



SECOND INTERNATIONAL AND
INTERDISCIPLINARY CONFERENCE

THE FUTURE OF THE HUMAN WORKFORCE

Book of abstracts



Nadia Molek, Vesna Grabnar
Editors



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Second International and Interdisciplinary Conference

The Future of the Human Workforce

Book of abstracts

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Nadia Molek and Vesna Grabnar, editors

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Conference Coordination: UNM FOŠ, Slovenia

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9:15-9:45	THE CHANGING WORLD OF WORK – FUTURE OR REALITY Irene Mandl (CEDEFOP) Moderator: Sílvia Costa Agostinho da Silva (ISCTE).	
9:45-10:00	Summary of the project (Reinhilde Pulinx, UCLL)	
10:00-10:10	<i>Coffee break</i>	
10:10-11:40	WORK, RIGHTS & EMPLOYMENT RELATIONS Moderator: Reinhilde Pulinx (UCLL) Aljoša Polajžar – Covert Monitoring at the Workplace. Aleksander Łoziński – AI and the Future of Work: Assessing Employee Readiness and Emerging Competencies. Alper Yilmaz - Towards a Just Transition Insurance Mechanism Integrating Climate Risk, Social Protection, and Green Finance. Andrieș, Gabriel-Bogdan; Andronic, Răzvan-Lucian; Găină, Liviu; Meclea, Mihai-Alin; Baiu, Cătălin - The Impact of Artificial Intelligence and Automation on Human Resources in the Air Defence Forces	AI, SKILLS & HUMAN–TECHNOLOGY RELATIONS Moderator: Nikola Abramović (Fpep, Univerzitet Adriatik Bar) Alexander van Biezen – Artificial General Intelligence and the Future of Work. Opportunities, Risks, and Adaptation. Lejla Imamović Lerić – Human–AI Coexistence in the Workplace: A Systematic Synthesis of Skills, Trust, Job Quality, and Well-Being Perspectives-Literature Review. Safiya Adejoh: Decarbonization and the Subsurface Workforce: Mapping Skills Transferability for CCUS in Nigeria’s Energy Transition
11:40-11:45	<i>Coffee break</i>	

11:45-13:15 POST WORK SOCIETIES IN THE EU AND BEYOND

Moderator: Nadia Molek (UNM FOŠ)

Talk with Dan Podjed (ZRC SAZU, FF-UL), **Elisabetta Costa** (University of Antwerp), **Enrique Fernandez Macias** (Joint Research Centre of the European Commission), **Lilla Mária Vicsek** (Corvinus University of Budapest).

13:15-14:30 *Lunch*

14:30-15:30 ROBOTICS AND AUTOMATIZATION TODAY AND IN THE FUTURE.

Moderator: Nika Brili - Rudolfovo

Rok Struna (Rudolfovo) Advance Support for Smarter Production

Vinko Longar (Rudolfovo) Autonomous Laboratories and the Future of Scientific Work

Jastin Zagorjan (Rudolfovo) Should Your Next Employee Be a Humanoid Robot?

15:30-15:45 *Coffee break*

15:45-16:45 EUROPEAN ROUND TABLE ON THE FUTURE OF HUMAN WORKFORCE

Moderator: Maruša Gorišek (UNM FIŠ)

Stelina Chatzichristou (Cedefop), **Ernest Ženko** (UPR)

16:45-17:00 Closing remarks (Nadia Molek, UNM FOŠ and Reinhilde Pulinx, UCLL)

FOREWORD

The world of work is undergoing profound transformation. Artificial intelligence, automation and robotics are reshaping occupations and workplaces, while demographic change, the green transition, new forms of employment and changing expectations around skills, equality and well-being are raising broader questions about the future of the human workforce.

The **Second International and Interdisciplinary Conference – The Future of the Human Workforce** brings again together researchers, practitioners, policymakers, and representatives of European institutions to discuss these transformations from different disciplinary and professional perspectives. Rather than approaching the future of work as a purely technological question, the conference considers how technological, social, economic, and institutional changes interact, and what they mean for workers, organisations, and societies.

The contributions collected in this Book of Abstracts reflect this interdisciplinary approach. They address topics ranging from artificial intelligence, robotics and automation to employment relations, occupational safety, skills, the green transition, and human–technology relations. Together, they invite us to consider not only how work is changing, but also how we want to shape that change and what kind of human workforce we want to develop for the future.

The conference is organised within the framework of the **TRANSFORM project**, funded by the European Union under the CERV-2023-CITIZENS-CIV programme.

We warmly thank all authors, speakers, moderators, committee members, project partners and participants for contributing their knowledge and perspectives to this shared discussion.



Dr. Nadia Molek
Conference Chair

ABOUT THE TRANSFORM PROJECT

TRANSFORM is a European project funded under the **EU Citizens, Equality, Rights and Values (CERV) programme**, bringing together partners from different European countries to explore the transformations shaping the present and future of the human workforce.

