Industry 5.0: Why should workers care?

Introduction

We are living in an interconnected world with a data-driven industry. Indeed, the wide adoption of multiple digital technologies has led to a substantive shift in the way added value is created in industry. The digital revolution entails a deep transformation of industry, as it will digitally connect processes and systems across the whole production system. It establishes networks that link machines, products, workers, customers and suppliers, with the help of big data, advanced automation and smart robots. Therefore, digitalisation is a game changer on many levels, with a huge potential to improve the efficiency and reliability of industrial processes, as well as the quality of products and services. In this way, it can support Europe's industrial leadership, contribute to finding solutions for the big societal challenges of today, and sustain high-quality employment. Furthermore, by reducing the carbon footprint and improving resource- and energy-efficiency of processes and products, digitalisation can also contribute to the green transition. Digital technologies, however, if not utilised in the right way, can also contribute to carbon emissions. Striking a balance between leveraging digital technologies and minimising their carbon footprint is imperative to achieve a reduction in emissions.

But the digitalisation of industry will also have major implications for the quantity and quality of jobs: job roles that will disappear or be transformed, new digital skill sets that will be required, risks for monitoring and control of workers. It raises several major concerns for European workers in industry, being the primary users of digital AI systems, who will bear the burden of the potential risks associated with these technologies.

For trade unions, it is important to note that digitalisation and artificial intelligence (AI) do not automatically lead to good or bad jobs. New technologies have often reduced arduous or repetitive tasks and have been a vector of social progress (shorter working hours, improvement in health and safety, etc.), but they have also often led to an intensification of work and in workers being workers' skills and know-how being eroded. The outcome for workers depends on how digitalisation and its applications are shaped and used at all levels in the workplace: from the legal framework, through regulation, to a tailor-made approach through social dialogue and collective bargaining, especially at sectoral and company level by the social partners.

IndustriAll Europe has been calling[1] for algorithms and systems that do not merely substitute human labour and increase work intensity. Nevertheless, these systems should augment human labour and protect humans from fatigue and a loss of autonomy at work, without leading to deskilling or technological determination. The focus should be on collaboration to enhance good industrial jobs[2].

From Industry 4.0 to Industry 5.0

The idea behind Industry 4.0 was to increase productivity and efficiency within processes based on digital technologies and connectivity between devices which communicate autonomously with each other along the value chain. However, the concept of Industry 4.0 is mainly focused on technology-driven organisational change (automation) with efficiency at its core. The trade-off between productivity/efficiency and the workers is a topic that comes back often as the shift of productivity came at a human as well as economic cost. Indeed, most companies, by integrating Industry 4.0 with its strong focus on replacing manual workers with automated systems, neglected the fact that human capabilities are the most important asset of any company.

Industry 5.0 advocates for a different approach. By integrating the dimensions of sustainability, human-centrism and resilience in the digital paradigm, industry 5.0 aims to build an inclusive industry that respects workers' rights, supports quality jobs and embraces post-GDP economic[3] objectives.

Industry 5.0 represents an important new development with the potential to have a deep impact on business processes and industrial relations. IndustriAll Europe supports this vision in the context of sustainability and digitalisation. We strongly argue that the 'human-in-command' principle must be behind every application of digital technology in the workplace.

One of the primary criticisms industriAll Europe has regarding the European Industrial Policy is its insufficient focus on the social aspect. We are currently witnessing a profound transformation of the industrial landscape driven by the green and digital transitions. Recognising that the primary actors affected by this transformation are the workers themselves is essential. Therefore, any policy aimed at addressing this industrial shift must consider the world of work and prioritise the wellbeing of workers.

The proposals put forth by European legislators have lacked this crucial focus on the social dimension. Recognising this gap, industriAll Europe has chosen to engage in discussions about Industry 5.0. This concept offers a concrete framework through which industrial policy can align with our social demands, ensuring that workers are not left behind in the face of green and digital transition.

Fortunately, the European Commission has recognised the significance and potential of Industry 5.0 for industrial policy and begun to address it. In November 2023, the Commission initiated its efforts on this topic through the Community of Practice (CoP 5.0). The primary objective of the Community is to conduct thematic analysis, focusing on the learning ecosystem approach, and to develop a prototype for the Industry 5.0 learning and assessment tool.

