



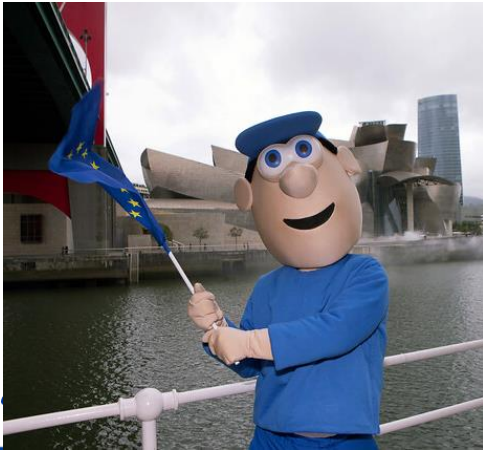
Occupational Safety in a green and digital world

Euroshnet Helsinki, 28 May 2025

**Annick Starren,
Senior Research Project Manager EU-OSHA**

European Agency for Safety and Health at Work (EU-OSHA)

- A body of the EU
- Established in 1996 in Bilbao, Spain
- EU-OSHA is committed to making Europe a safer, healthier and more productive place to work, by promoting a culture of risk prevention to improve working conditions in Europe.
- Tripartite Board bringing together:
 - governments, employers' and workers' organisations
 - the European Commission



EU agencies



<https://youtu.be/r5uTJZ6JVoY>

Europe's Green and Digital Transition



DIGITALEUROPE EVENT

Uniting the twin transitions: There is no Green Deal without digital

news events resource

The Just Transition Mechanism: making sure no one is left behind



: coal
ill

(Binh Nguyen/Canary Media)



<https://healthy>

Content

1. **Intro European Agency for Safety and Health at Work (EU-OSHA) and EU**
2. **Anticipating risks**
3. **OSH and the Green transition (Circular Economy)**
4. **OSH and Digital transition**
5. **Conclusion remarks**



EU –OSHA activity exmples:

“We work to make European workplaces safer, healthier and more productive — for the benefit of businesses, employees and governments.”

Research projects



Healthy Workplaces

Surveys

Campaigns



EENER



Foresight



E-tools / guides

EU-OSHA's Foresight on the Circular Economy (CE)



OSH and the green transition: Circular Economy (EU-OSHA's 3rd Foresight 2020-2023)



Relevance:

- Transitioning to a CE is a key driver of the EU Green Deal implementation and of the EU goal of achieving carbon neutrality by 2050 while creating sustainable growth and jobs.
- It has significant policy and regulatory implications that will affect future jobs.
- It will also have consequences for workers' safety and health.

Relevance to the EU OSH Strategic Framework 2021-2027

Key objective: “Anticipating and managing change in the new world of work brought about by the green, digital and demographic transitions”

Circular Economy and OSH

Adaptation/innovation in working processes, creativity in business models, short circles, new ways of collaboration, less waste

- new type of **design of working processes** for the future
- incorporation of **digital technology**.
- preserving and extending **what's already made**
- **prioritising regenerative resources**, especially use “waste” as a resource
- **adaption** of the existing ‘**Business models**’
- better **collaboration** to create joint value.

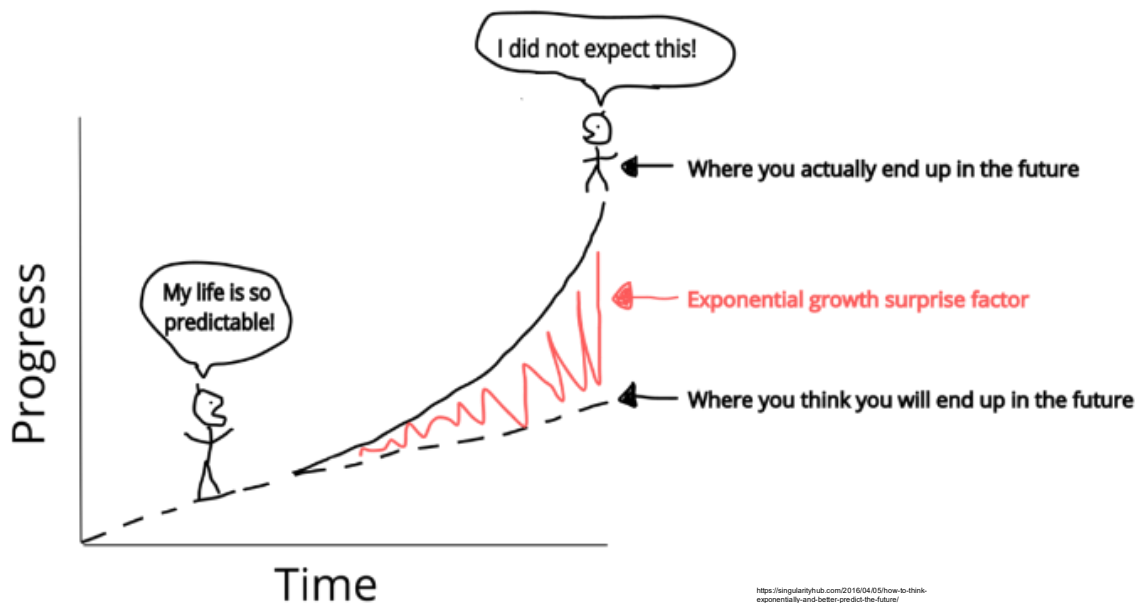


It will have consequences for workers' safety and health:

