



Precious Metals & Rhenium Consortium  
Brussels, 28 June 2012



# Refinables PM Refiners WG Meeting



## 1. Welcome & Introduction

• • •  
Edwin BROECKAERT



## 2. Reminder on Background & Current State of Play

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Caroline BRAIBANT



## 3. Workplace Exposure Assessment Update

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Daniel VETTER  
Jutta SCHADE  
Torsten GREWE



# RiCoG

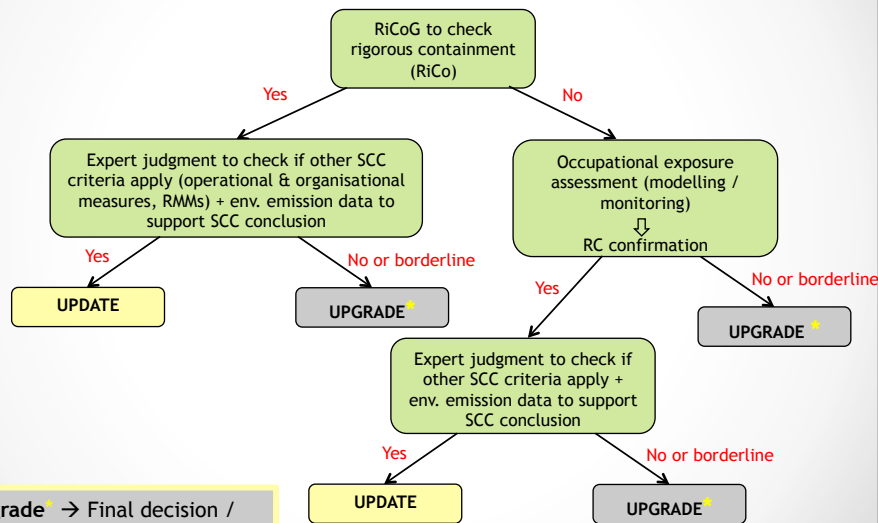
- **Rigorous Containment Guide**
- EBRC and Eurométaux; soon downloadable from EBRC's website
- Excel-based tool to identify **containment system in place in the workplace** based on Hirst *et al.* 2002 scheme and **possible solutions** to achieve RC
- **Practical translation of ECHA Guidance + NFM terminology and specificities:**
  - ✓ Intermediate per intermediate
  - ✓ Process step per process step
  - ✓ Over the whole life-cycle
- **Voluntary tool**
- **Only part of tool-kit** to be used in the decision-making

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## Assessment of SCC for the workplace and the environment



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## Recapitulation of previous project activities

- Questionnaires:
    - Heterogeneous feedback (extent and content)
    - Proposal to group processes based on titles, descriptions, PROCs, OCs and RMMs
  - MEASE: not used because of
    - issues with physical forms, and
    - expectation of very low DNELs
- **Decision to first screen inhalation monitoring data**

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## Measured inhalation monitoring data I/III

