

# Green Skills, Workplace Innovations and Just Transition

## Introductory notes

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Climate change, digitization, rapid transitions, shifting demographics and public health imperatives create new conditions and demands within organisations, driving the need for skill development, workplace innovations, organisational development and updates to occupational health and safety. Technologies such as AI, algorithms, robots and cobots, and new logistic tools in the value chain, are expected to redefine the interface between humans and machines, bringing new opportunities for advanced decision-making as well as unforeseen impacts on job quality. SDG 8 addressing decent work and economic growth, must thus increasingly be seen in a broader context of social, economic, and technological transformation. Ultimately, the green transformation of private life, society, and work at large must encompass a significant role for democracy and civic participation.

The green transformation actualizes various perspectives of relevance for employment, work, and job quality. It is not only about the implementation of non-carbon energy systems and non-fossil approaches. It concerns the importance of green growth and its impact on productivity, organizations, working and employment conditions and employment levels. These concerns also apply to the circular economy, recycling policies, practices, and processes. In a broader societal context, the socio-ecological transition illuminates interdependencies, potential contradicting demands, changing values and lifestyles, mobility, transport systems, and gender equity all weighed in terms of a fair transition.

The twin challenges of green transformation and digitization, compounded by AI-impact, imply a major transformation of our societies, work organisation and job quality, and the interfaces between the private and public sectors around health care, education, city planning and transport infrastructures. The social, economic and technological transformation has various repercussions on larger cities and regions, smaller cities and municipalities, as well as sparsely populated areas. Looking at the development of green jobs, new work organisations and changing labour market contexts must be seen in their broader societal context.

The changes are also in accord with the Agenda 2030 goals for sustainable development. The process of green transformation occurs at various societal levels, i.e., the macro level, the meso level, and the micro level, actualizing various challenges and threats in a local, regional,

and national perspective according to the EU's Green Deal and FitFor55 initiatives. Green jobs and skills are generic and debated concepts mirroring ongoing developments and transformations of the world of work in a global sense.

These connotations differ between continents, countries, and sectors of the labour market. The mission of this call is in part to identify and share definitions of green jobs and green skills (Castillo, ILO 2023, OECD 2023)<sup>1</sup>. How are green jobs and skills defined, and how are they to be pursued, and by whom? Will the green transformation per se lead to good or better jobs? Or will it bring new and unforeseen OSH-risks? The green transformation actualises challenges and risks, which make it more complex to analyse how the various components of a just transition interact and possibly trade off against each other. Do we anticipate goals and institutional support for a just transition with or without workers? Who is forced to carry the social and economic costs of these climate-oriented and low-carbon initiatives, and who will bring home the benefits - governments, enterprises, and/or social partners? And which new skill demands, forms of job strain and OSH-risks are expressed at the workers' level?

Skill formation and competence development via in-service learning, general and vocational education are necessary prerequisites and conditions to support the development of new, adaptive, and socially inclusive work organization configurations. Some familiar jobs will cease to exist, and new jobs will be created in emerging market segments within a globally interconnected and likely volatile economy, yet some of the actual outcomes will be seen in the future. However, the development will certainly lead to new job openings in a re-defined labour market within the primary sectors, as well as in other sectors.

The EU predicts that the green transformation will create around one million new jobs in Europe. Social partners have a crucial role in the greening of the European world of work by setting standards for good and inclusive workplaces. But employee-generated workplace innovations are also needed to drive and ease the adaptation to the greening imperative. Development towards sustainable change processes in the green transformation will require increased collaborations spanning over traditional boundaries. This requires collaboration by broad active ownership towards joint missions, trust, transparency, and solution oriented problem-solving, and continuous organisational learning. Moreover, strategic development towards green transformation requires considerations from perspectives such as gender equity, integration and protection of migrant workers and immigrants, and open inclusionary policies for people outside the labour market.

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<sup>1</sup> Castillo, Monica, Green jobs, green economy, just transition and related concepts: A review of definitions developed through intergovernmental processes and international organizations, Geneva: International Labour Office, 2023 and OECD (2023), Assessing and Anticipating Skills for the Green Transition: Unlocking Talent for a Sustainable Future, Getting Skills Right, OECD Publishing, Paris, <https://doi.org/10.1787/28fa0bb5-en>.

## Purpose and content

The purpose of this special Issue of the European Journal of Workplace Innovation is to provide enhanced theoretical and empirical understandings of green jobs, green skills and just transition in the global economy, while also taking Europe as a learning community by illuminating the role of formal, nonformal and informal learning contexts and how they can interact with various forms of workplace innovation, competitiveness, and socially sustainable workplaces and inclusive work organisations. More generally, this special issue aims at a mixture of policy visions and political missions, theoretical approaches as well as historical and contemporary empirical case studies, and examples of ongoing firm-level innovations in various sectors of working life that can inspire organisational strategy.