- impacts on jobs in hazardous sectors, related to maintenance and repair, disassembly and recycling, could have a negative impact on working conditions;
- changes in organisational processes and/or redesigning tasks could have an impact on job content and satisfaction

From forecast to foresight

Scenario-building

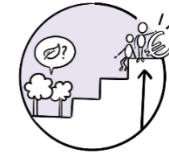


"It offers the possibility to be more creative than in usual meetings."

*"It opens your mind, a good tool to be creative."
"It gives a new vision & perspective."*

"We were all very skeptical at the beginning, now we're all very positive."

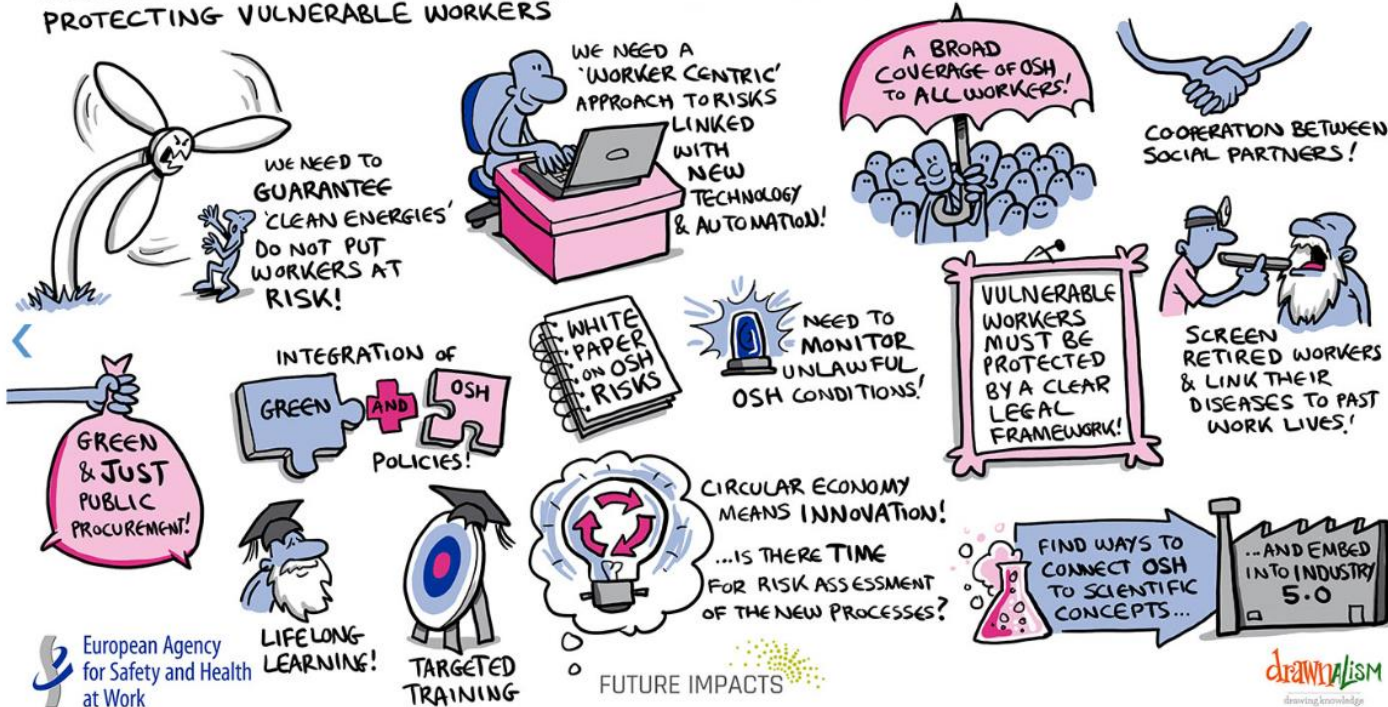
The 4 macro scenario's on CE and OSH in the EU until 2040



