12th ICdA- H&S Ctee

June 26th 2014

Statement of Compliance

- The purpose of the meeting is to address, under the applicable confidentiality rules, issues concerning cadmium and cadmium compounds producers and users and more particularly H&S issues, as reported in the Meeting's objectives .
- The minutes kept at 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, 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.

Objective of H&S Com meetings

- Reminder:
  - The H&S Ctee was set up **primarily** to assist ICdA members with the implementation of the ICdA Guidance document

    "ICdA Guidance on the management of the risk related to chronic occupational exposure to cadmium and its compounds"

- Source of this initiative:
  - Cd/CdO risk assessment (RA) showed a risk-conclusion for workers under current management methodologies (2007)
  - Under the current "REACH" regulation, the same "risk management precautions" apply, for Workers and for the Environment

Past (and future) H&S Ctees

- Launch of the committee, definition of the format and content
  - 1st Ctee, dated Nov 25th, 2008
- Measuring air quality
  - 2nd Ctee, dated March 10th, 2009
- Medical supervision adapted to cadmium risk
  - 3rd Ctee, dated June 16th 2009
- Individual and collective hygiene procedures
  - 4th Ctee, dated October 13th 2010
- Detailed procedures regarding medical surveillance
  - 5th Ctee, dated June 8th: 2010
- Status a the REACH registration process
  - 6th Ctee, dated October 15th, 2010
- Choosing and maintaining the right PPE
  - 7th Ctee, dated June 7th, 2011
- Implementing a prevention culture in our facilities
  - 8th Ctee, dated October 15th, 2011
- Communication flyers and Guidance ICdA
  - 9th Ctee, dated June 17th, 2012
- Water treatment- emissions minimization
  - 10th Ctee, dated October 23th , 2012
- Risk control improvements & committments: Guidance, targets and monitoring
  - 11th Ctee June 5th , 2013
- **Risk Managment at the workplace: REACH compliance and monitoring**
  - **12th Ctee June 26th , 2014**
- Next meeting (tbd)
  - 13th Ctee, date to be set

Agenda for Today's meeting

- Introduction:
  - Welcome / Competition law compliance
  - Objectives of the meeting: **Risk Managment at the workplace: REACH compliance and monitoring**
  - Agenda
- Approval of the minutes of the 11th H&S committee (June 2013)
- 1/. REACH developments:
  - authorisation,
  - restriction,
  - cadmium: threshold carcinogen
- 2/. Lobbying actions and strategies
  - Scoring and prioritization
  - OEL or BLV
- 3/. Cd Observatories:
  - OCdBIO-6: results, analysis, way forward
  - OCdAIR: results, analysis, discussion
  - IAR (Inventory of Air releases): results 2013
- Other business: UNEP, ICdA Code of Conduct
- Setting of the 13th H&S committee and … longer term planning

1/. **REACH developments**

Authorisation process

REACH: Authorisation: Cd, CdO, CdS

- Proposed by Sweden, Cd, CdO and CdS were eventually candidate-listed in 2013; $CdCl_2$ has been added recently (quasi-automatically) to that list
- Cd and CdO were considered for prioritization ranking, by ECHA; the exercise started early 2014 according the new scoring system:
  - As planned, position papers were prepared for Cd, CdO and CdS, with support of EPPA consult, involved members and LR >> showing quite low priority (15/45)
  - Updated files were submitted by the LRs; all co-registrants were contacted and advised to update their sections as well (e.g. uses in line with LRs)
  - Meetings were organized:
    - with 'unit-heads' of DG-ENV and DG-ENTR
    - with ECHA
    - with several Member States: F, B, UK, CZ, NL, .. (??)

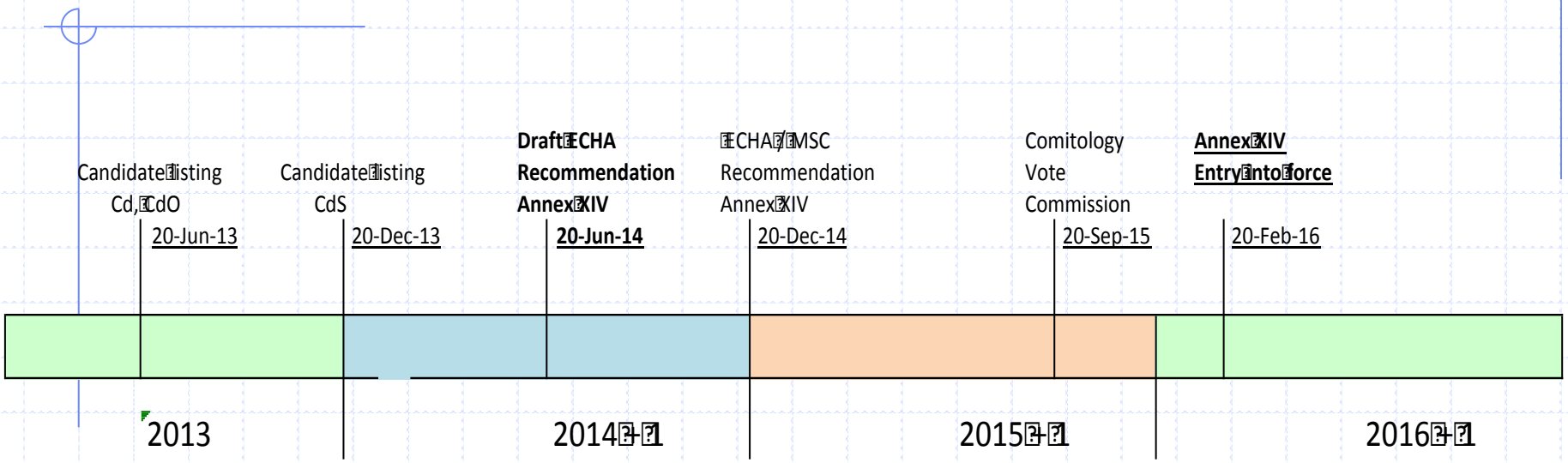
Scoring forecast and results

	Cd	CdO	CdS	$CdCl_2$	$Cd(OH)_2$
Inherent properties	1	1	1	1	1
Volume	9	9	3	3	12
Dispersiveness	5	5	5	5	5
TOTAL	**15**	**15**	**9**	**9**	**18**

Results so far…

- Some member States showed understanding for the low/moderate priority scoring of Cd and CdO for Authorization
- ECHA acknowledged information updates from all co-registrants and confirmed our scoring forecast
- ECHA did neither include (because of rather low score) Cd, nor CdO, in their proposed 6th priority list
- The 6th list contains so far 21 substances, including several Pb-compounds, Coal Tar Pitch (CTP), Hydrazine and Borates
  - A Public Consultation (parallel SEA track for Commission) will be organized as from September 1st
  - Several MS expressed their concern:
    - Number of 21 substances much too high…
    - Authorization procedure (without serious RMO) should be re-examined

Worst case time line for Annex XIV-listing



Authorisation process starting from Annex XIV inclusion

- ECHA distinguishes 2 ways of submitting a dossier
  1) **Adequate control route**: the risk is adequately controlled during the substance's lifecycle

  → Threshold route

  2) **Socio-economic assessment (SEA) route**: demonstrating that the social and economic advantages outweigh the risks to human health or the environment, which arise from the use of the substance

Cadmium: threshold carcinogen (1)

- In the past: "**non-threshold** CMR" reference for Cd
  - In 2005 (officially finalized in 2007) , the Risk Assessment (B) concluded that…
    - No definitive conclusions can be drawn about the genotoxicity of CdO and/or Cd metal….
    - The available data are conflicting, the studies have many shortcomings and confoundings but the overall assessment suggests a genotoxic potential of the cadmium compounds involved.
    - Elucidation of the mechanism of genotoxicity and the issue of the possible co-mutagenic activity of cadmium is critical to better interpret the diverging results of human studies and to develop prevention strategies.
    - As long as the mechanism of genotoxicity is not completely elucidated,…, according to TGD, *"it is prudent to consider that there is no threshold airborne exposure level below which effects will not be expressed".*
    - If it could be demonstrated that the genotoxic effect of cadmium compounds is fully mediated through a mechanism like inhibition of DNA repair enzymes**, it would be reasonable to assume, that a threshold relationship applies** to this kind of effects. Some epidemiological information is available … However, this quantitative information is of insufficient robustness to be formally used in a Risk Assessment..

Cadmium: threshold carcinogen (2)

- In 2008, the summary of the RA reported that…
  - As long as the mechanism of genotoxicity is not completely elucidated it must be assumed that Cd compounds are direct acting genotoxic substances and *that " it is prudent to consider that there is no threshold exposure level below which effects will not be expressed."*
- Still in 2008, the Risk reduction strategy meeting reported in its recommendation
  - that there is a need for specific measures to limit the risks, for workers and consumers, as the substance is *considered as a non-threshold carcinogen.*

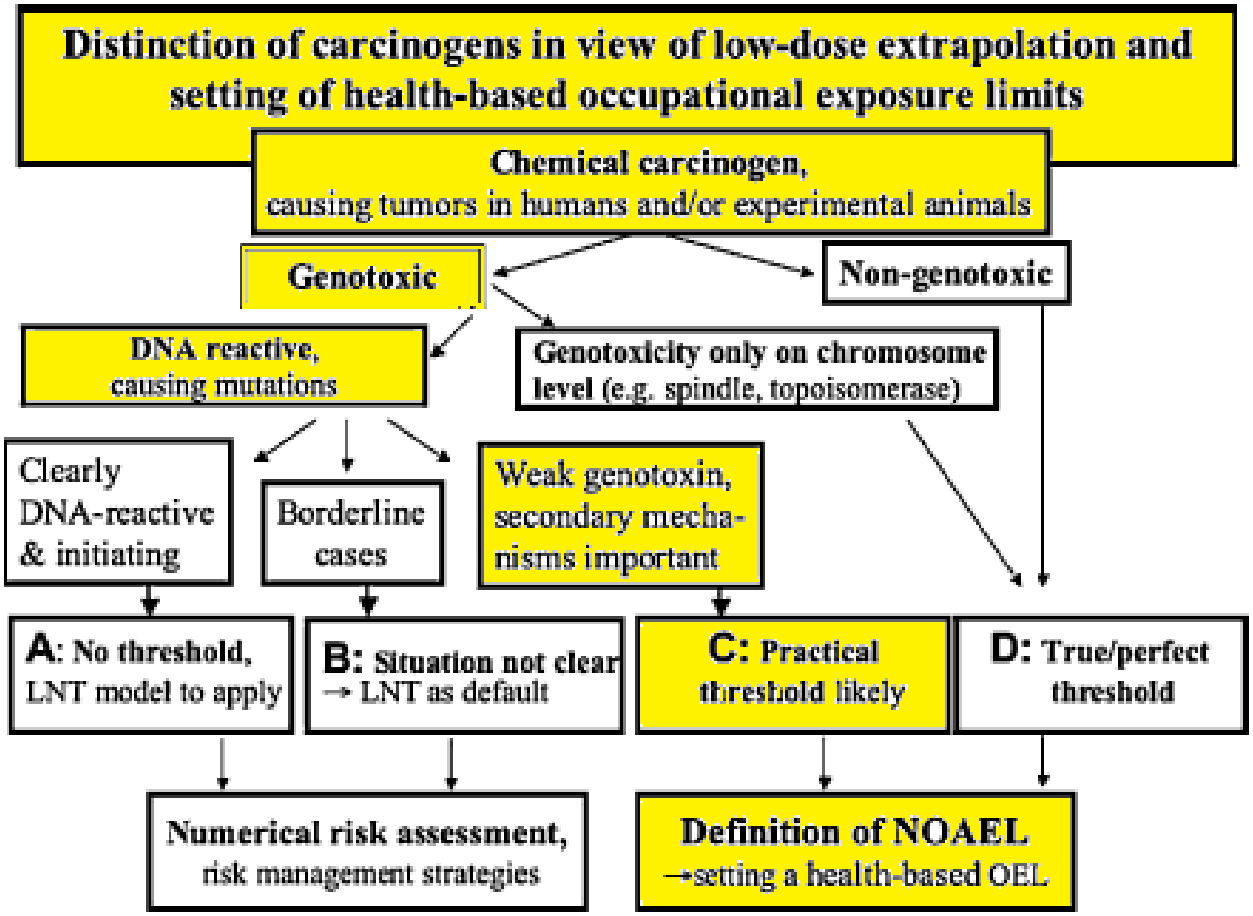
Cadmium: threshold carcinogen (3)

- Recently, SCOEL (2010):

  Category C carcinogen (*genotoxic carcinogen for which a practical threshold is supported)*