The ongoing green transformation of societies, industries, and work is a complex process that relates to all parts of human life, societal institutions and the health of our planet. As a field of research, it cuts across all faculties of science, disciplines, and research approaches. The problem of climate change and the urgent need to stop further warming of the planet has major repercussions for institutions, communities and ways of organising everyday life, not the least work. It also concerns politics and policies from UN to Europe, all countries, regions and municipalities. The text by the Swedish scholar **Staffan Laestadius**, professor emeritus in industrial technology, highlights the urgency of a universal roadmap to a future sustainable society.

A great transformation of human activities – and thus of working life - is inevitable for planetary reasons. The climate crisis is now so severe that a continuation of business, and life, as usual (BLAU) is not a realistic alternative on a global scale. Within a few decades, certainly within this century, BLAU will cause living conditions for humanity to deteriorate significantly, accompanied by extreme heat waves, large migration, shortage of food and water and not the least, large-scale conflicts due to the increased competition for land and food.

In his paper, Staffan Laestadius highlights the risks and the enormous negative impact on society, working life and biodiversity of the BLAU-strategy. He argues that industrial development and great economic acceleration post-WWII, has created today's climate crisis. Thus, there is a direct relation between energy systems and climate change. The energy input from coal, oil, and gas, has according to Laestadius, been growing by 3 percent annually. The growing Green House Emissions are a threat to biodiversity, and several tipping points are close, or have even been passed.

Emissions must be reduced by up to ten percent per year to reach climate targets. Substantial and critical adjustments are needed not only at work but also in society, including the everyday activities of citizens. The article discusses various policies to de-carbonize society and work life, and shortened working hours and a reduced growth orientation, is one example. The biggest change, however, is not institutional patterns for the pathways to a post-

fossil society. It is, according to Laestadius, “the transformation of our minds, i.e. the paradigm shift in our understanding of the planetary conditions for human activity and work.”

For many years, work was an outlying field in the policy development toward a more sustainable world. Now it is a fully accepted part of the sustainability family. There are still, however, major gaps in the global climate change discourse. Climate change policies could imply and have guidelines for several societal sectors, in which working conditions are embedded factors and not visible at the policy level. In Sweden, the government-supported platform Fossil Free Sweden contains 22 different industries that have produced their own roadmaps to show how they can enhance their competitiveness by going fossil-free or climate-neutral. The working contexts and occupational health risks for employees in these sectors are not so visible, making the challenge of a just transition crucial.

Change is taking place to build bridges between climate change and development in working life. Eurofound has recently published reports looking at the interface between climate change and job quality. The article in this special issue by **Agnes Parent Thirion and Jorge Carbrita** *The job quality side of climate change* is a condensed and augmented version of a Eurofound (2024) report with the same title.<sup>2</sup> It shows that workers will experience the effects of climate change in many ways: job insecurity, changes to their work tasks and responsibilities, and changes in their workplaces that may involve different work practices and the development of new activities and products. Green jobs are found to not always good jobs. In some sectors of the labour market, there could be exposure to hazards such as chemical substances, leading to lower job quality, productivity loss and greater job and work insecurity. According to the report, nearly half of workers in the EU will experience profound changes in their job tasks as economies adapt to climate change and climate mitigation strategies are implemented.

Other changes relate to work organisations and company structures. There are winners and losers among workers in the green transformations of the labour market. More generally, the article by Parent Thirion and Carbrita outlines the complex relationship between job quality and climate change, including the implication of green tasks in selected sectors. Most articles collected in this Special Issue reflect on the concept of the green transition. Greening of work and companies can also take the form of greenwashing. It is not only necessary to be more sustainable as a general societal goal but being green and sustainable could also be a marketing strategy.

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<sup>2</sup> Eurofound (2024), *Job quality side of climate change*, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/en/publications/2024/job-quality-side-climate-change>

## Thematic structure of the Special Issue

The first section contains the greening of societies and work from an international comparative approach.

