agreement ensured that new technology would not be used to monitor employees. In both German case studies (Miele and Siemens), the involvement of work councils was more substantial, not least because of a more conducive institutional and legal framework.

Therefore, trade unions could boost actions that help workers get involved in earlier stages of technology adoption and discuss broader impacts on the workplace (beyond task discretion). As the example of Miele (Germany) shows, trade unions can facilitate a successful transition by providing relevant guidance or tools (in this case, a "compass for digitalisation"). This case exemplifies well-established tools and mechanisms to involve workers via a combination of involvement models (direct and indirect) and at different levels (including supportive federal legislation, a guiding tool developed by a sectoral trade union, and involvement of works councils at the company level). But, if provided with the right conditions, trade unions can facilitate the twin transition in a less conducive environment as well. In Poland, the trade union representative was a main driving force behind pushing the company (PGNiG) to adopt technology for the benefit of workers. Although this exemplifies a more stand-alone case with pro-active action of a single person (trade union representative) with little systemic support, it shows that action can be effectuated at micro level.

Recommendation #6: Support trade union action directed at workers and workplaces (micro-level), such as developing or sharing tools, practices, and guidelines for successful transitions, or organising and funding training.

EU legal measures that aim to empower worker representatives at the company level already exist. However, their implementation often remains unsatisfactory or unclear (i.e. difficult to measure or quantify). The issue of building awareness of the changes taking place cannot be avoided (see the point above). Furthermore, there is a lack of recent empirical research on the current functioning of works councils (particularly in those countries where, prior to the implementation of the ICFD, unions were the only channel for employee representation); identifying countries and sectors where the Directive is ineffectively implemented would require further investigation. These results can inform proposals on how to adapt the Directive to the particular challenges faced by different Member States and sectors. In the case of the EWC Directive, the question of enforceability is particularly salient, as there remains limited access to justice and sanction mechanisms.

Recommendation #7.1: Conduct thorough research on the ICFD state of implementation to identify key challenges and suggest improvements to the Directive and further action.

Recommendation #7.2: Strengthen the right to information and consultation in transnational corporations by reinforcing the EWC's access to court and adequate sanction system. It also seems appropriate that all bodies for information and consultation in transnational corporations–irrespective of the moment of their establishment–should be subject to the minimum legal standards resulting from the Directive.

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ANNEX: PERSONS/ORGANISATIONS INTERVIEWED

A total of 22 people were consulted for the purpose of this study. Interviews took place between May and July 2022 and were conducted online using videoconferencing software, unless stated otherwise below. All interviewees are anonymised.

Interviews were conducted in two strands. First, representatives of eight EU-level social partners (including six trade unions and two employers' organisations) have been interviewed to provide insights into the macro-level state-of-play of social dialogue in the twin transition context. Social partners involved were as follows:

- BusinessEurope;
- European Confederation of Independent Trade Unions (CESI);
- European Trade Union Committee for Education (ETUCE);
- European Trade Union Confederation (ETUC) (written responses);
- European Trade Union Institute (ETUI);
- European Transport Workers' Federation (ETF);
- SMEUnited; and
- UNI Europa.

Second, 14 people have been consulted to inform eight company-level good practice case studies of employee involvement in technology adoption:

Case study	Interviewees
#1: BORGinsole	Company representative
#2: Helmes	Two company representatives and an employee (a group interview)
#3: Køge Gymnasium	School representative
#4: La Fageda	Company representative
#5: Miele	Trade union representative (IG Metall)
#6: PGNiG	• Company representative • Trade union representative (NSZZ "Solidarność")
#7: Renault	• Trade union representative (Force Ouvrière (FO)) • Trade union representative (Confédération générale du travail (CGT))
#8: Rold	• Company representative • Two employees (written responses)

This study overviews the impacts of the twin (digital and green) transition on the labour market and the workplace. It explores the role and presents good practice examples of employee involvement, both via social dialogue and collective bargaining and direct co-decision making, in shaping the transition at the macro and micro levels. Finally, the study summarises the main legislative and policy measures adopted at the EU level to foster employee involvement.

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