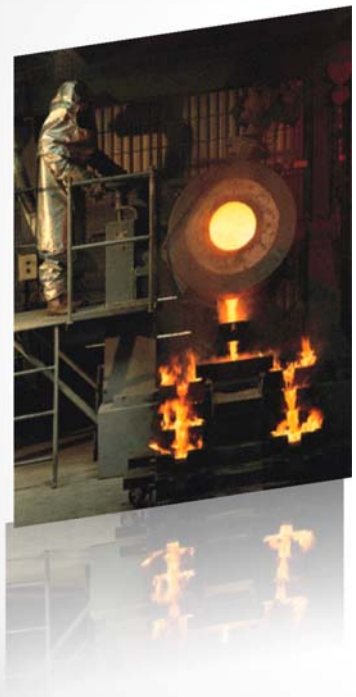
Precious Metals & Rhenium Consortium
Brussels, 5 November 2013



PM Refiners WG Meeting

1. Welcome & Introduction

Edwin BROEKAERT

- Reminder on Confidentiality and Competition Law
- Tour de table and apologies
- Approval of the Agenda
- Approval of minutes of last meeting (18 June 2013) – including status of action points

Agenda

1. Welcome and introduction
2. Update on activities Eurométaux REACH intermediate task force
3. Classification of PM Refinables
4. Splitting of PM slags, slimes & sludges and flue dust
5. CSR human health and occupational sections
6. CSR environmental sections
7. CSR generic and other sections
8. Timing of submission upgraded PM Refinables dossiers
9. Next steps, AOB, next meetings/calls and closing remarks

Actions (1)

Action	Who?	Status
Classification		
Add more detailed logbook of performed updates to MeClas website	KA to ask ARCHE	Done
Review classifications of the PM Refinables and submit updated classifications if necessary	Review: ARCHE, submission: LRs	Nov (submission by Apr 2014)
Check speciation assumptions in MeClas when deriving legal entity-specific classification, refine if needed	PMC Members	As needed
Check the impact of the 4th ATP to CLP on the classification of the PM Refinables and include updated classifications in the dossiers so they are submitted with the upgrades	PMC/ARCHE	Done
Check if HCl > 5% in Au electrolyte (triggering skin corrosion 1A classification) and inform PMC secretariat if testing is required to confirm/refine the classification	Registrants of Au electrolyte	Ongoing
Check ADR regulation and investigate relevance of packaging group I triggers for PM Refinables	KA	Ongoing
Cost-sharing		
Put cost-sharing exception proposal (KGHM paying 1500 €/PM Ref to allow legitimate access to other work under PM Ref project instead of full amount) to vote by the PMC Assembly in Dec 2013	CB	Dec
Substance identification		
Comment/provide input on the proposed sub-groups for PM slags, slimes & sludges and flue dust	PMC Members	Done
Following comments/input, revise the sub-groups for PM slags, slimes & sludges and flue dust at a face to face meeting	Designated task force	Done
Approve revised/final list of sub-groups for PM slags, slimes & sludges and flue dust	PMC Members	Skipped
Send survey to check which company's Refinables fit into which sub-group	PMC secretariat	Done for slags / To do for slimes-sludges in Nov
Determine the composition boundaries of the sub-groups	PMC secretariat	
Determine the classification boundaries of the sub-groups	ARCHE	
Decide on registration strategy for the sub-groups for PM slags, slimes & sludges and flue dust based on composition and classification boundaries	PMC Members	Slags: today Slime-sludges: Dec-Jan
Update ID Card of each Refinable to reflect main outcomes of splitting exercise	KA	Slags: Nov Slimes-sludges: Jan-Feb
Check all constituents have been reported in ID Cards and inform PMC secretariat on missing ones	PMC Members	
Provide further clarification/description on the new proposed Refinable 'slimes & sludges, rhenium containing' to allow adding it to the PM Refinables project scope	Registrant	As needed
Provide further justification to confirm (in)organic status of materials for reclaim - PM with or without supports (Refinable 9.1)	D Boyd / A Alderman	Ongoing

Actions (2)

Action	Who?	Status
Upgrades – Human health exposure assessment		
Send overview of assignments of activity classes (ACs) to workplaces from data submitters for review/confirmation	EBRC	Ongoing
Send survey on individual constituents typically handled in the specific workplaces over all handled substances to those PM Refiners who did not provide monitoring data (yet)	ERBC	Done
Provide workplace monitoring data to EBRC if not already done so	PMC Members	Request sent
Provide practical examples on the reporting options for the workplace exposure assessment in the ES, in order to allow PMC Members to make an informed decision	EBRC	Ongoing
Send questionnaire on blood Pb levels to PMC Members	EBRC	Done
Return questionnaire on blood Pb levels to EBRC through PMC secretariat	PMC Members	
Return all other requested information (i.e. assignment of ACs, additional monitoring data, information on composition over all handled substances) to EBRC	PMC Members	
Finalise case study to be presented to ECHA and send to PMC Members for review/approval	EBRC	Ongoing
Upgrades - Environmental exposure assessment		
Check how STP removal rates can be made available	KA/CB	Done
Further refine the Tier 2 assessment following the availability of STP removal rates and following modified parameter values and move to Tier 3 assessment if necessary	WCA	Ongoing
Send request for further site-specific info to develop SSRAs and to perform waste assessment	WCA	Done
Provide site-specific info for SSRAs and waste assessment	PMC Members	Ongoing
Develop SSRAs and perform waste assessment	WCA	
Upgrades		
Draft template CSR for all Refinables for input by consultants/Lead Registrants	KA	Ongoing
EM REACH Intermediate Task Force		
Continue development of guidance to risk assess inorganic UVCB under REACH, including test cases to demonstrate applicability of the developed approaches at September ECHA meeting	EM (with PMC support)	Ongoing
Recirculate slides with overview influx/outflux sectors for PM Refinables in order to further identify influx/outflux substances and give PMC Members 1 week to revert with comments/input	PMC secretariat	
Check approach EM/other consortia to demonstrate due diligence on dossier upgrades and communicate the preference of PMC Members to EM REACH Intermediates TF	D Vetter on behalf of PMC Sec	Done (at 28 June TF meeting)
Authorisation		
Check SVHC surveillance list and inform PMC secretariat of any missing substances	PMC Members	As needed

2. Update on activities Eurométaux REACH intermediate task force

Katrien ARIJS

2.1. Classification – feedback from workshop with ECHA (1)

- 3 October 2013, attended by
  - experts from ECHA classification/SID/Evaluation unit
  - EM delegation
- Focus: presenting MeClas classification tool & principles
- ECHA's overall reaction:
  - Positive on the tool
  - Acceptance of scientific assumptions
  - Concern on how it is used/possible 'misuses'
- Transparency of MeClas will be further improved to allow regulators to check use/possible 'misuses'
- Recommendations for registrants:
  - Include **MeClas output sheet** (with 'in-between calculations' - TBD) in registration dossier

2.1. Classification – feedback from workshop with ECHA (2)

- Variability in composition
  - Typical or max concentration?
  - Unrealistic worst case classifications should be avoided!
  - Suggested approach at consortia level: max of typical (for classification drivers: max of cut-off limits) = approach PM Ref WG
  - Approach will be included in MeClas manual
  - EM will draft guidelines on how companies should report their composition ranges
- During the workshop, ECHA expressed the need to clearly make the link from classification to the overall UVCB risk assessment process -> **follow-up meeting** suggested -> EM/ECHA risk assessment workshop foreseen early 2014 (date TBD)

2.2. Timing of submission dossier upgrades

- In the PROCs screening/communication with ECHA, industry (through EM) engaged to submit UVCBs Art 10 dossiers **by end 2013**
- ECHA has not received any upgraded dossiers up to now
- ECHA alerted EM/CEFIC that the PROCs screening will re-start
- Methodology discussions between ECHA and industry (through EM) are still ongoing; EM/ECHA risk assessment workshop foreseen early 2014 (date TBD)
- Deadline for submission **ALL** UVCBs Art 10 dossiers: no later than 3 months after that!
- **All upgraded dossiers will have to be submitted no later than half April 2014**

Dossier upgrades for Refinables

Refinable	Nr of companies	Nr of updates	Nr of upgrades	Highest status	Highest tonnage band
1. Doré	8	4	4	Non-SCC intermediate	≥ 1000
2. Matte, PM Refining	4	0	4	Non-SCC intermediate	≥ 1000
3. Slags, PM Refining	7	2	5	Non-SCC intermediate	≥ 1000
4. Slimes & sludges, PM Refining	9	3	6	Non-SCC intermediate	≥ 1000
5.1. Matte leaching residues	3	0	3	Non-SCC intermediate	≥ 1000
5.2. Speiss leaching residues	0	-	-	REACH exempt	-
6.1. Ag electrolyte	3	2	1	Non-SCC intermediate	≥ 1000
6.2. Au electrolyte	1	1	0	SCC intermediate	10-100
7. Flue dust, PM Refining	6	1	5	Non-SCC intermediate	100-1000
8. Residues, PM cementation and reduction	8	2	6	Non-SCC intermediate	100-1000
9.1. Materials for reclaim - PM w/ or w/o support	5	0	5	Non-SCC intermediate	100-1000
9.2. Materials for reclaim - PM in bricks, crucibles, trays, etc.	5	0	5	Non-SCC intermediate	100-1000
9.3. Materials for reclaim - PM production by-products	3	0	3	Non-SCC intermediate	100-1000
10. Pb bullion PM Rich	1	0	1	Non-SCC intermediate	10-100
		24%	76%		

Split?

