International Cadmium Association
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Minutes of the 22nd ICdA H&S Committee

June 5th, 2024
10:00 h – 13:00h
Hybrid meeting (ICdA office Brussels & web access)

Attendance list (*present in Brussels meeting room)

Name	Company	Name	Company
Claudio Piga	5N PLUS	Alexandre Noel	SNAM
Jeffrey Dossous	5N PLUS	Laurent Smits*	SNAM
Vanessa Germonpre	Aurubis	Mike McDowell	Teck
Leo Bukovsky	Bochemie	Paul Kolisnyk	Teck
Riina Luomansuu	Boliden	Henry Dörsing	Vital-pms
Abeer Ali Khan	First Solar	Christophe Gauder*	Vital-pms
Joerg Seidel	Gaz-gmbh	Sophie Potier*	Vital-pms
Rodrigo Rodriguez	Glencore	Inge Maes	Nyrstar
Holly Baverstock	James M. Brown	Robert Hosking	Nyrstar
Ian Shackley	James M. Brown		
Jane Buttery	James M. Brown	Howard Winbow*	ICdA
Nicola Sanna	Portovesme	Mik Gilles*	ICdA
Chanson Claude*	Recharge	Noömi Lombaert*	ICdA
Bariand Marc	Saftbatteries	Andreea Savu	IZA
Patrick de Metz*	Saftbatteries	Josef Daniel-Ivad	IZA
Jerry Gottfridsson	Saftbatteries	Heidi Northshield*	IZA

Before starting the meeting, Mik Gilles reminded participants about the Statement of Compliance. (slide 3)

Agenda

- Welcome, statement of Compliance (Patrick)
- Occupational exposure to cadmium
  - Substances of concern in the EU Batteries Regulation, Art 6 (Claude Chanson, Recharge)
  - Status update of the regulatory process (Mik)
    - OEL Review Process ended
    - End of transitional phase approaching fast
  - Annual reporting on cadmium occupational monitoring OCdAir and OCdBio (Mik)
  - Conclusions and recommendations. (Mik / Patrick)
- Cadmium releases to the environment (Mik)
- Regulatory Update
  - Cadmium Authorisation and Restriction, endocrine disruptors, … (Noömi, Heidi & Howard)
- Closing Summary and next meetings (Patrick / Mik)

Impact of the new EU Batteries Regulation on the Nicad batteries value chain. (see separate Recharge slide deck)

A presentation was given by Claude Chanson from the advanced rechargeable batteries association "Recharge" on the impact of the new EU Batteries Regulation on actors in the NiCad battery value chain.

The existing Restriction on use of batteries with more than 0.002% cadmium does not change with this regulation. There is an obligation to recycle at least 80% of NiCd batteries by end of 2025. Cadmium shall be separated during recycling and given a safe destination: reused or immobilized and safely disposed.

However, important points to note in the new Regulation are included in Article 6.5 'report on substances of concern contained in batteries or used in their manufacturing', and in Article 86 'preparing, if requested by the Commission, a restriction proposal on substances used in the manufacturing of batteries or present in batteries when they are placed on the market.' So all battery substances are therefore in scope and if no adequate control of risk to human health and environment for substances of concern (including cadmium) can be demonstrated, the EU Commission can prepare a Restriction proposal. This second route for setting Restrictions on use will have precedence over the existing REACH Restriction process. Claude Chanson expects that today's exposure risk control during NiCad batteries manufacturing use and recycling is sufficient to avoid a further Restriction, but only if we demonstrate this by sharing good performance of today's risk management with COM. An ECHA assessment process on Substances of Concern in Batteries has been initiated and a study was subcontracted to Ramboll who will do data gathering (April- 21 June 2024) through an online questionnaire accessible here:
https://ec.europa.eu/eusurvey/runner/batteries_survey. The deadline has just been extended until July 5th.

The list of waste (LoW) for batteries has been extended to cover all battery chemistries, but with no changes to the existing listing of waste NiCad batteries on the LoW as hazardous waste. With many more hazardous entries on the LoW for batteries, including PFAS, cadmium is now less in the picture as it was before.

Revision of the EU binding occupational exposure limit (BOEL) for cadmium (slides 6-8)

No agreement could be reached within the Working Party Chemicals between workers, employers and Member State representatives on a limit value more relaxed than 1µg Cd/m³, inhalable fraction. A biological limit value will not be imposed. The transition period during which an OEL of 4µg Cd/m³ inhalable (or 4µg Cd/m³ respirable if supported by biomonitoring) is implemented, will end on July 11th 2027. From that date on, Member States shall have to put into place a binding OEL of no more than 1µg Cd/m³, inhalable fraction.

As a result, ICdA now recommends its members to start or switch to monitoring of the inhalable fraction as the primary measure. Only by doing so, they will discover if the level of exposure is compliant with the future OEL, and if not, develop an improvement plan to ensure compliance by July 2027.

Reporting from the occupational exposure monitoring programs OCdAir and OCdBio (slides 9-31)
Air monitoring: OCdAir (slides 11-20)

Our assessment was done differently from previous years:

- We now focus on compliance of the 95 percentile of an exposure group (SEGs) with the OEL.
- A split was made between plants in the NiCad battery value chain and all other plants. This exercise was done to demonstrate an efficient risk management under the new EU Batteries Regulation.

For the batteries sector, the following is observed:

When not discriminating between the inhalable and the respirable fraction, a decrease of number of workers compliant with 1µg Cd/m³ is observed. But this observation is misleading.

A deeper dive shows that there was a massive shift from monitoring the respirable fraction towards the inhalable fraction, which is more stringent. We refer to earlier observations where the inhalable fraction is 4 to 10 times higher than the respirable fraction.

For both the inhalable and the respirable fraction, there is a significant increase of number of workers that are compliant with a limit value of 1µg Cd/m³ as compared to the year before. This demonstrates that again significant efforts have been made to lower the exposure of workers, anticipating the new OEL value of 1 µg Cd/m³ inhalable

fraction which should be met by July 2027. The 2027 target hasn't been met yet in all workplaces, but the degree of progress is promising.

In the non-batteries sector, a similar progress is observed, but the degree of compliance with the future OEL is already higher.

A final remark is that for some SEGs that are not compliant yet, non-compliance can be overcome by introducing personal respiratory protective equipment (RPE). In those workplaces where respiratory protection with a high protection factor is already implemented, there may be need to make further process or engineering changes to address the level of exposure.

Biomonitoring: OCdBio (slides 21-30)

The number of workers with increased cadmium in urine and/or blood continues to drop. Today, the observed higher cadmium in blood in workers is likely linked with high historically accumulated cadmium body burden rather than with a recent elevated exposure to cadmium.

Workers with urinary cadmium >2µg Cd/g creatinine dropped from 20.3% in 2008 to 2.9% in 2023. Today there are less than 9.6% workers with urinary cadmium >1µg Cd/g creatinine. Considering the slow rate of cadmium clearance from the human body, this is a performance we didn't expect to achieve when this exercise was started 16 years ago.

The progress made in workplace exposure as demonstrated by the continued drop of cadmium body burden of exposed workers is clear evidence that exposure is well managed. With the new and very low OEL values that will enter into force on July 2027, it is anticipated that the biomonitoring data will continue to progress in a positive direction.

Cadmium releases to the environment (slides 32-35)

ICdA started this year with the collection of data on cadmium releases to water and emissions to air. The participation in this data collection was already reasonably good but we urge more plants to report.

This exercise is needed to demonstrate that cadmium environmental risk is well controlled. The new Batteries Regulation already requires such proof of risk control. The collected data clearly demonstrate how little the NiCad battery sector contributes to cadmium pollution of the environment:

- Emissions to air from the NiCad battery value chain (Cd refiners, battery compound producers, battery producers and battery recyclers) contributed only 1.73% of all Cd emissions reported in E-PRTR.
- Release to water from this sector were at 1.02% of all Cd releases reported in E-PRTR.

ICdA will collect further data from its members and make additional comparisons with releases and emissions from other sectors that report into E-PRTR. (E-PRTR=European Pollutant Release and Transfer Register)

Reach: Authorisation (slides 36-40)

Cadmium and cadmium compounds are not in the 12th recommendation list (7 Feb2024). Inclusion in 13th list is unlikely but uncertainty remains:

- Endocrine disruptors score higher and push cadmium lower in ranking. If after the assessment, cadmium would be classified as an endocrine disruptor, it will move again higher in the ranking.
- The ongoing Reach revision is put on hold which might delay the decision on a 13th list. The Reach revision might include a different scoring or selection mechanism.

REACH: Restriction process (slide 41)

In the rolling restrictions roadmap to 2025-2027 (first published in 2022 and currently being updated (draft version 29/02/24), there are no indications of specific new restrictions on use of cadmium that might have an impact on ICdA members. There are more general Restriction proposals for CMR substances in Textiles and Childcare articles to which ICdA has responded in the consultation.