The roaring 40's – fully circular and inclusive	Carbon neutrality – of a hazardous kind	Staying afloat – amid economic and environmental crises	Regional Circularities – with European Divides
<p>In 2040, the products that sell best are those that are cradle-to-cradle and “net-positive” in terms of social and environmental sustainability.</p>	<p>The year 2040 marks the achievement of carbon neutrality in Europe. But: With environmental outcomes having been prioritized above all else, this has often come at the expense of job quality and working conditions.</p>	<p>In 2040, the biggest concern for many is just having a job – and not what the job entails. Most people are focused on keeping things afloat, so that there's little consideration for much else - neither the environment, social rights nor job quality.</p>	<p>In 2040, everyone knows: Contracted employees are well looked after, but those in non-standard employment are not. Neither is the environment, with circularity being mostly regional.</p>

What will the circular economy mean for OSH? (examples of workshop outcome 2022)

WORKING SESSION 3: ROAD-MAPPING / OCCUPATIONAL SAFETY AND HEALTH LEVERS FOR PROTECTING VULNERABLE WORKERS



Foresight on CE: Recommendations

- A call to **integrate OSH knowledge and regulation into the relevant EU policy areas,**
- The need to **integrate OSH expertise in the earliest stages of material, product, and process design within a CE,**
- The development of **clear CE/OSH guidelines, certification, standards** for every stage in the Life Assessment Cycle, ensuring that safe and trustworthy information **reaches all workers** via comprehensive up-to-date training, reskilling, and upskilling initiatives.

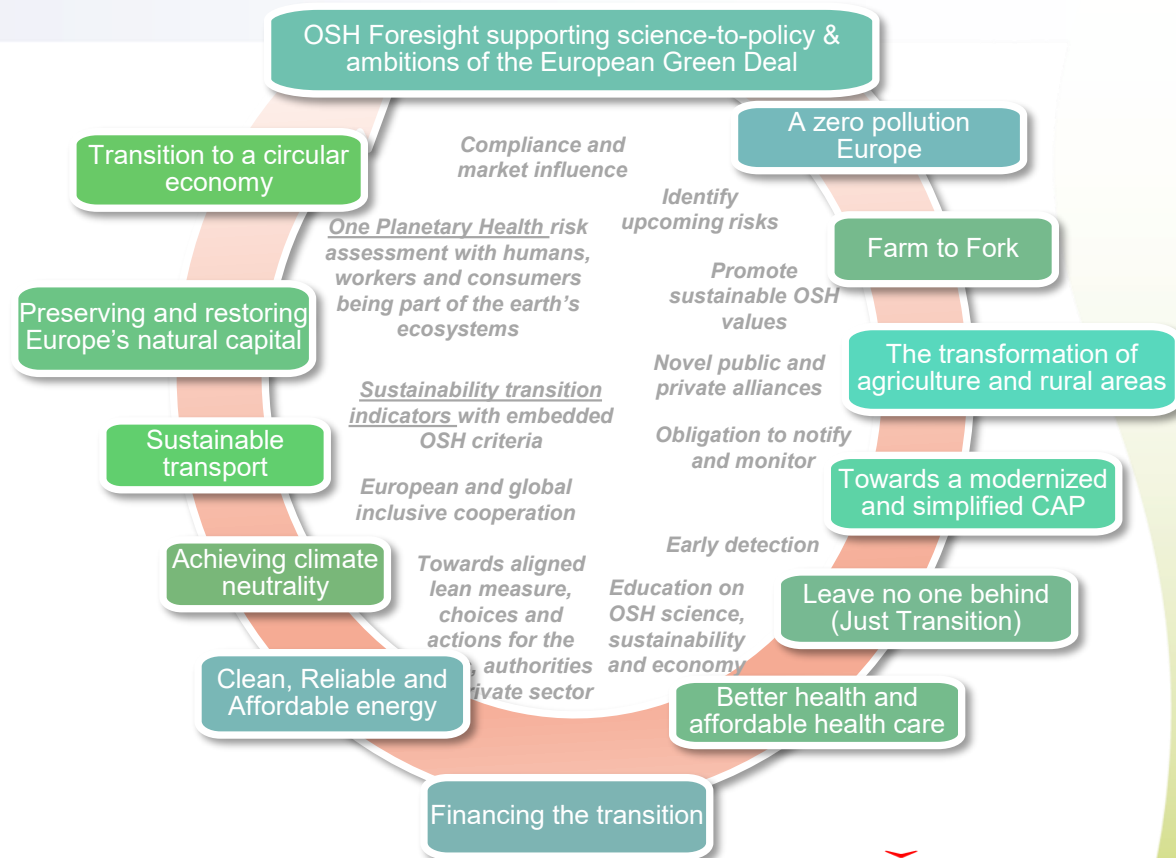
For example:

- standards to create a safe and trustworthy 'secondary raw materials
- better coverage of OSH information and training to those workers currently excluded (including those within the informal economy), through setting up local structures and networks in collaboration with social partners

OSH Foresight supporting the green, social and digital EU policies' transitions

Contributing to modernizing and **strengthening of OSH in key areas**, in view of the Union's employment and social policies.