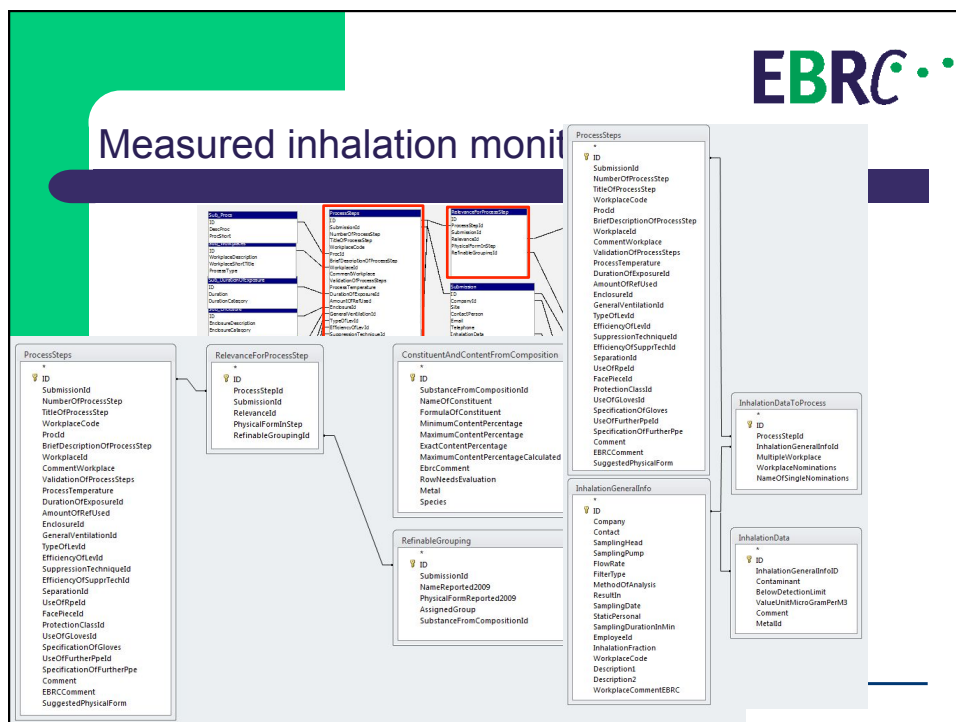
- Approach:
  - Low DNELs require exposure assessment based on monitoring data → modelled exposure levels are far too high
  - Exposure assessment to cover each site and refinable
  - Pooling of monitoring data required to enlarge database for specific exposure situations (strict requirements in R.14)
  - Pooling is justified for similar substances handled in similar processes → How to identify similarities?
    - based on composition → requiring information per stream
    - based on RMMs and OCs as described in questionnaire
  - “Pooled exposure assessments” = Pooled workplaces in ES

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## Measured inhalation monitoring data II/III

- Aim of analysis is three-fold:
  - To determine similar exposure groups and to assign exposure estimates to them (classical approach)
  - To estimate the contribution of individual parameters to variation in exposure (advanced approach)
  - Both approaches are examined in parallel considering the classical approach as a fall back strategy
  - To identify data-gaps (for conducting exposure monitoring)
- Status of data base:
  - Questionnaires: n=50, (1 further announced)
  - Monitoring data: n=710, further 54 not yet included

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## Processing of questionnaire information

- At this stage, focus on information submitted together with monitoring data:
    - Grouping of process steps (company-specific) to process types (i.e. “pooled workplaces”)
    - For each process step: Aggregating information on physical forms (e.g. “low emission potential” for damp solids, pastes, wet filter cakes) , where appropriate
    - Coding of RMMs and OCs to enable categorical analyses
    - Reformatting of composition information (currently exclusively based on elemental concentrations)
    - Currently exploring the best descriptor for composition: min, max, median concentration
- Providing basis for pooling/read-across

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## Processing of measured data

- Information used for the analysis of measured data:
  - Personal measurements of the inhalable fraction (static measurements will be used as supportive information)
  - Only measurements that were assigned to a specific workplace are currently used (not yet multiple workplaces or JR)
  - If a specific metal was not given in any of the related compositions but a measurement for this substance was provided, this measurement is currently not considered (perhaps originating from “non-REACH” materials)

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## Problems observed during analysis I/II

- In some cases, compositions were not provided
- Content ranges are often in a very wide range (e.g. 0 – 99 %)
- Total concentration of a single stream is often significantly less than 100 % (sometimes less than 20 %)
- Measurements exist for metals not reported in the compositions (or grouped as e.g. “PGMs”)
- Further materials (e.g. waste, non-refinables) are handled in specific workplaces
- Exact compositions of refinables handled during monitoring not available
- Additional parameters not yet considered (proportion of streams used during measurement)

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## Problems observed during analysis II/II

- Assignment of multiple workplaces/JR → is grouping of process steps possible (OCs and RMMs similar)?
- Multiple physical forms handled → grouping of physical forms possible according to “common” emission potential?
- Heterogeneous descriptions of physical forms may lead to vague grouping (information on dustiness may help)
- Sampling duration and exposure duration are sometimes in contradiction (exposure duration << sampling duration)
- Process steps defined in questionnaire according to process flow (e.g. smelting) reporting process parameters (e.g. high temperature) sometimes combining several exposure situations (e.g. including loading and unloading of cooled smelter)