Hazard classification: Endocrine Disruption (ED) (slides 42-45)
The EU has included new ED categories in CLP for HH and ENV (cat.1=known ED, cat.2=suspected ED).
We need to assess if cadmium shows ED in readiness for the CLP requirement by May 2025, but the regulatory text, which will lay out to define the assessment obligations, has still to be published. In the absence of a guidance, ICdA will use the EFSA Guidance as a proxy, noting that the final ECHA guidance may differ slightly. The ED assessment of cadmium will be done by ARCHE. Cadmium has reprotoxic properties, and has been shown to have oestrogen mimicking effects, which increases the likelihood of being Cd being classified. However, classification could be waived if you can sufficiently demonstrate the observed endocrine effects, is secondary to another form of toxicity (=caused by another toxicity). This might be a conclusion for cadmium. Considering the absence of the guidance at this stage, it is not sure if we will have a full ED assessment ready by May 2025.
If classified as ED for HH, the classification thresholds will be the same as for carcinogenicity. It will increase the Authorisation score and the new classification will need to be mentioned on the SDS and require appropriate hazard labelling. This will also affect CLP classification of zinc mineral concentrates shipped under IMO regulation to Europe and inevitably at a later stage also under GHS.

Other ongoing EU legislative actions. (slides 46-51)
An overview of other current legislative activity, and potential priorities during the next Commission cycle after the imminent EU Elections, was given by Howard Winbow.

The Chairman thanked all the participants for their presence and interactions and closed the meeting at 12:40.

Slides presented are added in Annex

The position of Cd in the new Batteries Regulation

ICdA Environment Health and Safety meeting

Claude Chanson, June 5th, 2024

Brussels

THE ADVANCED RECHARGEABLE AND LITHIUM BATTERIES ASSOCIATION

Agenda

1. Update of the Cadmium management in the batteries regulation.
2. Batteries Regulation Article 6 specific new requirements.
3. Are there further risks of Cadmium restriction in batteries with the Batteries Regulation article 6?

Update of the Cadmium management in the batteries regulation.

European Commission

- *Recital (22)*

In addition to the restrictions set out in Annex XVII to Regulation (EC) No 1907/2006, it is appropriate to set out restrictions for the presence of mercury, cadmium and lead in certain categories of batteries. Batteries used in vehicles which benefit from an exemption under Annex II to Directive 2000/53/EC of the European Parliament and of the Council (9) should be excluded from the prohibition to contain cadmium. With a view to further restrictions on substances present in batteries or used in their manufacturing, it is appropriate to carry out a mapping of substances of concern, defined in the Chemicals Strategy for Sustainability as substances having a chronic effect for human health or the environment, such as substances in the candidate list for eventual inclusion in Annex XIV to Regulation (EC) No 1907/2006 and in Annex VI to Regulation (EC) No 1272/2008, but also those which hamper recycling for safe and high quality secondary raw materials, in the context of the substance evaluation planned in the REACH Evaluation Joint Action Plan published on the website of the European Chemicals Agency set up under Regulation (EC) No 1907/2006 ('the Agency').

Update of the Cadmium management in the batteries regulation.

The restriction of use is unchanged

European Commission

- *Article 13- 5. All batteries containing more than 0,002 % cadmium or more than 0,004 % lead, shall be marked with the chemical symbol for the metal concerned: Cd or Pb.EN 28.7.2023 Official Journal of the European Union L 191/37.*

- *Annex 1- restriction on substances*
  - ❑ *2. Cadmium CAS No 7440-43-9 EC No 231-152-8 and its compounds*
  - ❑ *Portable batteries, whether or not incorporated into appliances, light means of transport or other vehicles, shall not contain more than 0,002 % of cadmium (expressed as cadmium metal) by weight.*

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Update of the Cadmium management in the batteries regulation.

- *ANNEX XII - STORAGE AND TREATMENT, INCLUDING RE* European Commission *MENTS*

Part A: Storage and treatment requirements

Parag 5. Mercury shall be separated during treatment into an identifiable stream, which is safely immobilised and disposed of and cannot cause adverse effects on human health or the environment.

Parag 6. Cadmium shall be separated during treatment into an identifiable stream, which is given a safe destination and cannot cause adverse effects on human health or the environment

- *Part B: Targets for recycling efficiency*
- *1. No later than 31 December 2025, recycling shall achieve at least the following targets for recycling efficiency:*
- *(c) recycling of 80 % by average weight of nickel-cadmium batteries;*

Article 6 new ECHA's tasks (Articles 6.5, 87 & 88)

ECHA EUROPEAN CHEMICALS AGENCY will support the European Commission by:

- *Article 6.5 – Assisting in preparing the report on substances of concern contained in batteries or used in their manufacturing*
- *Article 86 – Preparing, if requested by the Commission, a restriction proposal on substances used in the manufacturing* of batteries or present in batteries when they are placed on the market. (This can happen if the Commission considers that the substance used to manufacture batteries, present in batteries on the market or during recycling and waste stages poses a risk to human health or the environment that is not adequately controlled in the European Economic Area (EEA))
- Article 87 – Providing an opinion on the effectiveness of the restriction proposal to control the risk (through the Committee for Risk Assessment, RAC) and the socio-economic impact (through the Committee for Socio-Economic Analysis, SEAC).

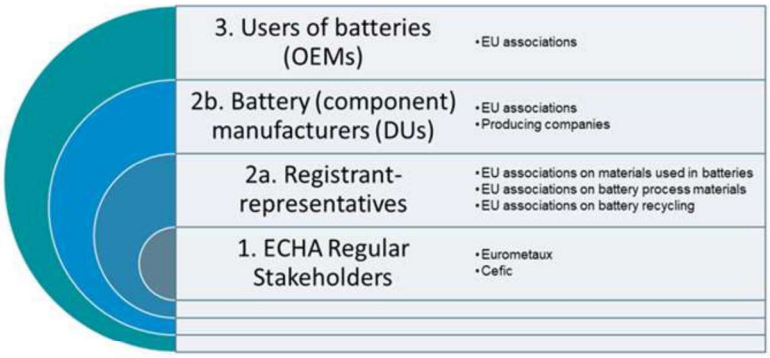
Restriction on Substances (Art. 6)

5. By 31 December, the Commission, assisted by the European Chemicals Agency…shall prepare a report on substances of concern, namely substances having an adverse effect on human health or the environment or hampering recycling for sage and high quality secondary raw materials, present in batteries or used in their manufacture.

- End of 2023 - Eurometaux were approached as the intermediatory between industry & the authorities
- 18 March 10.30-11.30 – Eurometaux held a preparatory call for both companies and associations to explain the practicalities of the workshop and get questions and issues to raise. Calendar invite sent on 29 February to WG5 & 6.
- 16-17 April – Eurometaux will host the first workshop of the Exchange & Capacity-building Group on Batteries Materials project (ECaBaM)
    - Follows from discussions with ECHA to organise an 'Intermediates program' type setup to facilitate information sharing, capacity building between authorities & the sector in preparation for news tasks in the context of the BR.
    - This will require additional knowledge on battery technologies, processes, substances used and supply chain actors.

Restriction on Substances (Art. 6)

Eurometaux propose different levels of participation:



- 16-17 April ECaBaM workshop:
    - Main attendees 1 & 2a
    - Max 40 participants in person in discussions + additional participants online in listening mode.
    - Participants with knowledge on battery technologies, processes, substances used & supply chain actors.
    - Proposal for DUs & battery users (2b & 3) to participate in preparatory & debrief info meetings of these workshops. Detailed minutes will be circulated.

14:40-15:10 Batteries Regulation Article 6 presentation at ECaBaM

ECHA tasks

Substances of concern: Phase 1 timeline

- → Mandate from the Commission (done)
- → Phase 1 contract definition (done)
- → Contract finalised: Ramboll selected as contractor (done)
- → Kick-off (done)
- → Information gathering from stakeholders (April-June 2024)
- → Drafting phase (June – Dec 2024)
- → Report to ECHA (March 2025)
- → Report to the Commission (June – 2025)

SoC: information gathering

- → Limited information on substances in batteries available in REACH registrations
- → Information on quantities and technical function missing
- → ECHA needs reliable information on
  - Substances in batteries including those used in manufacturing processes
  - Amount and technical function
  - Potential exposure to humans and environment in all life cycle stages
  - Availability of alternatives

Batteries Regulation Article 6

- Ramboll online data collection questionnaire is available: https://ec.europa.eu/eusurvey/runner/batteries_survey
- Questionnaire (from first ECaBaM workshop) revised according to:
  - Comments submitted
  - JRC LoW report
- ECHA & Ramboll decided not to conduct a second revision/feedback – although a second revision/feedback was stated at the ECaBaM workshop.
- Survey is open until 21 June 2024 –
- Any questions related to the survey contact: batteries_survey@ramboll.com.

