

baa:

Bundesanstalt für Arbeitsschutz
und Arbeitsmedizin



Challenges and chances for occupational safety and health in circular economy

Overview regulations, frameworks, strategies

- Green Deal
- Chemical Strategy for Sustainability
- EU's Circular Economy Action Plan
- Sustainable Product Initiative → Ecodesign Regulation
- Critical Raw Materials Act
- EU-Battery Regulation
- EU-Recommendation for establishing a European assessment framework for 'safe and sustainable by design' chemicals and materials
- Clean Industrial Deal & Competitiveness Compass
- Circular Economy Act?



<https://www.europarl.europa.eu/committees/de/circular-economy-action-plan/product-details/20201106CDT04441>

Future challenges

- Important strategic raw materials are carcinogenic (e.g. cobalt, nickel, ...) and will occur more frequently at new workplaces in the circular economy.
 - Decarbonisation promotes the use of **low-energy biological processes** in the chemical industry, so the **risk assessment of biological agents** must be stepped up.
 - Repair and recycling companies are not (well) informed about hazards and measures via labelling and safety data sheets.
- The digital product passport will offer the opportunity to improve the flow of information in the future.



■ Critical Raw Materials & Circular Economy

■ Critical Raw Materials Act, Clean Industrial Deal & Competitiveness Compass

- exploitation of raw material deposits in the EU
- recovery of secondary raw materials at the end of the life cycle
 - mandatory quotas for recycled material
- energy transition & circular economy
- conflicting objectives with the EU chemicals strategy for sustainability
 - e.g. “phase out” of CMR substances



Challenges for occupational safety and health

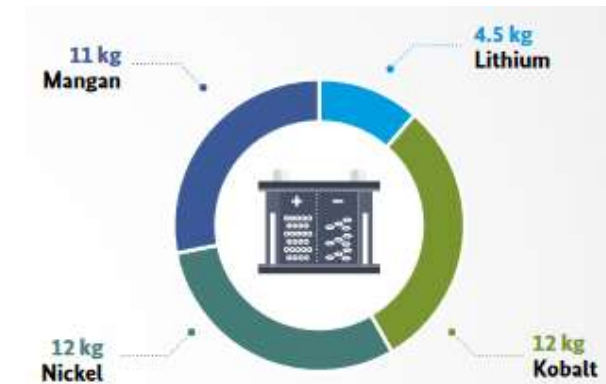
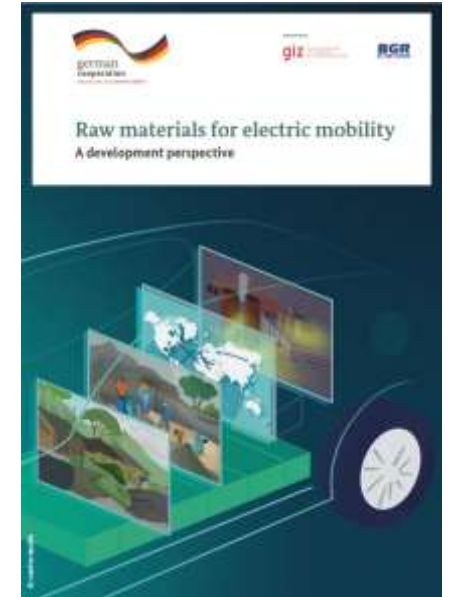
- plan and design (new) workplaces safe
- ensure information flow in the supply chain beyond the "product phase"
- adapt the legal framework in time

- **Connection to Occupational Safety & Health:**
- **E-mobility & electronic car batteries**



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- Lithium-ion batteries
- Battery Regulation: increasing minimum quantities of recycled cobalt (CR), lead (R), lithium (R?) and nickel (CMR) for newly produced batteries <https://eur-lex.europa.eu/eli/reg/2023/1542/oj/eng>
- Cobalt, lithium and nickel have been identified as critical raw materials <https://eur-lex.europa.eu/eli/reg/2024/1252/oj/eng>
- an average electric car battery contains 24 kilograms of cobalt and nickel compounds
- The EU Commission estimates that around 800,000 new jobs will be created in the EU's battery sector.



Raw materials contained in the cathode of the NMC111 battery with a capacity of 30 kWh

https://www.bgr.bund.de/EN/Themen/Zusammenarbeit/Techn-Zusammenarb/Downloads/2057_Rohstoffe_%20E-Mobilitaet_en.pdf?__blob=publicationFile&v=1

CMR substances a never ending challenge at workplaces!

BAuA activities:

- Research: what information is publicly available about electric car battery recycling and whether there is any exposure or biomonitoring data?
- Biomonitoring reveals increased co-exposure for workers in France
 - *Ogier Hanser, Mathieu Melczer, Aurélie Martin Remy, Sophie Ndaw, Waste Management 2022, 122.
- The promotional video for a pilot plant in Germany shows an open handling of the cobalt-containing ‘black mass’.

There are two main reasons for the shortcomings observed:

- 1) There is a lack of information about relevant hazardous substances.
- 2) Occupational safety is not considered in plant design.



Circular economy: a chance to improve occupational safety & health

- although battery recycling plants are subject to approval under accident prevention legislation, occupational safety and health is not covered by this approval process
- the latest report from the Commission for Plant Safety on battery cell manufacturing now includes recommendations on accident prevention legislation and occupational safety and health when working with hazardous substances!
- BAuA launched a project addressing inhalation and dermal exposure during various battery recycling activities → summer 2025 – summer 2029
- Getting an overview about the exposure situation at new workplaces
- Recommendations and control guidance sheets for common tasks during electric car battery recycling

Thank you very much for your attention!

I'd like to encourage you to check with your institutions to see what activities they are currently developing in the field of circular economy, and to find out if anyone else is working on battery recycling.

It would be great to hear from you!



Questions



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