And having in mind the European Pillar of Social Rights, the **European Green Deal** and the United Nations Sustainable Development Goals, as well as **challenges** related to **digitalisation**, the **changing world of work and work patterns as well as demographic changes**.



Adopted and modified from:

Fantke, Peter., Bruinen de Bruin, Yuri, Schlüter, Urs. et al. (2022). [The European Exposure Science Strategy 2020–2030](https://healthy-workplaces.eu). Environment International, p.107555.

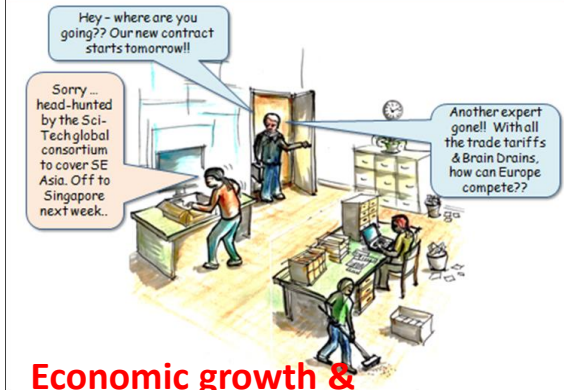
<https://healthy-workplaces.eu>

The serious game



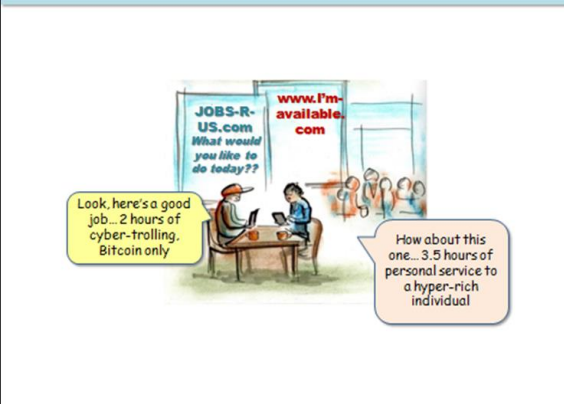
EU-OSHA's Foresight on Digitalisation

BRAIN DRAIN

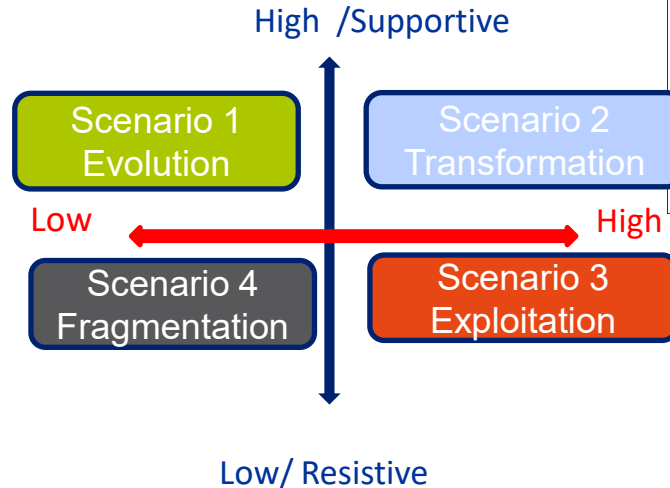


Economic growth & technology innovation
OUT OF SIGHT

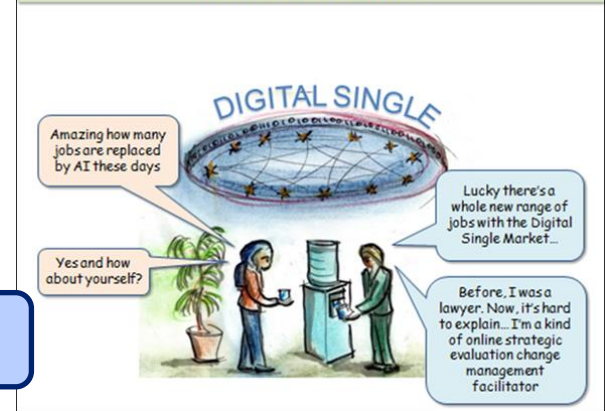
OUT OF SIGHT



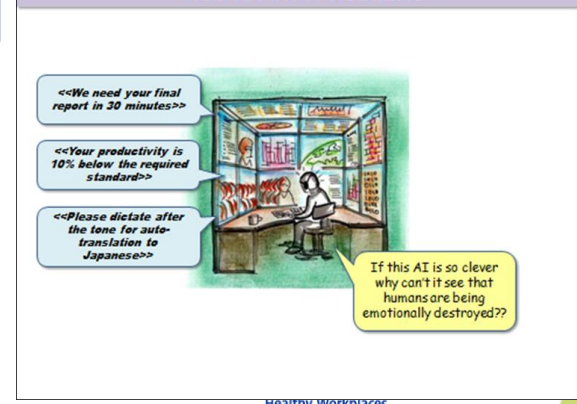
Governance & public attitudes



DIGITAL SINGLE MARKET