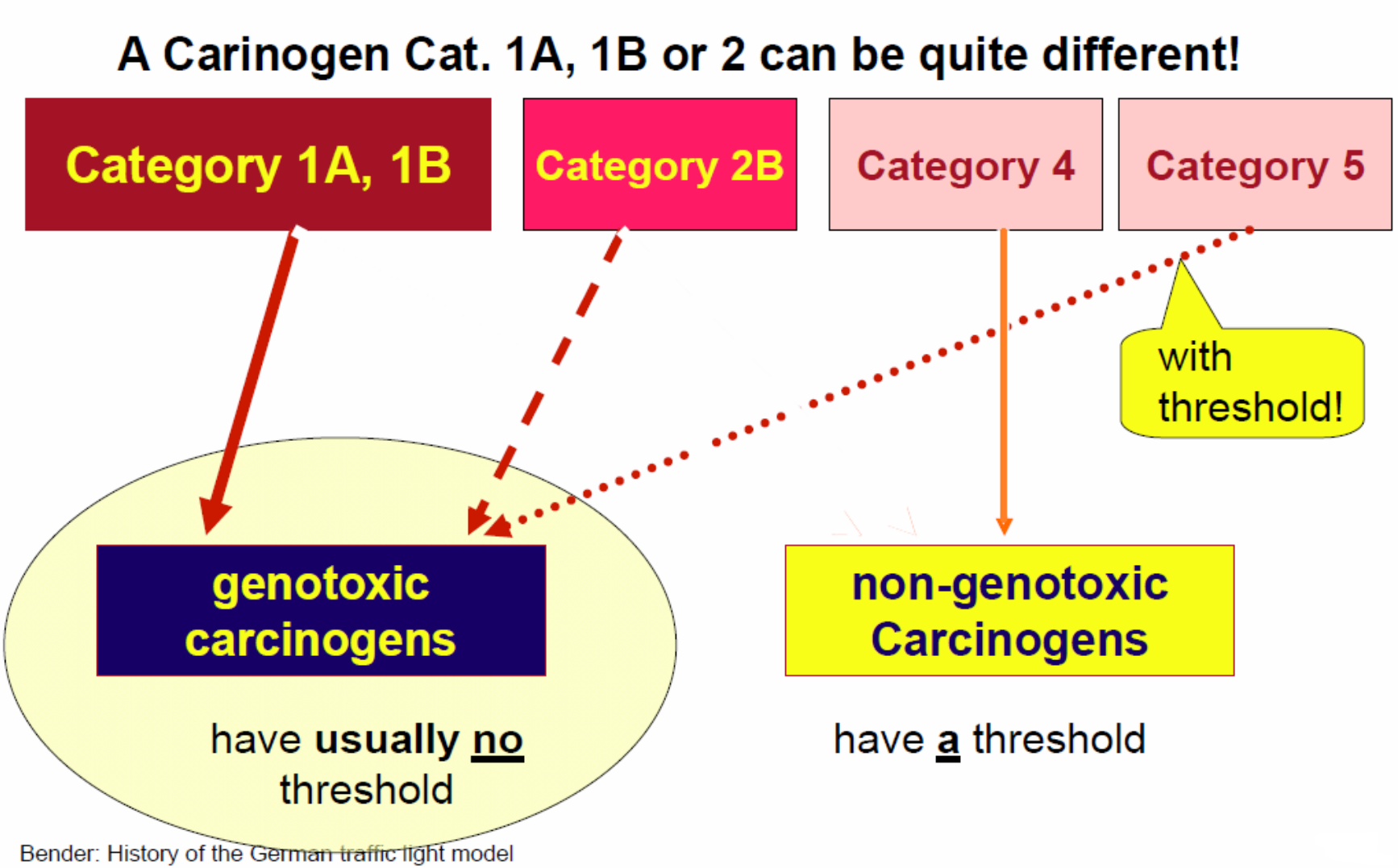
  - In 2010 , the SCOEL (Sumdoc 136), consulted as a recommendation of the RRM-comittee, concluded that…
    - Different and a priori non-mutually exclusive mechanisms for the carcinogenicity of Cd have been identified (in 2004, 2008 and 2009)
    - All these mechanisms are non-stochastic and characterised by a threshold below which no effect is expected.
    - SCOEL states "the mechanism of the carcinogenic activity of Cd is not exactly known, but involves, at least in part, genotoxic events mediated by indirect mechanisms for which a threshold can be identified (Category C, Bolt and Huici-Montagud, 2008), a threshold of 1000 µg/m³x years (or 25 µg/m³ during 40 years) has been reported for genotoxic effects in workers exposed to Cd by inhalation". (corresponding to 10 µg/g creatinine in Cd/urine (Forni et al 1990)

SCOEL approach for distinction of chemical carcinogens in relation to setting OELs



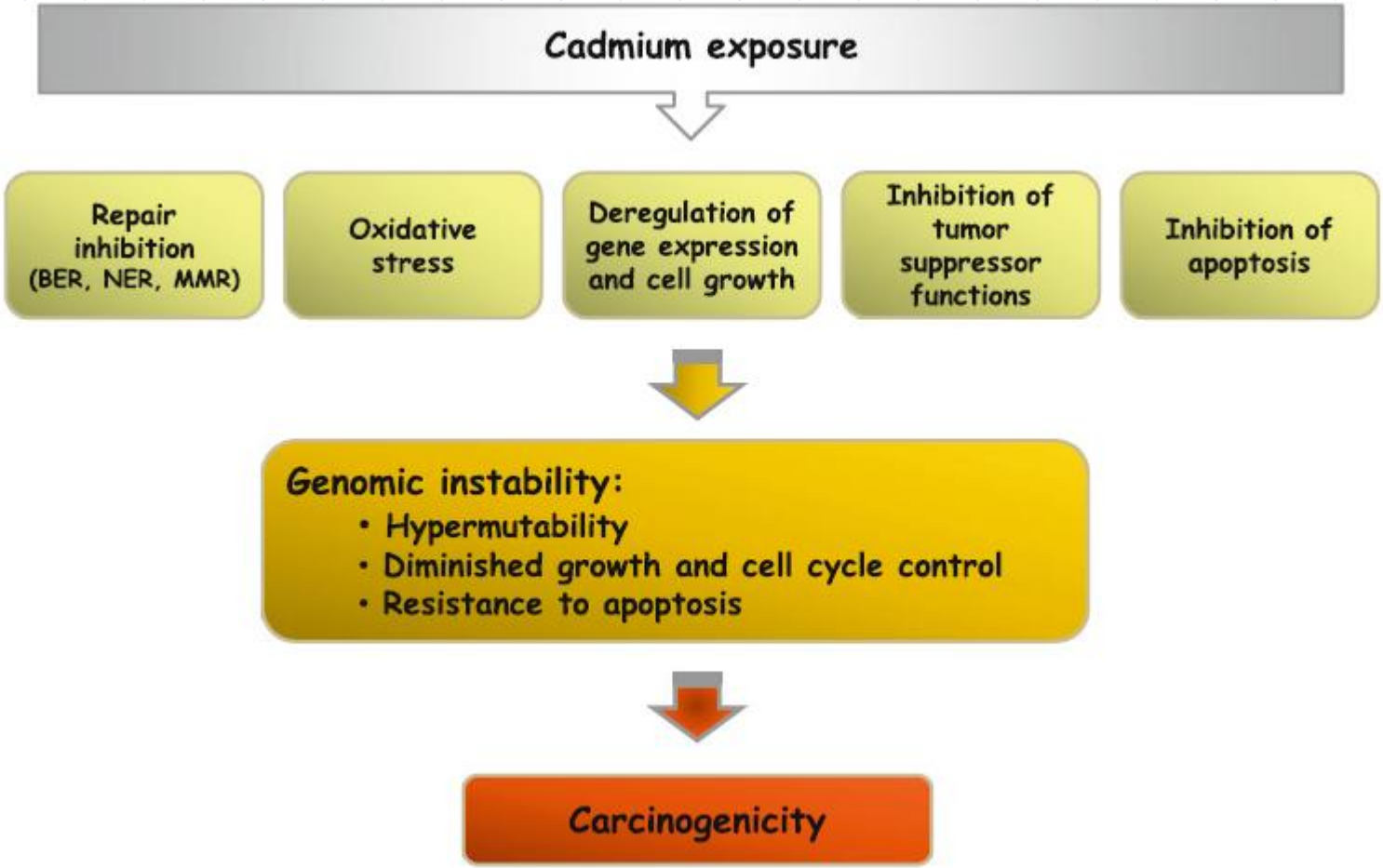
From: Bolt and Huici-Montagud, 2008, Arch Toxicol 82: 61 - 64

German approach (MAK)



Bender: History of the German traffic light model

Mechanisms involved in cadmium-induced carcinogenicity



From Hartwig et al 2010, Biometals , 23:951–960

Further research needed on the thresholds of genotoxic activity? (1)

- SCOEL 2010: threshold of 1000 µg/m³x years (or 25 µg/m³ during 40 years) has been reported for genotoxic effects in workers exposed to Cd by inhalation
  (corresponding to 10 µg/g creatinine in Cd/urine (Forni et al 1990, 1992)

- Forni A, Toffoletto F, Ortisi E and Alessio L (1990) Occupational exposure to cadmium. cytogenetic findings in relation to exposure levels. In:Environmental Hygiene II. Edited by NH Seemayer and W Hadnagy. Springer-Verlag. Berlin, Heidelberg, New York, 161-164.
- Forni A (1992) Chromosomal effects of cadmium exposure in humans. In:Cadmium in the Human Environment: Toxicity and Carcinogenicity. Edited by GF Nordberg, RFM Herber, and L Alessio. IARC. Lyon, 377-383.

Forni et al. 1990;1992

- Group of 40 cadmium workers (workers exposed to fumes and dusts in the production of Cd, Zn, Cu and Ag alloys, Cd Content 8-30%) with a wide range of cumulative exposure and 40 controls.
- An increase in chromosome-type aberrartions was recorded only in the subgroup of workers with the highest cumulative exposure to Cd (>1000 µg/m³xyears, or Cd-U>10 µg/L)

cumulative exposure index	% abnormal metaphases		% chromosome-type aberrations	
(µg/m³.y)	Cd workers	Controls	Cd workers	Controls
< 100	1.80	1.60	0.8	0.7
101 – 500	2.61	1.54	0.76	0.15
501 – 1000	2.44	2.33	1.00	0.55
> 1000	3.75	1.37	2.37*	0.50

*different from the other subgroups (p<0.01; Wilcoxon matched pair test)

Cd workers		Controls		
Cd-U (µg/l)	% Chrom. Aberr.	Cd-U (µg/l)	% Chrom.Aberr.	
< 10 (N=18)	0.67	nr	0.50	N.S
> 10 (N=20)	1.55	nr	0.41	P < 0.005

N.S: not statistically significant
nr : not reported

From Forni et al 1990

Further research needed on the thresholds of genotoxic activity? (2)

- Review Pary et al 2009, Consultants UK:
- Considerable evidence that the primary mechanism of genotoxicity is the production of oxidative lesions
  - → Thresholds at low doses where the DNA repair mechanisms remove the lesions
  - → Should be possible to determine NOAEL and generate dose response curves with threshold
  - → But since Cd can inhibit repair , the NOAEL will decrease

Further research needed on the thresholds of genotoxic activity? (2)

- Recommendation Pary et al 2009, Consultants UK:
  - Study to determine NOAEL for the genotoxicity (both chromosome and point mutations)

    + monitoring influence of modification of repair activity
  - University of Wales has experience in threshold dose relationships for ROS
- Second opinion? : Prof David Kirkland, Consultant, experienced genotoxicologist

Status of other Cd compounds versus SVHC status

- Expected Public consultation on harmonised classification and labelling proposals for Cd hydroxide, Cd nitrate

  Timing?

Restriction process

REACH: Restriction- proposals

1. For cadmium and cadmium-compounds (targeting especially cadmium pigments), an Annex XV dossier was announced in preparation by ECHA on request of the COM (cfr. Amendment on reg. 494/2011).
   This proposal has been withdrawn (so far) for lack of evidenced risks

2. Still for cadmium pigments (Artists paints, ~~ceramics and glazes~~), an Annex XV dossier has been issued (March 2014) by the Swedish agency (KEMI).

3. On request of the Commission, for administrative reasons and coherency of the existing Entry 23, Cd and Cd-compounds were proposed to be restricted (quasi-empty Annex XV) to be marketed and used in paints (Taric 3208-3209)

Annex XV ECHA – Cd & Cd-compounds in paints (Taric 3208-3209)

- We submitted a “principle” comment, regretting the precedent setting of arbitrary amending an existing restriction outside the legal frame of the REACH regulation …

"a risk to human health or the environment that is not adequately controlled and needs to be addressed."

Annex XV KEMI – Pigments in artist's paints

- Basis of the Annex XV:
  - Cd and Cd compounds are, for most of them, hazardous substances with potential adverse effects on human health (kidney, bone, … cancer)
  - Some Cd-based paints are already restricted (Taric 3208-3209)
  - EFSA 2012-report states that the safety margin is getting smaller and smaller with the TWI of 2,5 ug Cd/ kg bodyweight and that Cd-intake via food should be reduced
  - Artist's paints containing cadmium represent in EU a use of 8 t Cd contained
  - Artists using Cd-based paints wash their brushes under the crane, triggering a release of at least 5% of that Cd to the waste water system (=400 kgs Cd)
  - 80% of the waste water system is connected with a waste water treatment plant (=320 kgs Cd)
  - Sludges from those WWTP collect most of the contained Cd and a certain percentage of those sludges are used on agricultural soils (=150 kgs Cd)
  - It accumulates on soils (a time-frame of 150 y is considered) and it will contribute to the crop uptake and further contamination of the general population by food intake
  - A relationship is established (!) between dietary Cd intake and(1) increased risk of breast cancer occurrence for post-menopausal woman and (2) of male/female bone fractures: after 150 y from now, a restriction decided today will reduce the annual number of breast cancers by 16 and reduce the annual number of bone fractures by 47/30
  - An economic analysis (NPV) show a break-even between cost & benefits of the proposed Restriction after 74 years

Restriction proposal– Cd based Pigments in artist's paints

- As agreed in January, we sought , in view of the Public Consultation, for having the external support of:
  - Prof.Bernard on CdU as indicator of adverse effects (esp. Bones) at low exposure levels
  - Prof. G. van Maele on the cause-effect relationship (meta-analysis) of Cd and breast cancer
  - Prof. Smolders on soil Cd-accumulation and bio-availability of Cd from pigments
  - EFTEC-consult on socio-economic evaluation of bone-fractures

- A first set of comments was submitted before May 28, just before the RAC / SEAC meetings of June. Eurometaux is usually attending the meetings and we took the opportunity to send "Industry representatives"
  - For RAC, Prof. Smolders attended the meeting
  - For SEAC, C.Canoo attended the meeting

Restriction proposal– Cd based Pigments in artist's paints(2)