Batteries Regulation Article 6

Next steps:

- RECHARGE's reaction to the tight 21 June deadline, will be based on the LoW updated answers.
- Eurometaux will hold another ECaBaM workshop in October/November

Report from Waste Expert Group meeting on LoW DA held on 8/05/2024: Cd is now only 1 hazardous substance among others

Li-waste batteries – Hazard determination (I)

Cathode material

Battery chemistry	CAS No.	Hazard statement code, hazard class and category code		
LCO	12190-79-3	H360Fd	Repr. 1B	→ H360: May damage fertility or the unborn child HP 10: ≥ 0.3 %
NMC	various entries e.g. 179802-95-1 or 182442-95-1	H317; H330; H334; **H350**; **H360**; H372; H412	Skin Sens. 1; fatal if inhaled; Resp. Sens. 1; Carc. 1A; Repr. 1B; STOT RE 1; Aquatic Chronic 3	→ H350: May cause cancer HP 7: ≥ 0.1 %
LMO	12057-17-9	**H302; H332**; H413	Acute Tox. 4; Acute Tox. 4; Aquatic Chronic 4	→ H302+H332: HP 6 HP 7: ≥ 25 or 22.5 % **Sum of concentration!!!**
NCA	177997-13-6; 193214-24-3	H314; H317; H318; H330; H334; **H350**; H360; H372; H412	Skin Corr. 1B; Skin Sens. 1; Eye Dam. 1; Acute Tox. 2; Resp. Sens. 1; Carc. 1A; Repr. 1B; STOT RE 1 (lungs); Aquatic Chronic 3	→ H350: may cause cancer HP 7: ≥ 0.1 %
LTO	12031-82-2	-	not classified	
LiSOCl	not found*	-	-	
LPF	15365-14-7	-	not classified	

*No entry for LiSOCl. But entries exist for
- $SOCl_2$ (H315, H319, H332, H334, H335)
- LiCl (H302, H315, H319, H335)

Report from Waste Expert Group meeting on LoW DA held on 8/05/2024: Cd is now only 1 hazardous substance among others

Li-waste batteries – Hazard determination (II)

Electrolyte

Battery chemistry	CAS No.	Hazard statement code, hazard class and category code		
$LiPF_6$	21324-40-3	H301; H314; H318; **H372**	Acute Tox. 3; Skin Corr. 1A; Eye Dam. 1; STOT RE 1	→ H372: Damage to organs HP 5: ≥ 1 %
$C_3H_4O_3$	96-49-1	H302; H319; **H373**	Acute Tox. 4; Eye Irrit. 2; STOT RE 2 ((Kidney) (oral))	→ H373: May cause damage to organ, HP 5: ≥ 10 %

Chemical compounds formed during life-time

Battery chemistry	CAS No.	Hazard statement code, hazard class and category code		
HF	7664-39-3	**H300**; H310; H314; H330	Acute Tox. 2; Acute Tox. 1, Skin Corr. 1A, Acute Tox. 2	→ H300: Fatal if swallowed HP 6: ≥ 0.1 %

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European Commission

Report from Waste Expert Group meeting on LoW DA held on 8/05/2024 : based on hazardous susbstances, most batteries are hazardous waste

Waste batteries – amended codes

Current Waste Code		Proposal for Waste Code amendment	
16	**Waste not otherwise specified in the list**		
16 06	**Batteries and accumulators**	**16 06**	**Wastes from the manufacture, supply and use of batteries**
16 06 01*	Lead batteries (Pb-Acid)	16 06 01*	Waste lead-acid batteries
16 06 02*	Ni-Cd batteries (Ni-Cd)	16 06 02*	Waste nickel-cadmium batteries
16 06 03*	Mercury-containing batteries	16 06 03*	Waste mercury-containing batteries
16 06 04	Alkaline batteries (except 16.06.03*)	16 06 04*	Waste alkaline-based batteries (except 16 06 03)
16 06 05	Other batteries and accumulators	16 06 05	Waste batteries not otherwise specified other than those mentioned in 16 06 07
16 06 06*	Separately collected electrolyte from batteries and accumulators	16 06 06*	Separately collected electrolyte from waste batteries
20	**Municipal wastes**		
20 01	**Separate collected fractions (except 15 01)**		
20 01 33*	Batteries and accumulators included in 16 06 01*, 16 06 02* or 16 06 03* and unsorted batteries and accumulators containing those batteries	20 01 33*	Waste batteries included in categories 16 06 01 to 16 06 04, 16 06 07 to 16 06 11, 16 06 13 and unsorted waste batteries containing those waste batteries
20 01 34	Batteries and accumulators other than those mentioned in 20 01 33*	20 01 34	Waste batteries other than those mentioned in 20 01 33

- Wording changed to stress the waste status of the batteries listed
- Reference to "accumulators" removed in line with BR terminology
- Waste alkaline batteries reclassified as hazardous waste (absolute)

European Commission

Report from Waste Expert Group meeting on LoW DA held on 8/05/2024 : based on hazardous susbstances, most batteries are hazardous waste

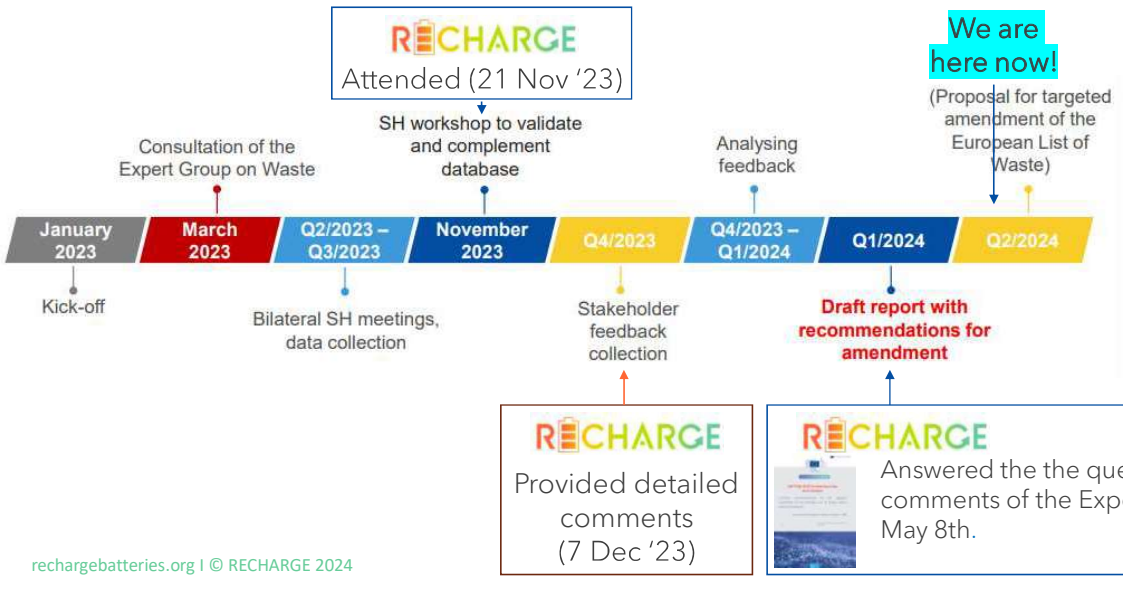
Waste batteries – new codes

16 06 07*	Waste batteries not otherwise specified containing hazardous substances
16 06 08*	Waste lithium-based batteries
16 06 09*	Waste nickel- based batteries other than those mentioned in 16 06 02 (e.g. NiMH, Na-$NiCl_2$)
16 06 10*	Waste zinc-based batteries, including silver oxide batteries
16 06 11*	Waste sodium-based batteries containing hazardous substances (except 16 06 13)
16 06 12	Other waste sodium-based batteries
16 06 13*	Waste sodium sulphur batteries

- Covers all relevant battery chemistries not previously addressed
- Hazardous code 16 06 07* introduced (mirror to 16 06 05) → catch-all

European Commission

Update of List of Waste (LoW) timeline



Are there further risks of Cadmium restriction in batteries with the Batteries Regulation article 6?

- *Article 6 is applicable with a Commission report on 31 dec 2027*
- *Will it contain indications about Cadmium? YES*
  - *It is very important to answer the Ramboll questionnaire, indicating that precautions are taken to protect health and environment*
- *Will it contain a proposal for further restrictions on Cadmium? IT IS POSSIBLE*
  - *But it will dépend on the assessement of the ECHA report : answer to Ramboll questionnaire is important*
  - *Cadmium is now only one of the multiple hazardous substancres contained in batteries, and not high in the radar, compared to new focus like PFAS.*

Are there further risks of Cadmium restriction in batteries with the Batteries Regulation article 6?

- *Is the article 6 a benefit for the Batteries Industry?*
  - *No: the hazardous substance used in the batteries are under high scrutiny.*
  - *Yes: the examination of the conditions for substitution, restrictions or authorizations will be under a specialized comitte, with hopefully a better understanding of the industry of the batteries. In principle , this committee will have precedence over other committees in the the global REACH process for batteries. At some point , transfer of dossiers from the global REACH process to the Batteries Regulation art 6 process may become beneficial for example for PFAs.*

Thank you

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International Cadmium Association

22nd Health and Safety committee meeting

Brussels, June 5th, 2024
10:00 -13:00

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Agenda

- Welcome, statement of Compliance (Patrick)
- Occupational exposure to cadmium
  - Substances of concern in the EU Batteries Regulation_Art 6 (Claude Chanson, Recharge)
  - Status update of the regulatory process (Mik)
    - OEL Review Process ended
    - End of transitional phase approaching fast
  - Annual reporting on cadmium occupational monitoring OCdAir and OCdBio (Mik)
  - Conclusions and recommendations. (Mik / Patrick)
- Cadmium releases to the environment (Mik)
- Regulatory Update
  - Cadmium Authorisation and Restriction, endocrine disruptors, … (Noömi, Heidi & Howard)
- Closing Summary and next meetings (Patrick / Mik)

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STATEMENT OF COMPLIANCE

- The purpose of the meeting is to address, under the applicable confidentiality rules, issues concerning Cadmium and Cadmium compounds producers and importers and more particularly their obligations under the several regulations.
- The minutes kept during the meeting will have to reflect all significant matters discussed during the meeting.
- No discussions will be held, formally or informally, during specified meeting times or otherwise, involving, directly or indirectly, express or implicit agreements or understandings related to: (a) any company's price; (b) any company's terms or conditions of sale; (c) any company's production or sales levels; (d) any company's wages or salaries; (e) the division or allocation of customers or geographic markets; or (f) customer or suppliers boycotts; or (g) any disclosure of information which may affect applicable rules on Competition Law.
- The International Cadmium Association (ICdA), as a group will make no recommendations of any kind and will not try to reach any agreements or understandings with respect to an individual company's prices, terms or conditions of sale, production or sales levels, wages, salaries, customers or suppliers.