The project examines the future of work from an interdisciplinary perspective, considering the interaction between technological change, demographic developments, the green and digital transitions, changing skills requirements, employment relations, equality, well-being, and social inclusion. Particular attention is given to how these transformations are experienced by workers and organisations and to the role of public policies, institutions, and social dialogue in shaping more inclusive and sustainable futures of work.

Throughout the project, TRANSFORM has combined research with participatory activities involving researchers, workers, employers, policymakers, civil society organisations and other stakeholders. Surveys, focus groups, expert discussions, conferences, ethical panels, public debates and foresight activities have provided different spaces for examining current challenges and discussing possible responses.

The **Second International and Interdisciplinary Conference – The Future of the Human Workforce** forms part of this wider process. It provides a space to bring together perspectives generated within the project and contributions from the wider academic and professional community, encouraging dialogue about the technological, social, ethical, and institutional dimensions of workforce transformation.

PLENARY SESSIONS

THE CHANGING WORLD OF WORK – FUTURE OR REALITY?

Moderator: **Sílvia Costa Agostinho da Silva (BRU-ISCTE)**

Irene Mandl

Cedefop

Abstract

Technological, societal, demographic, economic and environmental megatrends are increasingly affecting work and employment in Europe and beyond. Additionally, short- and longer-term shocks influence the structure of the labour market. Employers and workers will have to adapt to ensure a competitive future of Europe. But: when does the future start?

Keywords: *future of work, labour market, employment, Europe, adaptation, technological change.*

POST WORK SOCIETIES IN THE EU AND BEYOND

Moderator: Nadia Molek

Dan Podjed (ZRC SAZU, FF-UL), **Elisabetta Costa** (University of Antwerp), **Enrique Fernandez Macias** (Joint Research Centre of the European Commission), **Lilla Mária Vicsek** (Corvinus University of Budapest)

Abstract

What happens if technological development allows us to work less—or makes some forms of human labour increasingly unnecessary? In this session, Nadia Molek will explore this question in conversation with Dan Podjed, Elisabetta Costa and Lilla Mária Vicsek, bringing together different perspectives on work, technology, and social change.

The conversation will consider what might happen if paid work becomes less central to our lives. What would this mean for income, inequality, identity, social participation, and the meaning of work? Could automation create greater freedom and leisure, or might it deepen insecurity and exclusion? And if machines increasingly perform human work, who owns them, who benefits, and who gets to shape the societies that emerge?

The session will discuss technological utopias and dystopias, who benefits from automation, where human agency remains, and what kinds of post-work futures we might want to build in Europe and beyond.

Keywords: *post-work society, future of work, artificial intelligence, automation, universal basic income, meaning of work, human agency, inequality, technological change.*

ROBOTICS AND AUTOMATIZATION TODAY AND IN THE FUTURE

Moderator: Nika Brili (Rudolfovo - Science and Technology Centre Novo mesto)

Advance Support for Smarter Production

Rok Struna

Rudolfovo - Science and Technology Centre Novo mesto
rok.struna@rudolfovo.eu

Abstract

In modern manufacturing environments, alarm messages typically indicate that a deviation has occurred, but they often provide limited guidance on how the problem should be resolved safely and efficiently. Operators therefore rely on internal documentation, service records, online sources, or experienced colleagues, which can increase downtime and make troubleshooting dependent on informal knowledge. An AI-based assistant was developed to support fault diagnosis and decision-making by combining knowledge retrieval with real-time process context. The solution integrates internal documentation and selected external sources with alarm events, process and signal data, visual information, and operator feedback. While document-based information is sufficient for many well-documented faults, more complex situations often require an understanding of the current state of the production cell and the sequence of process events. The system therefore provides structured recommendations based on the available context, while keeping the operator in the decision loop and allowing predefined actions to be executed only after confirmation. The proposed approach aims to reduce the time from fault detection to the first meaningful decision, improve the consistency and traceability of troubleshooting procedures, and provide practical context-aware AI support for industrial environments.

Keywords: *industrial AI, manufacturing, fault diagnosis, decision support, process data, operator support.*

Autonomous Laboratories and the Future of Scientific Work

Vinko Longar*, Jastin Zagorjan, Jožica Piškur

Rudolfovo - Science and Technology Centre Novo mesto
vinko.longar@rudolfovo.eu

Abstract

Autonomous laboratories represent a transition from conventional laboratory automation toward experimental systems capable of independently executing, evaluating, and iteratively improving experiments. By combining automated instrumentation, real-time data acquisition, machine learning, and closed-loop optimisation, these systems can increasingly support decisions that have traditionally depended on continuous human intervention. This contribution explores autonomous laboratories not only as a technological development, but also as a transformation of scientific work. A developing autonomous laboratory for materials research is presented as an example, integrating material synthesis, electrochemical characterisation, application testing, and data-driven optimisation within a connected experimental workflow. The concept illustrates how repetitive experimental execution and data collection can gradually shift toward machine-assisted decision making and adaptive experimentation. As laboratory autonomy increases, the role of the researcher is consequently expected to evolve from primarily executing experiments toward defining research objectives, designing experimental strategies, supervising autonomous systems, interpreting results, and making higher-level scientific decisions. Autonomous laboratories therefore have the potential to reshape both the efficiency of experimentation and the skills required for future scientific work.