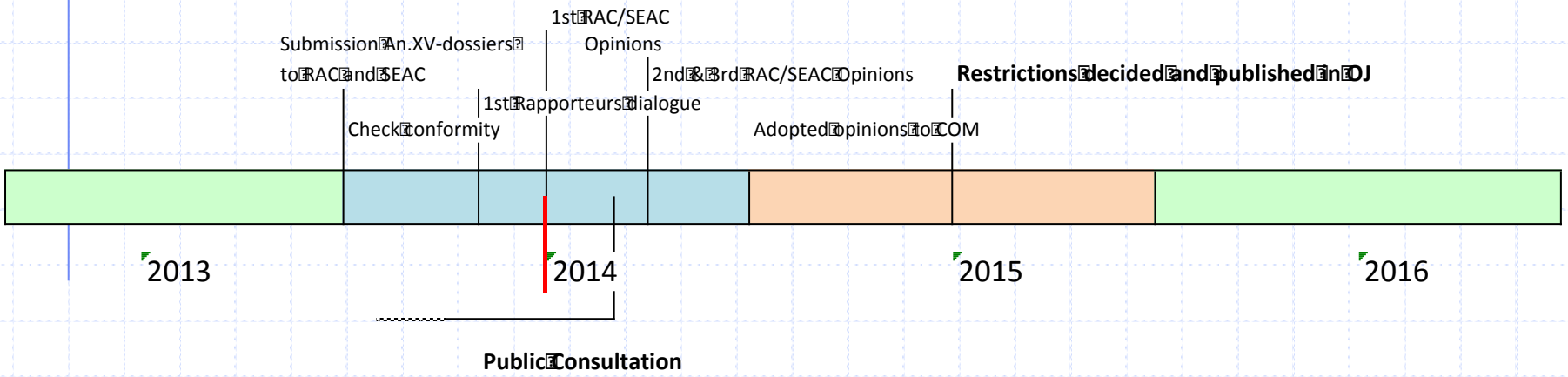
- Results so far:
  - RAC Rapporteur expressed concerns about "the insignificance and the large uncertainties of the dossier" and proposed to look at the dossier in the light of the referred EFSA report (too small margin between exposure of some parts of the population and the allowed TWI of 2,5 ug/bw).
  - They were also impressed by the explanations of Prof. Smolders on (1) the Cd-depletion scenario in the soils, (2) on the low importance of determining the exact time-stability/-degradation of the Cd-pigments in soils regarding the 150 years consideration and (3) the 'sludge-effect' on the reduced bio-availability of the Cd dissolved
  - SEAC rapporteur started also from the insignificance of the amounts, the too long timeframe considered and the uncertainties of the Annex XV-approach. **He clearly proposed not to recommend a Restriction on that basis;** the SEAC-members who intervened concurred with the Rapporteur's position. A report is expected early August
- Testing results:
  - Solubilisation tests so far have demonstrated that Cd-pigments are insoluble in water.
  - In soil, the first results indicated solubilisation after 4 months at higher temperature. This needs further understanding and study.

Way forward

- The Public Consultation is not finished and we propose:
  - To contact Prof. Smolders in order for us to prepare additional comments on the EFSA report, challenging notably the "small margin" between the EFSA standard and general population exposure
    - ⇨ Written scientific assessment to be submitted in public consultation
  - To contact CEPE and to further precise the market value of the artist's paints (Oil based vs. water/acrylic based)
  - To discuss the setting up of further testing on solubilisation of Cd from Cd-pigments contained in a matrix (paint, plastic, glaze,..) >>> Quid budget?
  - To develop a communication plan with some influential MS-CA, in order to present our case and to anticipate/prevent political pressure (through CA comments during the PC) on the "independent SEAC representatives"

- 23/6/14: 420 pages of RCOM on the Restriction case
  - ~= 900 public comments
  - Most comments are very critical for this proposal and blaim ECHA and EU for elaborating stupid ideas.
  - alternative measures like **labeling or waste recycling and/or collection systems** are proposed

Time line for Restriction cases



2/. Lobbying actions and strategies

Lobbying on Scoring/Priorization: the plan

- Development by the REACH Cd consortium of a tentative score for Cd and CdO using the new methodology:
  - two 40-page documents
  - a ppt presentation
- Presented to ECHA
- Presented to several MS along with a regulatory efficiency analysis
- Monitoring of ECHA official scoring of Cd/CdO

New scoring/prioritization methodology

- The ECHA scoring methodology was revised late last year and adopted during MSC-33 in December 2013, superseding the former May 2010 approach
- Formal document issued 10.02.2014:

Prioritisation of substances of very high concern (SVHCs) for inclusion in the Authorisation List (Annex XIV)

10 February 2014

New scoring/prioritization methodology

- Inherent properties
- Volume
- Wide dispersive use

- Additional consideration and refinements
- But no longer considering "regulatory effectiveness"

Cd/CdO scoring according to ECHA/MSC-33/2013/030

- **Inherent Properties:**

The inherent property score is assessed as follows:

Inherent property	Category	Score
57(a) or/and 57(b) or/and 57(c) or/and 57(f) [4,5]	low	1
57(f) (ED)	medium	7
57(d) or (e)	high	13
57(d) and (at least) one other SVHC property	high	15
or		
57(e) and (at least) one other SVHC property	high	15

[4] 57(f) in this category relates to substances not being endocrine disruptors.
[5] In case of PBT-like substances identified under Article 57(f), these should be considered in the PBT score.

- Score Cd: **1 point** Score CdO: **1 point**

Cd/CdO scoring according to ECHA/MSC-33/2013/030

- **Volume:**

The annual volume in the scope of authorisation is taken as a basis for assessing this criterion[6].

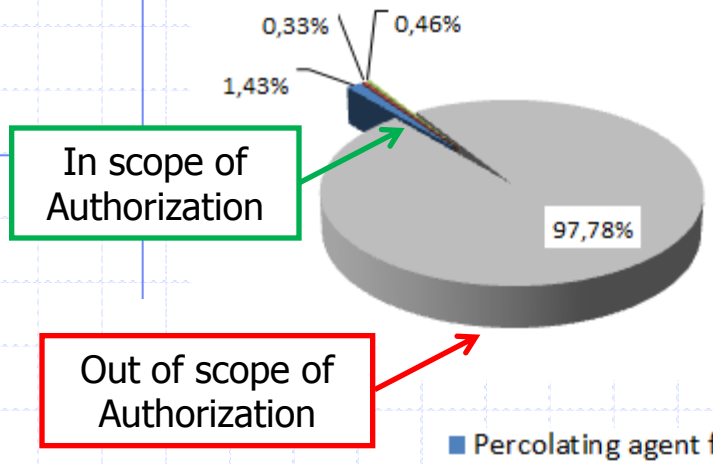
Tonnage	Category	Score
no volume	zero	0
< 10 t/y	very low	3
10 – 100 t/y	low	6
100 – 1,000 t/y	medium	9
1,000 – 10,000 t/y	high	12
> 10,000 t/y	very high	15

Beside the score there should be a verbal description illustrating how the score was derived.

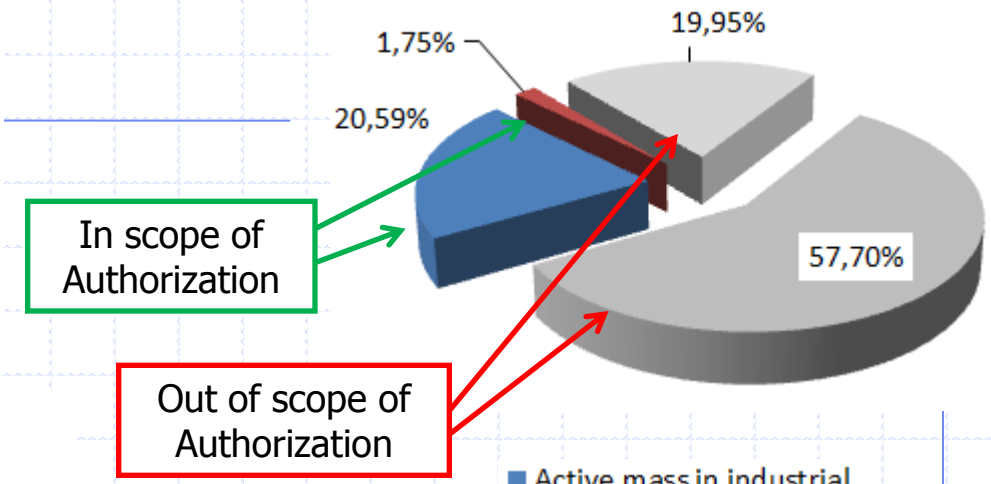
- Score Cd: 102t → **9 points**
- Score CdO: 767t → **9 points**

Cd/CdO scoring ....

Cadmium metal Cd



Cadmium Oxide CdO



Cd/CdO scoring according to ECHA/MSC-33/2013/030

Wide Dispersive Use:

- ***Industrial use (IND)**: Application of the substance as such or in a mixture in an industrial process with the purpose of incorporating the substance into an article, or technically supporting the production process but not intentionally becoming part of the product (processing aid). As a result of the use the substance has reacted, or become part of an article, or it has been released, and/or is contained in waste from this use. Uses are carried out at industrial sites (small or large).*

- ***Professional use (PROF)**: Application [...] in skilled trade premises. Professional use may include the use of substances as such or in mixtures, in order to deliver services to business or private customers. This may include sophisticated equipment and specialised, trained personnel. Uses by professional workers are considered to take place in a wide-dispersive manner. Compared to the use at single industrial sites, wide dispersive uses take place everywhere (corresponding to a municipal structure) by multiple actors each at low scale. The risk management capacity of the single actor is low, e.g. there is no site-based technical infrastructure to control releases.*

- ***Consumer use (CONS)**: includes the use of substances as such or in mixtures carried out by consumers leading to dispersive uses. It is assumed that the user is not trained. Use can take place in closed systems (lubricants for vehicles or hydraulic systems) or open systems (lubricants for bicycles). It may also include processing of material.*

Cd/CdO scoring according to ECHA/MSC-33/2013/030

- **Wide Dispersive Use:**
  - All uses are industrial
    - ✓ Use descriptors indicate low releases
    - ✓ Confirmed by actual industry data (2011 air releases):
      - Total including production: 86.1 kg/yr
      - (Of which Primary Cd manufacturers: 53.6 kg/yr)
  - Industrial batteries
    - ✓ No releases from the article/Long Service Life/Low Heavy Metal content/Strong collection & Recycling/

- Score Cd: **5 Points** Score CdO: **5 points**

Cd/CdO scoring according to ECHA/MSC-33/2013/030

- Inherent properties: **1**
- Volume: **9**
- Wide dispersive use: **5**
- TOTAL **15**

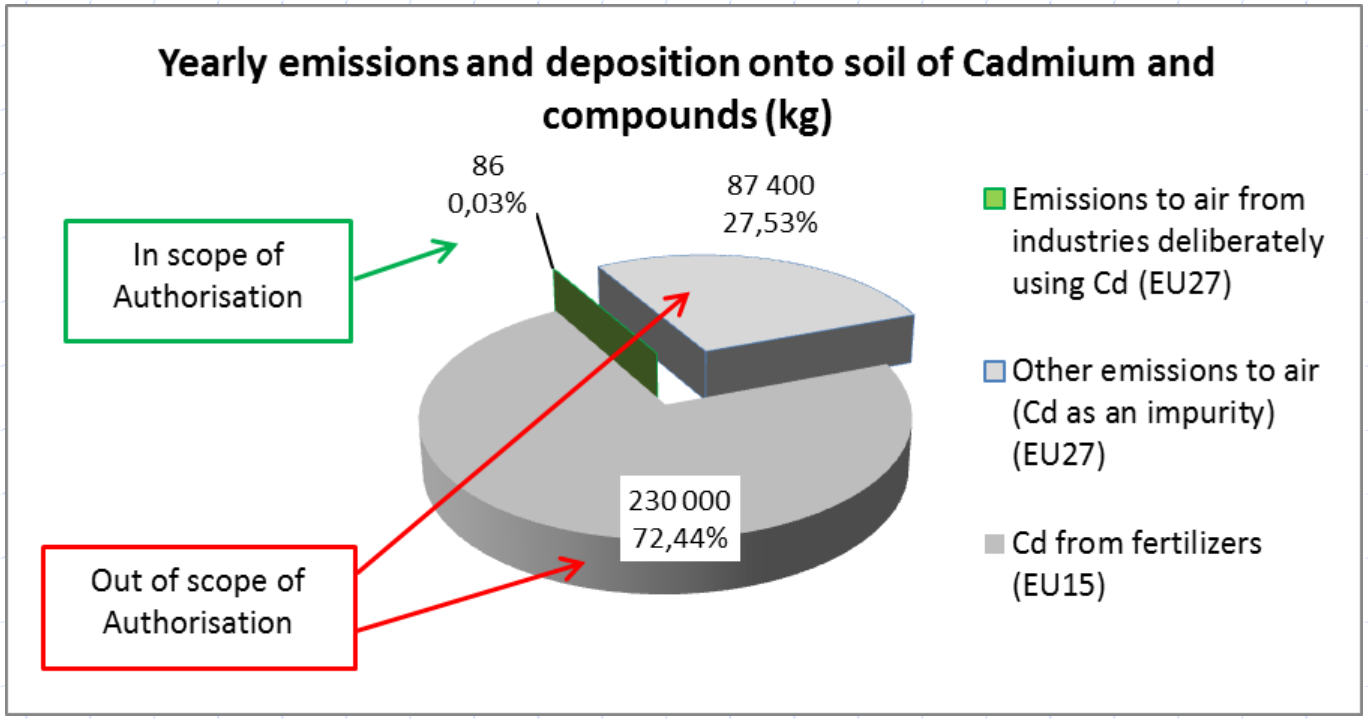
Regulatory efficiency

- Concern expressed by Swedish Annex XV about General Population
- Concern expressed by Swedish Annex XV about workers

Concerns expressed in Swedish annex XV about General Population

- *"Uses have been identified but the resulting releases are insignificant as such or compared to releases resulting from natural sources and/or uses not in the scope of the Authorization Title of REACH"*