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## Way forward

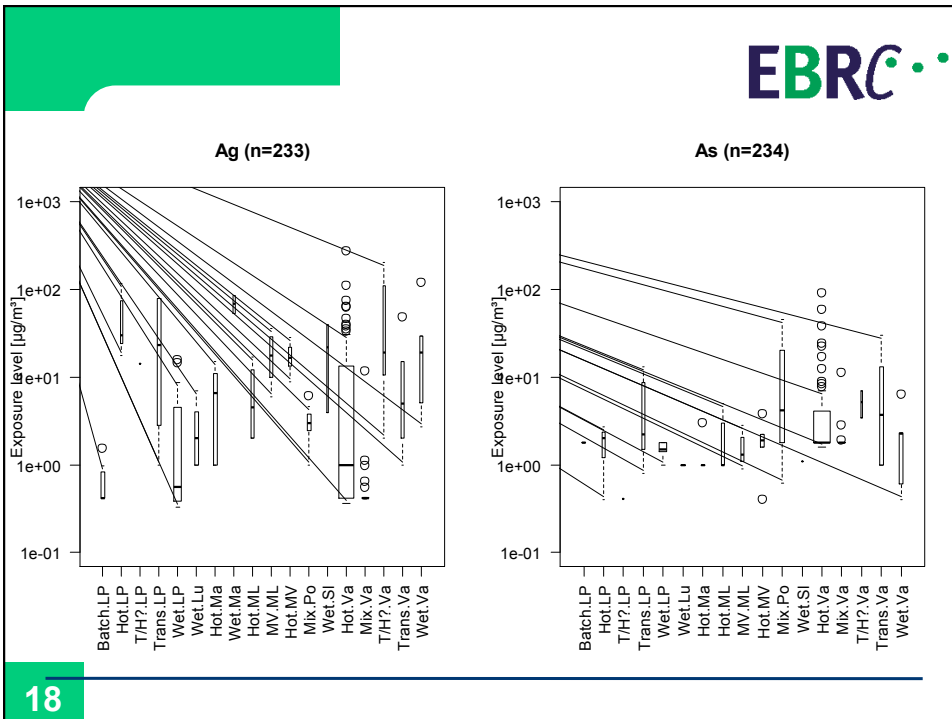
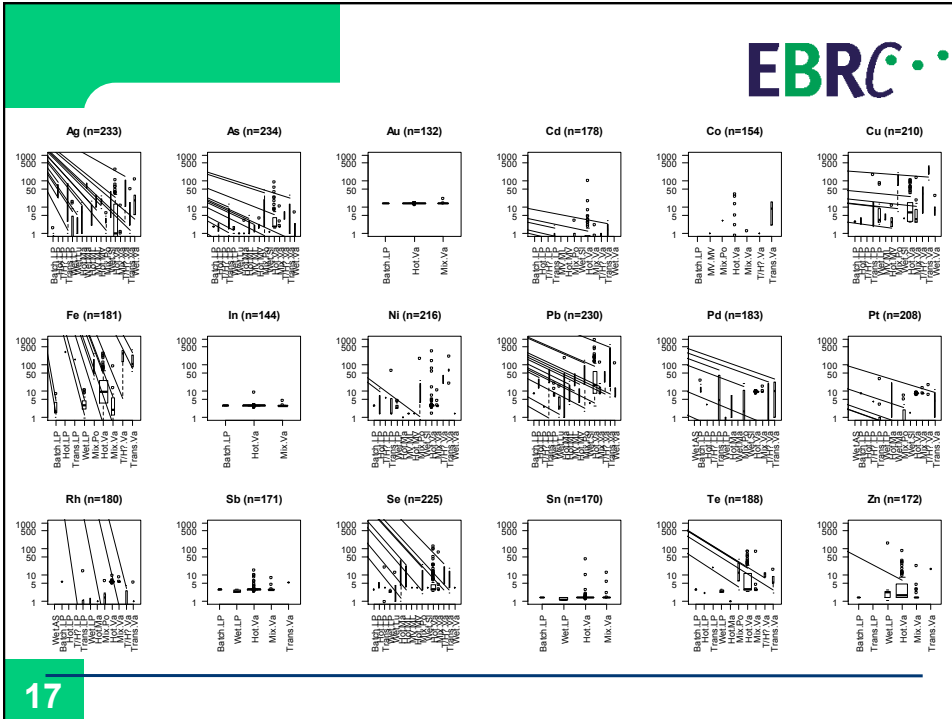
- Further clarifications by data submitters either by email/ telephone or in face to face discussions
- Similar discussions with non-data-submitters are to follow since further information is also required to enable read-across approach
- Advanced approach may involve huge workload for companies: costs and benefits are currently analysed in case study
- Fall back strategy: classical approach