In his article, **Steffen Lehndorff**, professor emeritus in economics at the Institut Arbeit und Qualifikation [Institute for Work, Skills, and Training] at the University of Duisburg/Essen, Germany, looks at what policy lessons Europe's Green Deal can learn from the New Deal in US during the 1930s. Which are the policy lessons to be learnt from the New Deal of the 1930s for the political and societal process that is necessary to drive forward a "Green and Just Transition" in contemporary Europe? He focuses the socio-ecological transformation of industry and the importance of trade unions in this process, exemplified by the case of Germany. In a contemporary comparative sense, unions in the US have a weaker position, but the industrial incentives are stronger. His article actualises the balance of power between investors and industry, and social partners. Was the New Deal mostly bottom-up connected, while the Green Deal seems to be more of a top-down strategy? There are both similarities and differences. The New Deal was a strategy to decrease unemployment, combat poverty and give new energy to the field of work and welfare. The Green Deal, however, has a much larger field of transformation recognising the role of biodiversity, nature, energy systems and the fight against greenhouse gas emissions.

**Mathieu Hocquelet and Nathalie Moncel**, Center for Studies and Research on Qualifications (CEREQ), Marseille, highlight the ecologisation of work and firms in France. Their study is based on mixed-method research conducted by a Cereq team from 2020 to 2023 analysing three interconnected levels: employment systems; value chains; and company strategies, occupations, skills, and work activities. Attention is given to the impact of new environmental norms on job structures in three different fields of industry reflected in the dynamics of what is virtuous and what is profitable and how striving for a greener economy interacts with market benefits. Their contribution illuminates the complexity of the green transition on industry and working conditions. The system perspective is applied at three levels: labour market and employment conditions; value chains; and corporate strategies as well as occupation and skills, provides a broader analytic framework than is usually applied. The article also presents the "ecologisation of work" as a generic concept for the analysing the transformation of jobs in a green economy, which can be contrasted with Stroud, et al.'s (2024) concept of "greening"<sup>3</sup>

Another national case is presented by **Warhurst, Harris, Cardenas Rubio, and Anderson**. Their paper reports the findings from an analysis of Scotland, applying the GreenSOC – an adaptation of the green occupation's classification of the US Bureau of Labor Statistics and O\*NET. The analysis uses the UK Labour Force Survey and web-scraped job vacancy data to assess the extent and demand for green jobs as well as the pay and gender composition of

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<sup>3</sup> Stroud, Dean, Luca Antonazzo & Martin Weinel. 2024. "Green skills" and the emergent property of "greening". *Policy Studies*, DOI: 10.1080/01442872.2024.2332441

these jobs. The findings are mixed. First, there are few new green jobs but a strong greening of existing jobs. Second, while green jobs offer higher wages, they tend to be dominated by male workers. Their study has several policy implications for a socially inclusive and gender-relevant transition.

The volume comprises further contributions from Finland, Sweden, South Africa and the UK, more focused on work organisation, job quality and green skills. Thus, the second area concerns the impact of green jobs on work organisation, occupational health issues and job quality. Are all green jobs healthy jobs? The green transition builds on a change to fossil-free energy and a circular economy. In a European context, the major policy initiative is the Green Deal. While this transition needs to be rapid, gains and losses of jobs need to be considered. This may have profound positive and negative effects for different occupational groups as greening of the jobs may both eliminate current risks (e.g. associated with fossil fuels) and introduce new ones. The article on safe and healthy green jobs, by **Albin, Håkansta, Bodin, Wadensjö & Broberg** on Sweden provides examples of such risks to occupational safety and health. It also discusses employment conditions and worker bargaining power in relation to the twin digital and green transition. To reduce the negative effects of the green transition on the health and safety of workers, they suggest that there is an urgent need to establish strategies for *Safe and Healthy Green Jobs*. The authors suggest steps towards such a Roadmap and indicate some key knowledge gaps.

One fundamental area of the green transformation is the role of the circular economy and promoting *resource efficiency* through *reduction, reuse, and recycling*. The present review article by **Sanne, Johansson, Miliute-Plepiene & Karlsson** synthesises the existing scientific knowledge on a sustainable working life in the transformation towards a circular economy: It is based upon the synthesis and critically explores the knowledge needs in relation to circular economy and working life. Its focus is on barriers and enablers; labour market changes; occupational health and safety management, (OHSM); skills requirements; the role for social partners; and policy challenges. The review ends with policy recommendations for research on creating and upscaling circular business models that promote transparency, collaboration, and value creation across supply chains, developing educational programs for stakeholders and the workforce. The focus should also be directed towards job quality and the role of social partners.

The twin challenges of green transition and digitization differ substantially between existing firms and the creation of new industrial clusters to produce new products needed for the greening of industries.

The article by **Säfsten, Harlin, Johansen & Öhrwall** is a process-oriented study on how manufacturing companies and organisations can attain sustainable and resilient production. It focuses on the fact that green transition necessitates that organisations address climate change and increasing uncertainties and how to incorporate sustainable and resilient solutions into their production development projects. The focus is on development practices

in greenfield projects such as building new factories or production systems, and their relation to active ownership, collaboration and learning potentially supporting lasting impact of change initiatives. Through this, the article contributes a new perspective on production development by emphasizing a learning-oriented approach. This learning approach is increasingly required for production development processes in emerging domains, such as the green transition.