Keywords: *autonomous laboratories, laboratory automation, artificial intelligence, closed-loop experimentation.*

Should Your Next Employee Be a Humanoid Robot?

Jastin Zagorjan

Rudolfovo - Science and Technology Centre Novo mesto,
jastin.zagorjan@rudolfovo.eu

Abstract

We will present different types of humanoid robots, explain how to choose the most suitable robot based on the production workflow, and discuss what it takes to implement it into an already automated or semi-automated production line. We will point out common challenges and misunderstandings surrounding humanoid robots.

In some cases, there is a misunderstanding that a humanoid robot is simply a device that can be plugged in and programmed like a conventional industrial robotic arm. However, this is far from the case. These kinds of robots require a different approach to “programming” or “teaching,” which requires a deep understanding of production workflows, ergonomics, kinematics, and the various adaptations needed for successful integration in a industrial environment.

The most important part of successfully integrating a humanoid robot is its training. Successful training is influenced by an array of environmental factors, such as lighting, the surface of the workpiece, the shape of the workpiece, and the overall infrastructure of the production plant. In addition to these factors, it is necessary to consider all the hardware required for time-efficient training of this kind. It is also necessary to account for the time required to set up a training environment that can mimic the real-world environment in which the humanoid robot will operate.

Keywords: *humanoid robot, humanoid robot training, reinforcement learning, NVIDIA Isaac Lab, NVIDIA Isaac Sim, virtual environment.*

EUROPEAN ROUND TABLE ON THE FUTURE OF HUMAN WORKFORCE

Maruša Gorišek (UNM FIŠ), Stelina Chatzichristou (CEDEFOP), Ernest Ženko (UPR)

Abstract

Artificial intelligence, robotics and automation are no longer distant scenarios: they are already transforming occupations, tasks, skills and workplaces across Europe. Yet technological capability alone does not determine the future of work. How these technologies are introduced, which tasks are automated or augmented, and how workers and institutions respond will shape whether technological change strengthens human capabilities or contributes to displacement, deskilling and new inequalities.

This European Round Table brings together complementary perspectives on technology, skills and the human workforce. Moving from current developments in robotics and automation to emerging skills needs and the ethical implications of AI, the discussion will explore how technological change is reshaping both what people do at work and what they need to know to remain active participants in changing labour markets.

The round table will address a central question: How can Europe harness technological innovation while preserving and developing human knowledge, skills and agency? Particular attention will be given to the risk of deskilling and the erosion of professional expertise, changing skills requirements and lifelong learning, and the relationship between humans, AI and increasingly autonomous technologies. Rather than asking simply whether technology will replace workers, the discussion considers what kind of human workforce Europe wants to develop alongside technological change.

Keywords: *future of work, artificial intelligence, robotics and automation, skills and lifelong learning, deskilling, human agency.*

WORK SESSIONS

COVERT MONITORING AT THE WORKPLACE

Aljoša Polajžar

*University of Maribor, Faculty of Law,
aljosa.polajzar@um.si*

Abstract

The development of information and communication technology (ICT) and artificial intelligence (AI) has brought numerous new possibilities for employers to control workers at the workplace. As has already been extensively discussed in literature the surveillance of a worker constitutes an interference with the worker's right to personal data protection. Therefore, the main problem (especially for employers) is where to draw the line between lawful and unlawful monitoring (surveillance).

In the European regional legal framework (Council of Europe and the EU) the most important standards for assessing the limits of permissible monitoring stem, inter alia, from the ECtHR case law, the provisions of the GDPR, and of the AI Act (in case the monitoring systems are based on AI).

However, gaps in legal science and EU case-law remain. The presentation addresses the question of whether covert surveillance at the workplace is (im)permissible and what are the consequences of impermissible monitoring – from the perspectives of ECtHR case law, the GDPR and the AI Act. Methodologically relevant case law and legal acts are analysed with a normative-dogmatic method of legal science. The added value and innovative aspect of this presentation lies in the fact that, in relation to covert monitoring in the workplace, it addresses and combines aspects of both ECHR and EU law (including the new AI Act).

In the first part the relevant ECtHR case law is examined. It follows that covert surveillance at the workplace is (under certain conditions) compliant with Article 8 ECHR – although the developments in ECtHR reasoning from case *Köpke* (2010) to case *Lopez Ribalda* (2019) show a more stringent ECtHR approach towards covert surveillance. Moreover, ECtHR itself highlighted in *Lopez Ribalda* (where there was no violation of Article 8 ECHR) that workers had (and should have resorted to) other available administrative, civil, and criminal procedures (besides the employment dispute) to protect their right to personal data.