≥12 dossier upgrades

3. Classification of PM Refinables

Katrien ARIJS

Classification

- Impact of 4th ATP to CLP:
  - New classification and labelling criteria for chemically unstable gases and non-flammable aerosols
  - New rules on the labelling of products that are corrosive to metals and of those in containers of less than 10 ml
  - No changes relevant for HH and ENV classification of PM Refinables
- 18 Jun 2013: classifications should be kept up to date -> PM Ref WG proposed to review the classification of the Refinables each year in November -> **TO DO**

4. Splitting of PM slags, slimes & sludges and flue dust

Katrien ARIJS

Background

- 13 Dec 2012 Ref WG meeting: identification, sameness check, and grouping of streams in the following Refinables could reasonably be challenged by ECHA:
  - Slimes and sludges, PM refining
  - Slags, PM refining
  - Flue dust, PM refining

  => **Task force** in charge of exploring possible criteria and approaches which could be considered to split the above entries in an objective manner
  - TF members: A Alderman, E Broekaert, D Cholakova, M Shepherd, H Stubberud
- Using:
  - source and process information of Refinables in scope;
  - the NFM industries BAT Reference document (BREF);
  - available information from splitting exercise done previously.

Background

- **13 March task force call**: discussion on possible criteria to split PM Refinables in scope

  -> document 'Proposal to split PM Refinables 3-4-7_130318.doc'
- **April-June**: Based on suggested criteria and the descriptions submitted by PM Refiners in Summer 2009 on production processes and sources, an initial sub-grouping was done by the PMC secretariat:
  - 2 proposed sub-groups for slags
  - 6 proposed sub-groups for slimes & sludges
  - no proposed sub-groups for flue dust
- **18 June Ref WG meeting**: initial sub-groups briefly introduced to the WG
- **June-July**: WG commented on proposed sub-groups
- **27 September**: task force meeting

4.1. Outcome TF meeting 27 September – PM slags

2 sub-groups:

1) Slags produced as by-products in the production (smelting, reduction, converting, and refining processes) of doré
2) Slags produced as a by-product in the smelting of PM bearing feeds to produce a PM containing material other than doré subject to further refining

- Check fluxes used (borax still used?)
- Sub-grouping PM slags could have impact on grouping doré
- ECHA guidance: main identifiers for UVCBs should be related to source/process -> proposed sub-groups for PM slags result in different products, but sources/processes can be the same/similar?

4.1. Outcome TF meeting 27 September – PM slimes & sludges (1)

- 5 sub-groups:
  1) Slimes obtained/produced during the electrolytic refining of Ag.
  2) Slimes obtained/produced during the electrolytic refining of Au.
  3) Slimes obtained/produced from hydro-metallurgical upgrading of PM containing solid materials including non-PM sources (i.e. removal of base metals or solvent, producing an upgraded/enriched residue).
  4) Slimes obtained/produced from the hydro-metallurgical leaching of PMs from PM containing solid materials (i.e. dissolution of PMs leaving a lower grade residue).
  5) Slimes obtained/produced by precipitation from solutions containing PMs.

4.1. Outcome TF meeting 27 September – PM slimes & sludges (2)

- Keep slimes obtained/produced during the electrolytic refining of Ag and Au separate -> composition and source very different (process similar)
- We might have to split other sub-groups according to source as well (e.g. Ag/Au) or we will need to be able to justify why we used different splitting/grouping criteria for different Refinables
- Check if slimes always result from hydro-metallurgical processes
- Check if members fit within the proposed sub-groups
- Following the sub-grouping of slimes & sludges, more Refinables that were originally in the slimes and sludges group may end up in the Ref group 'Residues, PM refining cementation and reduction', resulting in an over-grouping there
- Depending on the results of the determination of composition/classification boundaries of the sub-groups at a later stage, we might group sub-group 3, 4 and possibly 5 (even if different classification), but we need to prove first that we did not over-group and they cannot be distinguished from each other. Ideally, the sub-groups should allow refining the compositions.

4.1. Outcome TF meeting 27 September – PM flue dust

1/no sub-groups:

1) Product resulting from the smelting, refining and/or use of PMs and its alloys obtained from primary and secondary sources and including recycled plant intermediates. Recovered from exhaust air by filtration via cloth bags, arising from hygiene extraction systems on processes in the PM recovery flowsheet.

4.1. Outcome TF meeting 27 September – way forward

ID & sameness

- PMC secretariat to circulate revised sub-groups to the PMC Members
- PMC Members to assign their Refinable(s) to sub-group(s)

Define boundaries

- Determine composition and classification boundaries of sub-groups

Registration strategy

- Split registrations or register as sub-groups of 1 registration (or combination of both)?
- Determine availability of other EC numbers applicable to PM refining slags + slimes & sludges if separate registrations considered

4.2. Splitting of PM slags: status (1)

- PMC Members were asked to assign their slags to sub-groups
  - Response received from 7 companies; 1 registrant did not respond
  - 1 company declared slags in both sub-groups

Sub-group	Highest tonnage band	Nr of companies	Nr of slags for exercise	Fluxing agents used
1	> 1000 t/a	3	8	Causic soda, sand, sodium carbonate, borax, silica, coke
2	> 1000 t/a	5	4	Sodium carbonate, borax, silica, lime, alumina, phosphate, calcium hydroxide

4.2. Splitting of PM slags: status (2) Composition boundaries

	Sub-group 1		Sub-group 2	
	Min	Max	Min	Max
Ag	0,935	5,35	0,01	0,3
Al	0	0	2,96	11,5
As	0,091	3,9	0	0,04
Ba	3,97	16,4	0,044	8
Ca	0,27	0,35	1,5	20
Co	0	0	0,02	0,25
Cu	0,9	38	0,25	1
Fe	0,35	19	3	10
Mg	0,1	0,1	0,21	6,5
Mn	0,02	0,02	0,05	0,4
Na	1	11	0,1	45
Ni	0,4	2,7	0,071	0,3
P	0	0	0,1	0,5
Pb	2	44,4	0,02	0,91
Sb	0,32	10	0,05	0,1
Se	0,015	3,8	0	0,19
Si	3,29	12	15	20
Te	0,4	10,4	0	0,05
Zn	0,1	5,12	0,2	1,8

- Based on min and max of typical
- Constituents > 10% + constituents driving classification
- Sub-group 1:
  - relatively high Ag, As, **Cu**, Ni, **Pb**, Sb, Se, Te
  - relatively low Ca, Co, Mn, P
- Sub-group 2:
  - relatively high Al, **Ca, Co**, Mg, **Mn, P**
  - relatively low Cu, Pb
- **Differences in composition**

4.2. Splitting of PM slags: status (3) Classification boundaries

- MeClas used to derive classification
- No TDp test data used because no data available for borosilicate and carbonate slags (MeClas Tier 1)
- Speciation:
  - Mostly same as before (except Cr – Cr203 instead of Cr03)
  - Mostly oxides (except Na_2CO_3)
  - P_2O_5: not in MeClas before (P probably in crystalline form, not oxide -> could have effect on classification)
- Classification checked for max of max + max of typical:
  - Sub-group 1: classification max of max = classification max of typical
  - Sub-group 2: classification max of max > classification max of typical for:
    - Acute tox oral
    - Skin corr/irr
    - Skin sens

4.2. Splitting of PM slags: status (4) Classification sub-group 1

Endpoint	Classification max of typical (=max of max)	Classification company-specific slags (typical) 1	2	3	4	5	6	7	8
Acute toxicity-oral	Cat. 3; H301	v	v	Cat. 4	Cat. 4	NC	v	Cat. 4	v
Acute toxicity-dermal	Not classified	v	v	v	v	v	v	v	v
Acute toxicity-inhalation	Cat. 4; H332	v	v	v	v	NC	v	NC	v
Skin corrosion/irritation	Cat. 1B; H314	Cat. 2	Cat. 2	NC	NC	NC	v	NC	Cat. 2
Serious eye damage/eye irritation	Cat. 1; H318	v	v	v	v	Cat. 2	v	NC	v
Resp. or skin sensitisation	Skin Sens. Cat. 1; H317	v	v	NC	NC	NC	NC	NC	v
Germ cell mutagenicity	Not classified	v	v	v	v	v	v	v	v
Carcinogenicity	Cat. 1A; H350	v	v	v	v	Cat. 2	v	NC	v
Reproductive toxicity	Cat. 1A; H360	v	v	v	v	v	v	NC	v
Specific target organ toxicity - single exposure	Not classified	v	v	v	v	v	v	v	v
Specific target organ toxicity - repeated exposure	Cat. 1; H372	v	v	v	v	v	v	NC	v
Aspiration hazard	Not classified	v	v	v	v	v	v	v	v
Hazardous to aquatic environment - ACUTE	Acute Cat. 1; H400	v	v	v	v	v	v	v	v
Hazardous to aquatic environment - CHRONIC	Chronic Cat. 1; H410	v	v	v	v	v	v	v	v