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Occupational exposure to cadmium

Art.6 of the new Batteries Regulation on restrictions on substances and risk management of Substances of concern

https://eur-lex.europa.eu/eli/reg/2023/1542/oj

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Occupational Exposure to Cadmium

Status update of the regulatory process

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OEL Revision Process: Directive 2019/983

- Discussions at the WPC did not result in a proposal for amending the Directive
  - Worker's representatives were not willing to accept an air limit value lower as what is foreseen in 2027 (1µg/m³, inhalable fraction) and would see a biologic limit value only in addition to the air limit value.
  - MS representatives did not want to go against the worker's position.
  - Without agreement within WPC, the Commission will not take the initiative to issue a proposal for amendment of the Directive
- The transition period will end on July 2027, at which moment an EU wide binding occupational exposure limit value will be set at **1µg/m³ ,inhalable fraction**.
  - EU members states will need to implement this value by 11 July 2027.

The full text of the Directive 2019/983 can be found at: https://eur-lex.europa.eu/eli/dir/2019/983/oj

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Way forward

- In an international context, the ICdA position to protect workers from exposure to cadmium remains unchanged:
  - **an OELV at 4µg Cd/m³, respirable fraction** to protect against local respiratory adverse health effect
  - **combined with a BLV of 2µg Cd/g creatinine in urine** to protect against systemic adverse health effects." (ICdA guidance and ICdA Biomonitoring voluntary system)

- However, ICdA will assist its EU members to comply with the tougher workplace exposure criteria imposed today and in the future by EU member states.

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Occupational exposure to cadmium

Annual reporting on
Cadmium occupational monitoring
OCdAir and OCdBio

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OBSERVATORIES:
Monitoring Cd exposure of workers

- OCdAIR-11: results, analysis, discussion
  - Presentation of reported data from members
  - Conclusions
- OCdBIO-16: results, analysis, conclusions
  - Presentation of reported data from members: CdU, CdB, and post-2000 hires subgroup
  - Conclusions
- Way forward

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OCdAIR-11

Occupational Cadmium Air-monitoring Observatory

2023 monitoring results

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OCdAir-11

- Personal air sampling at the workplace
  - 11 years of data collection
  - Some plants dropped out (switch to Cd free alternatives)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Plants	12	22	20	16	30	25	31	33	33	32	29
SEGs	67	142	131	124	162	165	204	216	211	255	185
Workers	994	1548	1369	1278	2249	1857	3499	3662	3607	4039	3553

- Good reporting quality
  - All measurements mentioned respirable or inhalable fraction
  - Correction for Personal Protection Equipment during sampling

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OCdAir-11

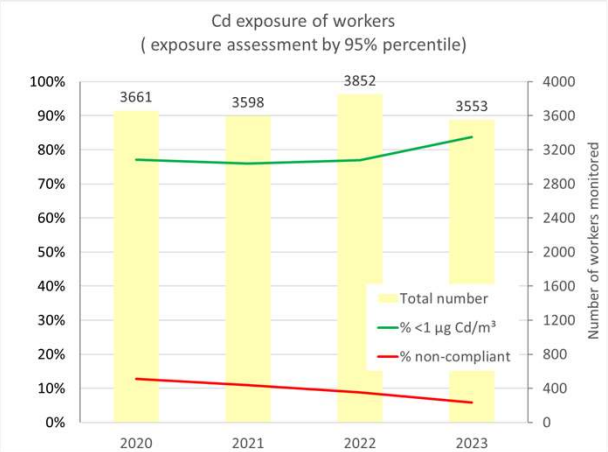
- ICdA guidance
  - Air quality should be under control to assure < 4µg Cd/m³ **respirable** air, always and for all workers
- Amendment of Carcinogens and mutagens directive:
  - In absence of biomonitoring:
    - ✓ Transitional value: < 4µg Cd/m³ **inhalable** air.
  - From 2027: < 1µg Cd/m³ **inhalable** air.
- RAC proposal:
  - Urinary cadmium 1µg Cd/g creatinine AND < 1µg Cd/m³ **inhalable** air

    =>ICdA is challenging this proposal at the WPC

12

Workers exposure: 95th percentile

- Gradually more workers have exposure <1µg/m³.
  - 77% => 84%
- Less workers are non-compliant with today's implemented limit value of 4µg/m³ (inh. or resp.)
  - 13% => 6%



13

Split between sectors

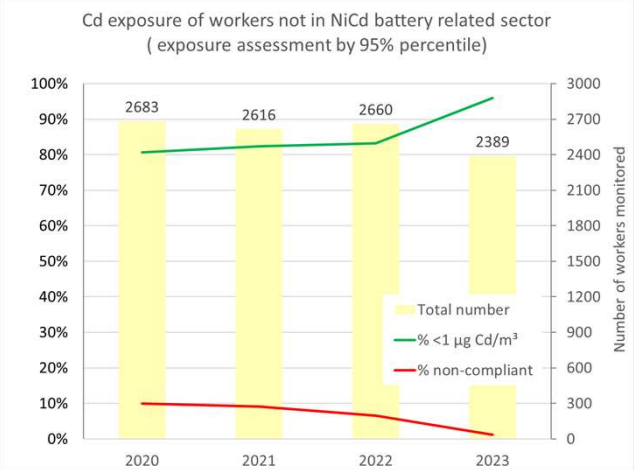
- With respect to the batteries Regulation, the reporting plants were split in 2 groups
  - Plants in the NiCd batteries value chain
  - Plants not in the NiCd batteries value chain

non-batteries sector		batteries sector	
5N+	Hydrometal	Gaz	Boliden Odda
Amphenol FR	JMB	Hoppecke	Glencore Nordenham
Amphenol UK	Lynred	Saft Bordeaux	KCM
Aurubis Belgium	Nyrstar Auby	Saft Ferak	Nyrstar Budel
Aurubis Spain	Nyrstar Balen-Pelt	Saft Nersac	Arts
Boliden Kokkola	Saxonia	Saft Oskarshamn	SNAM
Campine	Souriau		Accurec
First Solar	Umicore		
Glencore AZSA	VPMS		

14

Workers exposure: non-batteries sector (inh+resp)

- Gradually, more worker have exposure <1µg/m³.
  - 81% => 96%
- High degree of compliance achieved with today's implemented limit value of 4µg/m³ (inh or resp). Share of non-compliant workers continues to decrease
  - 10% => 1%

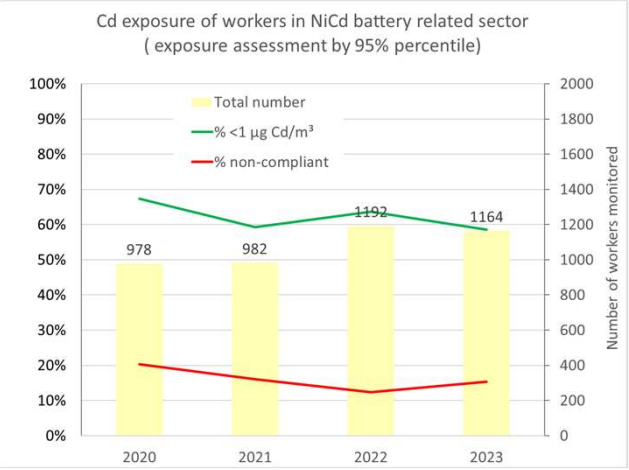


15

Workers exposure: batteries sector (inh+resp)

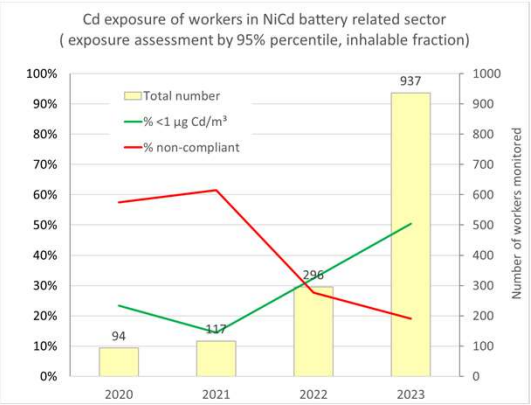
- A decreasing share of worker have exposure <1µg/m³ !!!
  - 67% => 59%
- Batteries sector has a lower degree of compliance with today's implemented limit value of 4µg/m³ (inh or resp). Share of non-compliant workers continues to decrease, but still at a high level
  - 20% => 15%

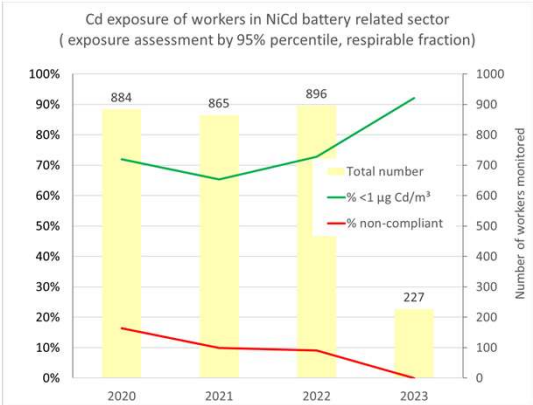
Remark: these observations do not discriminate between compliance with inhalable or respirable fraction!