Therefore, while ECtHR case law provides some guidance for possible outcomes of unjustified dismissal employment disputes – it by no means provides guaranteed guidance (without significant uncertainties) on possible outcomes of parallel administrative/punitive (administrative fines etc.) procedures for breaches of data protection rules (GDPR) and AI Act. In this vein, the analysis showed that covert surveillance runs in contrast with the fundamental obligations under AI Act and GDPR (transparency principle, right to prior notification etc.). Consequently, since covert surveillance at the workplace has in its essence become a question of interpretation of EU law (AI Act and GDPR considering EU Charter) a paradigm shift in worker's personal data protection litigation is required – where the CJEU would be given the decisive role for setting new legal standards (binding across the EU).

Keywords: *covert monitoring, employment relationship, artificial intelligence, right to privacy, personal data protection, ECHR, GDPR.*

AI AND THE FUTURE OF WORK: ASSESSING EMPLOYEE READINESS AND EMERGING COMPETENCIES

Aleksander Łoziński

University of Lodz, Faculty of Management,
Olekxd3421@gmail.com / UL0264454@edu.uni.lodz.pl

Abstract

The rapid development of artificial intelligence (AI) is changing the way employees perform their work and creating new expectations regarding skills and competencies. This study examines how employees perceive the growing role of AI in the workplace, with particular attention to employee readiness, the perceived benefits and barriers of AI adoption, future competencies, and expectations regarding the future impact of AI on professional activities.

The study is based on quantitative research conducted using a Computer-Assisted Web Interviewing (CAWI) survey among 104 administrative employees of an international pharmaceutical company operating in Poland. The respondents represented different organizational functions, including Finance, Human Resources, Procurement, Information Technology, and other business-support areas. The questionnaire examined employees' experiences with AI, attitudes towards AI-supported work, perceived barriers to effective AI use, competencies considered important in an AI-supported workplace, and expectations regarding the future role of AI. The empirical analysis combined descriptive statistics and cross-tabulations to identify patterns in employees' use and perceptions of AI.

The study contributes to research on AI-driven workplace transformation by examining employee readiness, future competencies, and organizational conditions within a single empirical framework. The findings show that AI is already embedded in employees' professional activities: 44.2% of respondents reported using AI tools daily and 29.8% several times a week. The results also indicate a generally positive assessment of AI, with 76.9% of respondents agreeing or strongly agreeing that AI supports the performance of their daily work tasks, while 76.0% agreed or strongly agreed that AI reduces task completion time. The analysis further confirmed the relationship between frequent AI use and more positive assessments of its impact on work efficiency and task performance.

At the same time, the findings reveal important organizational and competency-related challenges. Data security was identified as the most frequently reported barrier to AI adoption (62.5%), followed by insufficient AI-related knowledge or skills (56.7%) and concerns about the quality of AI-generated outputs (51.9%). The absence of clear organizational policies was also identified as a relevant barrier (30.8%), while 93.2% of respondents indicated that clear rules and regulations governing AI use are needed. Employees also emphasized the importance of critical evaluation of AI-generated outputs, analytical skills, and continuous learning. Moreover, 84.6% of respondents indicated that they intended to increase their use of AI tools within the next two years, demonstrating expectations of further AI integration into professional activities.

The findings suggest that AI-driven workplace transformation should not be viewed solely as a technological process. Effective and responsible AI adoption requires organizations to combine technological implementation with employee development, clear organizational guidelines, data

security measures, and appropriate human oversight. The results provide practical implications for organizations designing AI adoption and workforce development strategies and highlight the importance of reskilling, continuous learning, and transparent governance in preparing employees for the future of work.

Keywords: *artificial intelligence, future of work, employee readiness, AI adoption, future competencies, workplace transformation.*

TOWARDS A JUST TRANSITION INSURANCE MECHANISM INTEGRATING CLIMATE RISK, SOCIAL PROTECTION, AND GREEN FINANCE

Alper Yilmaz

Istanbul Bar Association
alper@gungor-yilmaz.com

Abstract

The transition to a low-carbon economy brings significant consequences for workers. Jobs may disappear or change, new skills may be required, and employment opportunities may move between sectors and regions. Existing unemployment insurance, social protection, retraining schemes, and climate-related financial instruments offer protection against some of these consequences, but they operate largely as separate mechanisms. This paper considers whether a specific insurance model could provide more comprehensive protection for workers affected by decarbonisation and climate-related change.

The research combines conceptual analysis with comparative policy and legal analysis. It considers unemployment and social insurance, active labour-market measures, retraining policies, climate-risk insurance, and green-finance instruments, with particular attention to the protection they provide to workers during the green transition. The purpose is not to reproduce a particular national system, but to identify gaps in existing forms of protection and consider how they might be addressed within a single model.