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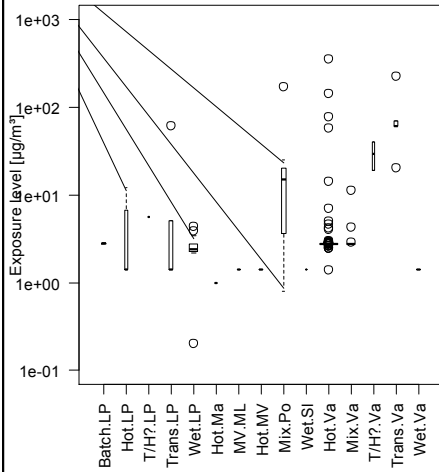
## Explorative data analysis

- Data used:
  - personal measurements
  - inhalable fraction
  - Assigned to single process steps
- Aggregation of data for
  - Processes → process types
  - Multiple physical forms → single physical form
  - Content information → evaluated as Min, Max, Median

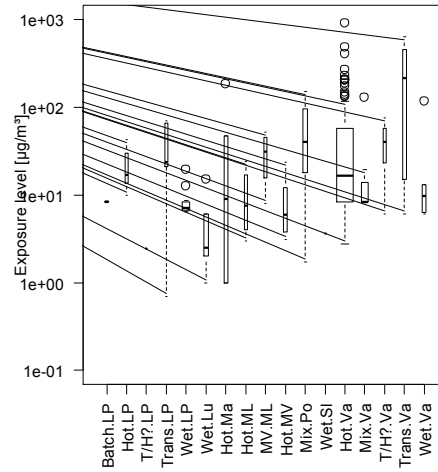
16



Ni (n=216)



Pb (n=230)



## 4. Environmental Emissions Assessment Update

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 Claire MASSEY

## Overview

- Update of where we are
- Bottlenecks
- Next steps

## Survey Questionnaires

- Captured information on:
  - » Refinable composition
  - » Tonnage
  - » Potential emissions
  - » Risk Management Measures (RMMs – type & efficiency)
  - » Monitoring data
  - » Local receiving environment
  - » Confounding factors

## Summary of responses so far

- 12 questionnaires received
  - » 9 contained good amount of useful information
  - » these data will be the basis of the GES
- Good level of information on waste-water output (and receiving environment) n=45
- Slightly less information on stack emissions but just enough to work with (n=31)

## Modelling and risk characterisation

- Refinables specific input derived from responses
  - » E.g. tonnages, operating days, emission factors
- But, modelling on hold until we receive the input parameters for each component
  - » E.g. partition coefficients, PNEC etc
- This is being collated by Eurometaux
- Once received we can run the environmental modelling

## Modelling and risk characterisation

- Provisional GES developed, primarily based on 9 sites providing most complete datasets
  - » Maximum or 90th percentile tonnage value for each constituent
  - » Description of RMMs and range of efficiencies
  - » Maximum or 90th percentile emission factors (EFs) to air and water (after RMMs) calculated across all constituents and for individual constituents (cf. SpERCs)
  - » 10P or median emission days (under review)
  - » Median or 10th percentile effluent flow rate and dilution factor (under review)