Graph 1: 2011 data in kg/yr (except fertilizers from 2008 Cd/CdO RA)



Air emissions from industries in which Cd is an impurity : EU-27

- E-PRTR registry
- EU-27
- Year 2011:

Pollutant releases / Facilities

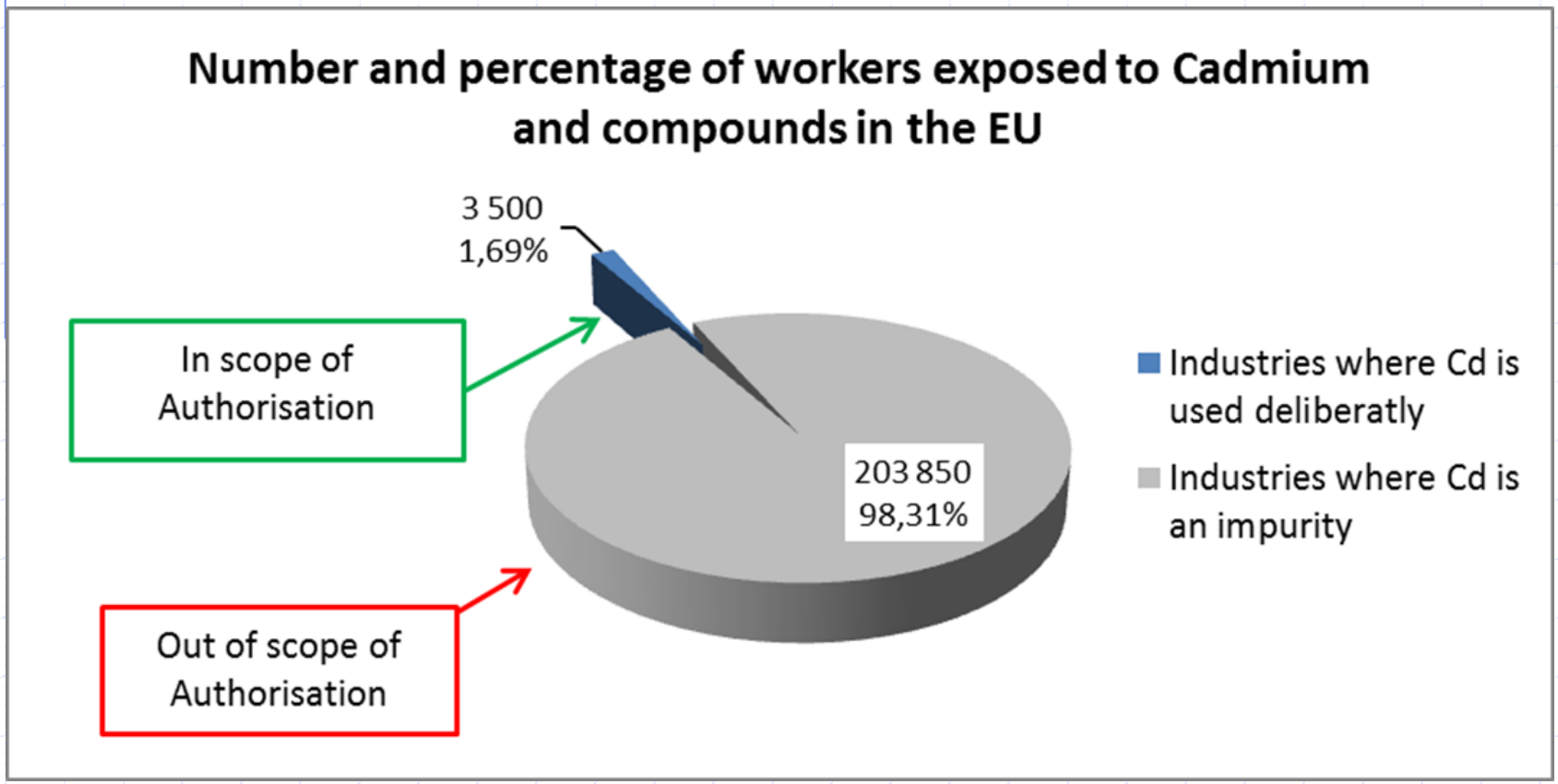
Pollutant: Cadmium and compounds (as Cd)
Year: 2011
Area: EU27
Facilities: 206

All values are yearly releases.

EU Cadmium industry air releases 2013: <100 kg/yr

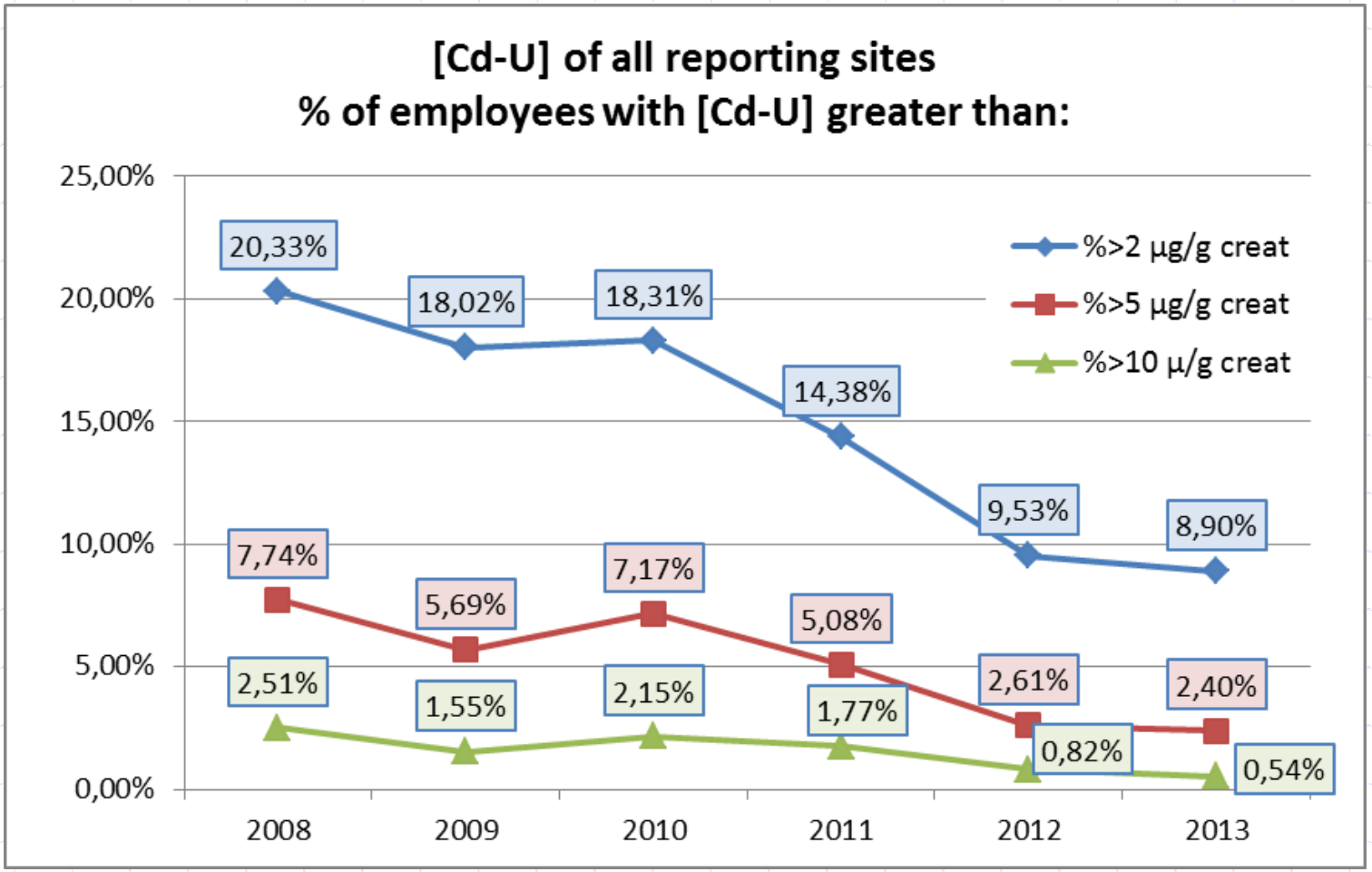
Facility	Quantity	Accidental	Accidental %	Activity	Country
Tata Steel IJmuiden BV	674 kg	30.7 kg	4.55%	2.(b)	NL
ArcelorMittal Poland S.A., Oddział w Dąbrowie Górniczej	505 kg	0	0%	2.(a)	PL
Section Mill	493 kg	0	0%	2.(b)	UK
Eesti Energia Narva Elektrijaamad AS, Eesti elektrijaam	406 kg	0	0%	1.(c)	EE
ARCELORMITTAL ESPAÑA - PLANTA SIDERÚRGICA DE AVILÉS Y GIJÓN	268 kg	0	0%	2.(b)	ES
FÁBRICA DE HUELVA (ATLANTIC COPPER, S.L.U.)	263 kg	0	0%	2.(e)	ES
ARCELORMITTAL ATLANTIQUE ET LORRAINE SITE DE DUNKERQUE	223 kg	0	0%	2.(c)	FR
ArcelorMittal FOS	218 kg	0	0%	2.(b)	FR
ARCELORMITTAL LIEGE sa (COKE-FONTE)	215 kg	0	0%	2.(b)	BE
Instalatsia za pirometalurgichno proizvodstvo na anodna med	192 kg	0	0%	2.(e)	BG
REPSOL PETROLEO S.A.	191 kg	0	0%	1.(a)	ES
Eesti Energia Narva Elektrijaamad AS, Balti elektrijaam	185 kg	0	0%	1.(c)	EE
ThyssenKrupp Steel Europe AG Werk Schwelgern	175 kg	0	0%	2.(b)	DE
U.S.Steel s.r.o.	149 kg	0	0%	2.(b)	SK
PGE Górnictwo i Energetyka Konwencjonalna S.A., Oddział Zespół Elektrociepłowni Bydgoszcz, ELEKTROCIEPŁOWNA BYDGOSZCZ II	145 kg	0	0%	1.(c)	PL
ThermPhos International BV	137 kg	0	0%	4.(b)	NL
Refinaria de Sines	129 kg	0	0%	1.(a)	PT
NLMK LA LOUVIERE sa (+ Duferco Belgium (Produits longs))	123 kg	0	0%	2.(b)	BE
ILVA S.P.A. Stabilimento di Taranto	117 kg	0	0%	2.(b)	IT
Vattenfall Europe Generation AG Kraftwerk Lippendorf	116 kg	0	0%	1.(c)	DE
Scunthorpe Intergrated Iron and Steel Works	109 kg	0	0%	5.(c)	UK
RUUKKI METALS OY, Raahen terästehdas	107 kg	0	0%	2.(b)	FI
Port Talbot Steel Works	107 kg	0	0%	2.(a)	UK
ThyssenKrupp Steel Europe AG Werk Beeckerwerth	104 kg	0	0%	2.(b)	DE
LE CREUSET INDUSTRIE SAS	101 kg	0	0%	2.(d)	FR

Concerns expressed in Swedish annex XV about Workers



Regulatory effectiveness

2,956 workers (out of 3,400) bio-monitored reported below (inclusive of workers removed from exposure by Occ. Dr)



Lobbying on scoring: outcome

- MS position:
  - AGAINST inclusion in annex XIV: FR-BE-UK-IT-CZ
  - LEANING against: DE-BG-RO-PL
  - NEUTRAL: NL
- ECHA "draft scoring" released in **MSC-35** (mid-April)
  - **Cd**: 15 (to 17) points
  - **CdO**: 15 points
- Cd/CdO listed in second half of a "list of 23 substances with a high score" presented at this MSC
- Cd/CdO not listed on ECHA "6th draft ECHA recommendation of 21 substances for inclusion in Annex XIV" presented to **MSC-36** (mid-June)