4.2. Splitting of PM slags: status (5) Classification sub-group 2

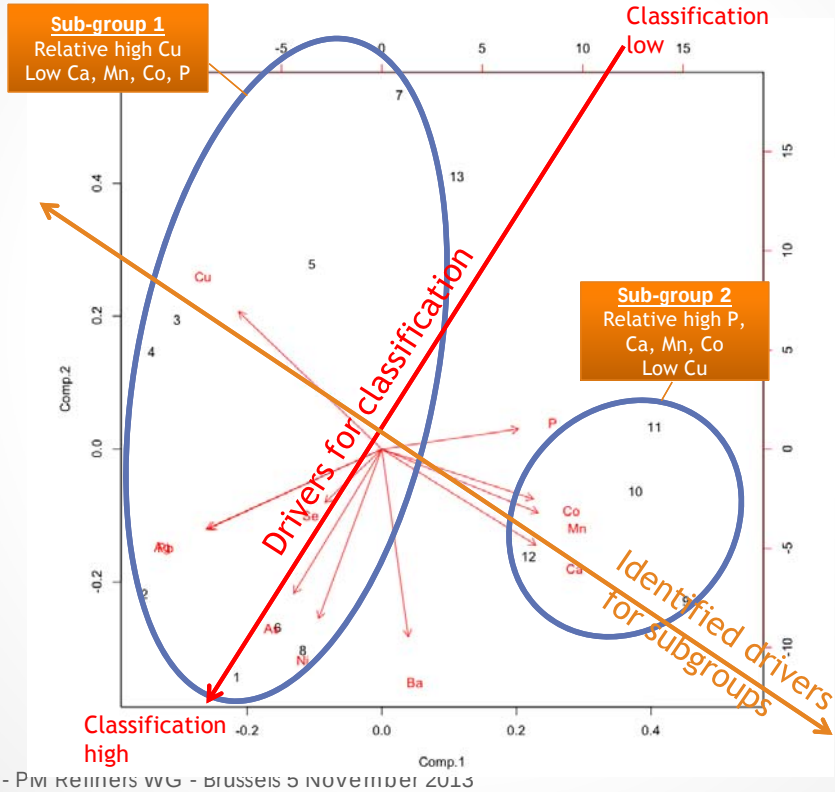
Endpoint	Classification max of typical	Classification max of max	Classification company-specific slags (typical) 1	2	3	4
Acute toxicity-oral	Not classified	Cat. 4; H300	v	v	v	v
Acute toxicity-dermal	Not classified	Not classified	v	v	v	v
Acute toxicity-inhalation	Not classified	Not classified	v	v	v	v
Skin corrosion/irritation	Cat. 2; H315	Cat. 1A; H314	v	v	NC	NC
Serious eye damage/eye irritation	Cat. 1; H318	Cat. 1; H318	v	v	Cat. 2	Cat. 2
Resp. or skin sensitisation	Not classified	Skin Sens. Cat. 1; H317	v	v	v	v
Germ cell mutagenicity	Not classified	Not classified	v	v	v	v
Carcinogenicity	Cat. 1A; H350	Cat. 1A; H350	v	v	NC	v
Reproductive toxicity	Cat. 1A; H360	Cat. 1A; H360	NC	v	NC	v
Specific target organ toxicity - single exposure	STOT SE Cat. 3; H335	STOT SE Cat. 3; H335	v	NC	NC	NC
Specific target organ toxicity - repeated exposure	Cat. 1; H372	Cat. 1; H372	v	v	v	v
Aspiration hazard	Not classified	Not classified	v	v	v	v
Hazardous to aquatic environment - ACUTE	Acute Cat. 1; H400	Acute Cat. 1; H400	NC	v	NC	NC
Hazardous to aquatic environment - CHRONIC	Chronic Cat. 1; H410	Chronic Cat. 1; H410	Cat. 2	v	Cat. 2	Cat. 2

4.2. Splitting of PM slags: status (6) Classification sub-group 1 versus 2

Endpoint	Classification sub-group 1	Classification sub-group 2
Acute toxicity-oral	Cat. 3; H301	Not classified
Acute toxicity-dermal	Not classified	Not classified
Acute toxicity-inhalation	Cat. 4; H332	Not classified
Skin corrosion/irritation	Cat. 1B; H314	Cat. 2; H315
Serious eye damage/eye irritation	Cat. 1; H318	Cat. 1; H318
Resp. or skin sensitisation	Skin Sens. Cat. 1; H317	Not classified
Germ cell mutagenicity	Not classified	Not classified
Carcinogenicity	Cat. 1A; H350	Cat. 1A; H350
Reproductive toxicity	Cat. 1A; H360	Cat. 1A; H360
Specific target organ toxicity - single exposure	Not classified	STOT SE Cat. 3; H335
Specific target organ toxicity - repeated exposure	Cat. 1; H372	Cat. 1; H372
Aspiration hazard	Not classified	Not classified
Hazardous to aquatic environment - ACUTE	Acute Cat. 1; H400	Acute Cat. 1; H400
Hazardous to aquatic environment - CHRONIC	Chronic Cat. 1; H410	Chronic Cat. 1; H410

- Based on max of typical
- Minor differences in classification
- For classification: Inter-company variability > Inter-sub-group variability
- **Differences in classification not significant**

4.2. Splitting of PM slags: status (7) Cluster sub-group 1 versus 2



4.2. Splitting of PM slags: way forward

- Composition sub-group 1 and 2 different
- Classification not significantly different
- **2 registrations?** UVCB grouping should be based on process/composition/source
- **What about differences process/source?**

4.3. Splitting of PM slimes & sludges: way forward

- Exercise to be repeated for PM slimes & sludges
- 5 sub-groups
- PMC Members to assign their slimes & sludges to sub-groups in November

4.4. Pros and cons analysis of 1 versus multiple registrations

Registration option	Pros	Cons
One registration for identified sub-groups	• Lower registration costs • No additional phys-chem testing needed	• Risk to be challenged by ECHA/considered 'over-grouped'
Multiple registrations for identified sub-groups	• Risk to be challenged by ECHA/considered 'over-grouped' lower • Possibly simpler effects and exposure assessment (as the variability of each sub-group could be less than for the group as a whole)	• Higher registration costs for companies who have multiple sub-groups (depending on tonnage) • Risk to be considered as 'escape route' if sub-grouping results in lower tonnage/no need for registration • Additional phys-chem testing needed (impact on time/cost line) • Additional EC numbers needed (process to be checked)

4.5. UVCB identification rules for other Refinables

- Source and process information currently in ID cards is being checked for ALL Refinables
- Further refinement/completion might be necessary
- More details for processes
- Add current sub-groups

5. Update on occupational exposure assessment for Refinables

Refinables WG Meeting

Brussels

05 November 2013

Daniel Vetter
EBRC Consulting
Hannover, Germany

Short summary of approach

- Hazard assessment is constituent-specific
  - Speciation considered on worst-case basis (considering plausibility)
  - Pb assessment is based on internal threshold levels (blood-lead)
  - Combined toxicity is addressed on a qualitative basis
- Exposure assessment is constituent-specific
  - Sources of exposure are not attributable to specific UVCB
  - Assessment is workplace-specific rather than substance-specific
  - Various activities may be relevant for specific workplaces
- Exposure assessment to cover each site and Refinable
  - Pooling monitoring data required to meet strict requirements of R.14
  - Pooled exposure data sets = activity classes in ES

Progress since last meeting

- Gathering of further information on composition profiles
- Collection of blood lead data
- Statistical analyses of monitoring data (on-going) → GEA
- Methodology document constantly developed
- Example ES developed (confidentiality issues)

Analyses of monitoring data

- Grouping of similar exposure settings under same ACs
- ACs assigned to workplaces
- For each AC, modifying parameters are reflected by individual exposure estimates, including:
  - enclosure of emission source
  - type and presence of LEV
  - overall concentration of constituent in total handled material

→ Enabling of exposure assessment for tasks/avtivities taking into account workplace-specific operational conditions and risk management measures

Live demonstration of various documents

- Generic exposure assessment (draft)
- Methodology paper (draft)
- Example exposure scenario as test-case

Proposed timing

- Closing of remaining data gaps: 6 Dec 2013
- Delivery of 1st draft company-specific ES: 18 Dec 2013
- Comments on 1st drafts: 8 Jan 2014
- 2nd draft company-specific ES: 15 Feb 2014
- Comments on 2nd drafts: 1 March 2014
- Final draft occ. ES: Mid March 2014

Data Requirements for HH Refinables

Refinables WG Meeting

Brussels

05 November 2013

Torsten Weil
EBRC Consulting
Hannover, Germany

IUCLID File Update

- As agreed in former meetings, IUCLID files will be updated utilising a template provided by EUROMETAUX
  - A draft template has already been circulated
  - Updated version will be available soon
- Endpoint summaries will be completed with constituent specific information (all constituents)
- Specific endpoints will include MeClas information/results
  - Different grades will be separated in individual endpoint records

Data Requirements

- The following datasets will be required to close existing data gaps:

Aluminum**	Boron/borates**	Sulfur**	Zirconium**
Antimony*/**	Cobalt*/**	Cerium**	Bismuth**
Arsenic & Arsenic trioxide*/**	Silicon dioxide**	Molybdenum**	Barium**
Cadmium*/**	Hydrogen chloride aq.*	Tungsten**	Chromium**/***
Selenium*/**	Calcium oxide/calcium chloride**	Manganese**	Iron**
Tellurium*/**	Tin**	Magnesium**	

*Data access is definitively required without the need of further confirmation.

**All relevant forms (elemental, oxides, chlorides, sulfates, e.g.) should be included in the LoA, it is noted that "relevance" need to be further specified based on input from industry. Such input was already previously requested and is now urgently required in order to define the scope of the hazard assessment.