The essence of Industry 5.0 lies in the shift "*from efficiency to sustainability and resilience,*" serving as a crucial link between society and industry. At the same time, through the shift of focus from technology-driven progress to a thoroughly human-centric approach, it also introduces a social dimension, often forgotten. Consequently, companies of the future will have to embrace the wider perspective of a value-

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[1] https://news.industriall-europe.eu/Article/924 and https://news.industriall-europe.eu/Article/901
[2] Defining Quality Work: An ETUC action plan for more and better jobs
[3] A post-growth economy puts life, and everything needed to maintain it, at the centre of economic and social activity. It recognises that on a planet of finite material resources, extractive economies and populations cannot grow infinitely. Read more: industriAll Europe Policy Brief: Industry 5.0

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driven approach besides the focus on profitability. In this way, Industry 5.0 aims to shape the digital revolution in a smart, green and human-centred way.

Human-centric pillar

The human-centric approach in Industry 5.0 reframes the narrative around workers. They are indispensable resources, essential for driving innovation, productivity and wellbeing of a company, rather than a cost to be minimised. Industry 5.0 departs from workers as an economic output: it places a higher value on people, outside a strictly economic vision. At the core of this approach is the acknowledgement that workers are not just passive participants in the production process, but active contributors, whose involvement and empowerment are critical for achieving organisational goals. Fostering greater equality and empowering workers doesn't just complement growth within a company, it stimulates growth itself. It is not merely an accessory to growth but a fundamental incentive driving it forward.

In an environment characterised by rapid technological advancements and evolving market dynamics, businesses must equip their workforce with the skills and knowledge necessary to navigate and thrive amidst change. This entails investing in upskilling and reskilling initiatives that enable employees to acquire new competencies, adapt to emerging technologies, and seize opportunities for growth and development. While Industry 4.0 was primarily focused on rapid automation, in some cases it created distrust and insecurity among workers about their potential to adapt to the new technologies and about their future employment in the company. This approach aligns with industriAll Europe's approach to Just Transition which foresees workers as actors in their own destinies.

Benefit for workers

The human-centric approach emphasises the importance of anticipating and adapting to change proactively. Ultimately in Industry 5.0, workers are recognised as a valuable resource rather than a mere expense. By acknowledging and nurturing the intrinsic value of workers, companies can establish a sustainable and thriving workplace environment where workers feel appreciated, motivated and empowered to contribute significantly to their organisation's success.

Industry 5.0 aims to combine the efficiency of digital technologies with the creativity, skills and capabilities of workers. It aims to adapt digital technologies to the needs of industrial workers and to create a safe and inclusive workplace in which workers will feel empowered. By advocating a meaningful interaction of humans and machines, and by putting workers centre-stage in the digital transformation, Industry 5.0 aims to fully leverage human capabilities.

Industry 5.0 places workers at the forefront of operations, valuing them as pivotal contributors to the entire organisational ecosystem, unlike traditional models that often quantify workers solely in financial terms. Within this paradigm, workers are regarded as fundamental resources rather than burdens. Their diverse knowledge, skills and experiences drive innovation and continuous advancement in the company. By actively involving workers in decision-making processes and granting them autonomy in their roles, companies can unleash their full potential.

Industry 5.0, with its focus on human-centricity and placing the workforce at the centre of production processes, can play a vital role in addressing the twin transition. By reinforcing the role and contribution of industry to society, Industry 5.0 can bring the social (human-centric) dimension to the twin transition. As Industry 5.0 includes empowering workers and having them as a key element of the decision making process, this will also strengthen collective bargaining in the workplace. Collective bargaining is also about ensuring a fair digital and green twin transition and a fairer society. In countries where collective

bargaining structures are strong and work well at all levels, and in which social partners have room to negotiate, especially at the sectoral level, we can see that the transition is much more advanced and benefits everyone[4]. An example in which the human principle is included is the Framework Agreement on Digitalisation[5], which was signed by the European Social Partners in 2020. This Agreement allows employers and unions to jointly address digital transformations with a focus on a human-orientated approach, at national, sectoral, and company levels.