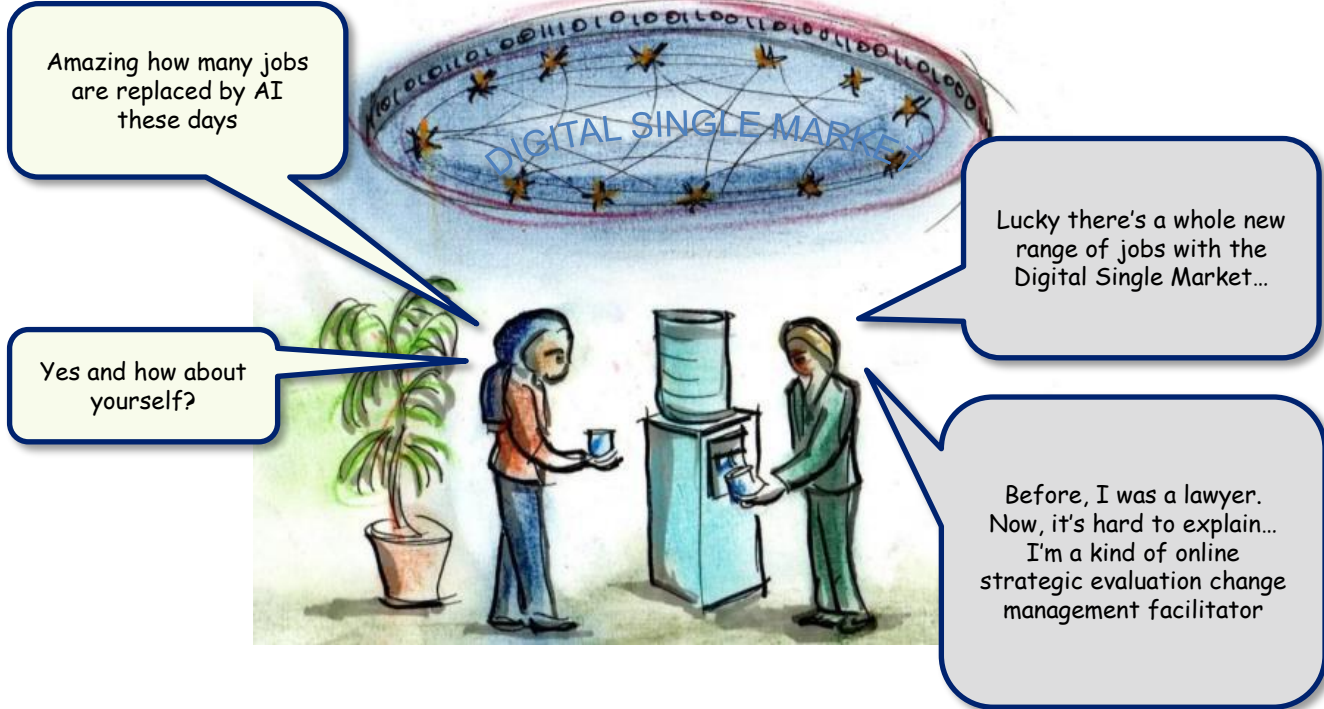


PRODUCTIVITY PROBLEMS



DIGITAL SINGLE MARKET

Scenario 2 Transformation



PRODUCTIVITY PROBLEMS

Scenario 3 Exploitation

<<We need your final report in 30 minutes>>

<<Your productivity is 10% below the required standard>>

<<Please dictate after the tone for auto-translation to Japanese>>



If this AI is so clever why can't it see that humans are being emotionally destroyed??

EU-OSHA's foresight: OSH aspects common to all scenarios

- Changing work patterns,
- Loss of and changes to jobs
- Increasing numbers of self-employed and online platform workers
- Change to employer/employee relationship
- Increasing use of wearable ICT and smart PPE
- Ergonomic risks by online work
- Automation, robotics, AI and new HMIs will remove people from dangerous environments
- Work related stress

The difference is the **pace of change**, how widespread or fragmented this is across sectors and how well these changes are managed.