***It should be clarified if Cr(VI) is relevant for the respective refinables.

Data Requirements

- We suggest issuing a brief questionnaire to companies, in which our specific questions would be answered, e.g.
  - Which form of the elements of interest are present (element, oxide, chloride, bromide, sulfur compounds) or may be present during processes (for exposure assessment),…
- Some examples in the Word document…

EBRC

Thank you for your attention!

wca environment
today's consultants for tomorrow's challenges

6. Environmental exposure assessment of refinables & IUCLID entry

Ed Stutt, Rhiannon Smith & Becky Marks

Overview

- Recap of approach to environmental assessment
- Exposure assessment and risk characterisation
  - GES
  - SSRA
- Additivity
- Waste
- Filling in IUCLID
- Next steps

Environmental exposure and risk characterisation

- Focussing on refinables components that have an environmental classification
  - » Ag, As, B, Cd, Cr, Cu, Ni, Pb, Zn
- Assess each component separately (no consideration of additivity at present)
- Local environmental concentrations estimated according to R16 guidance (metal EUSES)
  - » Same approach for GES and SSRA

Refinables exposure database

- Data available for 12 sites 'processing' refinables
- Reasonable level of information on waste-water output and receiving environment (n=38) – supports use of SpERCs
- Now have similar amount of information on stack emissions (n=37) – further assessment required but appears to support use of SpERCs

Refinables exposure database

- Problems with data availability from sites and for exposure modelling parameters
  - » Variability in data provision from companies (some late data & some companies have opted out)
  - » Delays due to provision of values for exposure modelling from MMD (initially undertaken with data independently compiled by wca)
  - » Repetition of effort in exposure assessment

➢ Some additional cost

Generic Exposure Scenario(s)

- 3 scenarios required for discharge to aquatic environment
  - » Freshwater with emission via STP
  - » Freshwater without STP
  - » Direct to marine waters
- GES based on Tier 3 exposure assessment
  - » SpERCs for emissions to water and air (more info later)
  - » 50P values for flow rates etc & defaults for dilution etc
  - » Some RCRs>1 ⟶ Msafe tonnage
- *GES narrative for inclusion in CSR (Sections 9 & 10)*

Development of GES

	Emission Factor (AIR)	Emission Factor (WATER)
SpERC for 'Manufacture of metal compounds'	0.03% (90P of 145 sites)	0.001-0.2% (90P of 201 sites)
EFs from refinables database	0.00002-0.08% (37 values for 8 metals from 8 sites) **Overall 90P = 0.0395% (excluding statistical outliers)**	0.000002-1.0% (38 values for 8 metals from 8 sites) **Overall 90P = 0.072% (excluding 'statistical outliers')**

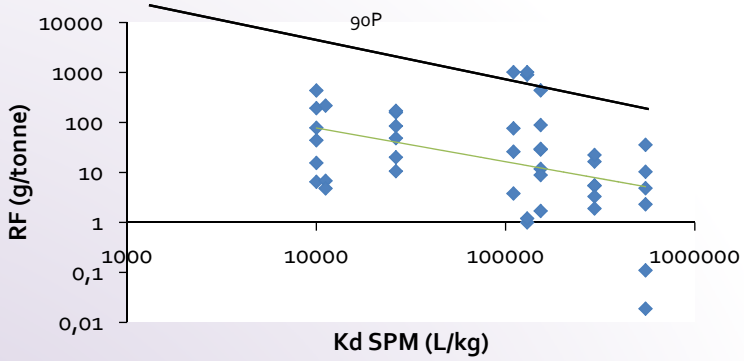
Supports use of SpERCs which come from a more robust dataset

Tier 3 risk assessment using SpERCs for aquatic emissions

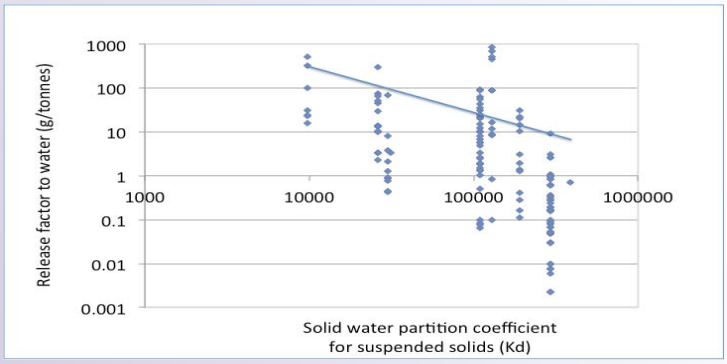
- Latest (metal specific) SpERCs for emissions to aquatic environment are modified by partition coefficient, K_d
- Taken from ARCHE approach developed for Eurometaux metal SpERCS

"A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc…."

Relationship between EF and Kd



Refinables



Metal SpERCs

Msafe GES

- CSR requires exposure scenario demonstrating no risk to the environment (i.e. RCRs<1)
  - But GES based on sector specifc values and defaults for exposure assessment gives some RCRs>1
- SpERCs & sector-specific exposure parameter values used in conjunction with PNECs to calculate the tonnage of each classifiable constituent that can be safely processed (manufactured or used) WITHOUT posing a risk to environment (RCR<1)

➢ Msafe approach

Msafe GES with STP from Tier 3 Assessment

Metal	Silver	Nickel	Lead	Zinc	Chromium
Msafe tonnage (tpa)	200	50	1000	50	10
RCR					
Discharge to STP	0.04	0.013	0.044	0.12	8.2E-05
Freshwater	0.86	0.9	0.22	0.18	0.1
Marine water	0.01	0.04	0.01	0.49	0
Freshwater sediment	0.08	NA	5.28 (local: 0.55)	14 (local: 0.87)	1.2 (local: 0.0036)
Marine sediment	0.01	NA	2.31 (local: 0.069)	1.9 (local: 0.024)	0.01
Terrestrial	0.12	0.48	0.13	1.4 (local: 0.0037)	6.9 (local: 0.0048)
Air (MvE)	0.01	0.8	NA	9.60E-06	0.79

Msafe GES with STP from Tier 3 Assessment

Metal	Arsenic	Boron	Cadmium	Copper
Msafe tonnage (tpa)	20	100	0.5	200
		RCR		
Discharge to STP	NA	0	0.0033	0.024
Freshwater	2 (local: 0.72)	0.01	0.59	0.42
Marine water	0.06	0	0.13	0.22
Freshwater sediment	NA	NA	39 (local: 0.64)	5.35 (local: 0.53)
Marine sediment	NA	NA	13.2 (local: 0.0025)	0.9 (local: 0.014)
Terrestrial	0.21	0.48	0.46	0.38
Air (MvE)	NA	0	NA	0.00043

Outstanding issues

- Some of the marker substances have background concentrations > PNEC (e.g. As in freshwater).
- The Kd values for some metals are very high, with strong partitioning to sediment and soil, which in some cases has caused RCR>1 or very low Msafe tonnages (partitioning from background water concentration).
  - » Possibility of over-writing standard EUSES approach (check approach in existing metal CSRs)
- The Kd value for boron is very low (1.95 L/kg) indicating that the metal SpERCs are not applicable.

Site specific risk assessment (SSRA)

- Sites falling within the operating conditions described by the GES are covered but, if the operating conditions at a site do not fit within the GES further information may be used to demonstrate that this site does not present an unacceptable risk to the environment.
  - » Use site specific data to undertake individual risk assessment for each constituent (maximum of 9 but only considering those discharged at the site)
    - o ***These assessments are confidential and only shared with the respective companies***
  - » Will identify those sites which can demonstrate safe use, and those sites which need additional refinement to demonstrate safe use (i.e. more information or monitoring)

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SSRA – RCRs for Silver

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	1.2E-04	0.15	0.033	0.0022	0.0081	0.094
B	not used	9.5E-05	0.15	0.033	0.0037	0.010	0.094
C	not used	8.4E-06	0.15	0.033	0.0022	0.0081	0.094
D	not used	2.7E-04	0.17	0.034	0.0030	0.0093	0.094
F	0.017	0.0063	0.42	0.051	0.0035	0.010	0.10
G	0.0045	0.0025	0.18	0.035	0.0026	0.0086	0.10
K	not used	2.1E-06	0.15	0.033	0.0022	0.0081	0.094
L	8.7E-06	7.0E-05	0.15	0.033	0.0022	0.0081	0.094

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SSRA– RCRs for Nickel

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	0.37	0.82	NA	0.058	NA	0.48
B	not used	0.59	0.83	NA	0.092	NA	0.48
C	not used	2.0	0.82	NA	0.035	NA	0.48
D	not used	2.4	0.82	NA	0.038	NA	0.48
F	0.0041	15 (15)	0.84	NA	0.036	NA	0.48
G	0.0019	1.2 (1.0)	0.82	NA	0.036	NA	0.48
K	not used	0.22	0.82	NA	0.035	NA	0.48
L	2.5E-06	0.21	0.82	NA	0.035	NA	0.48

Values in brackets represent site specific RCRs without regional background contributions

SSRA– RCRs for Lead

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	NA	0.20	4.8 (0.025)	0.015	2.5 (0.31)	0.13
B	not used	NA	0.20	4.8 (0.048)	0.017	2.8 (0.60)	0.13
C	not used	NA	0.20	4.7 (0.00)	0.013	2.2 (0.00)	0.13
D	not used	NA	0.20	4.8 (0.042)	0.014	2.3 (0.052)	0.13
F	6.9E-04	NA	0.20	4.7 (0.0087)	0.013	2.2 (0.0011)	0.13
G	4.3E-04	NA	0.20	4.7 (0.0024)	0.013	2.2 (6.8E-04)	0.13
K	not used	NA	0.20	4.7 (0.00)	0.013	2.2 (NA)	0.13
L	2.2E-06	NA	0.20	4.7 (2.7E-05)	0.013	2.2 (3.4E-06)	0.13

Values in brackets represent site specific RCRs without regional background contributions