The paper proposes a Just Transition Insurance System (JTIS) covering workers whose employment or income is adversely affected by decarbonisation measures, climate risks or technological changes linked to the green transition. JTIS would provide temporary income support together with reskilling and green-skills programmes, assistance in moving to new employment and, where necessary, support for relocation. Financing would be shared between employers, public authorities, and workers, with carbon-pricing or emissions-trading revenues providing possible additional sources.

The paper treats these consequences as transition risks, rather than simply another form of unemployment. Protection should therefore begin before workers permanently lose their connection with the labour market. JTIS seeks to combine income security with continued employability and access to emerging green jobs. The model is intended to be adaptable to differences between national labour markets, social-protection systems, and regulatory structures.

Keywords: *just transition, just transition insurance, social protection, green finance, green skills.*

ARTIFICIAL GENERAL INTELLIGENCE AND THE FUTURE OF WORK. OPPORTUNITIES, RISKS, AND ADAPTATION

Alexander van Biezen

Arcadia, Aarschot
alexandervanbiezen@hotmail.com

Abstract

AGI, or artificial general intelligence, is hailed as nothing less than the holy grail of current AI research. It is by no doubt a highly polarizing topic, with passionate advocates on one side and determined skeptics on the other. Although AGI does not exist as yet, its possible future development is increasingly important to consider. Whether, when, and in what form AGI might become a reality remains uncertain, and it would therefore be premature to treat its arrival as an established prediction. Nevertheless, the prospect of AGI is sufficiently consequential that we should seriously consider its potential implications for the future of work already today. If AGI were to become a reality, it could fundamentally redefine the job market. In this article, I explore the possible opportunities and risks for the human workforce in such a scenario, as well as several suggestions for how we might prepare and adapt. Even if AGI ultimately develops differently, arrives much later than anticipated, or does not materialize in the form currently envisaged, considering these possibilities can help us think more carefully about the direction in which AI-driven automation and human-machine collaboration may evolve.

I defend the claim that, if AGI were to become a reality, rather than causing mass human obsolescence, the future of work will shift toward a human-machine collaboration, gravitating toward oversight and complex problem-solving. I also claim that the possible risks are not to be sought in the advent of AGI itself, but in the exclusive position of the companies behind the development of this technology. I investigate the possible scenario where an unprecedented concentration of power which would ensue from the development of AGI could have devastating consequences and which merits our genuine concern.

My contribution is envisaged as a scenario-based reflection grounded in existing literature. We may witness a significant shift in many job roles. In some sectors, daily work could gradually move from executing routine operations toward managing and overseeing increasingly automated workflows. Repetitive, data-heavy, and structured activities, such as basic data entry, standard proofreading, and certain forms of frontline customer support, may become increasingly amenable to automation. Workers in fields such as programming, finance, and legal analysis could, in some contexts, increasingly take on the role of reviewing, guiding, and refining AI-generated outputs rather than producing all baseline materials manually. At the same time, new career paths may emerge around forms of human-machine collaboration. These could include roles related to AI ethics, system integration, prompt engineering, as well as occupations that place a premium on emotional intelligence, interpersonal skills, or complex physical dexterity.

In such a transitioning economy, and particularly in anticipation of increasingly capable AI systems and a possible AGI era, it may become useful to look beyond narrow job titles and place greater emphasis

on broader skills and adaptive ways of working. The development of skills for the future could increasingly revolve around the ability to handle complexity, uncertainty, and changing technological environments. Critical thinking nuanced contextual interpretation, and relationship building may become especially important, particularly in areas where AI systems remain limited or where human judgment and interaction continue to be valued. More generally, work could in some cases involve a shift from directly performing certain tasks toward overseeing, coordinating, and designing AI-supported systems that carry out those tasks.

Keywords: *artificial general intelligence, artificial intelligence, AI agency, AI ethics, workforce, future of work, automation, workforce transformation.*

HUMAN–AI COEXISTENCE IN THE WORKPLACE: A SYSTEMATIC SYNTHESIS OF SKILLS, TRUST, JOB QUALITY, AND WELL-BEING PERSPECTIVES-LITERATURE REVIEW

Lejla Imamović Lerić

University of Novo mesto, Faculty of Organizational Studies
lejla.imamovic.leric@fos-unm.si

Abstract

Artificial intelligence (AI) is increasingly embedded in workplace decision-making, service delivery, and knowledge production, yet its implications for workers remain contested. This thematic narrative review synthesises heterogeneous literature on worker–AI coexistence, bringing together perspectives from skills theory, labour economics, occupational health, job-quality research, algorithmic management, and individual well-being. Rather than applying a protocol-driven systematic-review approach, the study uses an interpretive thematic synthesis to identify conceptual linkages and recurring patterns across these perspectives.

