GREEN-LOOP: Sustainable manufacture systems towards novel bio-based materials

Occupational safety and health for GREEN-LOOP manufacture systems

Workshop - First Session – speaker: Riccardo Varotto, NSB

Day 1: 22/11/2023

Co-funded by the European Union

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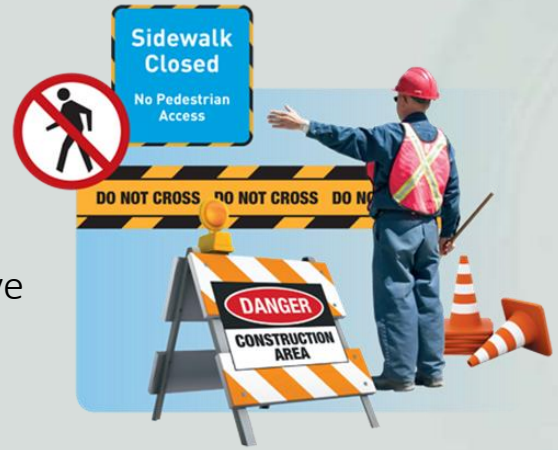
Occupational safety and health (OSH) workshop plan – Day 1

- **First part** (30 minutes)

1. Occupational safety and health (OSH): framework and definition
2. Main EU regulations for OSH in biovalue chains: some references
3. Main UK regulations for OSH in biovalue chains: some references
4. OSH focusing on manufacturing processes of GREEN-LOOP: framework and perspective



- **Q&A time** (15 minutes)
- **Break** (10 minutes)
- **Second part** (30 minutes)

5. OSH in the manufacturing of rubber panels
6. OSH in the manufacturing of bioplastic bottle closures for the packaging of food and beverage sectors
7. OSH in the manufacturing of wood composites to produce sliding bearings
8. The assessment of OSH issues in the GREEN-LOOP value chains

- **Q&A time** (15 minutes)
- **Workshop quality evaluation questionnaire** (10 minutes)

The training materials will be available after the session on the project's SharePoint and Website.

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Workshop on *occupational safety and health for GREEN-LOOP manufacture systems*

First part:

1. Occupational safety and health (OSH): definition and framework
2. Main EU regulations for OSH in biovalue chains: some references
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1. Occupational safety and health (OSH): definition

Occupational safety and health (OSH), also known as workplace safety and health, is a multidisciplinary field that focuses on ensuring the well-being, safety, and health of workers in their workplaces. The primary goal of OSH is to prevent work-related injuries, illnesses, and fatalities, as well as to promote and maintain a safe and healthy work environment for all employees.

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1. Occupational safety and health (OSH): framework (a)

Workplace Safety: which includes measures and practices designed to protect workers from physical hazards, such as machinery accidents, falls, electrical shocks, and fires.

Occupational Health: This aspect deals with the impact of work on the physical and mental health of employees. It includes the identification and control of health hazards in the workplace, such as exposure to harmful chemicals, noise, and ergonomic risk factors.

Health and Safety Management Systems: often involves the implementation of systematic approaches to manage workplace safety and health, such as the development of safety policies, procedures, and risk assessment practices.

Regulations and Compliance: relevant regulations and standards are put in place by the EU and the UK. and National governments and regulatory bodies to establish minimum safety and health requirements for workplaces.

Training and Education: Proper training and education are essential components of OSH. Employees need to be informed about potential workplace hazards, safe work practices and how to use safety equipment.

Risk Assessment and Hazard Identification: OSH professionals and employers conduct risk assessments and identify potential workplace hazards to implement preventive measures.

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1. Occupational safety and health (OSH): framework (b)

Emergency Preparedness: OSH involves planning for emergencies, such as fires, chemical spills, or medical emergencies, and ensuring that workers are adequately trained and equipped to respond effectively.

Ergonomics: Ergonomics focuses on designing workspaces and tasks to fit the capabilities and limitations of the workers to minimize physical strain and discomfort.

Occupational Hygiene: This involves the control of physical and chemical exposures in the workplace, including monitoring air quality, noise levels, and exposure to hazardous substances.

Psychosocial Aspects: psychological factors in the workplace, such as stress, harassment, and workplace bullying, which can impact the mental health and well-being of employees.

Health Promotion: Some programs include health promotion activities to encourage employees to adopt healthy lifestyles and practices that contribute to their overall well-being.

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2. Main EU regulations for OSH in biovalue chains: some references

European regulations related to health and safety in bio-value chains manufacturing consists of some relevant directives:

- REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals)
- Biocidal Products Regulation (BPR)
- Genetically Modified Organisms (GMO) Regulations
- Chemical Agents Directive (CAD) and Carcinogens and Mutagens Directive (CMD)
- Directive 2000/54/EC on Biological Agents at Work
- Directive 98/24/EC on Chemical Agents at Work
- Environmental Protection Legislation.