## Tiered Risk Assessment Approach

- Once component input parameters are available environmental modelling will progress quickly
- Tier 1
  - » GES with 'reasonable worst case' using maximum or 90<sup>th</sup> percentile tonnage, typical RMMs and EF
- Tier 2
  - » Same GES but use latest metal SpERCs to refine emission estimates to aquatic environment (based on Kd)
- Tier 3
  - » Site specific assessment



## 5. Classification Update

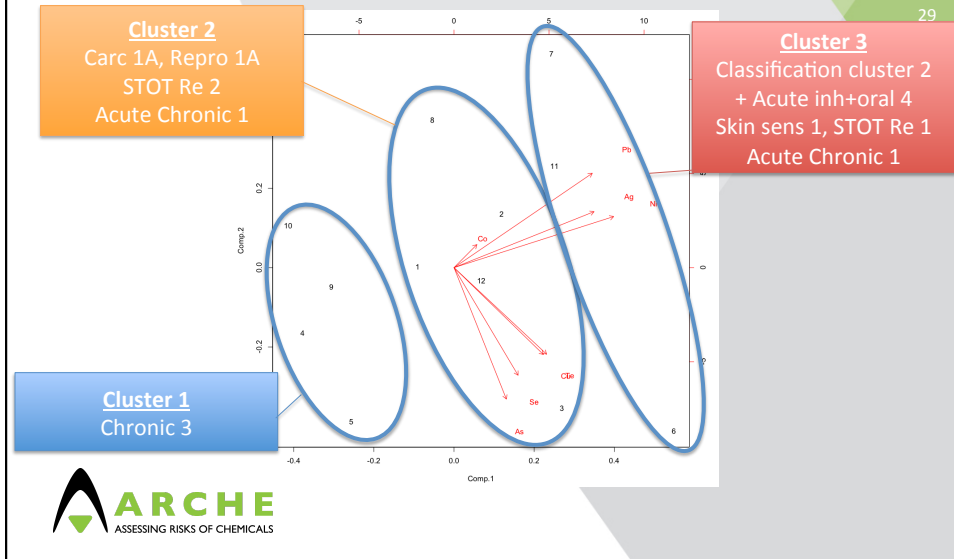
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Frederik VERDONCK

### ▶ Outline

- Overview classifications
- Example for reclaim (Group 9.2)
- Upcoming additional updates

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## ▶ Reclaim (9.2)



## ▶ Reclaim (9.2)

### Quick ID

### Detailed ID

	Classification CLP	Classification DSD	Composition / classification drivers
1 (low Ni/Pb)	Env Chronic 3	R52/53	NiO < 0,1%; Pb comp < 0,3%; Se < 10%; Co < 1% $100 / ((\%As + \%Se + \%Te \text{ comp})/100 + (\%Pb \text{ comp} + \%Sb/Sb \text{ comp})/500) > 2000 \text{ mg/kg}$ $100 / ((\%As + \%Se)/700 + (\%Pb \text{ comp} + \%Sb/Sb \text{ comp})/4500) > 20000 \text{ mg/kg}$ $(\%Ag \times 5,15 + \%Cu \times 0,08) < 1$ $(\%Ag \times 1,05 + \%Cu \times 0,031) * 10 < 1$
2 (low Ni/high Pb)	Carc 1A, Repro 1A, STOT Re 2, Env Acute 1, Env Chronic 1	R48 R49 R60/61 R50/53	NiO 0,1% - 1%; Pb comp $\geq$ 0,3%; Pb comp $\geq$ 0,5% or Se $\geq$ 10%; Co < 1% $100 / ((\%As + \%Se + \%Te \text{ comp})/100 + (\%Pb \text{ comp} + \%Sb/Sb \text{ comp})/500) > 2000 \text{ mg/kg}$ $100 / ((\%As + \%Se)/700 + (\%Pb \text{ comp} + \%Sb/Sb \text{ comp})/4500) > 20000 \text{ mg/kg}$ $(\%Ag \times 5,15 + \%Cu \times 0,08) > 1$ $(\%Ag \times 1,05 + \%Cu \times 0,031) > 1$
3 (high Ni/Pb)	Acute inh+oral 4, Skin sens 1, Carc 1A, Repro 1A, STOT Re 1, Env Acute 1, Env Chronic 1	R20/22 R43 R48 R49 R60/61 R50/53	Pb comp $\geq$ 0,3% NiO $\geq$ 10% NiO $\geq$ 1% and Co < 1% $100 / ((\%As + \%Se + \%Te \text{ comp})/100 + (\%Pb \text{ comp} + \%Sb/Sb \text{ comp})/500) \text{ between } 300 - 2000 \text{ mg/kg}$ $100 / ((\%As + \%Se)/700 + (\%Pb \text{ comp} + \%Sb/Sb \text{ comp})/4500) \text{ between } 2500 - 20000 \text{ mg/kg}$ $(\%Ag \times 5,15 + \%Cu \times 0,08) > 1$ $(\%Ag \times 1,05 + \%Cu \times 0,031) > 1$