Risks for workers

A common expectation in this respect is that Industry 5.0 will enable a shift in workers' activities, from operational to supervisory, coordination and planning tasks, and from manual to data-driven and more analytical tasks. However, despite the strong focus on 'man and machine' working together, and workers in control of machines (and not vice versa), it is important to identify the risks of further digitalisation of working life:

- polarisation between jobs with high educational requirements, well-paid jobs in industry and jobs with lower requirements for skill-sets, low-paid jobs in related services.
- wage polarisation.
- Widening differences between regions with and without industries embracing Industry 5.0, and the framework to support these industries.
- growing numbers of digital gig workers.
- increases of the digital divide in the workforce.
- advanced surveillance and monitoring of workers with algorithmic control, leading to intensification of work and loss of privacy.
- AI able to generate content and automate non-routine tasks (and thus taking over the work of high-skilled workers).
- reduced autonomy of workers as they have to closely follow instructions from digital systems.

It is essential to acknowledge the risk of human centricity manipulation or misuse to the harm of workers. Companies may adopt superficial human-centric initiatives or programmes without genuinely committing to improving the working conditions or opportunities for their workers. This can include implementing wellness programmes or employee engagement activities as mere window dressing, without addressing underlying issues such as low wages, lack of job security, or toxic workplace culture.

Overall, while human-centricity has the potential to drive a 'good jobs' agenda and to create a positive and empowering work environment, but companies' commitment is crucial to ensure that it is implemented authentically and ethically.

> In order to ensure that the human-centric pillar benefits workers, we demand that:
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> - Digital technologies are used to support workers rather than replacing them, to improve health and safety at work and reduce physically arduous work. They should respect fundamental workers' rights, like autonomy, privacy, decent working conditions. For industriAll Europe, human-centrism means that technologies should be adapted to the needs of workers and not vice versa.
> - Only if the existing workforce is actively involved in shaping the digital transition will this transition be a Just Transition. Meaningful and timely social dialogue, in which social partners

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[4] From a recent survey-based study by the Organisation for Economic Co-operation and Development.
[5] Framework Agreement on Digitalisation: here

have room for manoeuvre for autonomous collective bargaining, will be key to mitigate the negative consequences of the introduction of digital technologies and to ensure a fair distribution of its underlying benefits. Social Dialogue must take place with strengthened bodies of worker representation in companies, as well as on the level of value chains and sectors. IndustriAll Europe calls for improving workers' rights to information, consultation and participation, together with a stronger focus on the twin green and digital transition at company and value chain/sectoral level.

- Greater attention to vocational training and lifelong learning[6], and to fostering a learning culture at company level; the need for prospective studies and granular mapping to identify future needs in regions in terms of skills.
- Investment in upskilling and reskilling the workforce, with tailor-made solutions for workers in particular situations.
- Workers' representatives and the workers must be involved in the training programmes necessary to upskill/reskill workers in their working life, to enable them to use new technologies. This involvement should be from the creation to the end of the training programmes. Workers and their representatives should be able to propose ad-hoc additional training or support, when necessary, in order to make sure that no worker should be left aside.
- Workers' representatives must be fully - and in a timely manner - involved in the introduction and shaping of new organisational models and digital systems in the workplace.
- Workers and their representatives must be able to make informed decisions on new technologies in the workplace and to properly assess technology before it is introduced in their company. They need to have timely access to meaningful and comprehensive information, and enough time and resources to process it with the support of external experts of their choice.
- Avoiding a dual digital labour market by increasing the digital literacy of workers at all levels and by regulating the digital 'precariat' (the gig workers on the digital platforms).

Sustainability pillar

The sustainability pillar within the context of Industry 5.0 represents a commitment to environmental responsibility, social equality and economic prosperity (the 3Ps: people, planet, prosperity). Sustainability is integral to Industry 5.0's vision of creating a manufacturing industry that is not only efficient and productive, but also environmentally friendly and socially responsible. In this respect, Industry 5.0 strongly draws on circularity and regeneration by breaking the linear 'take-make-waste' economic model and replacing it with a regenerative economy based on re-use and re-manufacturing (e.g. through improved product design that avoids waste). This pillar emphasises the need for businesses to adopt practices that minimise their ecological footprint, promote social inclusion, and contribute to long-term economic viability.

Risks

Implementing sustainable practices often requires significant investments in new technologies, processes, infrastructure and a change of economic model to focus on post-GDP objectives. Additionally, the return on investment for sustainability measures may be uncertain or take longer to materialise, posing financial risks for organisations.