The review identifies five cross-cutting themes. First, worker distrust of workplace AI reflects not only concern about job loss but also a gap between promoted and demonstrated capabilities, together with limited transparency about how systems are trained and how decisions are reached. Second, sustainable worker–AI coexistence requires technical, human, and conceptual competencies. Human and conceptual skills are especially important where work is redesigned, judgement is required, and workers must adapt to AI-supported processes. Third, whether AI augments or displaces workers depends substantially on organisational and economic conditions, including financial resources, labour-market institutions, job design, and bargaining power; technical capability alone does not determine employment outcomes. Fourth, AI's implications for safety, health, and well-being are uneven. They are mediated by employment conditions and social position, including age, gender, race, disability, and employment precarity. Fifth, algorithmic management may reshape workers' autonomy, status, and dignity even when it does not lead directly to job loss.

The synthesis also exposes a central tension. Skills-based accounts imply that reskilling and upskilling can preserve a durable division of labour between workers and AI. A structural perspective, however, raises the question of whether organisations facing budget constraints or labour-market pressure will invest in the resources needed to deliver such reskilling. Individual differences add further complexity: the same AI deployment may produce different effects on engagement and well-being depending on workers' perceived opportunity, autonomy, and organisational support.

The study's contribution is an integrated framework for analysing human–AI coexistence in the workplace. It connects four lenses that are often treated separately: skills and competencies; organisational and labour-market structures; job quality and occupational health; and individual differences. The review argues that reskilling alone is unlikely to ensure beneficial coexistence. Durable outcomes require transparent implementation, meaningful worker participation, supportive organisational conditions, and equitable job design. Future research should test these relationships

longitudinally and across sectors, while examining how organisational resources shape the distribution of AI-related risks and benefits.

Keywords: *artificial intelligence, workplace AI, human–AI coexistence, thematic narrative review, skills, trust.*

DECARBONIZATION AND THE SUBSURFACE WORKFORCE: MAPPING SKILLS TRANSFERABILITY FOR CCUS IN NIGERIA'S ENERGY TRANSITION

Safiya Adejoh

PhD Candidate, University of Abuja
safiyaadejoh35@gmail.com

Abstract

As global climate commitments accelerate the transition toward lower-carbon energy systems, Sub-Saharan Africa, and Nigeria in particular, faces the dual challenge of advancing decarbonization technologies while managing the socioeconomic implications of changing energy-sector employment. Carbon Capture, Utilization, and Storage (CCUS) offers potential pathways for reducing emissions from hard-to-abate industrial and energy activities, including through the utilization of Nigeria's existing petroleum subsurface knowledge and infrastructure. However, the workforce implications of transitioning from conventional hydrocarbon operations toward carbon storage and broader geoenergy activities remain insufficiently explored.

This study investigates the transferability and repurposing of subsurface petroleum skills for emerging CCUS activities in Nigeria. A qualitative policy analysis is combined with a skills-mapping matrix covering core subsurface domains, including petrophysics, reservoir engineering and simulation, structural geology, geomechanics, and fluid-flow analysis. The study compares competencies developed through conventional upstream petroleum activities with those required across key stages of geological carbon storage, including site characterization, storage assessment, injection planning, monitoring, risk assessment, and containment management.

Preliminary mapping indicates high transferability across several core competencies, particularly reservoir characterization, numerical simulation, geological interpretation, and fluid-flow analysis, while identifying important gaps in environmental risk assessment, long-term containment assurance, regulatory compliance, digital monitoring, and carbon-accounting practices. The analysis further highlights how automation, digital monitoring, and data-driven decision-making may alter technical roles and competency requirements within the transitioning energy workforce.

The study argues that workforce transition should be integrated into national CCUS and energy-transition planning rather than treated as a secondary consequence of decarbonization. It proposes a skills-repurposing pathway linking petroleum-sector competencies with targeted upskilling, higher-education curricula, industry training, and labour-market policies. The findings provide a basis for developing context-specific Just Transition strategies that retain valuable subsurface expertise while preparing Nigeria's workforce for emerging sustainable geoenergy systems. The findings further indicate that Nigeria can reduce potential skills displacement by prioritizing targeted reskilling and curriculum adaptation rather than developing an entirely new CCUS workforce.

Keywords: *CCUS, workforce transition, skills transferability, just transition, energy transition.*

ABOUT THE AUTHORS, CONTRIBUTORS AND SPEAKERS

Safiya Adejoh (University of Abuja) is a PhD researcher in the Centre for Environmental Management and Climate Change (CEMCC) at the University of Abuja, Nigeria, and holds an MSc in Petroleum Technology from the University of Bergen, Norway. Her research interests include Carbon Capture, Utilization and Storage (CCUS), energy transition, carbon management, environmental governance, and workforce transformation in the energy sector. She has a background in petroleum technology, HSE, and environmental management, with experience in petroleum-related research and CO₂ storage. Her current work explores how existing oil and gas skills can support Nigeria's transition toward a lower-carbon energy system.