16

Workers exposure: batteries sector (inh. vs resp.)



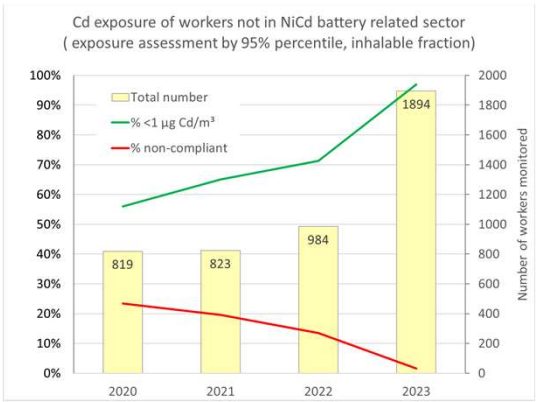


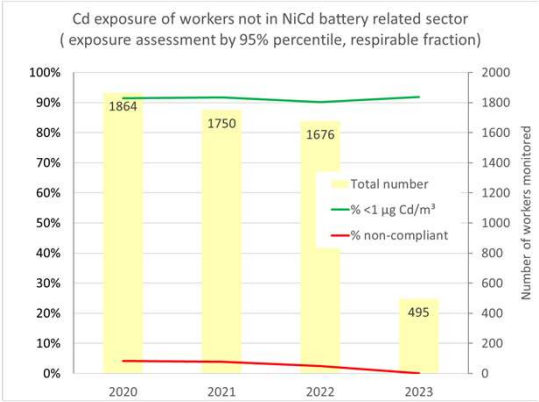
- Non compliance of the batteries sector is mainly connected with the inhalable fraction.
- Share of worker not compliant with 4µg Cd/m³ inhalable fraction is decreasing (57% => 19%) but still high, as it was only discovered after sampling switched to the inhalable fraction.
- 50% is already compliant the future 1µg/m³ threshold.

- In 2023 there was a clear shift from monitoring the respirable fraction towards the inhalable fraction, reaching 80%
- Share of worker not compliant with 4µg Cd/m³ respirable fraction is decreasing and now reaching full compliance
  - 16% => 0%
- Share of workers below 1µg/m³ respirable is increasing
  - 72% => 92%

17

Workers exposure: non-batteries sector (inh. vs resp.)





- Non-compliance with the inhalable fraction is decreasing
  - 23% => 2%
- Share of worker compliant with 1µg Cd/m³ inhalable fraction is sharply increasing
  - 56% => 97%

- A shift from monitoring the respirable fraction towards the inhalable fraction is also observed in this sector.
  - For 79% of workers, the inhalable fraction is monitored
- Today, all worker are compliant with 4µg Cd/m³ respirable fraction
- Share of workers below 1µg/m³ respirable is fairly stable.
  - 91% => 92%
- Further efforts needed when switching to the inhalable fraction.

18

Conclusion on Cd in Workplace air

- A consistent lowering of the Cd exposure at the workplace is observed.
- Starting July 2027, the binding occupational exposure limit will be at 1µg Cd/m³, inh.
  - If we assume that 0,25µg Cd/m³ respirable corresponds to 1µg Cd/m³ inhalable we can estimate today's compliance with the 2027 mandatory target:
    - ✓ Battery sector 50% compliant
    - ✓ Non-battery sector 94% compliance
  - Biggest change required in the batteries sector.
    - ✓ Little use of PPE today, so compliance can often be achieved by use of PPE.
  - Non-batteries sector faces tougher challenges because today, compliance is mostly reached by use of PPE.
    - ✓ There are limits to raising the protection factor of PPE. Likely more need for structural changes that address cadmium exposure. => it requires more time to change process equipment than to changing type of respirator!!!
- If not done yet, urgent need to monitor inhalable fraction to understand situation in your plant and develop an action plan

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OCdBio

Observatory of Occupational Cadmium Bio-monitoring

2023 Results

20

OCdBio - Occupational Cadmium Bio-monitoring Observatory

- Since 2008, Cd bio-monitoring data is collected in the Cd industry in order to convince ourselves and authorities on:
  - the efficiency of our risk management program
  - the compliance of the current exposure levels with the OELs
- It is interesting for ICdA members to compare their own data with aggregated data from the whole Cd using industry
- A meaningful follow-up requires:
  - A long-term involvement of the companies: currently 16 years follow-up!
  - A strong coverage of EU industrial sites: in 2023 we received reporting from 4906 workers on 37 sites!!!

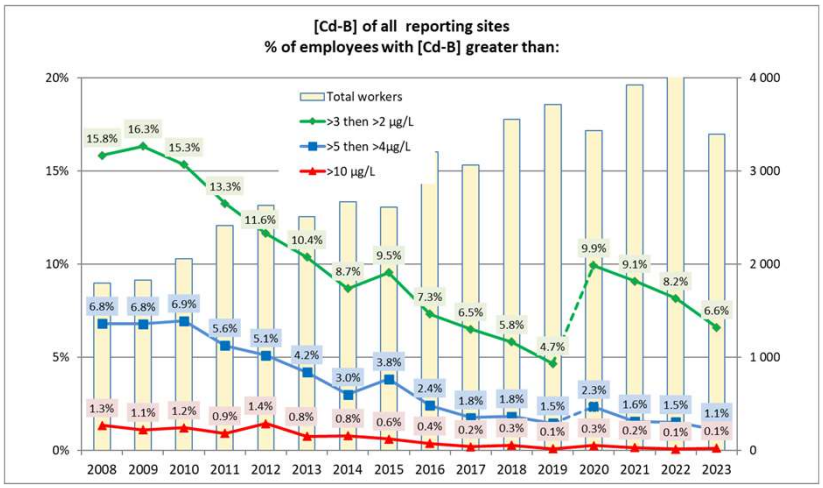
21

Selected biomarkers of exposure

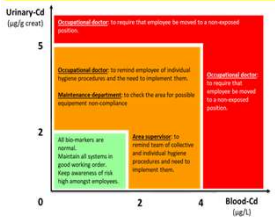
- Cadmium in blood – CdB:
  - indicator of recent (and older) exposure
  - Measurement: Cadmium in whole blood (µg Cd/L)
- Cadmium in urine – CdU:
  - Biomarker of the amount of Cd stored in the body and in particular in the kidney cortex where the first signs of Cd toxicity develop
  - Representative for cumulative cadmium absorption in the body over past 20 years
  - Normalized measurement: Cadmium in urine (µg Cd/g creatinine)
  - Study Prof. Van Maele demonstrated that Cd is a threshold carcinogen for systemic effects with urinary limit value
    - ⇒ CdU is an indicator to demonstrate zero risk of systemic cancers
    - ⇒ Lung cancer is not covered by this indicator!!! => OEL (air) required.

22

CdB distribution
- all sites in % -



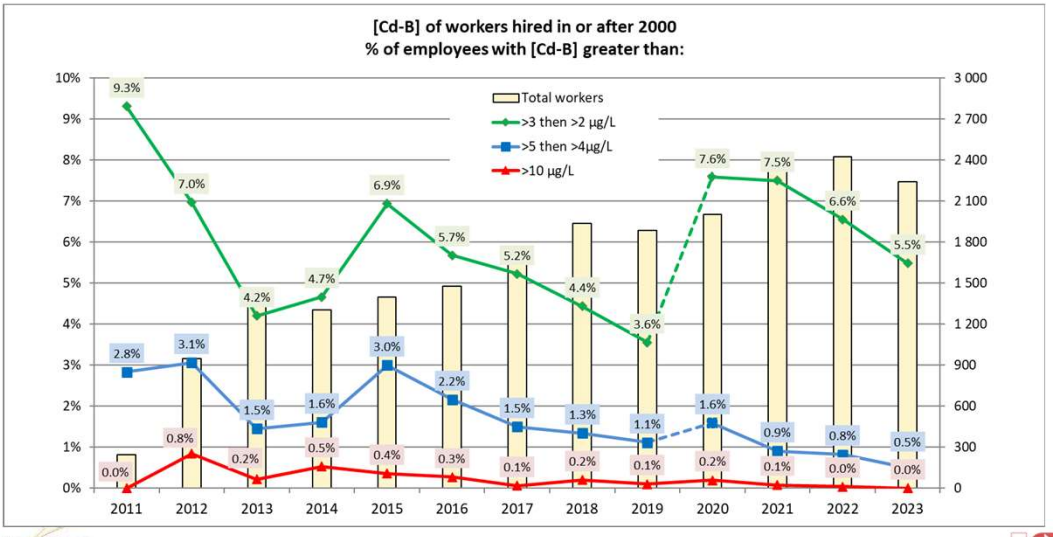
Target values reset in line with ICdA Guidance



from 2020, the green and blue lines represent workers with CdB >2µg Cd/L and with CdB >4µ Cd/L.
Previous target values were 3µg/L and 5 µg/L.
Hence the upwards jump in 2020.
The thin line shows the previous 3µg/L level which continues to drop at the same rate.