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[6] *Vocational training is distinct from learning how to do a job, which is a matter of acquiring experience within the company. It is a right available throughout life, which includes the acquisition of knowledge and know-how, so that each worker obtains a qualification and retains sovereignty over his or her employment.*

A big risk linked to circularity and sustainability is the practice of **greenwashing** that companies can apply by carrying a false or misleading impression of a company's environmental or social commitment to enhance its reputation or gain a competitive advantage. As businesses increasingly recognise the importance of sustainability in maintaining their competitiveness, there is a temptation to engage in greenwashing to capitalise on the growing demand for environmentally friendly products and practices.

Another risk is the regulatory compliance with environmental regulations and sustainability standards that is essential for businesses operating within the sustainability pillar. However, navigating complex and evolving regulatory landscapes can be challenging, particularly for multinational companies operating in multiple jurisdictions with varying regulatory requirements. This could lead to relocation and outsourcing of activities to regions outside the EU with less stringent regulatory requirements. Therefore, ensuring a level playing field is a necessity and risk.

In order to ensure that the sustainability pillar benefits workers, we demand that:

- The shift to a more sustainable economy has to be strongly integrated into the industrial policy, at European, national and regional levels.
- Environmental policies must also have a strong social dimension which identifies the impacts on the quantity and quality of jobs, involvement of social partners, strong skills anticipation and programmes, health and safety at work and on the population.
- There cannot be a fair sustainable transition without social dialogue. We are calling for a stronger social dialogue and collective bargaining at all levels.
- Companies should take responsibility for the entire lifecycle of their products, from design and production to end-of-life disposal.
- On the company level, raising awareness and acquiring knowledge about what a more sustainable business model, such as circular economy, entails, and its consequences, but also what possibilities and opportunities it offers for the company and employment.
- Only a perspective supported by workers can really make the transition happen. That knowledge must be put to work at all levels where trade unions are stakeholders, from making plans together to outlining trajectories and carrying out concrete actions.
- Corporate Social Responsibility must become an effective tool to take proper account of social, environmental and general interest concerns as part of a company's 'licence to operate'.
- Industries must commit rapidly to make sustainable products the norm, and an extension of the producer's responsibility must be envisaged.
- Internationally, trade and competition policy must guarantee a level playing field and avoid carbon leakage in support of sustainable growth and jobs.
- Workers' representatives must have the necessary means to participate actively in the debate and make proposals related to sustainability. Thus, workers' representatives should be informed of the sustainable actions taken by their employers and also be trained in these key topics.
- Due to climate change, the adaptation of workplace – infrastructure and organisation – should be made to ensure a safe working place for the workers that meets health and safety requirements. Workers' representatives should be entitled to validate that the working conditions are set to cope with the new needs that will appear due to climate change.

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Resilience pillar

Growing geopolitical tensions and the climate challenge have significant consequences for the way companies manage risks. Resilience strategies in value chains include diversification and shortening of supply chains, increasing the modularity and flexibility of production systems, and reshoring of activities. Also, the creation of a circular economy to reduce strategic dependencies related to the access to raw materials is key for enhancing economic resilience.

The resilience pillar within Industry 5.0 focuses on ensuring the ability of businesses and workers to adapt, withstand and recover from disruptions, challenges, and uncertainties. The focus is on creating a robust industrial system that not only remains within planetary boundaries, but which also remains functioning when confronted with unexpected challenges and disruptions. In this respect, Industry 5.0 strives to use digital technologies to create more adaptable production capacities, a more flexible business organisation, and agile, decentralised decision-making processes. Digital technologies are also key in developing circular value chains.

While resilience is essential for safeguarding the stability and continuity of operations, there are risks associated with this pillar that can impact workers.

Risks for workers

The drive towards resilience could indeed imply reshoring of activities and thus bring back jobs lost because of the globalisation of our economies. However, as labour costs in Europe are in general higher, this process could lead to increased pressure on working conditions.

Furthermore, while the circular economy has the potential to create additional jobs in mainly labour-intensive activities, it must be ensured that these sectors offer decent working conditions (which is not always the case today).