3/. OBSERVATORIES

a. OCdBIO
b. 2017-2020 initiative
c. OCdAIR
d. Inventory of Air releases

a. **OCdBIO**

Observatory of Occupational Cadmium Bio-monitoring

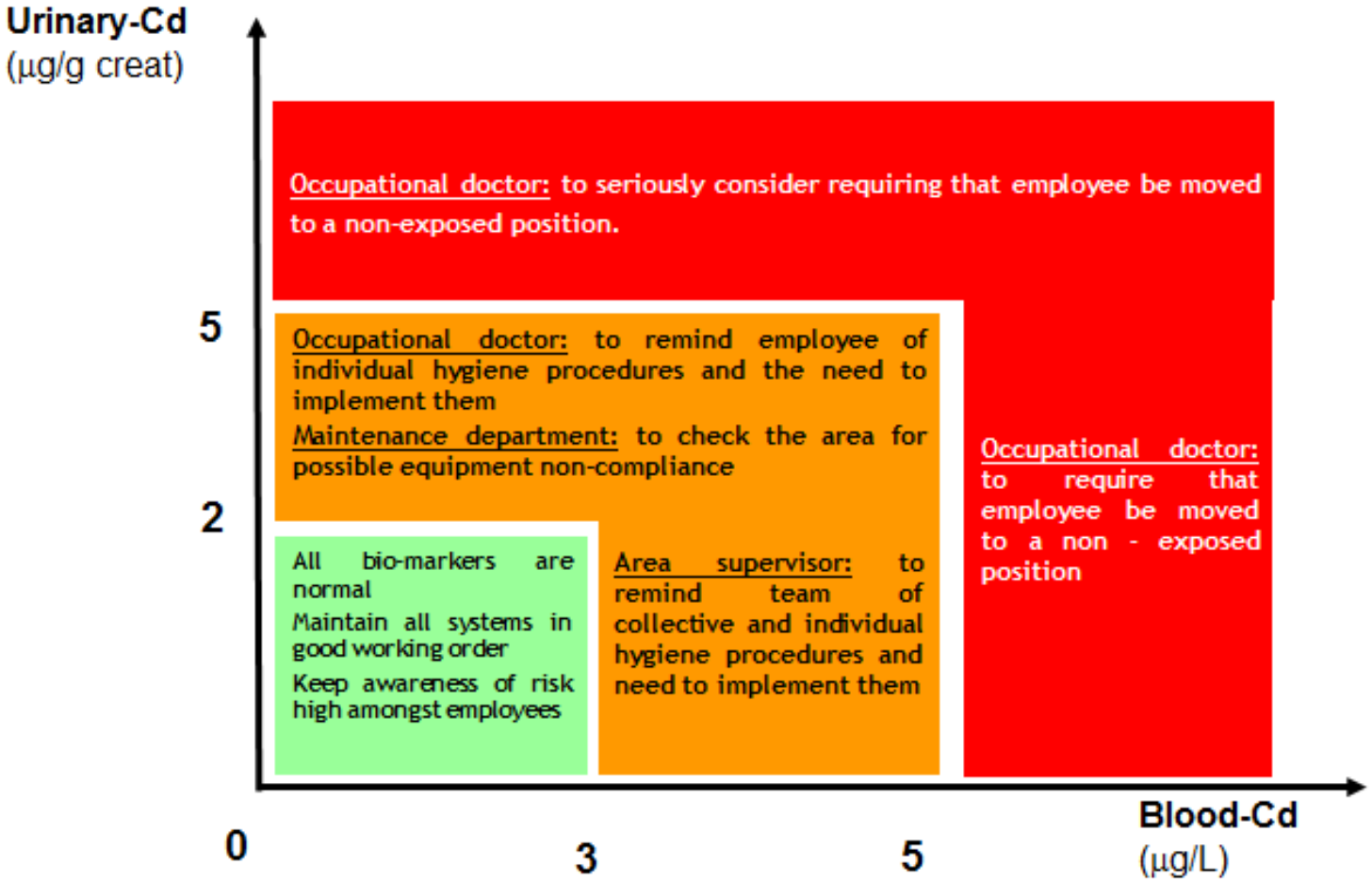
OCdBIO -Occupational Cadmium Bio-monitoring Observatory

- Since 2008, Cd biomonitoring 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 follow-up is interesting only if:
  - There is a long-term involvement of the companies; currently 6 years follow-up!
  - A strong coverage of EU industrial sites in for OCdBIO-6 (2013 data): 24 sites reporting CdU and 23 sites reporting CdB

Selected biomarkers of exposure

- Cadmium in blood – CdB:
  - indicator of recent (and older) exposure
  - Cadmium in 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
  - Cadmium in urine (µgCd/g creatinine)

Using "exposure biomarkers" to conduct adequate advanced medical surveillance (2013 ICdA Guidance)



EU-Sites concerned (CdU or CdB)

Zn Smelters without Cd refining

- Boliden Kokkola (FI)
- ~~Nyrstar Auby (FR)~~
- Nyrstar Balen (BE)
- Nyrstar Overpelt (BE)
- Xstrata San Juan (SP)
- Portovesme (IT)

Zn smelters with Cd refining

- Boliden Odda (NO)
- Nyrstar Budel (NL)
- Xstrata Nordenham (DE)
- KCM Plodiv (BU)
- ~~OCK (BU)~~
- Miasteczko (PL)

Recyclers

- SNAM Viviez (FR)
- EuroDieuze Industries (FR)
- Accurec Wiehagen (DE)
- ZM Silesia (PL)

Battery Manufacturers

- Saft Oskarshamn (SE)
- Saft Ferak (CZ)
- Saft Nersac (FR)
- Saft Bordeaux (FR)
- Hoppecke Brilon (DE)
- Enersys GAZ Zwickau (DE)
- ARTS Energy (FR)

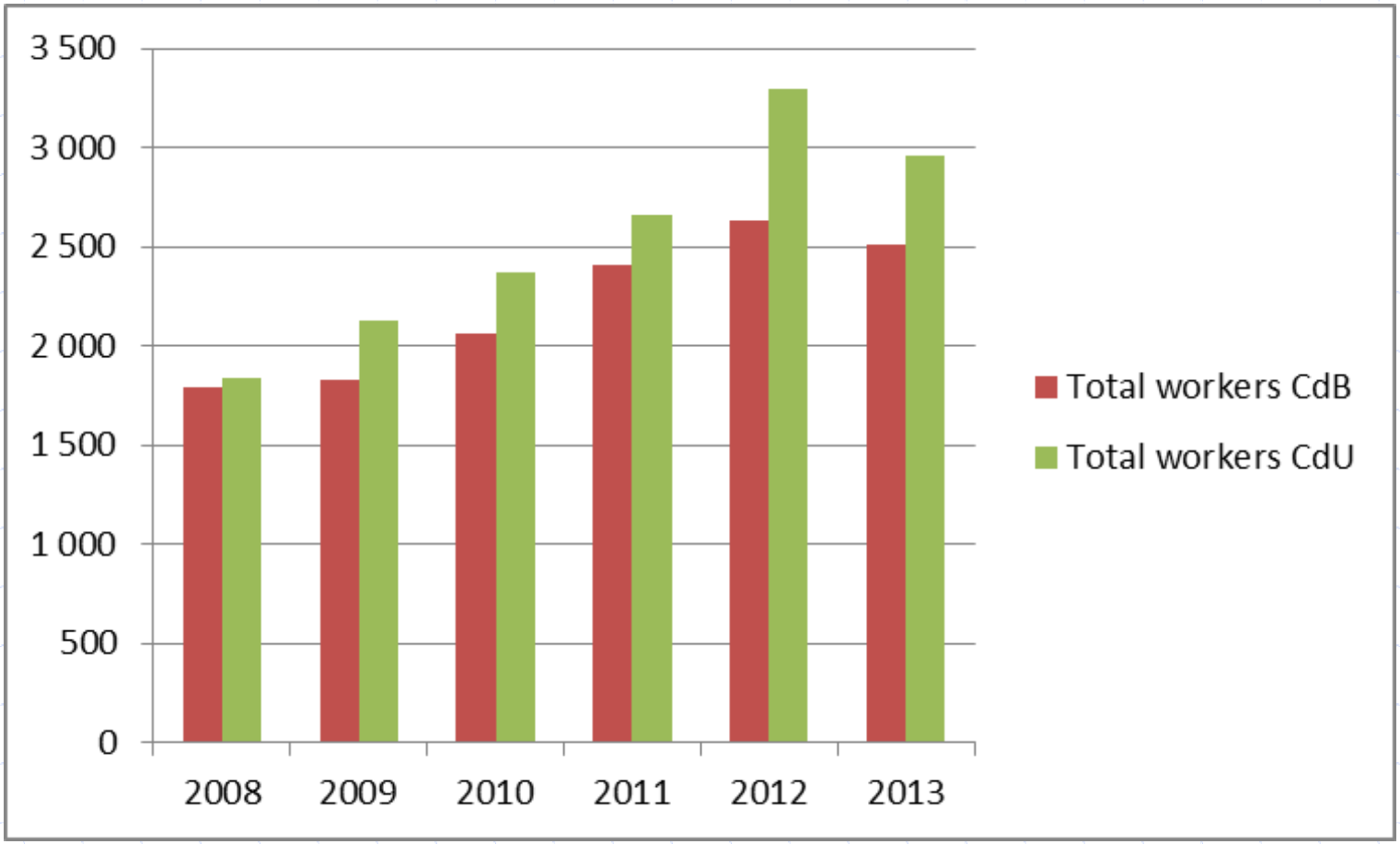
Compounds - Pigments - PV

- Floridienne Ath (BE)
- Bochemie (CZ)
- Rockwood Kidsgrove (UK)
- JMB Fenton (UK)
- 5N+ Eisenhuttenstadt (DE)
- First Solar Frankfurt/Oder (D — Closed
- Calyxo Bitterfeld (DE)
- Umicore Thin Film Hanau (DE)

Missing

- Alloy manufacturers
- Surface treatment operators
- others?