Healthy Workplaces Campaign 2023-25

Safe and healthy work in the digital age

Ensuring effective prevention in the digital world of work

Priority areas



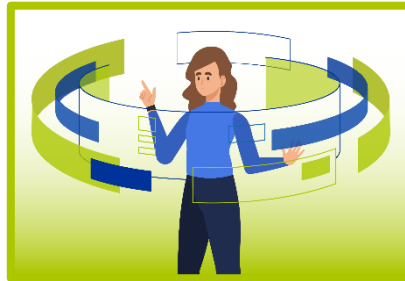
Digital platform work



Automation of tasks



Remote and hybrid work



Worker management through AI



Smart digital systems

Campaign objectives

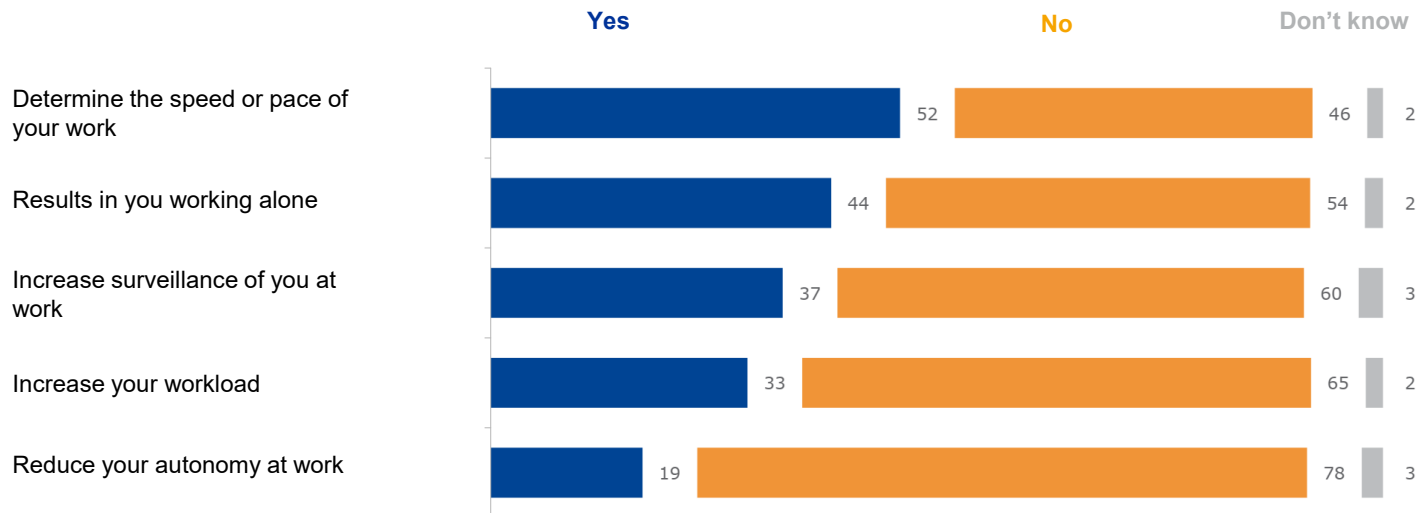
The campaign aims to:

- Increase knowledge about the safe and productive use of digital technologies across all sectors
- Raise awareness of digitalisation and its OSH implications
- Inform about emerging risks and opportunities
- Promote risk assessment and the healthy and safe management of digital transformation of work
- Facilitate the exchange of information and good practices

Facts and figures – use of digital technologies

EU-OSHA, OSH Pulse 2022

Would you say that the use of digital technologies in your workplace... ?



Base: all respondents, EU27 (n=25 683)

<https://healthy-workplaces.eu>

Napo in Digitalisation

<https://www.napofilm.net/en/napos-films/napo-in-robots-at-work>



This film provides an introduction to workplace robotics safety, and describes some of the emerging robotic technologies, the types of accidents associated with robotics, the main hazards and how they can be controlled.

Production line workers are at the greatest risk, followed by maintenance workers. Poor workplace design and human error cause most injuries.

Advances in automation technologies including fixed robots, collaborative and mobile robots, and