In pursuit of resilience, some companies may also implement measures such as automation, digitisation, and restructuring, to enhance efficiency and flexibility. While these initiatives can improve business resilience, they may also result in job displacement or changes in job roles, especially for workers whose roles are susceptible to automation. As part of the digital transformation, there will be a new division of tasks between digital technologies and human workers. Automatable tasks will be undertaken by new technologies, and tasks that require social skills will remain with humans. There will be a need for a different skill set: the so-called human-centred skills or soft skills, that will therefore increase in importance.

The rapid technological advancements and changing market dynamics require workers to adapt and acquire new skills to remain relevant and resilient in the workforce. However, there may be a mismatch between the skills demanded by resilient businesses and the skills possessed by workers. This skills gap can hinder workers' ability to effectively contribute to resilient operations and may lead to underemployment or unemployment in the long term.

> In order to ensure that the resilience pillar benefits workers, we demand:
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> - Due diligence, in accordance with international and European labour standards, and social dialogue in all parts of the circular economy needs to be ensured. Workers must have the right

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and possibility to organise in all segments of the circular economy. The right to collective agreements must be secured.

- Transparency from companies regarding their business practices, supply chains, and environmental and social impacts. This includes disclosing information about production processes and labour practices.
- Investments in re-shoring of activities must be supported by good framework conditions.
- Flexibility arrangements can only be the result of social dialogue; a more flexible work organisation may also not lead to an increase in temporary or precarious jobs.
- Companies, when confronted with disruption, make the most of the available collective intelligence of workers (apply the principle of human-centrism).
- Corporate and social governance.

Implications for industrial Policy

A key aspect of industrial policy lies in its role to facilitate continuous adaptation within the economy. This entails embracing digital transformation, but also going beyond and including the workers in the innovation processes. As such, industrial policy should take into account the broader societal implications of technological change, including potential disruptions to employment and social inequalities.

In the context of Industry 5.0, the implications for industrial policy and industrial workers are profound and far-reaching. Industrial policy should serve as a guiding framework that not only fosters innovation, but also ensures equitable sharing of benefits, safeguards the well-being of workers and mitigates negative consequences.

In essence, Industry 5.0 should provide the necessary framework for industrial policy to drive innovation, share benefits, and ensure that no one is left behind. By embracing these principles, industrial policy can lay the foundation for a resilient and prosperous industrial sector that benefits both businesses and workers alike.

Risks of Industry 5.0

The transition to Industry 5.0 carries with it significant risks and challenges that need to be addressed to ensure its successful implementation and alignment with broader societal goals.

One notable risk is the current lack of widespread awareness and debate surrounding Industry 5.0, as the discussion on Industry 5.0 remains relatively limited and academic. Moreover, there is a concern regarding the potential concentration of benefits from Industry 5.0 within a small elite group. The benefits from Industry 5.0 must be distributed equally. If the benefits of technological advancement are not distributed equitably, this could exacerbate existing inequalities and contribute to social unrest and discontent. Therefore, it is crucial to ensure that the benefits of Industry 5.0 are shared among all stakeholders to promote inclusive growth and development.

Lastly, companies play a significant role in shaping the trajectory of Industry 5.0. However, there is a risk that companies may prioritise short-term profits over long-term sustainability and societal well-being. It is imperative for companies to embrace corporate responsibility and ensure that their actions align with broader societal and environmental goals, thus contributing positively to the transition to Industry 5.0.

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a) Regional Implications

A major risk is the big differences between regions where some regions and their industrial bases are better prepared to adopt Industry 5.0 than others. We are already witnessing unbalanced investment distribution, with the EU Innovation Fund projects being developed mainly in Belgium, Italy, Sweden, France, Spain and Finland.