Number of reported workers

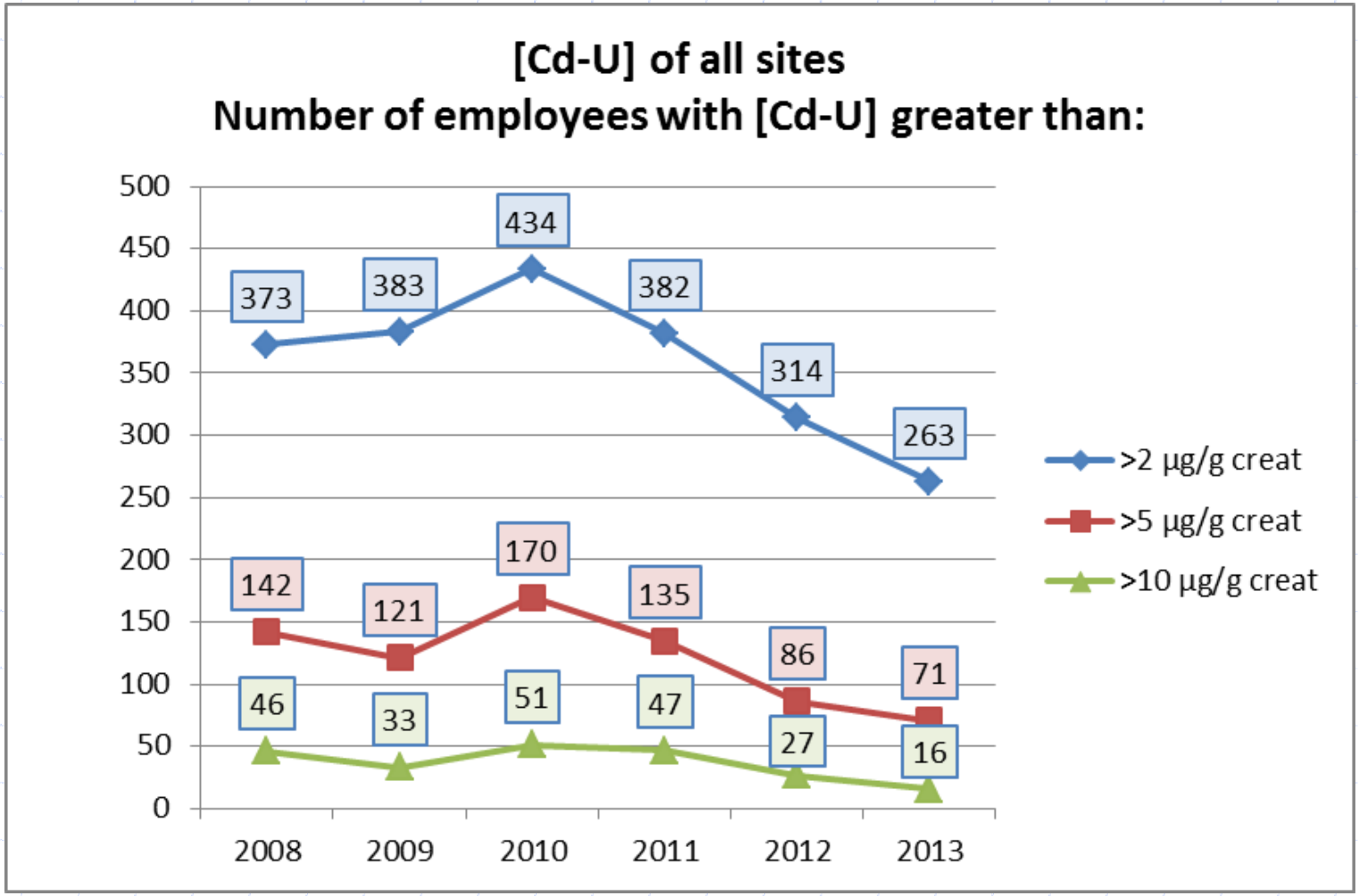


Non reporting companies
200 – 400 workers missing

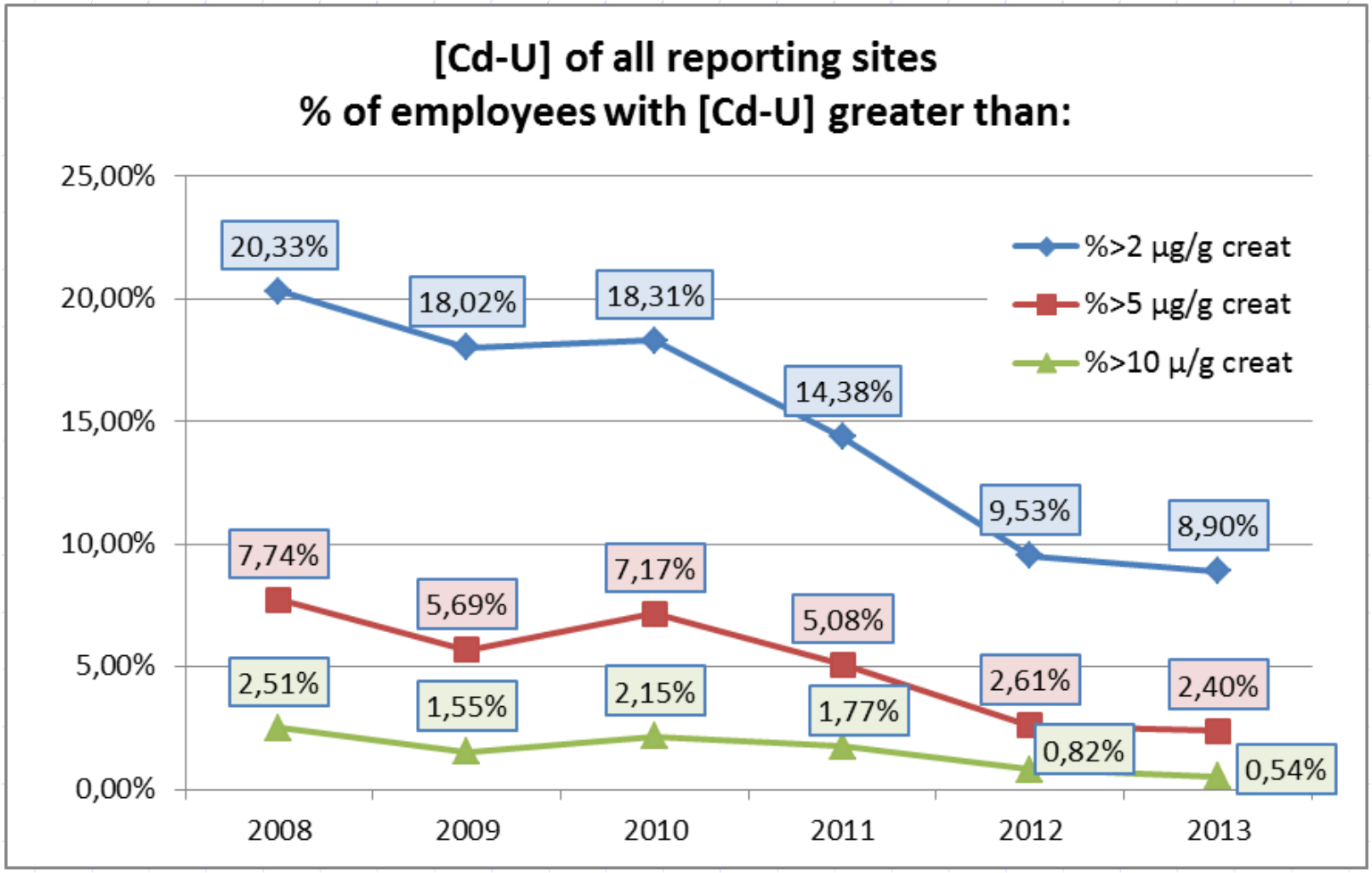
- Zn smelters
  - Missing two plants in PL and BG
- Alloy industry
  - Moderator bars for nuclear power plants
  - Specialty electrical contacts manufacturers
- Plating industry
  - Aerospace contractors
- Specialty chemicals manufacturers
- Others?

- Where to search?
  - ICdA
  - REACH Cd consortium
  - SIEF
  - Downstream users

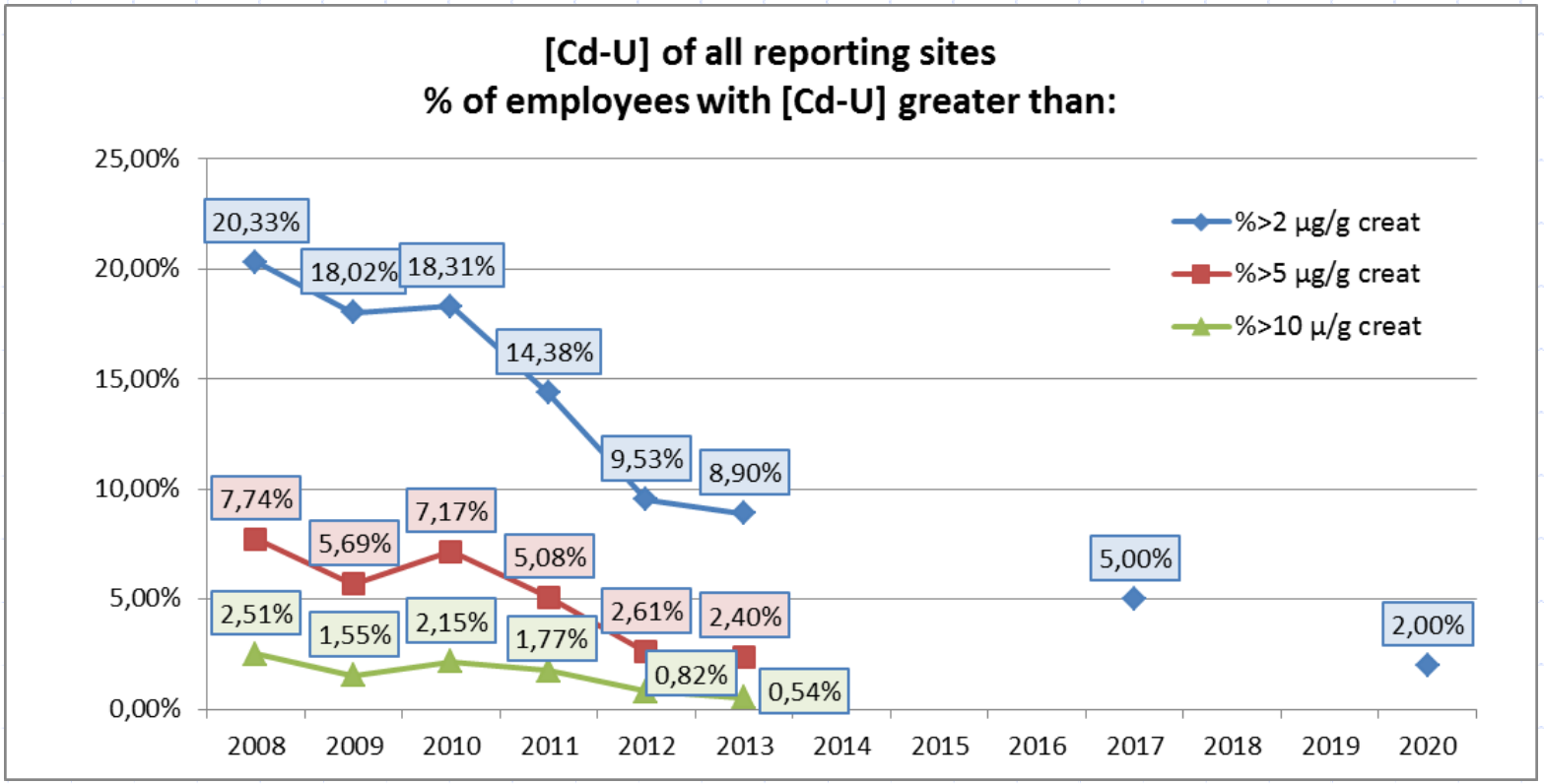
CdU distribution
- all sites in absolute numbers -