Download

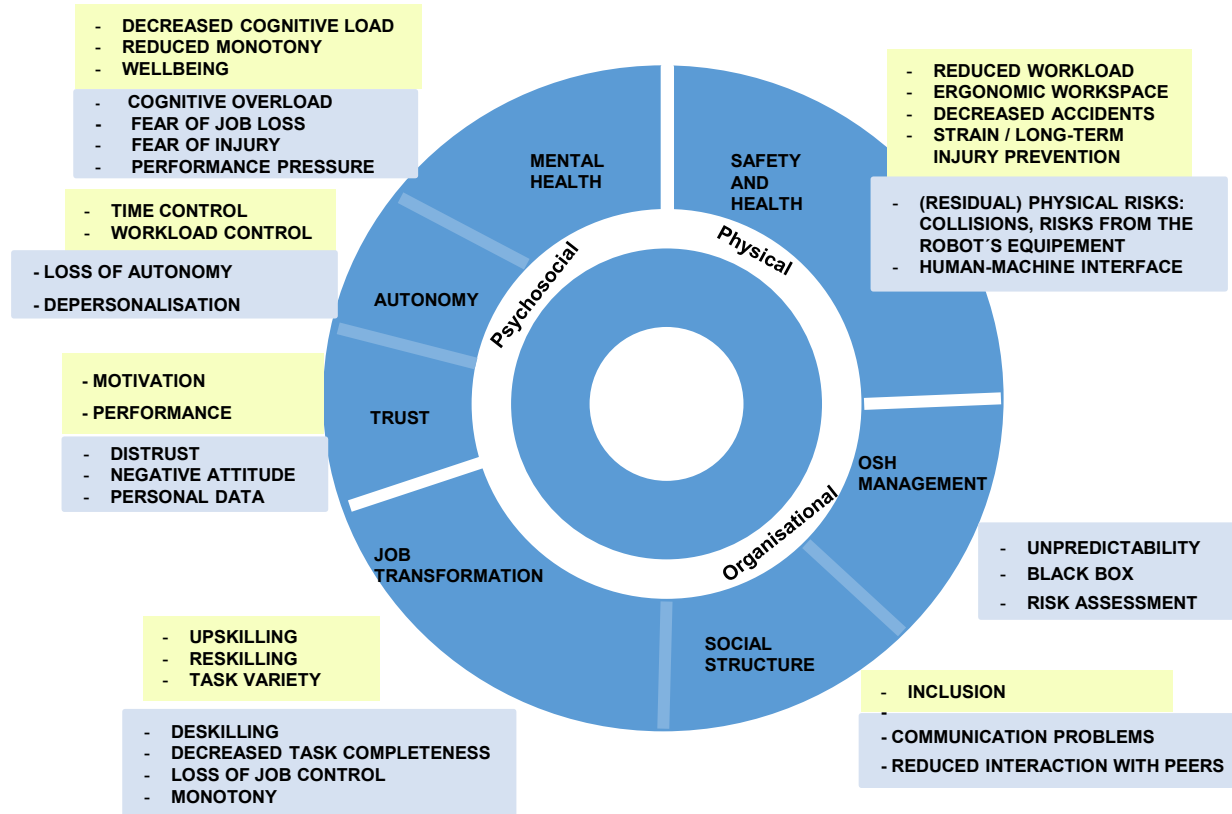
Video (527.76 MB) 

Scenes (325.39 MB) 

Download all 

Automation of tasks through AI & advanced robotics

Main OSH opportunities and risks



Priority areas – Worker management through AI

OPPORTUNITIES

- Improved scheduling and task allocation
- Optimised work organisation
- Information to identify OSH issues



RISKS AND CHALLENGES

- Reduced worker autonomy and control
- Increased pressure to work faster
- Invasion of privacy

“It is essential to build trust in these systems by informing, consulting and allowing workers to participate in their design and implementation.”

Opportunities and challenges of algorithmic/AI-based management of workers



- Reduce hazardous exposures, incl. harassment & violence
- Real-time tailored feedback to individual workers
- Advanced workplace risk assessment
- Evidence-based prevention & interventions
- More efficient, targeted OSH inspections



- Job control and autonomy
- Work intensity
- Performance monitoring/rating and pressure
- Relationships with peers/managers
- Unstable work schedules
- Permanent availability
- Blurring work/life
- Over-reliance on technology
- “Black box”
- Information imbalance
- Discriminatory bias
- Loss of trust
- Privacy



- Mental health
- MSDs
- Cardiovascular disorders
- Incidents
- Accidents



<https://healthy-workplaces.eu>

Prevent



Priority areas – Smart digital systems

OPPORTUNITIES

- Prevent and minimise harm to workers
- Improved OSH compliance
- Informed decision-making
- Effective enforcement
- More training opportunities in virtual environment



RISKS AND CHALLENGES

- Data inaccuracies or misinterpretation
- Overreliance on technology
- Loss of control over work tasks

These new systems use digital technologies to collect and analyse data or signals in order to identify and assess OSH risks, thereby preventing or minimising harm and promoting OSH.”

Examples of smart digital tools with (real-time) assessment functions



**Smartphone
apps**

**Smart glasses
or drones**



**E-textile
technologies**

Smart watches



VR/AR tools

**Wearable
devices**

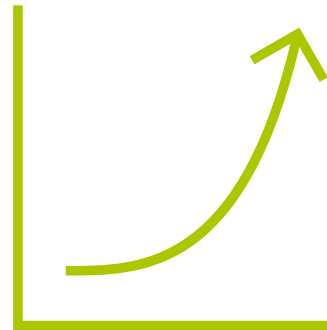


Opportunities for OSH

- ✓ Real-time data
- ✓ Predictive insights
- ✓ Actionable recommendations
- ✓ Proactivity

Support for the workplace:

- Improved compliance
- Better-informed decision-making
- Increased training opportunities



Smart Digital Tools for monitoring workers' OSH: risks/challenges

Practical limitations

Technology malfunctioning

e.g., batteries exploding or sensors not working

Sensor accuracy

How reliable are sensors in facilities with multiple environmental factors?