Project proposal by country
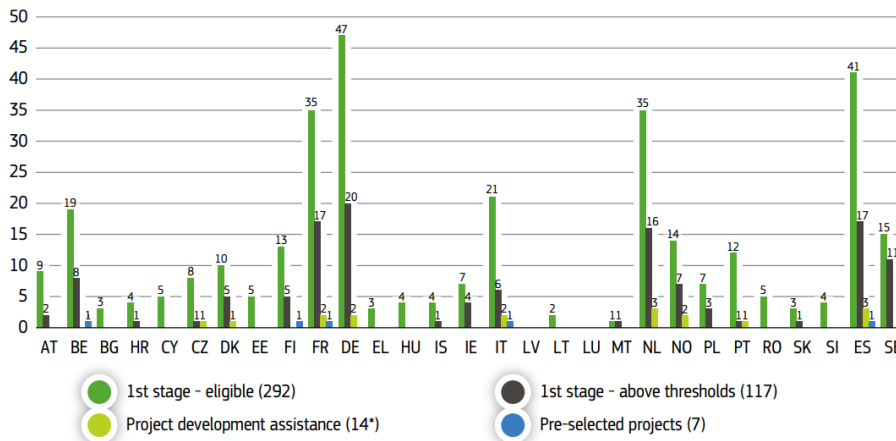
Source: Innovation Fund Progress Report 2022

It is therefore essential that the overall industrial strategy takes into account the regional dimensions as well as the social and territorial cohesion of the European Union.

Industry 5.0 could present an opportunity to enhance European resilience, security and strategic autonomy by implementing regional development plans. This approach not only fosters industrial innovation and competitiveness but also addresses regional challenges, contributing to a more sustainable and robust economic landscape.

IndustriAll Europe's demands regarding industrial policy

- From an industrial policy view, it is important that Industry 5.0 not only focuses on single businesses, but also addresses value chains and ecosystems. It is also key that Industry 5.0 embraces circularity and regeneration, and contributes to reducing the dependency on the import of strategic raw materials, components and energy.
- By promoting digitalisation to achieve societal objectives, rather than to support traditional consumption patterns, Industry 5.0 should contribute to post-GDP objectives.
- Industry 5.0 should build on and integrate existing European policies, such as the Green Deal, the Industrial Strategy, the mapping of transformation pathways for industrial ecosystems, Corporate Due Diligence, the Skills Agenda and the European Pillar of Social Rights. At the same time, these policies should also integrate the vision of Industry 5.0.
- Industrial policy should support the further development and deployment of Industry 5.0 technologies (such as the industrial Internet of Things, big data analytics, cobots and digitalised business processes…) with a view to supporting an environmental and human-centric approach to digitalisation and promoting societal and ecological values.
- European innovation policy should pay more attention to creating sustainable economic models, markets and industrial ecosystems.
- Industry 5.0 should also act as a lever for regional transformation strategies, combining economic and sustainable development with shorter and circular value chains, and with attention to

developing regional competences, deploying Just Transition policies and organising social support policies. By addressing regional challenges, Industry 5.0 can contribute to a more resilient and balanced economic fabric across Europe.

- Support of the creation of stakeholder platforms to develop a common understanding of industry 5.0, including identifying bottlenecks and addressing impediments for its adoption. These platforms should also develop business cases, exchange and scale up good practices and develop programmes for the dissemination of the Industry 5.0 vision.

Conclusion

Industry 5.0 is a revolutionary concept and far removed from the traditional economic model. Despite this, it will not be substituting Industry 4.0 as a chronological continuation or alternative, but it will be contributing to the fourth industrial revolution by ensuring a framework for industry that combines competitiveness and sustainability, allowing industry to realise its potential by putting human-centricity at its core. Industry 5.0 displays a way of framing how the European industry of the future and emerging societal trends and needs will co-exist. Industry 5.0 is not a new industrial revolution. It is an adaptation of Industry 4.0 to the new realities that have emerged since this concept was introduced: sustainability is today much more important than a decade ago, the notion of resilience is the result of the new geopolitical situation.

It is important to improve the understanding of Industry 5.0 by making workers at all organisational levels part of the introduction of new technologies and their implications in the organisation of work. Timely information and consultation at company, value chain and sectoral level must accompany the introduction of digital technologies to mitigate possible negative implications and ensure a fair distribution of the benefits. Only by making workers part of the decision-making processes regarding the introduction of new technologies, can a common understanding of the impact of these technologies be achieved.

As Industry 5.0 is still a largely theoretical concept which still needs to be put into practice, it is important to develop business cases, implement action programmes and organise the exchange and scaling-up of good practices. This will require a sustained political commitment, underpinned by social dialogue and collective bargaining, needed at both European, national and regional levels. IndustriAll Europe and its members are willing to contribute to the introduction of the Industry 5.0 principles in the companies and sectors where they are represented.