23

CdB distribution workers hired after 2000
- all sites in % -



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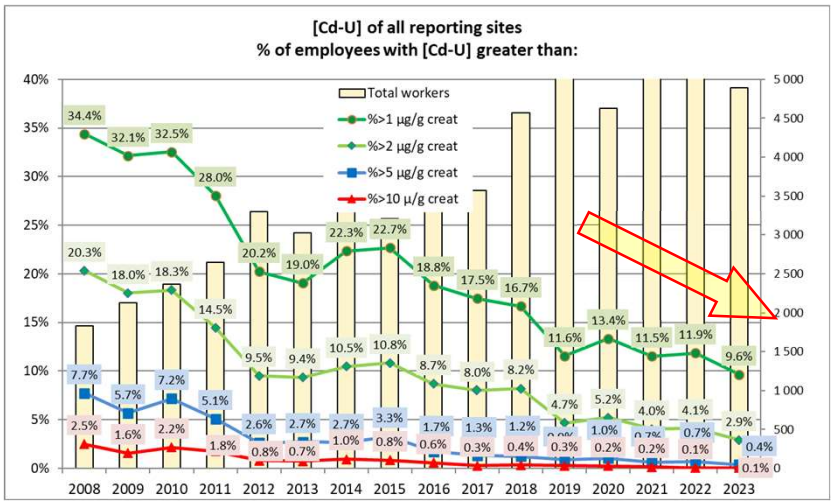
Cd in Blood: conclusion

- ❑ Further progress was made: Exposure of most workers was reduced in 2023
- ❑ Only 5,5% of workers have >2µg Cd/l in blood
- ❑ workers with >4µg Cd/l in blood dropped from 0,8% to 0,5%
  - ➢ Comparison with CdU data shows that the number of increased CdB values is very similar with number of workers with CdU > 5µg Cd/g creatinine. Observed workers with CdB >4 are likely linked with high historic burden and not with recent exposure.
- ❑ Closely observing exposure situation of workers above 2 µg Cd/L in blood is recommended to identify existing sources of exposure.
  - ➢ 5,5% "new hired" workers with > 2µg Cd/L in blood
  - ➢ 6,4% "new hired" workers with > 1µg Cd/g creatinine

25

CdU distribution - all sites in % -

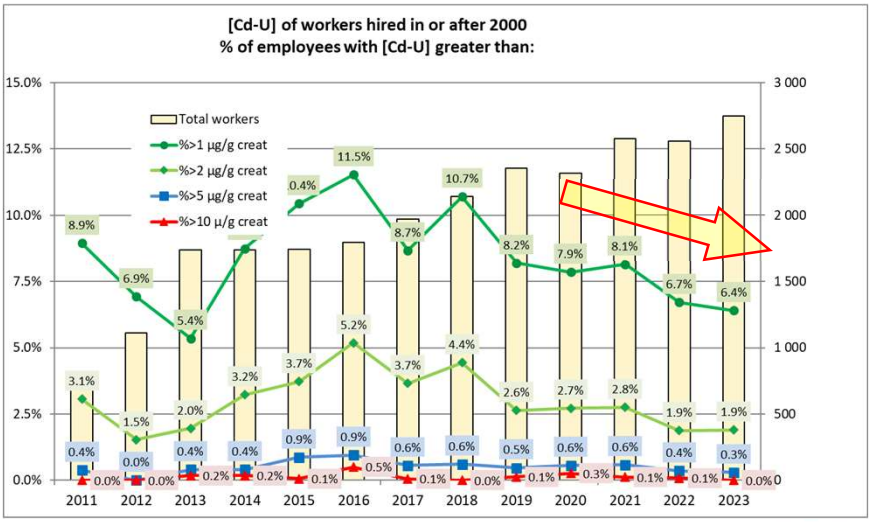
- Reduction of cadmium body burden continues
- 0,4% above the LOAEL for occ. exp. of 5µg
- 2,9% of workers above ICdA recommended BLV (2 µg/g creat.)
- 9,6% above RAC proposed BLV (1 µg/g creat.)



26

CdU distribution
- all sites in % - workers hired after 2000

- Numbers slowly drop further.
- Only 6,4% of workers >1µg Cd (including smokers!)
- 1,9% of the "new" hired workers have CdU >2µg Cd
- 8 workers above 5µg/g creat. Representing 0,3%



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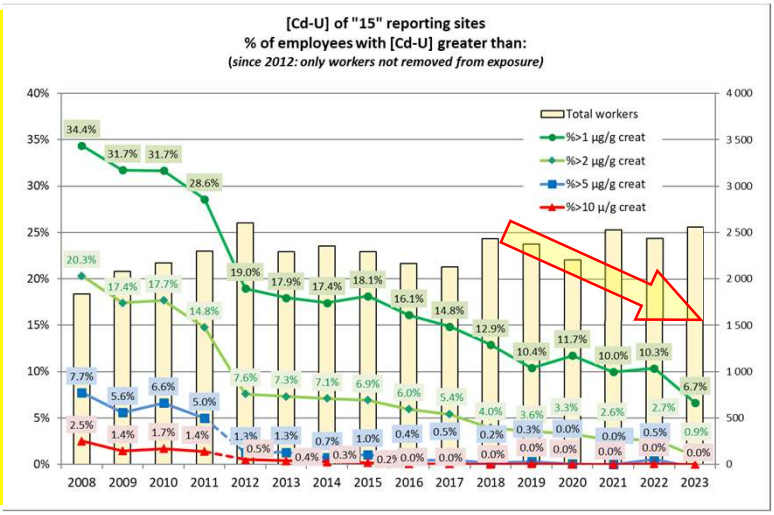
CdU distribution
- original "15" sites in % - (removed workers excluded)

Cadmium body burden of workers from accumulated during historic exposure is going down due to continued low exposure to cadmium.

•93,3% of all workers has CDU < 1 µg/g creat.

•Only 0,9% of workers with CdU >2µg/g creat.



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Conclusion

- CdB
  - Over the past 15 years, our industry has consistently improved the workplace exposure of its workers…and these efforts should continue
  - The new CdB action levels now respectively set at 2µg/L and 4µg/L (see Guidance 2018) need to be strictly implemented by the occupational doctor to ensure that CdU of recent workers (hired since 2000) does not rise above 2 µg/g creat.
- CdU:
  - Further decrease of urinary cadmium levels.
  - Workers that have CDU values above the ICdA recommended threshold of 2µg Cd/g creatinine have dropped from 20% in 2008 to 2,9% in 2023!!!

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Comments from the chairman on the ICdA Guidance and exposure risk management

30

Cadmium releases to the environment

Reporting on cadmium releases to air and water from our industry sector

31

Data collection from members

- ICdA experiences increasing political pressure on environmental fate of substances like mercury, lead, cadmium and arsenic.
- ICdA believes that contribution of our industrial activities to cadmium releases to the environment is modest as compared to other sources of emissions.
- Some information is available in the public E-PRTR database but it does not cover all activities and emission below a certain threshold (10kg to air, 5kg to water) are not reported
- Therefore ICdA asked its members to report on environmental performance related to cadmium
  - monitored cadmium emissions to air
  - monitored cadmium releases to water
  - imposed limit values
  - Type of water discharge (to surface water or to municipal WWTP)
- 23 out of 41 plants have shared information

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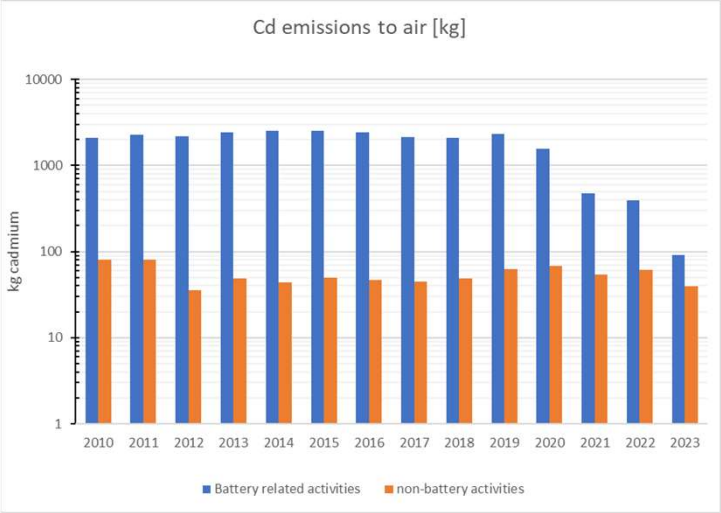
Cadmium emission to air

- Cadmium emissions to air have dropped significantly from 2156 kg in 2010 to 130 kg in 2023
- Drop was most significant in batteries sector where it dropped from 2076 kg to 91 kg
- non- batteries related plants reduced emissions from 80 kg to 39 kg
- Total emissions to Air in E-PRTR is 5,230 kg
- Share of Battery sector: 1,73%



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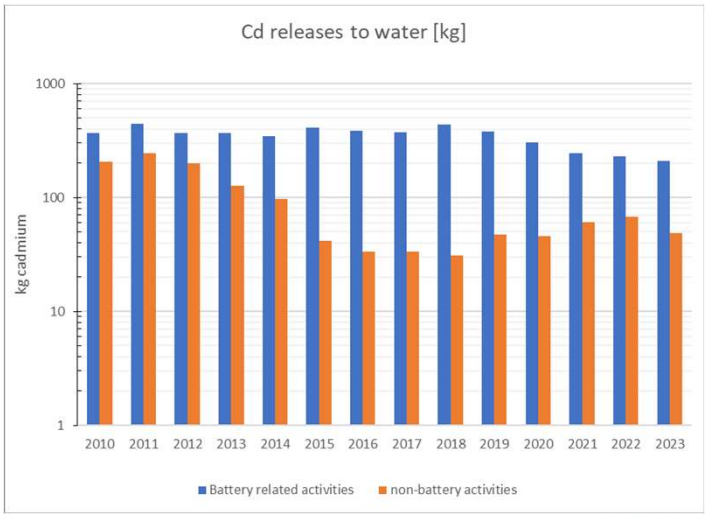
Cadmium emission to water