Hardware hindering movement

Wearing exoskeletons or PPE's

OSH monitoring systems' technological limitations

e.g., infrared-cameras

OSH monitoring systems' net effects

e.g., impact of redistribution of weight through exoskeletons for other parts of the body

Psychosocial / physical harm

Work intensification

Workplaces as electronic sweatshops?

Work alienation

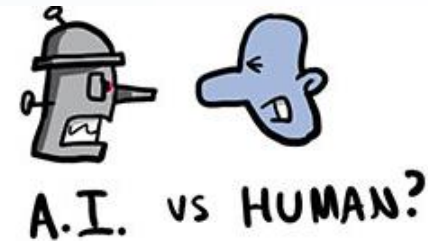
Quantity vs. quality

Work as a social place

Invasion of privacy

Loss of ownership

Overwhelming OSH managers with data and expectations



Data considerations

Data privacy, security and Data accuracy

Data interpretation and (mis)use



Case study example



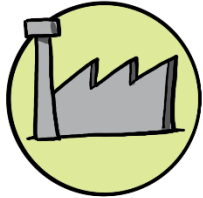
SMART INSOLES FOR LONE WORKER PROTECTION

3

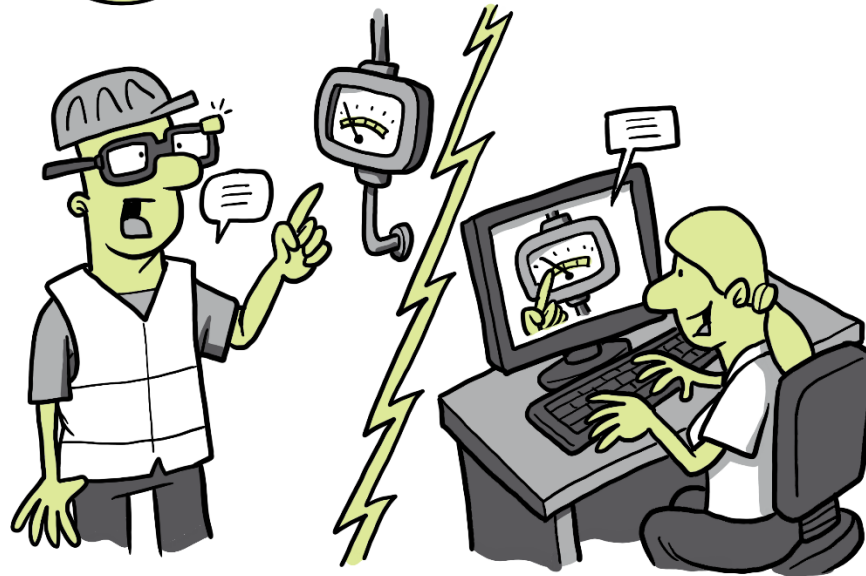





OSH IMPACT	
OPPORTUNITIES	CHALLENGES
<p>LONE WORKER PROTECTION!</p>	<p>COMPANIES MAY SEND ONE WORKER INSTEAD OF TWO!</p>
<p>FASTER REACTION TIME!</p>	<p>RELIABILITY AND TRUST!</p>

Case studies (9)



SMART GLASSES FOR REMOTE OSH ASSESSMENT & AUDIT



OSH IMPACT	
OPPORTUNITIES	CHALLENGES
<p>NO PHYSICAL PRESENCE REQUIRED!</p> <p>REMOTE PARTICIPATION OF OSH SPECIALISTS!</p> 	<p>REQUIRES PRACTICE AND PREPARATION!</p>  <p>CONTINUOUS CONNECTIVITY REQUIRED!</p> 

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Smart digital tools – key takeaways

- Smart digital tools can improve workplace safety & health in an innovative proactive way
- **Transparent** use of technology is essential
- Distinguishing between **performance measurement and OSH monitoring** helps maintain and build workers' **trust**
- **Worker engagement and involvement** in the entire process of smart digital tool onboarding is important
- Smart digital systems **must complement other OSH measures**
- **Legislation, labour inspections, and research** must evolve to keep pace with smart digital systems
- Technologies like wearables promote **inclusion** and diversity



EU-OSHA publications

- **OSH overview Digitalisation and OSH (2021-2023):**
<https://osha.europa.eu/en/themes/digitalisation-work>
- **Campaign Safe and healthy work (2023- 2025)**
www.healthy-workplaces.eu
- **Foresight study on Circular economy**
<https://osha.europa.eu/en/emerging-risks/circular-economy>



Risk prevention

- **Human-centred approach**
- **Equal access to information of all stakeholders**
- **Worker consultation/participation in the development, implementation and use of digital technologies and systems**
- **Transparency about the way a digital tool operates**
- **Holistic approach to evaluating the impact of digital technologies and systems on OSH**



<https://healthy-workplaces.eu>



Thank you!

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