SSRA– RCRs for Zinc

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	7.6E-06	0.17	131 (0.078)	0.49	19 (0.22)	1.3 (6.2E-07)
B	not used	1.2E-05	0.17	133 (1.5)	0.64	23 (4.2)	1.3 (1.4E-06)
C	not used	1.7E-05	0.17	131 (0.00)	0.49	19 (0.00)	1.3 (2.3E-06)
D	not used	1.5E-05	0.17	137 (5.6)	0.55	20 (1.6)	1.3 (2.0E-06)
F	0.0016	6.6E-05	0.17	131 (0.12)	0.49	19 (0.0033)	1.3 (5.6E-05)
G	0.0021	4.5E-05	0.17	131 (0.068)	0.49	19 (0.0042)	1.3 (6.8E-05)
K	not used	4.0E-06	0.17	131 (0.00)	0.49	19 (0.00)	1.3 (0.00)
L	3.8E-06	4.5E-06	0.17	131 (2.8E-04)	0.49	19 (7.7E-06)	1.3 (1.6E-07)

Values in brackets represent site specific RCRs without regional background contributions

SSRA– RCRs for Chromium

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	0.61	0.081	1.2 (0.017)	0.0034	0.010	6.9
B	not used	0.00	0.082	1.2 (0.017)	0.013	0.038	6.9
C	not used	2.9	0.081	1.2 (0.017)	0.00	0.00	6.9
D	not used	2.7E-06	0.081	1.2 (0.017)	4.4E-10	1.3E-09	6.9
F	1.0E-05	31	0.083	1.2 (0.017)	2.2E-04	6.3E-04	6.9
G	3.1E-06	6.9	0.081	1.2 (0.017)	6.5E-05	1.9E-04	6.9
K	not used	0.47	0.081	1.2 (0.017)	0.00	0.00	6.9
L	1.7E-08	0.07	0.081	1.2 (0.017)	3.6E-07	1.0E-06	6.9

Values in brackets represent site specific RCRs without regional background contributions

SSRA– RCRs for Arsenic

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	NA	1.4 (0.14)	NA	1.1 (1.1)	NA	0.21
B	not used	NA	1.3 (0.032)	NA	0.27	NA	0.21
C	not used	NA	1.3 (0.00)	NA	0.00	NA	0.21
D	not used	NA	1.5 (0.20)	NA	0.16	NA	0.21
F	NA	NA	1.3 (0.018)	NA	0.0015	NA	0.21
G	NA	NA	1.3 (0.035)	NA	0.0065	NA	0.21
K	not used	NA	1.3 (0.00)	NA	0.00	NA	0.21
L	NA	NA	1.3 (1.2E-04)	NA	9.88E-06	NA	0.21

Values in brackets represent site specific RCRs without regional background contributions

SSRA– RCRs for Boron

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	1.2E-05	0.0092	NA	0.015	NA	0.48
B	not used	0.00	0.0077	NA	0.00	NA	0.48
C	not used	0.00	0.0077	NA	0.00	NA	0.48
D	not used	0.00	0.0077	NA	0.00	NA	0.48
F	0.00	0.00	0.0077	NA	0.00	NA	0.48
G	2.4E-04	2.7E-07	0.0078	NA	1.21E-05	NA	0.48
K	not used	0.00	0.0077	NA	0.00	NA	0.48
L	0.00	0.00	0.0077	NA	0.00	NA	0.48

SSRA– RCRs for Cadmium

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	NA	0.59	395 (6.4)	0.19	134 (2.5)	0.46
B	not used	NA	0.60	400 (12)	0.24	136 (4.7)	0.46
C	not used	NA	0.58	388 (0.00)	0.13	132 (0.00)	0.46
D	not used	NA	0.60	397 (9.2)	0.14	132 (0.36)	0.46
F	3.0E-04	NA	0.58	389 (0.60)	0.13	132 (0.0023)	0.46
G	8.9E-04	NA	0.58	389 (0.79)	0.13	132 (0.0068)	0.46
K	not used	NA	0.58	388 (0.00)	0.13	132 (0.00)	0.46
L	0.00	NA	0.58	388 (0.64)	0.13	132 (0.00)	0.46

Values in brackets represent site specific RCRs without regional background contributions

SSRA– RCRs for Copper

	STP	Local Air (MvE)	Fresh Water	FW Sediment	Marine Water	Marine Sediment	Soil
A	not used	1.5E-05	0.37	4.8	0.21	0.89	0.38
B	not used	2.1E-05	0.38	4.9	0.27	1.1 (0.25)	0.38
C	not used	1.3E-05	0.37	4.8	0.21	0.89	0.38
D	not used	5.3E-05	0.38	4.9	0.22	0.91	0.38
F	0.010	1.7E-04	0.39	5.0	0.21	0.89	0.38
G	0.0013	1.4E-05	0.37	4.8	0.21	0.89	0.38
K	not used	5.6E-06	0.37	4.8	0.21	0.89	0.38
L	1.2E-06	4.1E-06	0.37	4.8	0.21	0.89	0.38

Values in brackets represent site specific RCRs without regional background contributions

Site specific risk assessment

- Resolve metal-specific issues (background and partitioning)
- Additional data requirements for some sites
  - » Flow rates (to calculate dilution factors) are required for both STP **and** ultimate receiving water body
  - » If not already provided..... additional data on stack emission (e.g. Temperature, stack height/diameter)
  - » May also possibly need further information on local aquatic environment (e.g. pH, DOC , hardness)

Assessment of mixture effects

– Current Eurométaux approach is to aim for an RCR < 1 for all individual constituents with additivity of metal RCRs not to be considered for UVCB intermediates

.....but future guidance from ECHA may change this

– Summed environmental marker substance GES RCRs, with and without background PEC:

Compartment	Total RCR	Local RCR
Discharge to STP	0.25	0.246
Freshwater	**5.2**	1.6
Marine water	0.96	0.083
Freshwater sediment	**65**	2.6
Marine sediment	**18**	0.12
Terrestrial	**10**	0.037
Air (MvE)	**1.6**	1.5

Assessment of mixture effects

- Msafe tonnages when considering the RCRs for:
  - (A) environmental marker substance individually; and
  - (B) summed RCRs for each compartment (additivity)

Substance	A	B
Silver	200	100
Nickel	50	25
Lead	1000	250
Zinc	50	20
Chomium	10	5
Arsenic	20	10
Boron	100	10
Cadmium	10	0.3
Copper	200	50

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Eurometaux position on assessment of waste for intermediates

- Eurometaux agreed that waste life cycle stage is not applicable for refinables.
- The refinables are used only as intermediates, chemically modified to become other substances.
- The refinables themselves are recycled as part of the manufacturing process.

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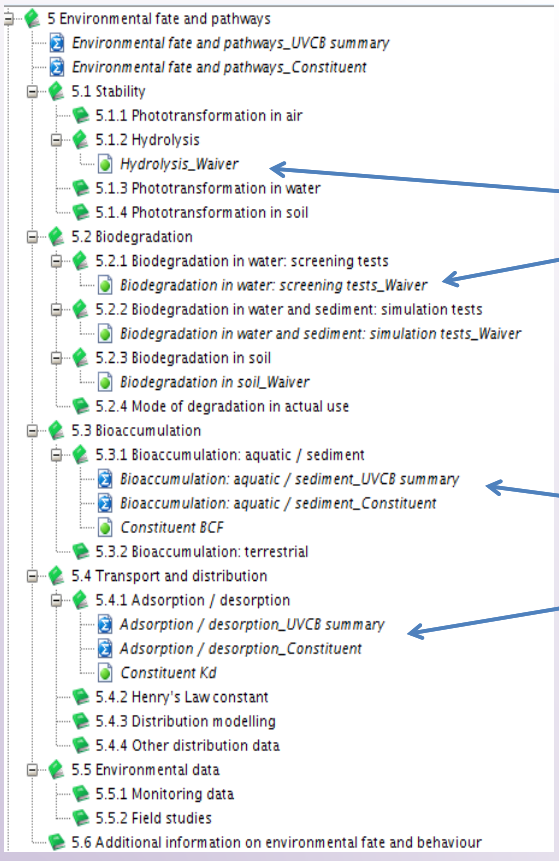
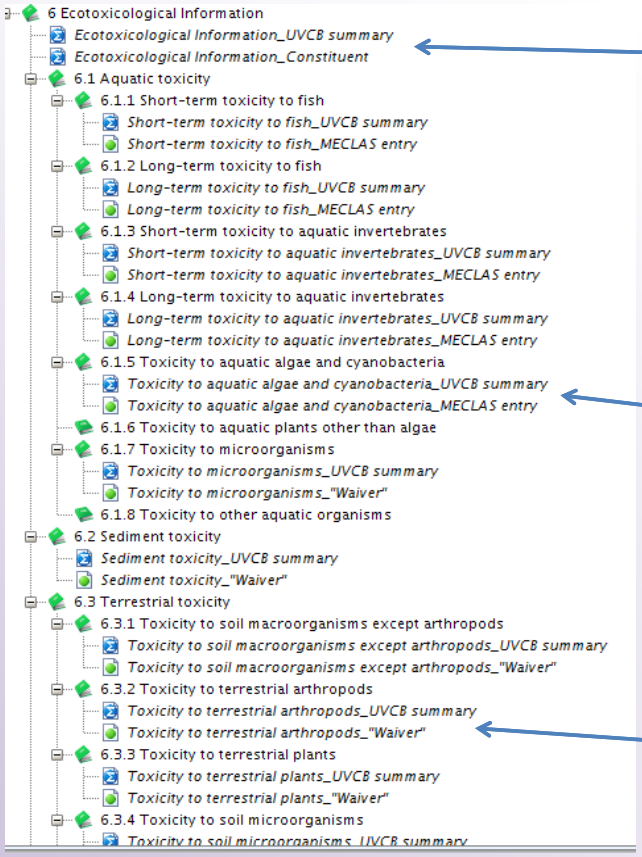
IUCLID entry