- Cadmium emissions to water have dropped significantly from 572 kg in 2010 to 258 kg in 2023
- Batteries related plants reduced emissions from 366 kg to 209 kg
- Non-batteries related plants reduced emissions from 206 kg to 48 kg.
- Total emissions to water in E-PRTR is 20,000 kg (data 2021)
- Share of Battery sector: 1,02%



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Update on REACH Restriction and Authorisation

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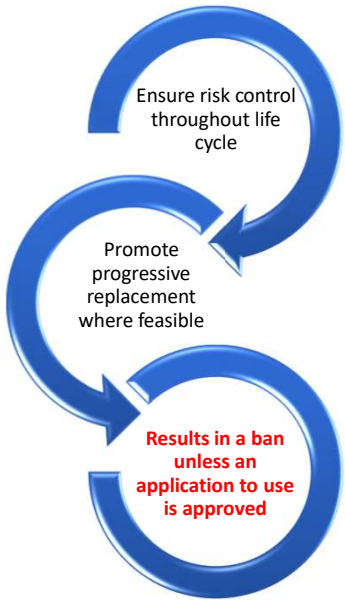

Authorisation

- Draft recommendation of List of Substances Subject to Authorisation ("Annex XIV"):
  - Every 18 months ECHA selects 6 – 12 substances (av. 8) of highest (Inherent properties + Volume + Wide Dispersive Use) score, but can also use grouping.
- 11th Recommendation list published April 12th, 2023 (8 substances including Pb)
- 12th Draft Recommendation list (7 Feb 2024)
  Cd and compounds not selected ✔

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12th Draft Recommendation list

ECHA EUROPEAN CHEMICALS AGENCY

7 February 2024

Draft 12th Recommendation of Priority Substances to be included in Annex XIV of the REACH Regulation (List of Substances Subject to Authorisation)

Draft Annex XIV entries									
#	Substance	EC number	CAS number	SVHC-relevant intrinsic properties*	Latest application date pursuant to REACH Art. 58 (1) (c) (ii)**	Sunset date	Review periods	Exempted uses or categories of uses	Exemptions for PPORD
1	Melamine	203-615-4	108-78-1	Equivalent level of concern having probable serious effects to human health (Article 57(f) - human health). Equivalent level of concern having probable serious effects to the environment (Article 57(f) - environment)	Date of inclusion in Annex XIV plus 18, 21 or 24 months	Latest application date plus 18 months	None	None	None
2	S-(tricyclo[5.2.1.0 2,6]deca-3-en-8(or 9)-yl) O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2 -ethylhexyl) phosphorodithioate	401-850-9	255881-94-8	PBT (Article 57d)	Date of inclusion in Annex XIV plus 18, 21 or 24 months	Latest application date plus 18 months	None	None	None
3	Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	278-355-8	75980-60-8	Toxic for reproduction (Article 57 c)	Date of inclusion in Annex XIV plus 18, 21 or 24 months	Latest application date plus 18 months	None	None	None
4	Barium diboron tetraoxide	237-222-4	13701-59-2	Toxic for reproduction (Article 57c)	Date of inclusion in Annex XIV plus 18, 21 or 24 months	Latest application date plus 18 months	None	None	None
5	Bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof	-	-	vPvB (Article 57e)	Date of inclusion in Annex XIV plus 18, 21 or 24 months	Latest application date plus 18 months	None	None	None

DRAFT

ECHA Scoring Sept. 2023

Total score	Properties	Justification for prioritising
40	ELoC HH, ENV	High priority score (cut-off 32)
32	PBT	High priority score (cut-off 32)
23	Repr.	Grouping consideration with substances already recommended
22	Repr.	Grouping consideration with substances already recommended
34	vPvB	

Cut-off score: 32

Scores: **$Cd(OH)_2$: 18; Cd: 16; CdO: 15**

12th Draft Recommendation list and beyond: Cadmium?

- Cd and Cd compounds were out of the risk zone for the 12th recommendation list
- 13th list?: might anyway (still) come due to the delay of the REACH review.
  - Even with a 13th list: unlikely Cd will be selected.
    - ✓ Reason: many PBT (persistent, bioaccumulative and toxic), vPvB (very persistent & very bioaccumulative) and also ED (endocrine disruptor) substances that score higher than Cd

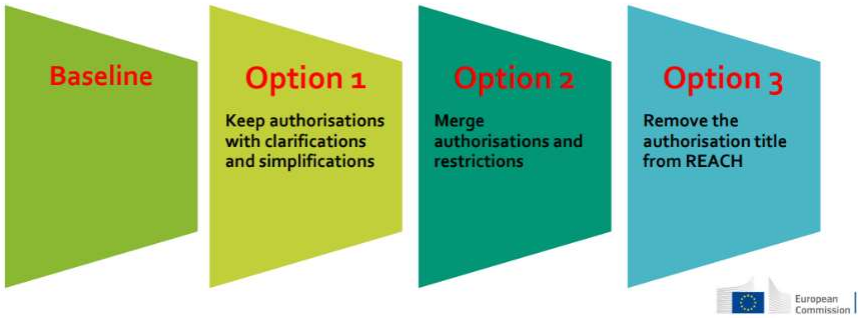
Inherent property	Category	Score
57(a) or/and 57(b) or/and 57(c) or/and 57(f) [5,6]	low	1
57(f) (ED)	medium	7
57(d) or (e)	high	13
57(d) and (at least) one other SVHC property or	high	15
57(e) and (at least) one other SVHC property	high	15

Restriction and Authorisation Review:

37	Proposal to revise the REACH authorisation and restriction processes

REACH Revision – Reform of Authorisation and Restriction Processes

- ⇨ *The REACH authorisation process is **too burdensome**, slow and controversial*
- ⇨ *Applies only to manufacturing in the EU – **non-level-playing field with imports***
- ⇨ *Once an authorisation is given, there is **not enough incentive for substitution***



European Commission

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Meanwhile.., Restriction process continues, and a Rolling Restrictions Roadmap to 2025/7 has been developed

2. The updated Restriction Roadmap

Quite some important changes

- **COMMISSION objectives**:
  - Publishing already the draft list up to 2025-'27…

PRE-ROI on Restrictions (new) or ongoing	Complementing Annex XIV after SSD
PAHs in clay targets, considering other substances then CTP-HT	As2O3, As2O5, As acid : NO restriction
Lead in PVC : ~~other substances used in PVC?~~	Cr2O3: NO restriction at present (2022)
Other substances in infill materials (depending outcome microplastics) (TBD)	CTP and Anthraceen oil: Restrictions probably needed on other uses then Clay Targets (2022 screening report)
CMRs in child care articles (2022)	Specific borates: screening work ~~to start~~ ongoing (2022)
Pb in consumer articles (review no priority)	Cr acids, Sod. Dichromate,… no need for restrictions at present (2022)
Ni in articles (~~adress scope issue~~) (low priority)	
Substances in fertilisers (impurities in phosphate fertilisers) ~~2022~~ (2023)	
Borates (assessment of need pending)	
Skin sensitizers in consumer mixtures (investigation launched) TBD	**Groups where CLH or candidate listing with restriction as RM**
~~Professional mixtures of PBT or CMR subst.~~	Simple Mn compounds Restr + Auth ? (TBD)
Pb in ammunition and fishing tackling	Simple V compounds (OEL or restriction) (TBD)
Flame retardants: need for RMM for all but focus on brominated '23	

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Cadmium and endocrine disruptors: an update

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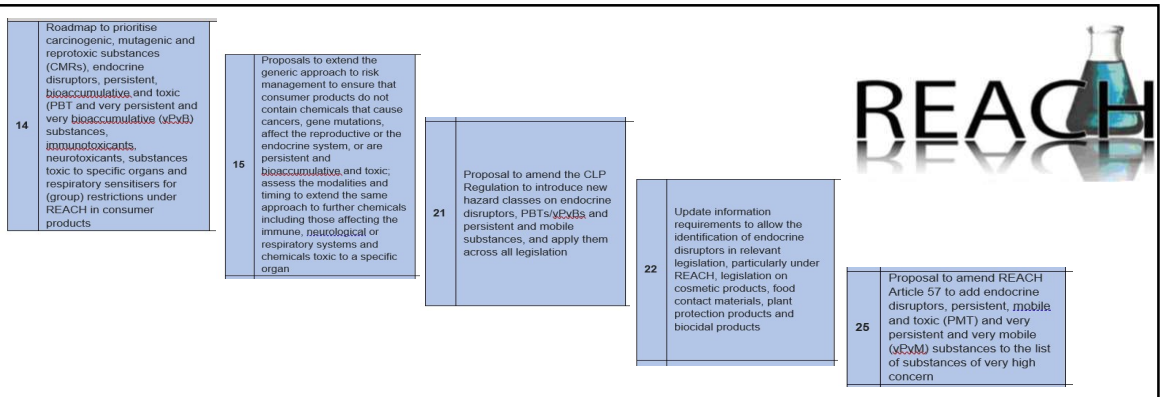

- REACH-CLP revision: state of play
- Endocrine disruption

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REMINDER

1. REACH – CLP revision: timing and projects

REACH 2.0

- Nov 2023: REACH revision draft proposal
- June 2024: European Parliament elections
- Q3 2024: new Commission staff