## Example Step 1: quick ID

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Element	Concentration%
Ag	0.370
Al	10.160
B	0.120
Cr	11.400
Cu	0.310
Fe	21.800
Mg	6.200
Ni	0.130
Pb	0.920
Se	0.100
Sn	2.180
Ti	1.100
Zn	0.300
Zr	5.600

> 0.1% and < 1% -> med Ni cluster  
> 0.3% -> high Pb cluster

Quick ID:  
Cluster 2



## Example Step 2: full detailed ID

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Element	Concentration%
Ag	0.370
Al	10.160
B	0.120
Cr	11.400
Cu	0.310
Fe	21.800
Mg	6.200
Ni	0.130
Pb	0.920
Se	0.100
Sn	2.180
Ti	1.100
Zn	0.300
Zr	5.600

ok ok

NiO 0,1% - 1%; Pb comp >= 0,3%; Pb comp >= 0,5% or Se >= 10%; Co < 1%	
$100 / ( (\%As + \%Se + \%Te \text{ comp}) / 100 + (\%Pb \text{ comp} + \%Sb / Sb \text{ comp}) / 500 ) > 2000 \text{ mg/kg}$	ok
$100 / ( (\%As + \%Se) / 700 + (\%Pb \text{ comp} + \%Sb / Sb \text{ comp}) / 4500 ) > 20000 \text{ mg/kg}$	ok
$(\%Ag \times 5,15 + \%Cu \times 0,08) > 1$	ok
$(\%Ag \times 1,05 + \%Cu \times 0,031) > 1$	not OK but less stringent

Co, As, Te not present

Full ID:  
Cluster 2 confirmed



Example  
 (optional) Step 3:  
 MECLAS or full manual classification

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- Endpoint**
- Acute toxicity-oral
  - Acute toxicity-dermal
  - Acute toxicity-inhalation
  - Skin corrosion/irritation
  - Serious eye damage/eye irritation
  - Respiratory or skin sensitisation
  - Germ cell mutagenicity
  - Carcinogenicity
  - Reproductive toxicity
  - Specific target organ toxicity - single exposure
  - Specific target organ toxicity - repeated exposure
  - Aspiration hazard
  - Hazardous to aquatic environment - ACUTE
  - Hazardous to aquatic environment - CHRONIC

**Cluster 2**

- Classification**
- Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Cat. 1A; H350
  - Cat. 1A; H360
  - Not classified
  - Cat. 2; H373
  - Not classified
  - Acute Cat. 1; H400
  - Chronic Cat. 1

**MECLAS**

- Classification**
- Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Not classified
  - Cat. 1A; H350
  - Cat. 1A; H360
  - Not classified
  - Cat. 2; H373
  - Not classified
  - Acute Cat. 1; H400
  - Chronic Cat. 2