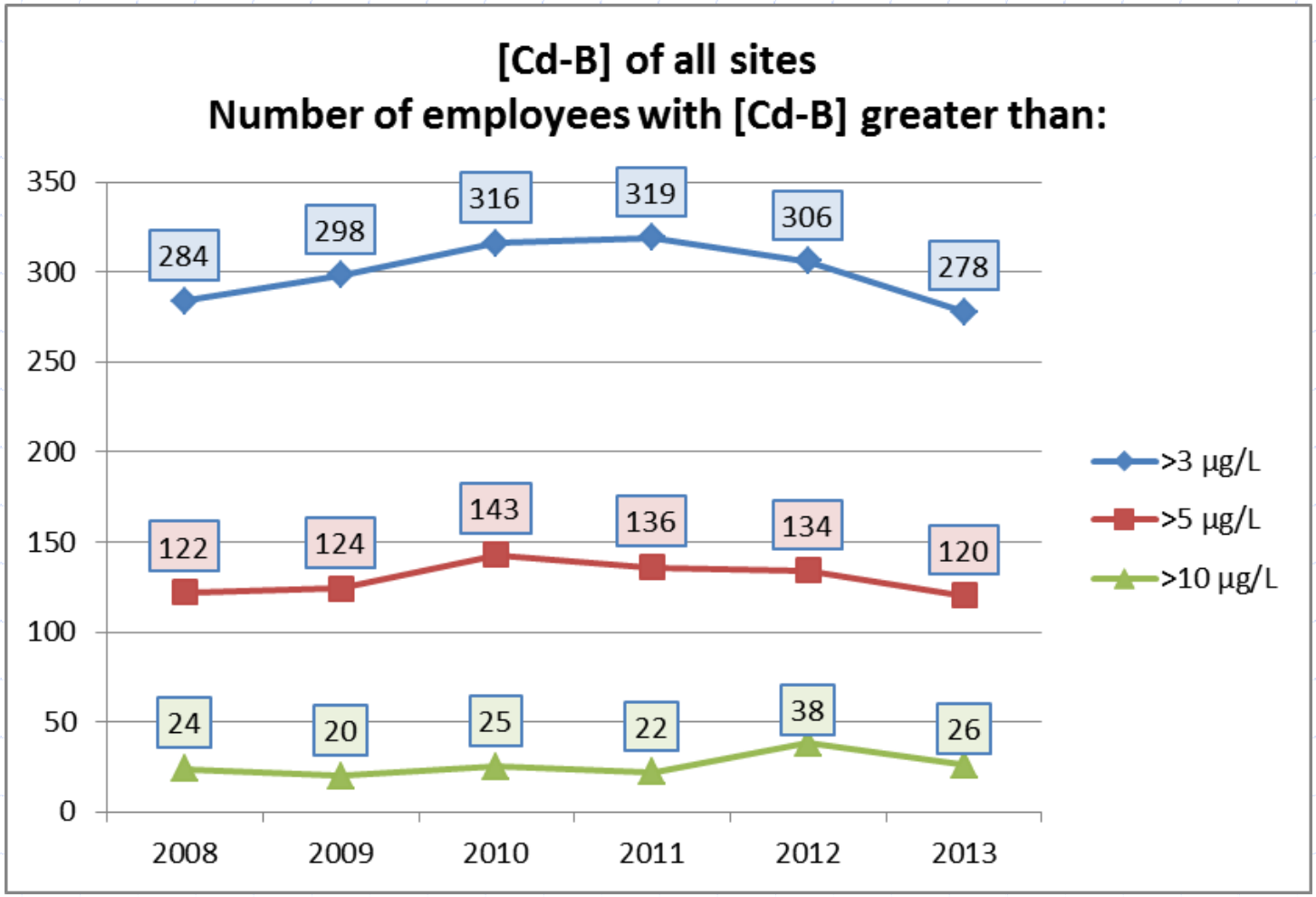
CdU distribution
- all sites in % -



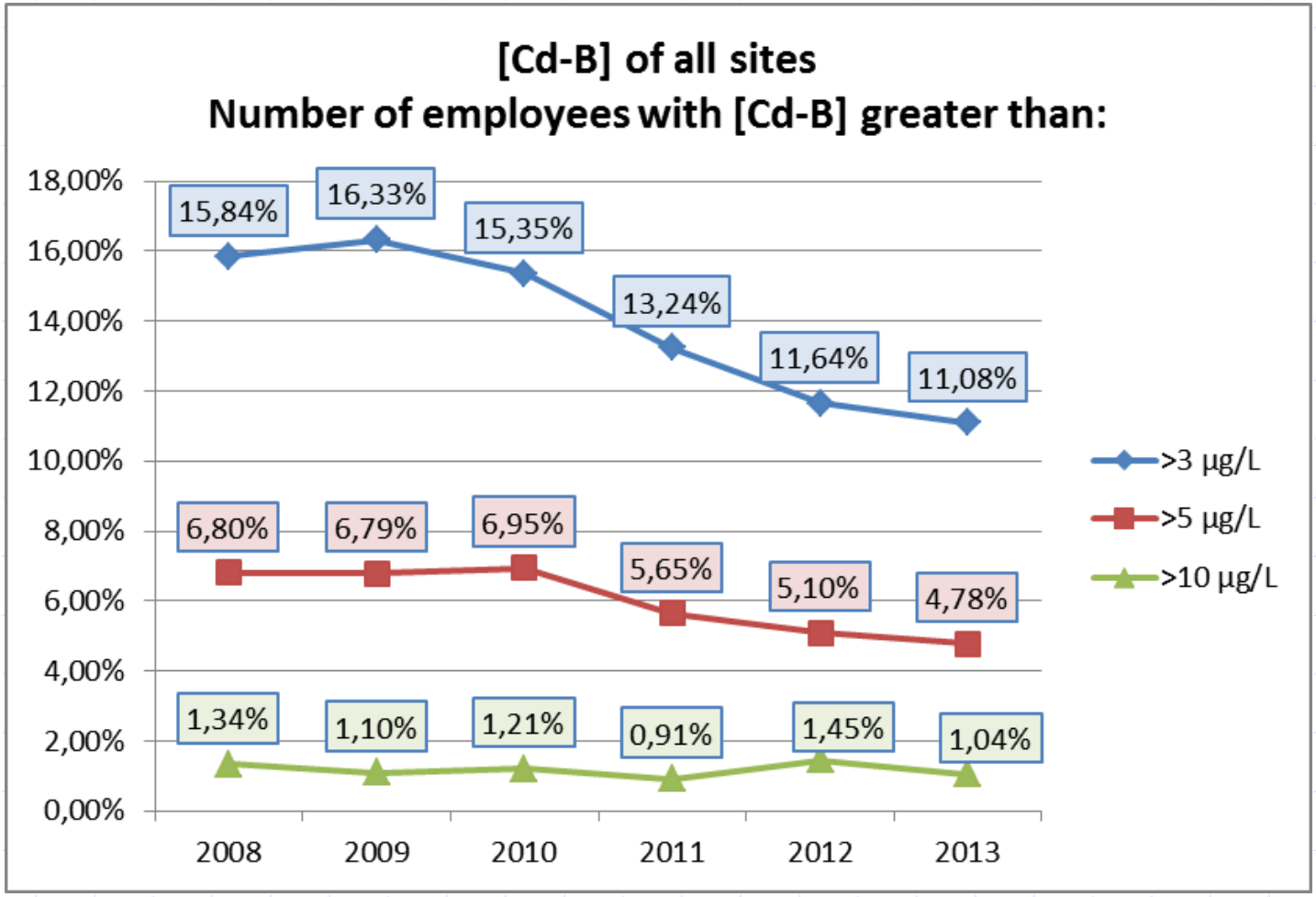
CdU distribution
- 2020 Outlook -



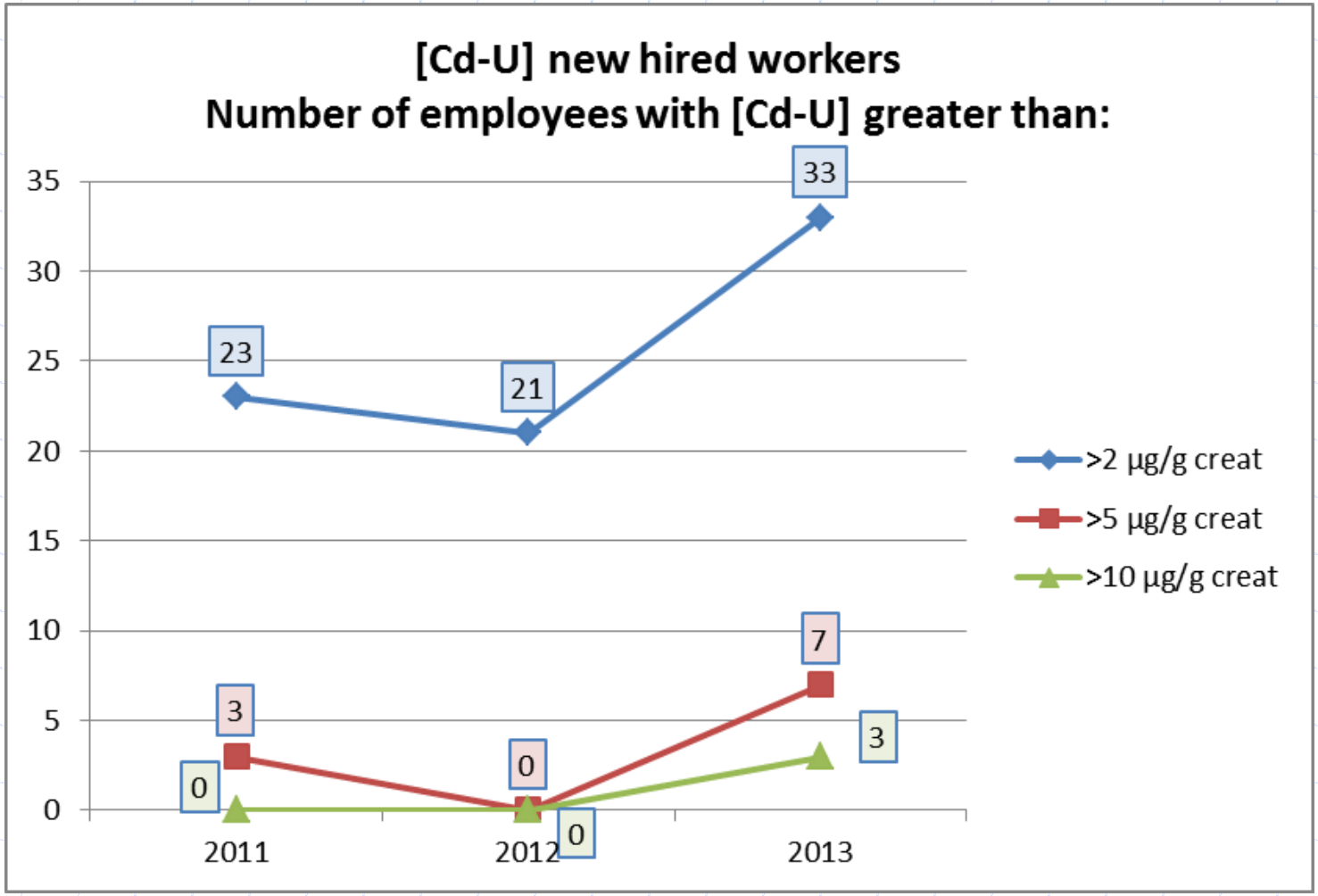
CdB distribution
-all sites in absolute numbers -



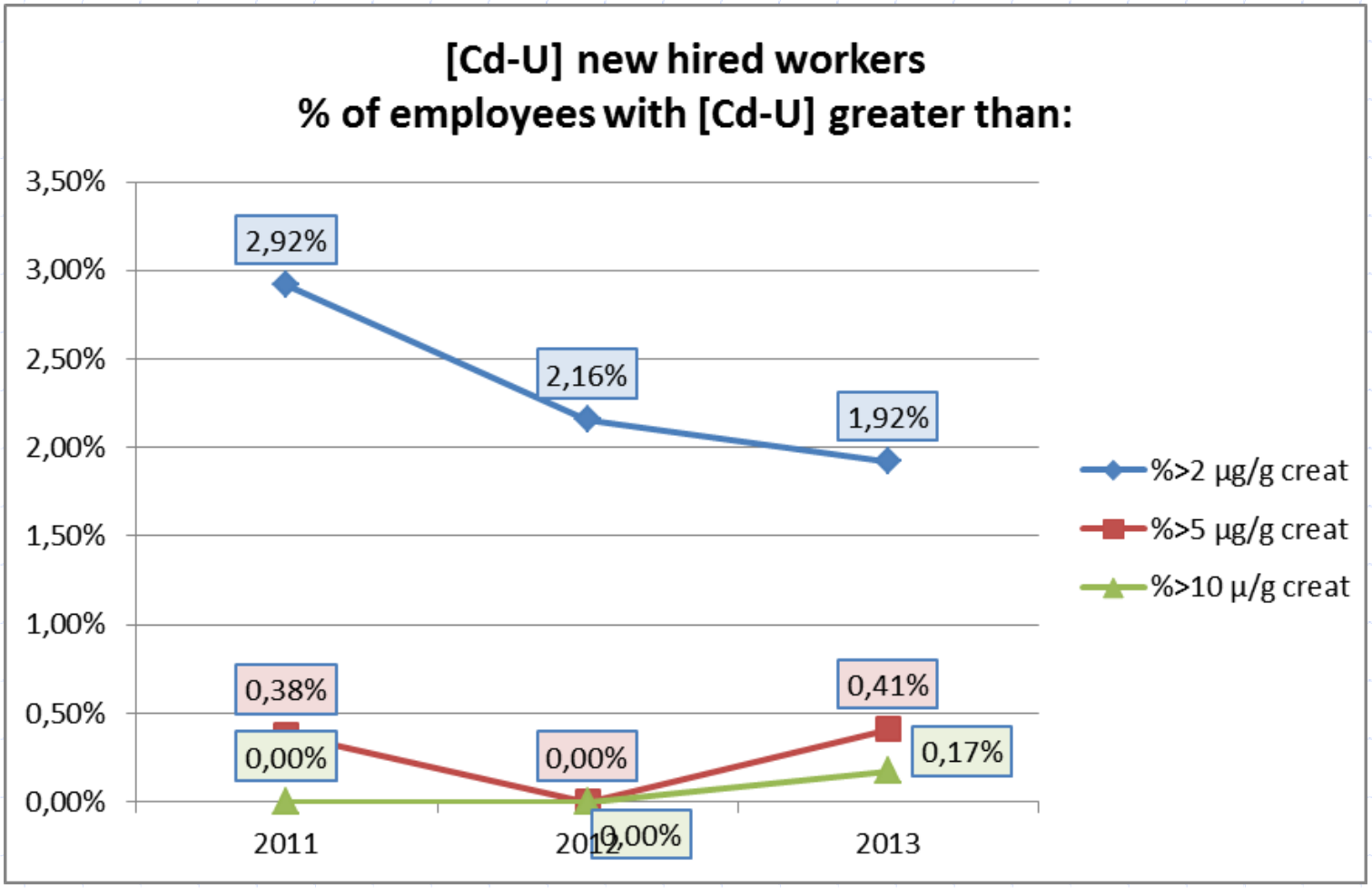
CdB distribution
- all sites in % -



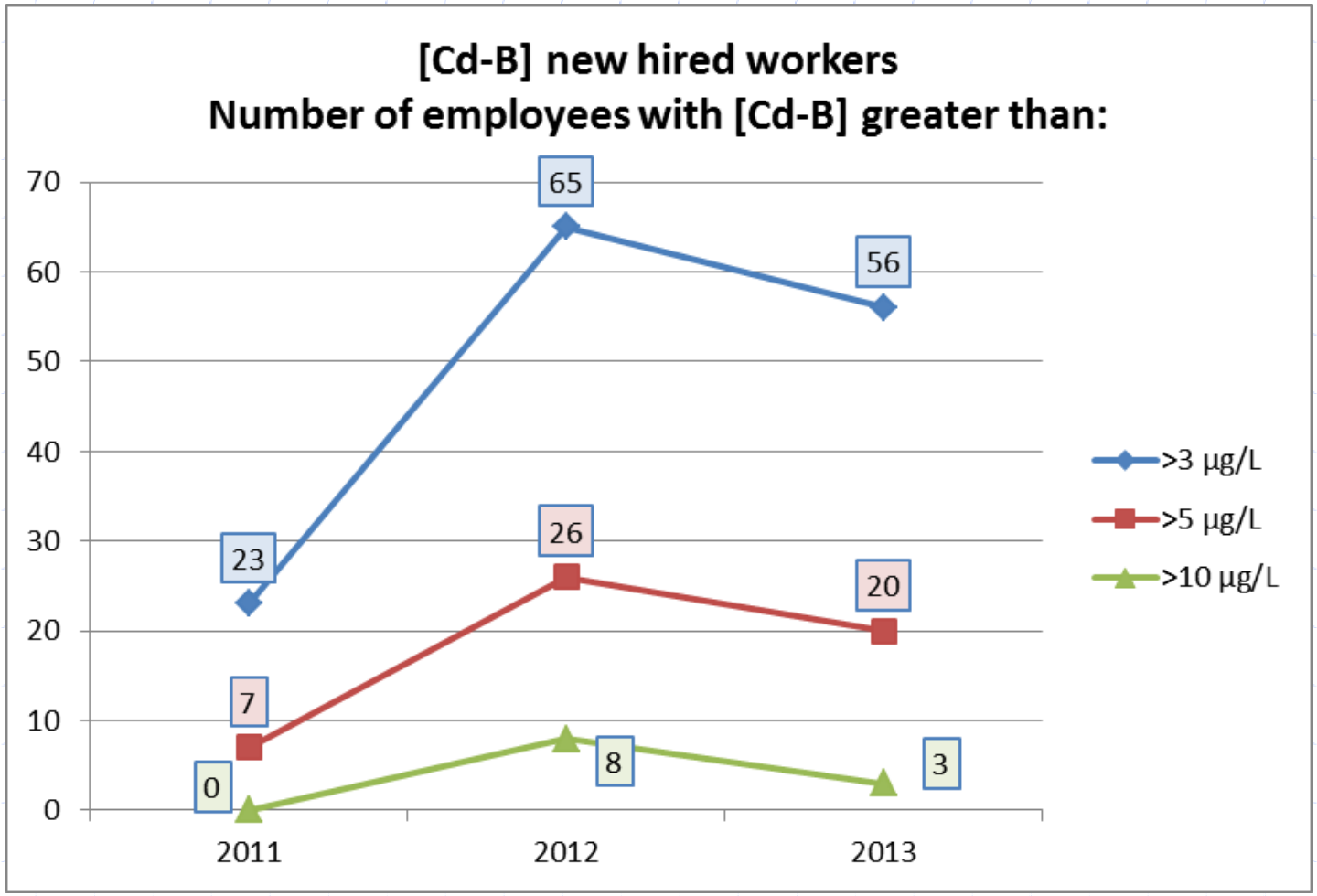
CdU distribution (workers hired after 2000) - all sites in absolute numbers -



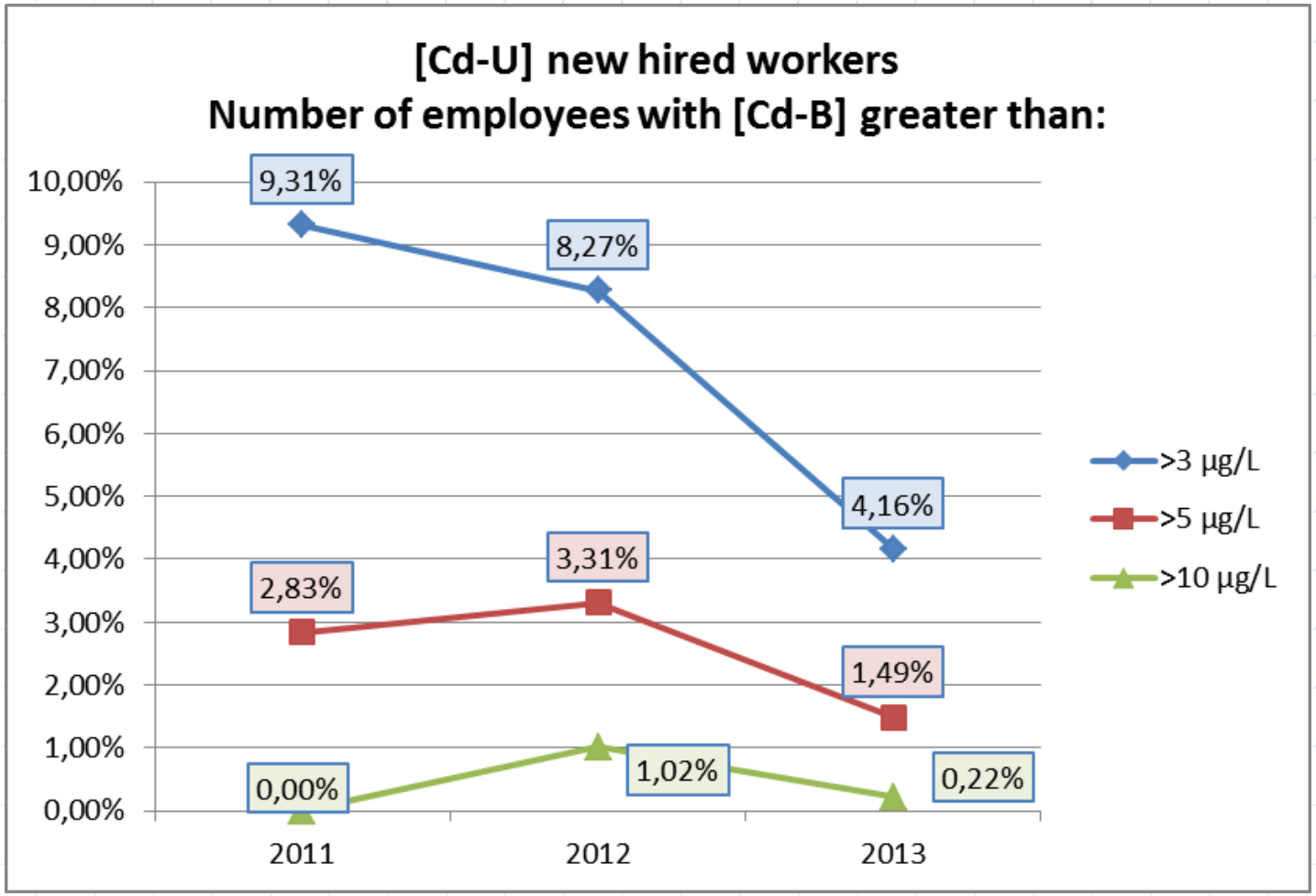
CdU distribution (workers hired after 2000)
- all sites in % -