Further delayed

CLP

- 31 Mar 23 : new hazard classes published in Official Journal
  - Classification of substances already on the market by May 2025
  - Classification of mixtures by May 2026

New Hazard Endpoint in CLP: Endocrine Disruptors

- EU COM information proposal to UN GHS to consider ED hazard class in their 2023 – 2024 workplan: adopted → OECD mandated to review existing hazard classes.
- ECHA preparing update of Guidance on the Application of the CLP criteria to include guidance on the new hazard classes, expected mid-2024*
- Multi-metallic ED projects to investigate metal specificities, collect information on toxicity mechanisms of metals:
  - HETAP** (HH project ongoing)
  - ETAP*** (Env paper published)

*Apr '24: iuclid release with new hazard classes for use by REACH registrations

** Health Technical Advisory Panel
*** Ecotox Technical Advisory Panel

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REMINDER

Foreseen requirements for EDs

❖ New hazard class for endocrine disruptors

Aim of Green Deal/CSS to include EDs within REACH and CLP regulations via ongoing revisions to minimize exposure/manage risks by harmonizing legislative frameworks (included in BPR* and PPP**)

❑ New ED hazard class in CLP:

- Category 1: Known or presumed endocrine disruptors (ED HH/ENV 1)
- Category 2: Suspected endocrine disruptors (ED HH/ENV 2)

❑ Additional REACH information requirements related to EDs:

! New ! ARCHE to start literature review ← - Systematic literature review (HH & env) - Additional ED testing

If a substance is classified →

- Mentioned on SDS
- Substance added to SVHC list
- Labelling - ED hazard statements

* Biocidal Products Regulation
** Plant Protection Products Regulation

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Other ongoing EU legislative actions

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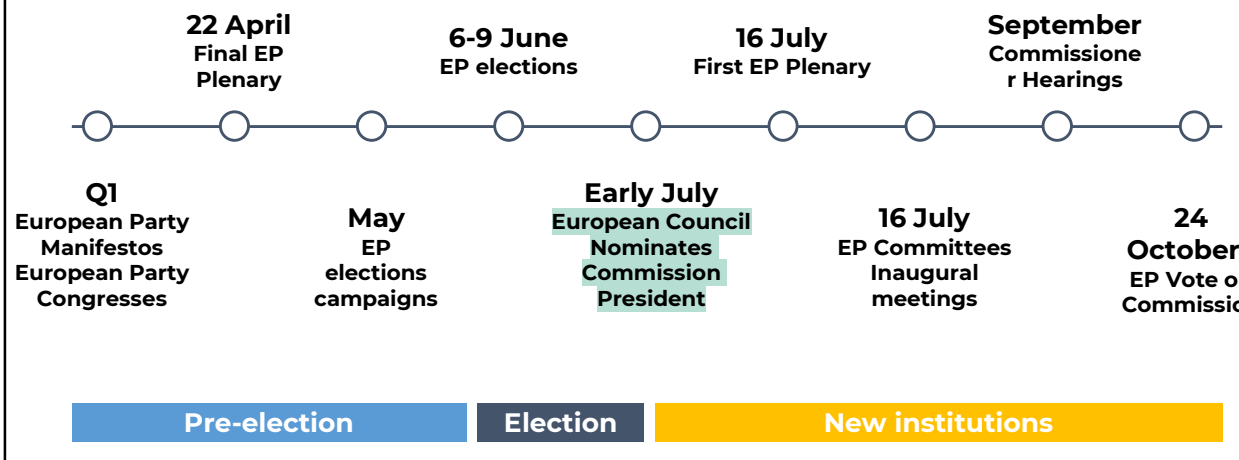
What next? 2024: A year of change



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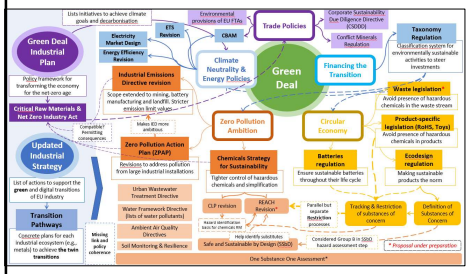

Revised	Ambient Air Quality Directive
New	Batteries Regulation (formerly a Directive)
New	Critical Raw Materials Act
Revised	New CLP classes: Endocrine Disruptors
New	Drinking Water Directive: EU positive list of materials
New	Eco-design for Sustainable Product Regulation
New	Net Zero Industry Act
Revised	Industrial Emissions Directive
New	Soil Monitoring Law
Revised	Waste Shipment Regulation
Revised	End-of-Life Vehicle Directive
Revised	REACH 2.0
Revised	Water Framework Directive

☑

ANNEX 1

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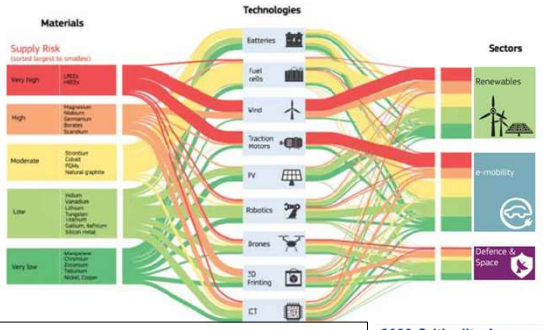
Critical and Strategic Raw Materials

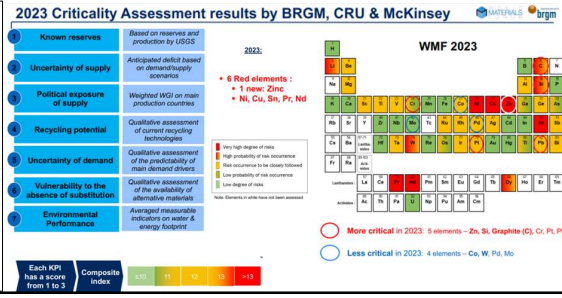


Zinc and co-metals status May 2024

Jurisdiction	Included
EU	Ge
US	Zn, Ge, In
US – Dept of Energy	(Ge)
Canada	Zn, Ge, In
Australia	Ge, In, Zn
India	Ge, In, Cd
South Korea	Zn / Ge, In, Cd
Japan	Zn, In
World Materials Forum	Zn just added

IZA/ICdA advocacy focus:

- Promote 1° investment support for Zinc mining and Smelting
- Link additional benefits of Zn providing key co-metals: Cd, Ge, In
- Highlight positive attributes for renewables infrastructure, batteries and electricity grid
- Growing 2° recycling and recovery as part of the solution



Next review: July 2024, Paris

ANNEX 1

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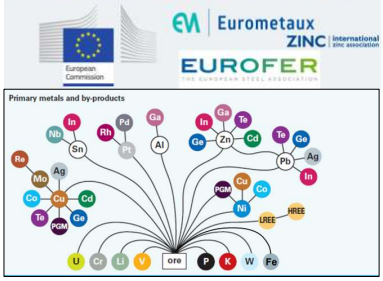
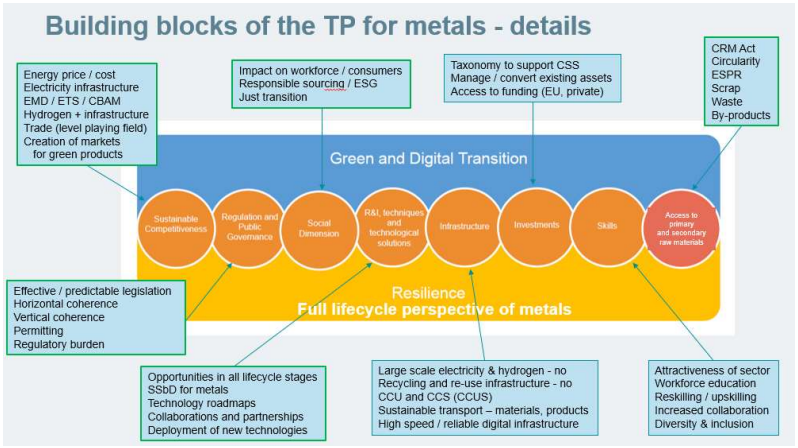
Opportunity for Positive Messaging and Advocacy narrative across the Regulatory Landscape:
..*'without metals there is no Transition..'*





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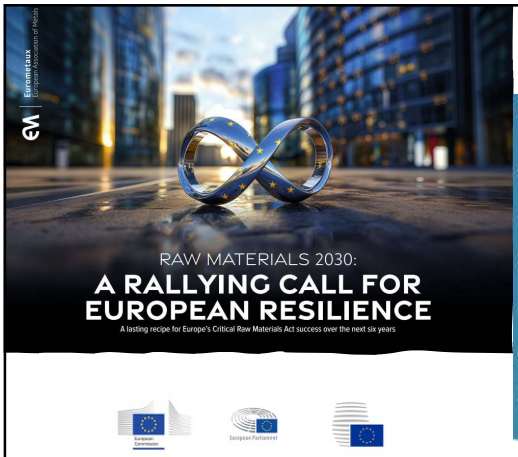

'An Industrial Green Deal'

Metals at the forefront 2024-2030: a European manifesto

https://eurometaux.eu/content/files/landing-pages/rm2030/2030%20resilience%20manifesto.pdf

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Summary

- Closing Remarks
- Next Meetings:
  - ICdA General Assembly and Technical Session, Oct-Nov 2024, TBC
  - ICdA H&S Committee, June 2025, TBC

- Thank You for your attention and contributions ☺

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