- IUCLID files need to be upgraded to full substance files
- Following the approach developed by Eurometaux
- Endpoints to be filled using waivers, data on constituents shared by other Consortia or UVCB classification (MECLAS) entries
- IUCLID files will be completed as soon as possible with files for all refinables ready by mid March



Biodegradation and hydrolysis endpoints waived as inorganic

Bioaccumulation and adsorption / desorption data for constituents to be obtained from consortia



UVCB summary explaining approach of reading across from constituents and providing classification of UVCB

Summary for each constituent containing PNECs and classification for the constituent

UVCB summary explaining approach of reading across from constituents

Study summary based on Meclas entry

UVCB summary referring back to PNECs derived for each constituent

Meclas entry not appropriate; text refers back to Section 6 (PNEC) summary

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Next steps

- Refinement of GES and agreement on narrative and quantification of exposure assessment for GES to go into CSR
  - » Dealing with issue of background concentrations and metal-specific issues (access to existing CSRs?)
- Circulation of SSRAs and receipt of questions
  - » Incorporation of additional data if available and higher tier modelling if necessary
- Data entry to IUCLID

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7. CSR generic and other sections

• • •

Katrien ARIJS

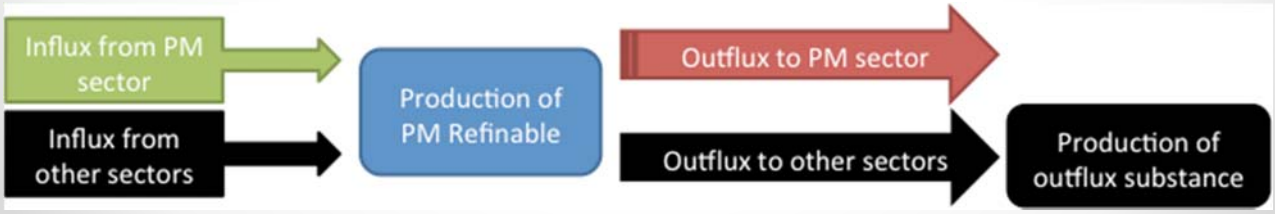
CSR general section for Refinables

Draft 1 CSR for each Refinable, so EBRC/WCA just need to input the exposure assessment dataset and interpretation/calculation in template

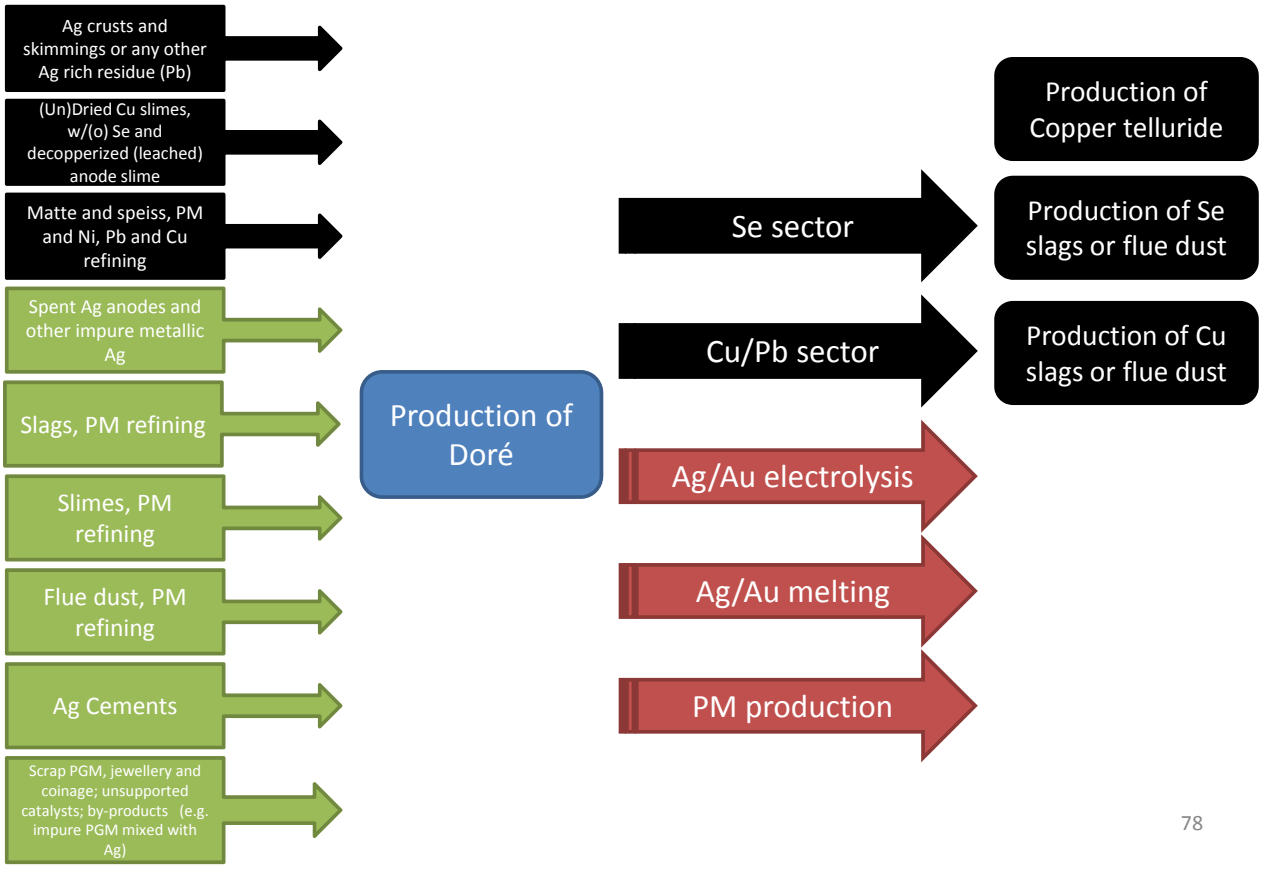
- Colour-code sections to be generated by PMC Members / PMC Consultants
- Extract process descriptions from NFM BREF document Precious Metals chapter (probably generic, not mentioning each individual Refinable) to be added to all CSR as relevant
- Explain difficulties in grouping/splitting the Refinables
- Each LR to draft a comprehensive proposal of a description of:
  - ✓ How the manufacture of the Refinable occurs (Cf. CSR Cu slimes and sludges Chapter 2.1-2.2)
  - ✓ How the Refinable and its production process by-products are further processed/transformed
- Ref WG to review the draft CSR (description) per Refinable and agree on a wording/scope of content

Mapping exercise influx/outflux UVCBs in different NFM sectors

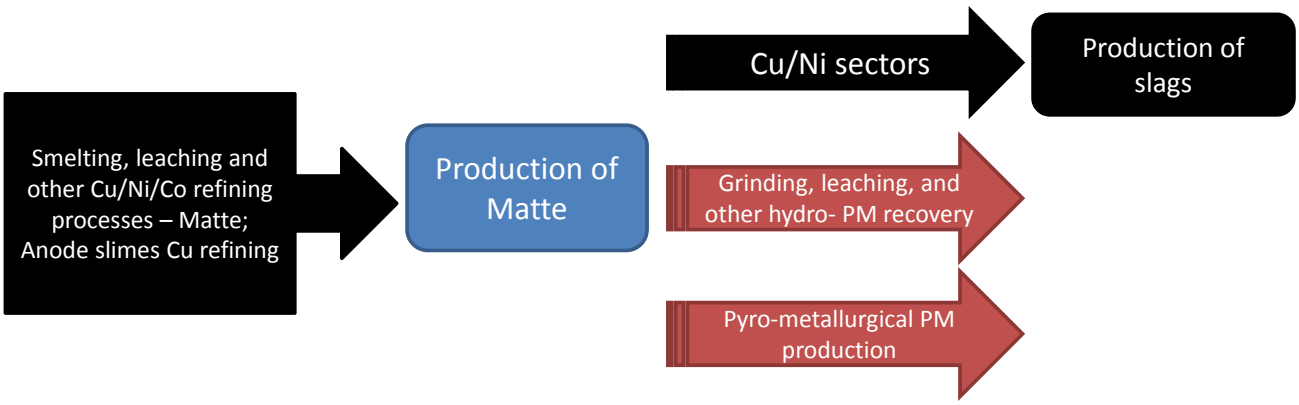
- First mapping exercise: map out situations where PM Refinables are not exclusively related to the PM sector in order to identify sectors with whom we will have to share data
- Follow-up: "what is transformed into what" – identify influx/outflux substance in order to link the various relevant (UVCB and other) dossiers
  - Name should be linked to EC number
  - Other useful info: what type of treatment or processing the material is subject to once in the other sector