European Agency for Safety and Health at Work

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3. Main UK regulations for OSH in biovalue chains: some references

The UK follows a regulatory framework that is partly aligned with European Union regulations, especially in the context of health and safety. Here are some relevant UK regulations related to health and safety in bio-value chains manufacturing:

- Health and Safety at Work Act 1974
- Control of Substances Hazardous to Health (COSHH) Regulations
- Genetically Modified Organisms (Contained Use) Regulations 2014
- Biocidal Products Regulations 2013
- The REACH (Amendment etc.) (EU Exit) Regulations 2019
- Control of Major Accident Hazards (COMAH) Regulations
- Biological Agents Regulations 2005
- Environmental Permitting Regulations
- Waste Management Regulations.

BRITISH SAFETY COUNCIL

OSH Stakeholder Alliance

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4. OSH focusing on manufacturing processes of GREEN-LOOP (a)

The manufacturing of novel bio-based materials and products, like any industrial process, poses specific health and safety concerns for workers. These concerns may vary depending on the specific processes and materials involved, but some common issues include:

Exposure to Hazardous Chemicals and Biological Agents: Workers may be exposed to chemicals, solvents, and biological agents used in the production of bio-based materials. Proper handling, storage, and disposal of these substances are essential to prevent chemical and biological hazards.

Dust and Particulate Matter: Some manufacturing processes may generate dust and particulate matter. Prolonged exposure to airborne particles can lead to respiratory issues, so adequate ventilation and personal protective equipment (PPE) are crucial.

Noise Exposure: The machinery and equipment used in manufacturing can generate high levels of noise, which can lead to hearing damage over time. Hearing protection and noise reduction measures are necessary.

Machine Safety: Workers operating manufacturing machinery are at risk of injuries, such as cuts, crush injuries, and entanglement. Proper training, machine guarding, and safety protocols are essential to prevent accidents.

Ergonomics: Poor ergonomics can lead to musculoskeletal disorders, such as repetitive strain injuries. Workers involved in repetitive or physically demanding tasks should have ergonomic workstations and receive training in proper posture and lifting techniques.

Heat and Cold Stress: Depending on the manufacturing process and location, workers may be exposed to extreme temperatures, leading to heat or cold stress. Adequate facilities, PPE, and training should be provided to mitigate these risks.

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4. OSH focusing on manufacturing processes of GREEN-LOOP (b)

Fire and Explosion Hazards: Certain bio-based materials and manufacturing processes can create fire and explosion hazards. Proper storage, handling of flammable materials, and fire safety measures are essential to prevent accidents.

Electricity Hazards: Electrical equipment and wiring in manufacturing facilities pose a risk of electrical shock and fires. Regular maintenance, electrical safety training, and the use of appropriate protective equipment are vital.

Chemical Reactions and Reactor Safety: Some bio-based materials may require chemical reactions and the use of reactors. Ensuring the safe design and operation of these systems is crucial to prevent accidents and chemical exposures.

Material Handling and Storage: Improper handling and storage of raw materials and finished products can lead to accidents and health risks. Adequate training and safety procedures for material handling are essential.

Personal Protective Equipment (PPE): Workers should be provided with appropriate PPE, including gloves, goggles, respirators, and other safety gear, to protect them from specific hazards they may encounter in the manufacturing process.

Emergency Response and First Aid: Adequate training and access to first aid equipment should be available to address injuries and health emergencies promptly.

Worker Fatigue and Stress: Extended work hours and high-pressure work environments can lead to fatigue and stress-related health issues. Employers should monitor work hours, provide adequate breaks, and address stress factors in the workplace.