Refinement



Example  
 (optional) Step 4: evaluate further refinement  
 potential

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Identify  
 drivers

Tier 2 environment								
Element	Concentration (%)	7d TDP (%)	Corrected soluble ion (ug/L)	Acute Toxic Unit	28d TDP (%)	Corrected soluble ion (ug/L)	Chronic Toxic Unit	Removal from the water column?
Se	0.1	0	0	0	0	0	0	N
Zr	5.6	0	0	0	0	0	0	N
Zn	0.3	0	0	0	0	0	0	N
Pb	0.92	0	0	0	0	0	0	N
Ni	0.13	0	0	0	0	0	0	N
Al	10.16	0	0	0	0	0	0	N
Ti	1.1	0	0	0	0	0	0	N
Mg	6.2	0	0	0	0	0	0	N
Cr	11.4	0	0	0	0	0	0	N
Fe	21.8	0	0	0	0	0	0	N
Ag	0.37	0.1135	0.41995	1.90886363636	0.45000	0.34965	3.885	N
Cu	0.31	0.2065	0.64015	0.025606	62.30000	1.9313	0.096565	N
B	0.12	0	0	0	0	0	0	N
Sn	2.18	0	0	0	0	0	0	N
TU acute (at 1 mg/L)				1.93446963636		TU RD chronic (at 1 mg/L)	0	
						TU NRD chronic (at 1 mg/L)	3.981565	
						TU RD + NRD chronic (at 6.1 mg/L)	0.3981565	



## ▶ 2nd ATP assumption Use of additivity rule Tier 2 class.

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Multimetal support:

- The summation rule applies to classical mixtures (eg mixture of powders or alloys)
- For multiconstituents substances with known ingredients (including known classification) the additivity ruling can still be used
- Normally, UVCB intermediates like the PM Refinables are considered substances under REACH meaning that the additivity rule can be used
- Only exception would be if the UVCB is formed from a deliberate mixtures of components (which seems not the case.... maybe with the exception of slags???)



## ▶ Upcoming additional updates

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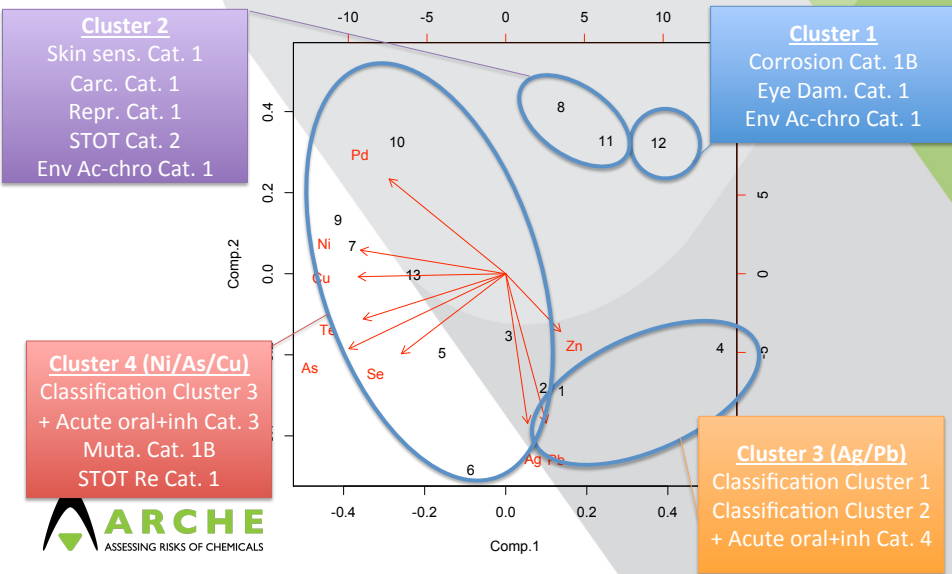
- Multimetallic platform to include “removal from water column” in next months: If Cu, Pb, Zn,... are driving environmental classification, significant impact!
  - E.g. Chronic 1 > Chronic 2
  - E.g. Chronic 2 > Chronic 3
  - E.g. Chronic 3 > no classification
- Updates multimetallic ERV data collection: low impact expected