Nika Brili (Rudolfovo - Science and Technology Centre Novo mesto) holds a PhD in Mechanical Engineering from the University of Maribor and has also conducted research at the University of Oxford. She is a researcher and Head of the Centre for Advanced Technologies at Rudolfovo – Science and Technology Centre Novo mesto. Her work focuses on artificial intelligence and advanced digital technologies in engineering and manufacturing, including intelligent monitoring systems, thermography, and augmented and virtual reality. She combines academic research with extensive industrial experience, with a strong focus on translating emerging technologies into practical engineering solutions.

Elisabetta Costa (University of Antwerp) is an Associate Professor in Digital Anthropology and Cultures at the University of Antwerp, Belgium. Her research focuses on how people's everyday uses of media technologies change relationships, gender, politics, work, and mobility. She has conducted extensive fieldwork in Lebanon, southeast Turkey, and Italy. Her books include *Social Media in Southeast Turkey* (2016, UCL Press), *How the World Changed Social Media* (with Miller D. et al., 2016 UCL Press), the *Routledge Companion to Media Anthropology* (co-edited with Lange P. G, Haynes N., and Sinanan J., 2022, Routledge). Elisabetta is now the PI of the ERC-funded project [*ReWorkChange*](#), which examines the social consequences of remote work in eight different countries.

Stelina Chatzichristou (Cedefop) is an expert in skills intelligence, skills foresight, and labour market analysis at Cedefop. Her work focuses on anticipating future skills needs, analysing labour market trends, and supporting evidence-based policies for vocational education, lifelong learning, and workforce development across Europe. She has contributed to numerous European initiatives on skills forecasting, future occupations, and the impact of digital and green transitions on employment.

Enrique Fernandez Macias (Joint Research Centre of the European Commission) is currently coordinating the Employment and Skills team of the Joint Research Centre, developing a research programme on the socio-economic implications of automation, digitisation and platformisation of work. He has a PhD in Economic Sociology from the University of Salamanca, where he worked several

years as a researcher and lecturer. Previously, he also worked as a researcher in Eurofound (Dublin), participating and coordinating large European research projects, such as the European Working Conditions Survey or the European Jobs Monitor. He has published many policy-oriented and academic papers on job quality, occupational structures, technical change, and socio-economic inequalities.

Annmarie Gorenc Zoran (University of Novo mesto, Faculty of Organizational Studies) is a Full Professor and the Dean of the Faculty of Organization Studies and serves as an external peer reviewer for the National Agency for Quality Assurance in Slovenia (NAKVIS). During her academic career she has received numerous awards, most recently the teaching and research excellence awards at FOS and the University of South Florida's Undergraduate Education Excellence Award. She is also an internal assessor ISO 9001:2008 and an ECQA manager of Social Responsibility. She has also served as an editor, on editorial boards of scholarly journals, and on program.

Maruša Gorišek (University of Novo mesto, Faculty of Information Studies) is an assistant professor in the field of sociology and the Vice-Dean for Research at the University of Novo mesto, Faculty of Information Studies. She also works as a research fellow at Alma Mater Europaea university. Her research focuses primarily on the concept of meritocracy, the role of knowledge, science, and experts in society, and public attitudes toward science. She is also a member of the National Committee of the Management of Social Transformations (MOST) Programme at the Slovenian National Commission for UNESCO.

Lejla Imamović Lerić (University of Novo mesto, Faculty of Organizational Studies) is a Researcher, Lecturer/Assistant Professor and PhD in Organisational Psychology, with expertise in research methodology, statistics, data analysis, and the application of artificial intelligence in social and human sciences. She teaches Methodology, Research Methodology, Research Sciences, and Statistics, with a particular focus on the design, implementation, analysis, and interpretation of research. Her professional and academic expertise encompasses both qualitative and quantitative research methods, statistical analysis, and data-driven approaches across diverse fields within the social and human sciences. Her research interests include organisational psychology, social psychology, personality psychology, sociology, education, behavioural and learning processes, youth and social issues, and organisational and interpersonal dynamics. Her work focuses particularly on understanding psychological and social processes through systematic research and the analysis of empirical data. She has extensive experience in research design, qualitative and quantitative data analysis, statistical methods, academic research, teaching, and scientific project coordination. Her expertise also includes the use of artificial intelligence and emerging digital technologies in research, data analysis, education, and the social and human sciences.

Vinko Longar (Rudolfovo - Science and Technology Centre Novo mesto) is a researcher and PhD student specialising in industrial automation, robotics, smart manufacturing, and autonomous laboratory systems. His background combines extensive hands-on experience in the development and implementation of robotic cells, PLC and SCADA systems, and advanced automation solutions with research into the next generation of intelligent and autonomous experimental and production systems.

His current research focuses on the digital transformation of laboratory and manufacturing processes through digital twins, artificial intelligence, machine learning, automated experimentation and closed-loop optimisation.