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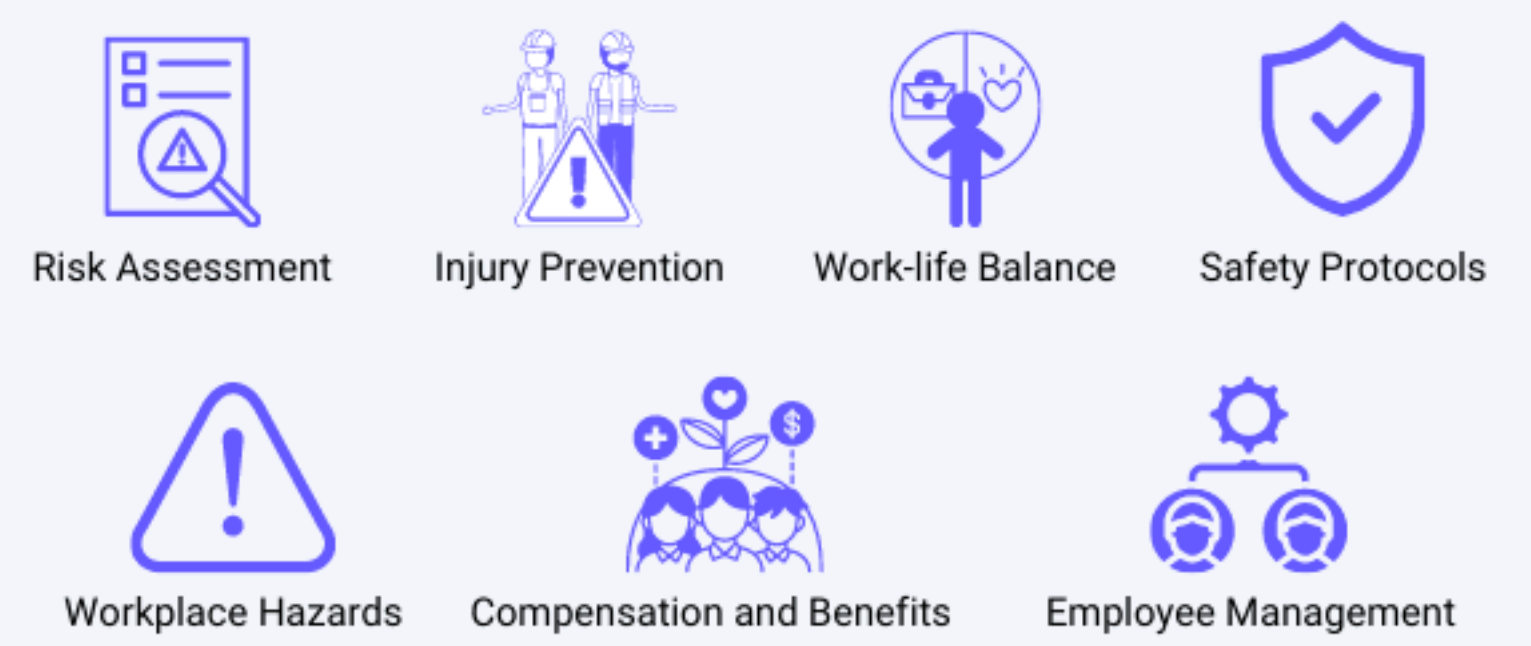
4. OSH focusing on manufacturing processes of GREEN-LOOP: perspective

It's essential for employers in the manufacturing of novel bio-based materials or products to conduct comprehensive risk assessments, provide proper training with compensation and benefits to their workers, enforce safety protocols, and continually monitor and improve workplace safety to mitigate these concerns and protect the health and well-being of their workers.



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Questions & Answers time

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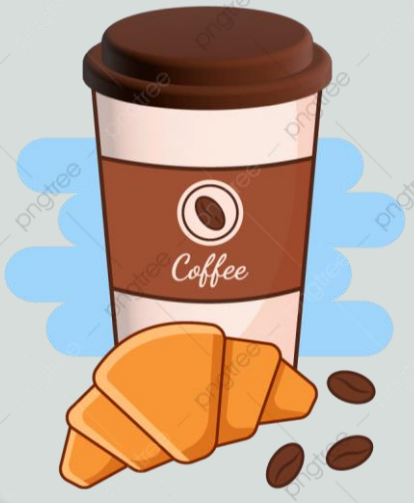
Let’s take a break…



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Workshop on *Occupational safety and health for GREEN-LOOP manufacture systems*

Second part:

5. OSH in the manufacturing of rubber panels
6. OSH in the manufacturing of bioplastic bottle closures for the packaging of food and beverage sectors
7. OSH in the manufacturing of wood composites to produce sliding bearings
8. The assessment of OSH issues in the GREEN-LOOP value chains

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5. OSH in the manufacturing of rubber panels

The manufacturing of rubber panels, in IIR o in SBR, for civil applications involves various occupational safety and health issues, which can vary depending on the specific processes and materials used. Some common issues and concerns in this manufacturing process include:

Chemical Exposure	Fire and Explosion Hazards
Dust and Fumes	Chemical Handling and Storage
Noise Exposure	Material Handling and Lifting
Machine Safety	Personal Protective Equipment (PPE)
Ergonomics	Emergency Response and First Aid
Heat and Cold Stress	Worker Fatigue and Stress

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6. OSH in the manufacturing of bioplastic bottle closures for the packaging of food and beverage sectors

Occupational safety and health (OSH) could be a critical concern also in the manufacturing of bioplastic bottles closures. Workers involved in this process can be exposed to various hazards, and it's essential to implement safety measures to protect their well-being. Here are some specific OSH considerations for this manufacturing process:

Chemical Exposure and handling	Fire Safety
Dust and Airborne particles	Chemical Storage
Noise Exposure	Waste management
Machine Safety	Personal Protective Equipment (PPE)
Ergonomics	Emergency Response and First Aid
Heat Stress	Psychosocial Well-being

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7. OSH in the manufacturing of wood composites to produce sliding bearings

Occupational safety and health (OSH) could be a critical concern also in the manufacturing of wood composites to produce sliding bearings. Workers involved in this process can be exposed to various hazards, and it's essential to implement safety measures to protect their well-being. Here are some specific OSH considerations for this manufacturing process:

Chemical Exposure	Safety inspections and reporting
Machine Maintenance and Inspections	Documentation and Records
Handling Heavy Materials	Personal Protective Equipment (PPE)
Fire Safety	Psychosocial Wellbeing
Ergonomics	Emergency Response and First Aid
Waste Management	Legal compliance

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8. The assessment of OSH issues in the GREEN-LOOP value chains

Have you risk assessed your safety culture?

"A good safety culture is made up of several norms, but when was the last time you checked up on them?"

The methodology for assessing Occupational Safety and Health (OSH) issues in the GREEN-LOOP manufacturing processes lead involve a systematic approach to identify and mitigate risks.

In the next slides are listed the main points for conducting such assessments by the GREEN-LOOP partners.

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8. The assessment of OSH issues in the GREEN-LOOP value chains (a)

1. Identify Stakeholders for each value chain: Identify the key stakeholders involved in the different manufacturing process, including workers, management, safety officers, and regulatory authorities.

2. Define Objectives: Clearly define the objectives of the OSH assessment, such as identifying hazards, ensuring compliance with regulations, and improving workplace safety.

3. Data Collection: Collect relevant data, including process documentation, incident reports if relevant, safety records, and information on materials, equipment, and machinery used.

4. Hazard Identification: Identify and assess potential hazards within the manufacturing process, including physical, chemical, biological, ergonomic, and psychosocial hazards. This can be done through observations, walkthroughs, and consultation with workers.

5. Risk Assessment: Evaluate the risks associated with identified hazards by considering factors such as the likelihood of occurrence, severity of consequences, and the number of exposed workers. This can help prioritize risks for mitigation.

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8. The assessment of OSH issues in the GREEN-LOOP value chains (b)

6. Regulatory Compliance: Ensure that the manufacturing process complies with all relevant OSH regulations and standards. Review current regulations and verify compliance in all aspects.

7. Safety Measures and Controls: Identify existing safety measures and controls in place and assess their effectiveness. Determine if additional controls are required to mitigate risks.

8. Employee Involvement: Involve employees in the assessment process. Gather their insights, experiences, and feedback regarding OSH issues, as they are often most familiar with workplace hazards.

9. Data Analysis: Analyze the collected data and information to gain insights into trends, recurring incidents, and areas of improvement.

10. Prioritization: Prioritize identified hazards based on the risk assessment and regulatory compliance. Develop an action plan to address these issues, including control measures, timelines, and responsibilities.

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8. The assessment of OSH issues in the GREEN-LOOP value chains (c)

11. Implementation of a plan: Execute the action plan and implement control measures, engineering solutions, administrative changes, or PPE to reduce or eliminate identified hazards.

12. Training and Education: Provide necessary training and education to employees, ensuring they are aware of the risks and know how to work safely.

13. Monitoring and Evaluation: monitor the effectiveness of implemented control measures and evaluate their impact on OSH. Adjust the action plan as needed.

14. Incident Reporting and Investigation: Establish clear incident reporting procedures and conduct thorough investigations to determine the root causes of incidents. Use the findings to improve safety measures.

15. Documentation and Record-Keeping: Maintain accurate records of the assessment process, action plans, training, incidents, and safety measures. Keep these records accessible for regulatory inspections and audits.

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8. The assessment of OSH issues in the GREEN-LOOP value chains (d)

16. Communication: Ensure clear communication about OSH issues, safety policies, and incident reporting throughout the organization. This includes regular safety meetings and updates.

17. Review and Continuous Improvement: Periodically review the OSH assessment and action plans, making necessary adjustments based on changing processes, technology, regulations, and feedback from employees.

18. External Audits and Consultation: Seek external audits and consultation, when necessary, especially for complex manufacturing processes. Third-party experts can provide valuable insights and recommendations.

To support the relevant GREEN-LOOP partners to verify and address the key OSH areas, a Check List on OSH is available in the Annex 2 of Deliverable 8.11 “Report on Occupational safety and health for GREEN-LOOP manufacture systems (M14)”.

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WORK HEALTH AND SAFETY

WORLD DAY FOR SAFETY AND HEALTH AT WORK

APR 28

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