# BACKUP SLIDES

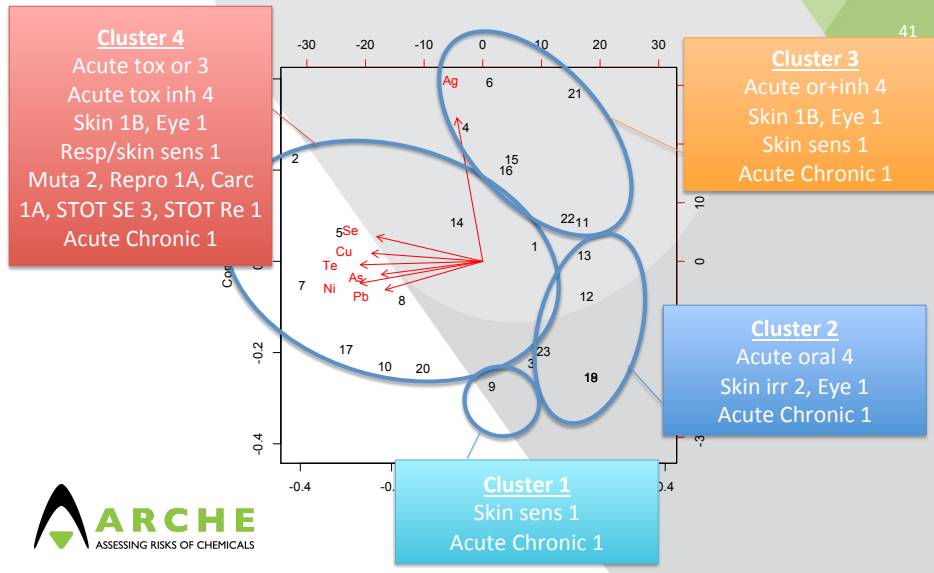


## ▶ Flue dust

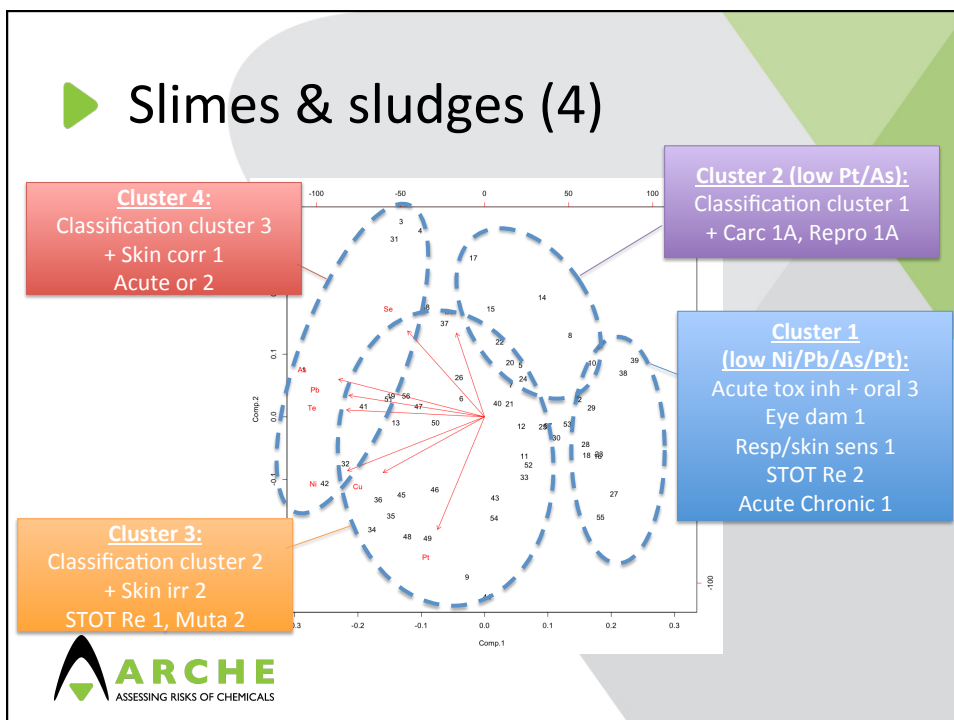




## ► Residues (8)



## ► Slimes & sludges (4)





## 6. Preparing for Inspections

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Caroline BRAIBANT



## 7. AOB, Next Meetings/Calls & Closing Remarks

• • •  
Edwin BROECKAERT