CdB distribution (workers hired after 2000) -all sites in absolute numbers -



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



Past results – future progress

- **Past results**
  - Increasing coverage of EU Cd industry, good today, still room for improvement
  - Excellent performance on CdU reduction
  - More moderate performance on CdB reduction

- **Future progress**
  - Bring in ICdA, Consortium, SIEF and DUs into OCdBIO
  - Continue to implement ICdA management programme with same dedication
  - Continue to work on ICdA guidance three areas of improvement:
    - ✓ Plant cleanliness, including [Cd-air]
    - ✓ Collective and individual hygiene procedures
    - ✓ Medical surveillance
  - Select tighter action levels over looser ones

b. **ICdA 2017 - 2020 initiative**

ICdA- 2017/2020 initiative (1)

- **Aim:**
  - Not an individual but a collective commitment to achieve challenging targets in terms of biomonitoring results of workers potentially exposed to Cd
- **How:**
  - Revision and further implementation of ICdA guidance with the goal of further reducing occupational exposure of their employees
- **Goal**:
  - 95% of European employees subject to medical surveillance and bio-monitoring as required by their occupational medical doctor, <2 µg Cd/g creatinine at end of 2017.
  - 98% of European employees subject to medical surveillance and bio-monitoring as required by their occupational medical doctor, <2 µg Cd/g creatinine at end of 2020.

ICdA – 2017/2020 initiative (2)

- Based on a triple commitment:

1. Implementation of revised ICdA guidance 2013
2. Regular exchange of best practice between ICdA members
3. ICdA members report yearly results of exposure biomarkers monitoring to ICdA-trustee
   (OCdBio program)

ICdA – 2017/2020 initiative (3)

- Removal of highly exposed workers
  - Remove workers when >5µg Cd/g creatinine
  - No data recorded on removed workers with high Cd levels in blood
  - More engagement is required to commit to the ICdA guidance.

µgCd /g creatine	Total	Removed
5-7	35	20
7-10	20	12
>10	16	5
	71	37

c. **OCdAIR**

Occupational Cadmium Air-monitoring Observatory

Workplace air monitoring: practice

In order to show compliance with the DNEL(respirable) of **4µg/m³** and efficiency of our management system, we will have to be able to show results and improvements

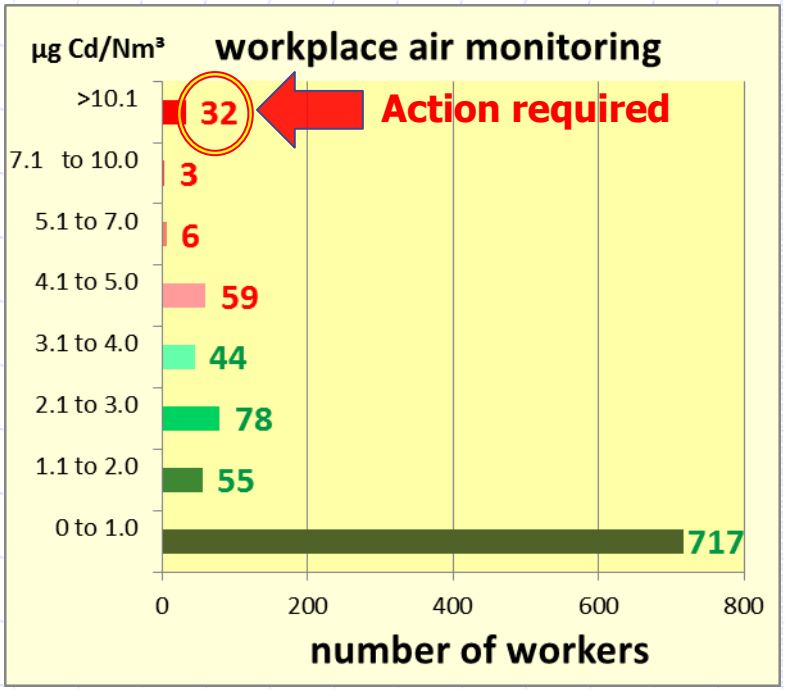
- We are on good track with our database 'OCdBio' that we need to further refine according to best practice
- We started in 2013 systematic measurements-campaign of Cd-air

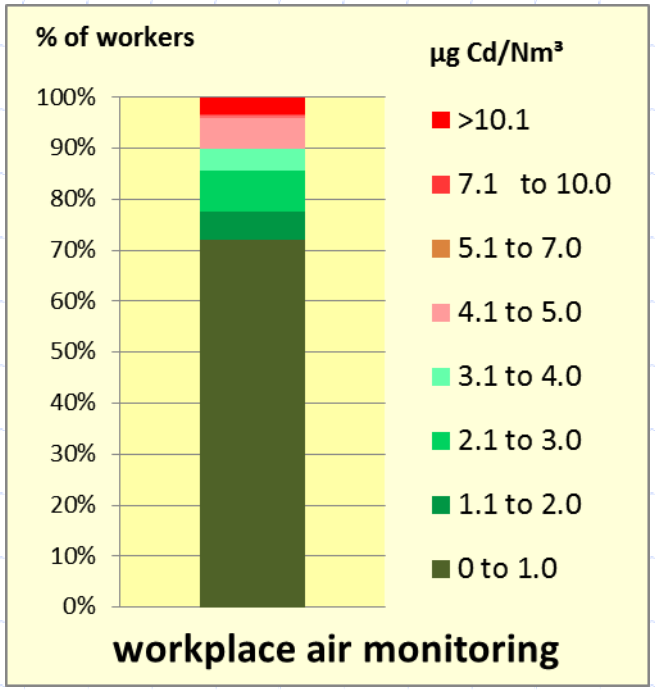
  « Respirable fraction » vs total/inhalable fraction
- Most of measurements are specific for respirable fraction, but in a few cases, when 'inhalable' measurements indicate all values below the DNEL, those values are recorded (worst case) as 'respirable'
- 12 EU plants participated in OCdAir-1

Workplace air monitoring: results

Range	Number of workers	Value calculated (µg/m3) **respirable fraction**	SEG in this range
0 to 1.0	717	0,49	37
1.1 to 2.0	55	1,47	9
2.1 to 3.0	78	2,43	2
3.1 to 4.0	44	3,77	6
4.1 to 5.0	59	4,67	5
5.1 to 7.0	6	6,26	2
7.1 to 10.0	3	8,39	2
>10.1	32	14,53	4
Total number of workers	**994**		**67**

Workplace air monitoring: results





- 10% of workplace measurements are above 4µg Cd/m3
- 3,5% of workplace measurements are above 10µg/m³ !!!

We need better performance for our advocacy!!!

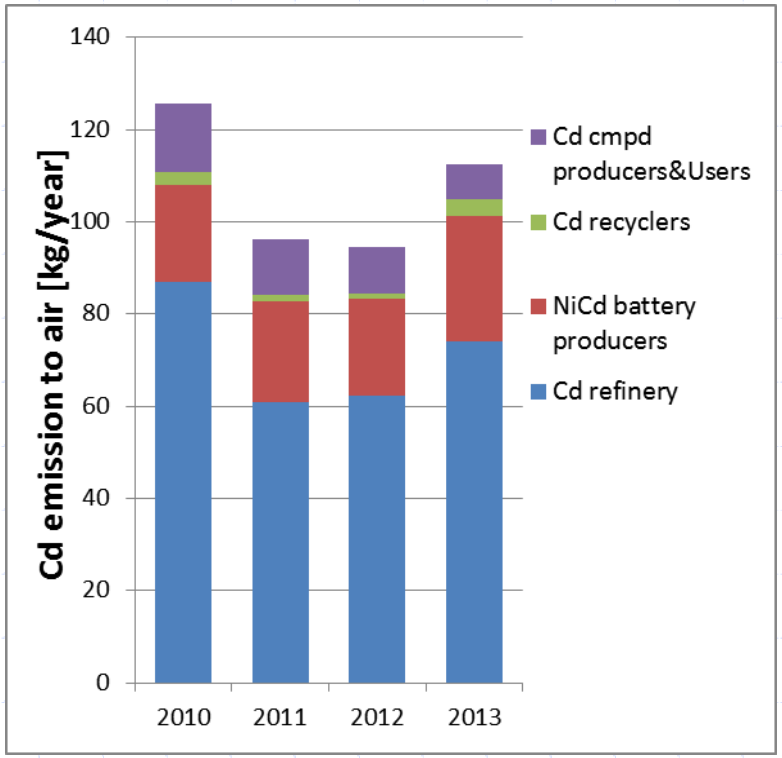
d. **IAR**

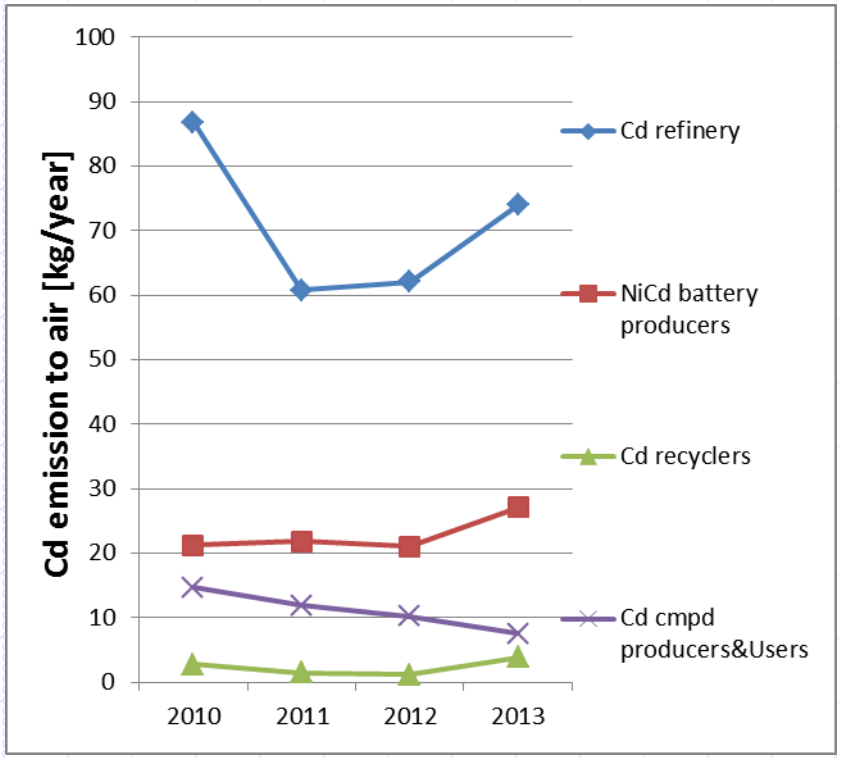
Inventory of Air Releases

IAR-Inventory of Air releases

	Kg emission to air				Nr of reporting plants			
	2010	2011	2012	2013	2010	2011	2012	2013
Zn refinery	53,6	63,0	23,6	20,3	4	4	4	4
Cd refinery	86,8	60,8	62,1	74,0	5	5	5	5
NiCd battery producers	21,2	21,9	21,1	27,1	6	6	6	7
Cd recyclers	2,8	1,5	1,2	3,8	3	3	3	3
Cd cmpd producers&Users	14,7	11,9	10,3	7,6	6	6	8	5
Cd ref.+bat.+rec.+cpds.+users	**125,5**	**96,1**	**94,6**	**112,6**	**20**	**20**	**22**	**20**
+Zn ref.	**179,1**	**159,2**	**118,2**	**132,9**	**24**	**24**	**26**	**24**

IAR-Inventory of Air releases





- More emission points measured
- Detection limit is reported (actual emission is lower)

Other business

Other business (1)

UNEP Public consultation:

- Comments of the International Cadmium Association on UNEP Decision 27/12 Chemicals and Waste Management; Section II on Lead and Cadmium , Paragraph 4
  - Information on techniques for emissions abatement and on the possibility of replacing cadmium with alternate substances was submitted.
  - Many references were made to the CADMIUM 2011 Kunming conference papers

Other business (2)

ICdA members Code of Conduct developed

- Members shall observe the highest standards of business and personal conduct in all activities relating to recovery, processing and use of cadmium, including:
  - Compliance with all applicable national and international laws, rules and regulations.
  - Ethical behavior in their activities demonstrating respect for human rights and children's rights.
  - Avoidance of activities that may damage or reflect adversely upon worldwide image of cadmium and its processing industry.
  - Develop, maintain and promote high standards of practice for all industry participants.
- The code will be submitted for official approval to the general assembly in October

Other business (3)

Cadmium and Water Framework Directive

Conclusions / Next meetings