Irene Mandl (Cedefop) is Head of Department for VET and Qualifications at Cedefop. Before joining Cedefop, she was Head of the Employment research unit at Eurofound, where she led cross-European research on labour market developments, new forms of work and the future of work. She has also held a senior position at the European Labour Authority as Head of the Information and EURES Unit. Her work focuses on labour market change, skills, vocational education and training, employment policy and the transformation of work in Europe.

Nadia Molek (University of Novo mesto, Faculty of Organizational Studies) is a researcher at the University of Novo mesto, Faculty of Organisation Studies, Slovenia. She holds a degree and a PhD in Anthropological Sciences from the Faculty of Philosophy at the University of Buenos Aires (UBA), Argentina. Her research focuses on the future of work, migration, diversity, social inclusion and workforce transformation. She is participating in research supported by the Slovenian Research and Innovation Agency (ARIS) and the Marie Skłodowska-Curie Actions (MSCA) and is currently involved in the EU-funded TRANSFORM project, where her work addresses the social and organisational dimensions of changing labour markets and the future of the human workforce.

Dan Podjed (ZRC SAZU, University of Ljubljana, Faculty of Arts) is a Research Fellow at the Institute of Slovenian Ethnology, ZRC SAZU, and an Associate Professor at the University of Ljubljana. His research focuses on anthropology, digital transformation, human-centred technologies, the future of work, mobility, and participatory innovation. He has coordinated and contributed to numerous European research projects addressing societal challenges related to digitalization, sustainability, and citizen engagement. His work bridges anthropology, technology, and public policy to promote human-centred approaches to innovation and social change.

Rok Struna (Rudolfovo - Science and Technology Centre Novo mesto) is a mechanical engineer and technical associate at Rudolfovo, working at the Centre for Advanced Technologies. His work focuses on manufacturing digitalisation, process automation, and the development of practical AI solutions for industrial environments. His current work explores how artificial intelligence can be connected with production data, technical documentation, and industrial systems to provide operators with faster and more effective support in troubleshooting and decision-making.

Alexander van Biezen is a philosopher of science, graduated from the Free University of Brussels-VUB as a Doctor of Philosophy and Moral Sciences. He specialized in the philosophy of cosmology, with a doctoral dissertation on the cosmological models of Stephen Hawking and Thomas Hertog. His book *Top-Down Cosmology and Model-Dependent Realism* (2022, VUB Press) is freely available online through the research portal of the Free University of Brussels-VUB (<https://researchportal.vub.be/>). He has an additional background in religious studies and in computer science. Currently, he is employed

as a teacher of philosophy and religion with the Arcadia school group in Aarschot, Belgium. His main areas of interest are cosmology and the philosophy of artificial intelligence.

Lilla Mária Vicsek (Corvinus University of Budapest) is Professor of Sociology at Corvinus University of Budapest. Her research focuses on the social and ethical implications of artificial intelligence and other emerging technologies. She has studied societal expectations and imaginaries surrounding AI and robotics, including with respect to work. Expectations can play a vital role in legitimizing and steering actions of various stakeholders. Rather than focusing social discourse on what the impact of technology will be, perceiving technological development as a kind of inevitable, uncontrollable phenomenon outside society, she has argued that it was important to address questions such as: How might technological development help to create a desirable future state? What is a desirable future state even like? Who could and should have a say in the development of AI and how?

Alper Yilmaz is an attorney-at-law (Galatasaray University, 2001) with approximately 25 years of experience. He began his career at Arthur Andersen and Ernst & Young Türkiye and has practised independently since 2004. His practice focuses on employment and social security law, industrial relations, and corporate law, advising Turkish and multinational companies on employment contracts, workforce restructuring, disputes, and collective labour relations. He is a member of the Istanbul Bar Association and previously served on its Labour Law Commission. He is currently pursuing an LL.M. in Private Law at Okan University. His academic interests include climate change and labour law, just transition, maritime labour law, AI and algorithmic management, and social protection. His recent research examines decarbonization policies and the development of Just Transition Insurance (JTIS), a social protection model for workers affected by the transition to a low-carbon economy. His publications include 500 Questions on Labour Law and the Turkish translation of the EU AI Act.

Justin Zagorjan (Rudolfovo - Science and Technology Centre Novo mesto) is a Mechatronics Engineer specializing in PLC programming, industrial automation, and custom software solutions. Experienced with Siemens & Beckhoff, Structured Text, Ladder Logic, Python, and hardware integration. With strong interests in robotics, humanoids, autonomy, and NVIDIA Isaac Sim. Highly hands-on and solution-oriented, with a talent for developing creative solutions to complex engineering problems. Main programmer on my largest industrial automation project to date.

Ernest Ženko (University of Primorska, Faculty of Humanities) is a Full Professor and Senior Research Fellow at the Faculty of Humanities, University of Primorska. He teaches and researches in the fields of media studies, anthropology, and cultural studies, with a broader focus on philosophy, aesthetics, critical theory, film theory, photography, philosophy of science and utopian studies. His work explores the intersections between culture, visuality, media, knowledge, and contemporary social thought.

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