This volume comprises two studies on workplace innovation in Finland. The first article by **Moilanen and Turunen** at FIOSH, looks at the interface between work and societal conditions. They find that although learning and innovation are key drivers of sustainability transitions, workplace innovation has gained little attention in the research area. Workplace innovation has the potential to produce local change and development toward environmentally sustainable working life and society, since employees' ideas and initiatives can foster the adoption of environmentally sustainable work practices and processes both at the workplace and within work-related networks. Their article presents an empirical analysis of findings from a representative sample of Finnish employees collected in 2022 in the Climate change and work survey (n=1917), and analyses the results using a mixed methods approach. However, the lack of environmental workplace innovation efforts in Finland indicates that there is a need to strengthen and support local development efforts on green topics.

The other contribution from Finland by **Teperi, Lyytimäki, Heikkilä, Malve-Ahlroth, Mervaala, Ratinen & Thatcher** aims at analysing workplace innovation from human factors theory combined with an ergonomic perspective. They argue that environmental degradation requires workplaces to undergo a profound shift towards ecologically sustainable work that goes beyond continual growth and holds justice and the well-being of workers as a core value. Workplaces have a critical role in realising policies for a just green transition, their structures provide a link through which this transition could be achieved. However, there is a lack of clear and systemic definition and an easily applicable model to guide workplaces to become both just and green (JGT). In this paper, they aim to define the key characteristics of a just green workplace by using human factors/ergonomics (HF/E) as the underlying theoretical approach. Based on the findings, they present criteria/recommendations for a just green workplace. In addition, the value and development needs of the HF/E approach in fostering sustainability are discussed.

Another theme in this volume concerns the importance and value of green skills.

**Gustavsson, Halvarsson Lundkvist and Persson Thunqvist** highlight the role of higher vocational education in the green transformation of the labour market, work organisation and jobs. The manufacturing industry is undergoing a significant transformation, characterised by a green transition and rapid digitalisation. Technological advances have dominated Industry 4.0, whereas the transition to Industry 5.0 emphasises improving technology from a human-centric lens. This necessitates focusing on digital and green skills development to accelerate the green transition in industry. Within the context of Swedish higher vocational



education (HVE), this paper aims to investigate HVE providers' experiences of challenges in providing industry with the skills needed for green transition. Interviews were conducted with 22 representatives of HVE providers collaborating with industry. The findings indicate that there was an imbalance in pace between HVE and industry caused by various challenges at three transitional levels, i.e. individual level, company level and, finally at the level of recruitment of students.

Based on research to identify environmental skills needed in the South African mining industry, and other sectors, **Eureta Rosenberg** proposes in her article a few methodological innovations. One is to expand the standard value chain analysis, by using a critical realist methodology that also looks for absences: value that should be there but is currently destroyed or untapped. An example is the restoration of mined land, a form of regenerative economy with the potential to reduce value destruction and create new social, economic and ecological value. Identifying such leverage points can show up the possibility of new or re-configured jobs in the transitions to more sustainable development, in this case a transition away from coal. Another innovation involves the identification of the associated skills requirements. More than technical skills are needed, but just what do so-called 'soft skills' entail, and how can they be developed? The paper concludes with tools to apply at the organisational level for green skills needs analysis, using a framework of technical, relational and transformational competencies, in support of the quest for green growth in senescent or at-risk value chains.

## Green transformation at risk? Concluding remarks

At the end of the volume, Kenneth Abrahamsson, guest editor for the special issue, reflects on the future of climate change, green jobs and the green transformation from a policy perspective. In addition to that, Peter Totterdill, Frank Pot and Paul Preenen give their views on theoretical and conceptual approaches to support change in the workplace in an innovative way.

Postscript reflections were authored by **Richard Ennals** on work-life research in retrospect. This paper is written based on a series of concurrent discourses and dialogues over the last 50 years, as a researcher, research manager, writer and editor. This meant starting from a UK perspective on Skill and Justice, with the work of John Bellers, then moving to Scandinavia, and ending with a European synthesis and international systematisation, where we can regard our ongoing differences as a crucial resource for sustainable development.<sup>4</sup>

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<sup>4</sup> As was mentioned previously, Richard Ennals, editor in chief for European Journal of Workplace Innovation, passed away late autumn 2024. His postscript reflects his analytic mind and research interests being part of his life-achievements.