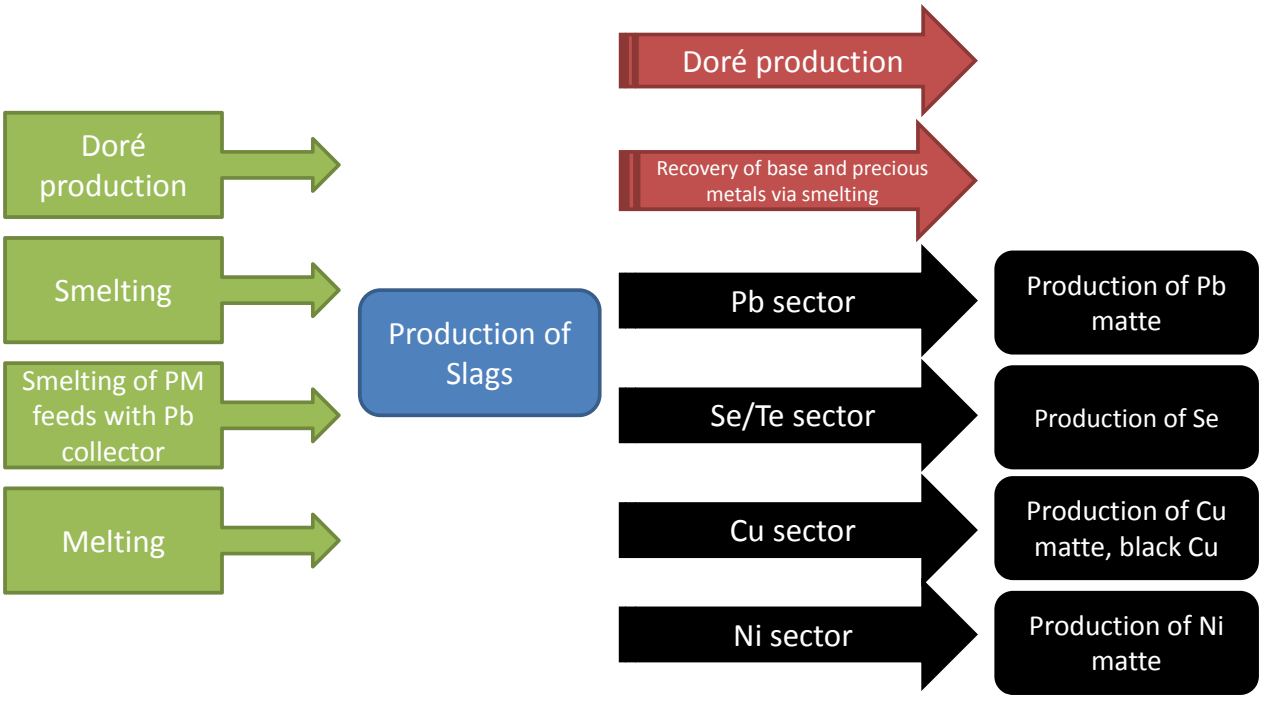
1. Doré



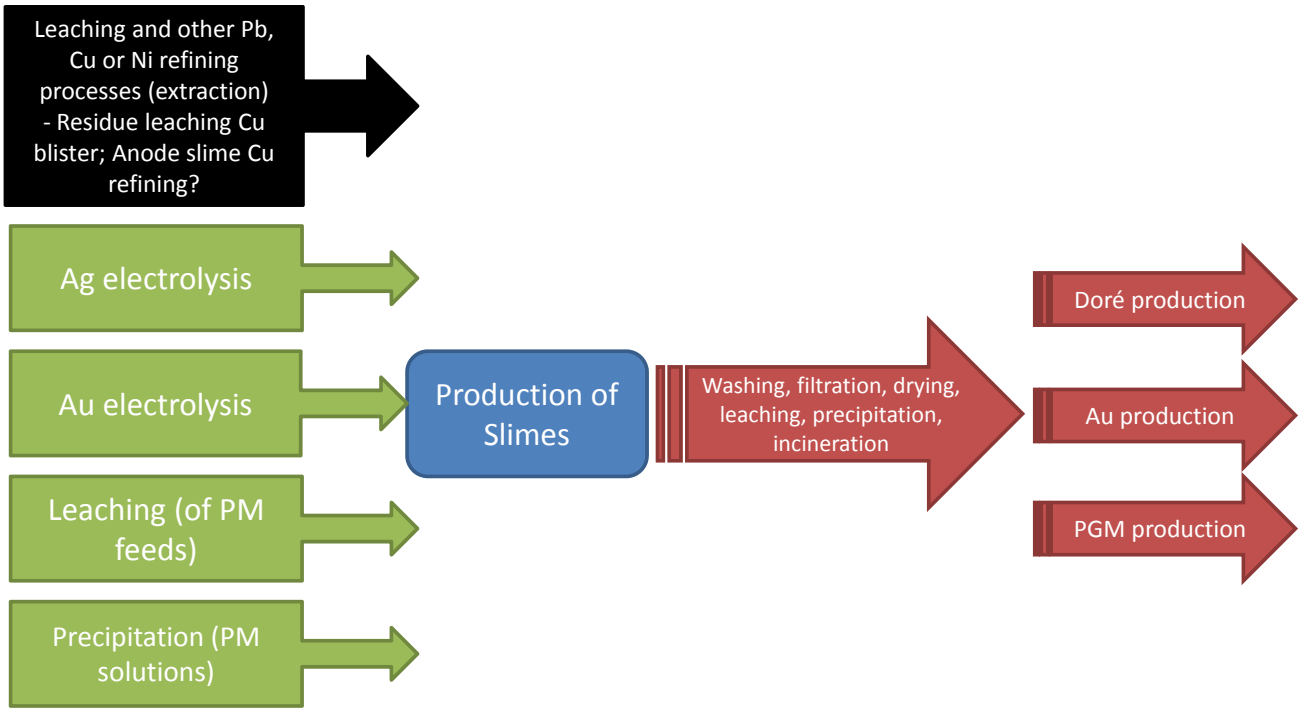
2. Matte, PM refining



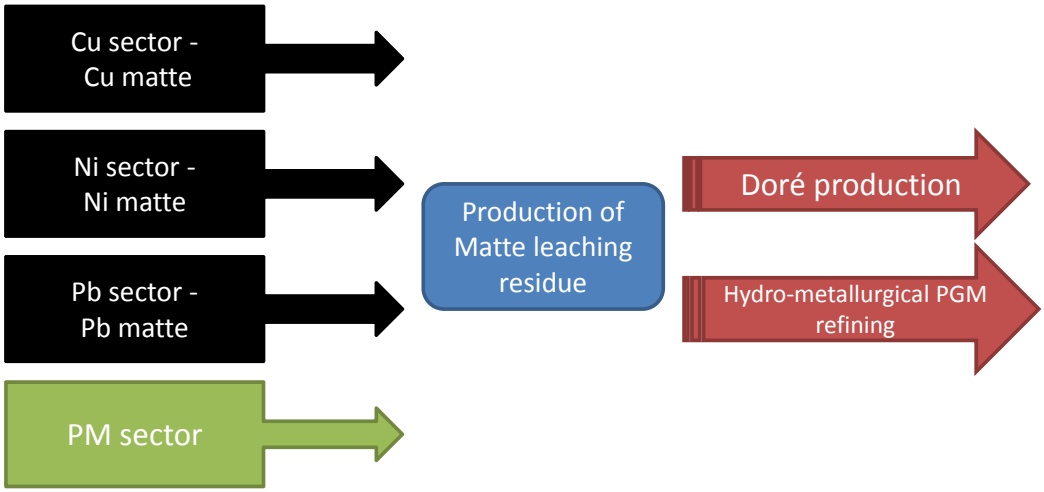
3. Slags, PM refining



4. Slimes and sludges, PM refining

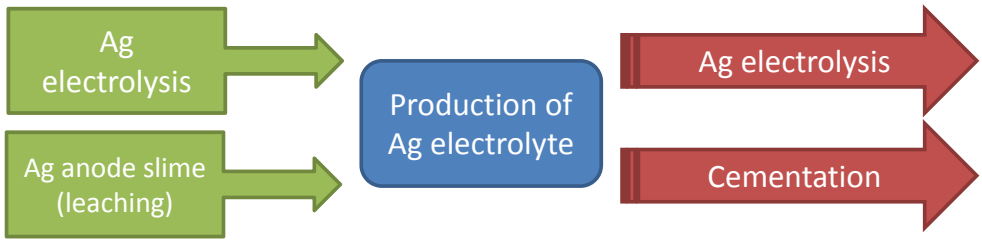


5.1 Matte leaching residue

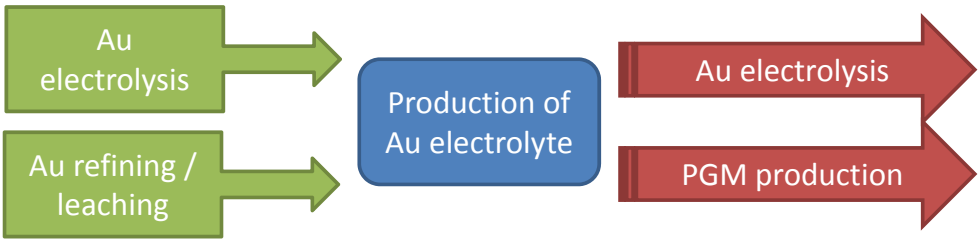


5.2 Speiss leaching residue

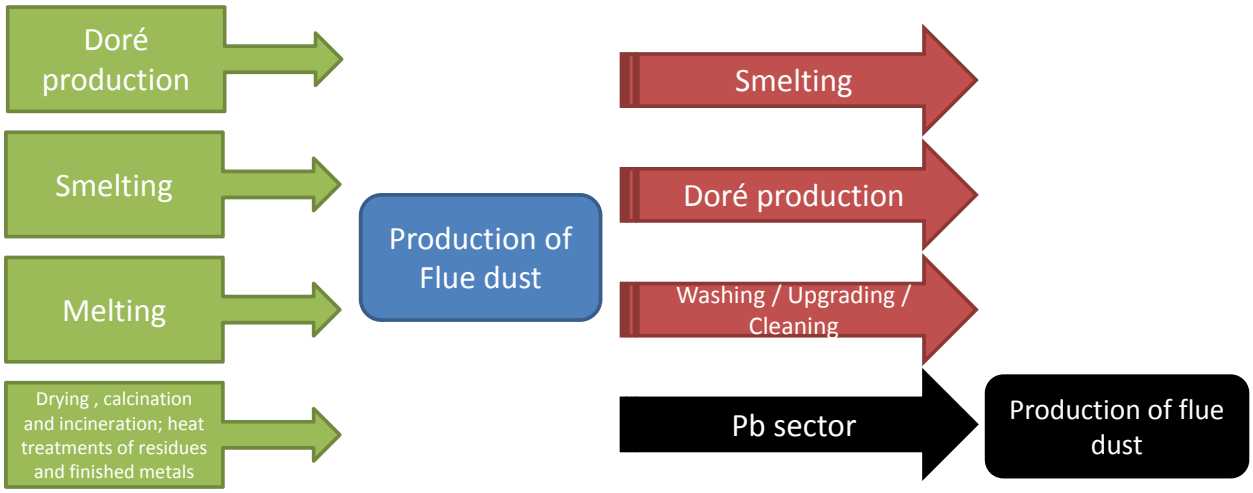
6.1 Ag electrolyte



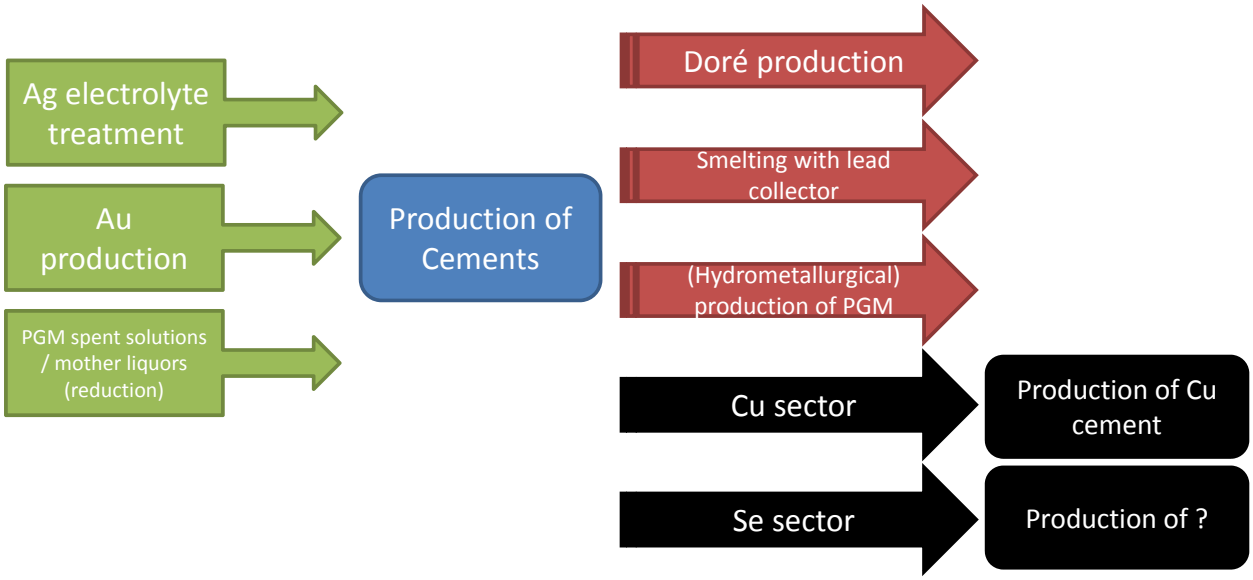
6.2 Au electrolyte



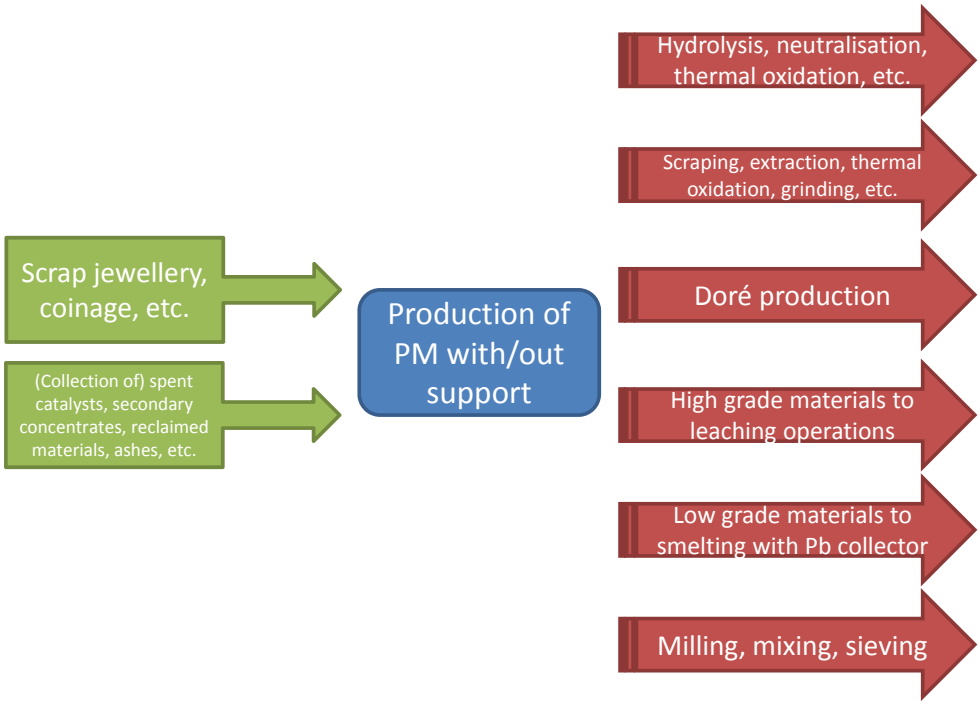
7. Flue dust, PM refining



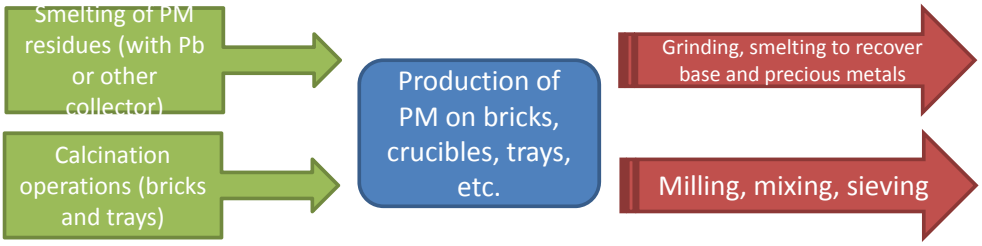
8. Residues cementation and reduction, PM refining



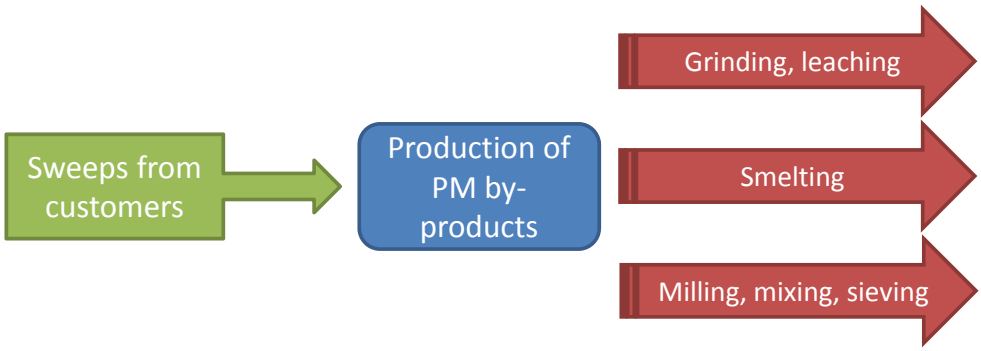
9.1 Materials for reclaim, PM with or without support



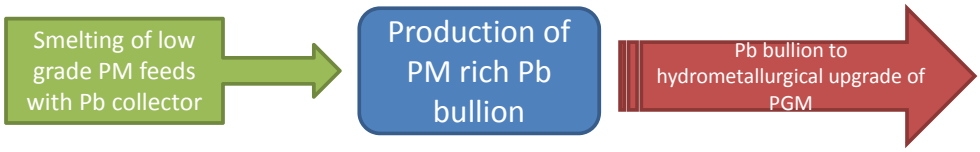
9.2 Materials for reclaim, PM on bricks, crucibles, trays, etc.



9.3 Materials for reclaim, PM production by-products



10. Lead bullion, precious metal rich



8. Timing of submission upraded PM Refinables dossiers

Katrien ARIJS
Caroline BRAIBANT

8.1. Status data-sharing agreements

- Update from C. Braibant

8.2. Phys-chem endpoints

- Refinables registered in 2010 as intermediates under SCC at <1000 tonnes only required available data to be submitted
- Some phys-chem testing was conducted, for classification endpoints
- For refinables being upgraded to full substance registrations, phys-chem endpoints now need to be filled
- Some endpoints can be waived, but some additional testing is required
- Decision required regarding conduct of these additional tests

wca environment
today's consultants for tomorrow's challenges

Proposed tests

Substance	Melting point	Boiling point	Vapour pressure	Density	Granulometry	Auto-flammability	Flammability	Oxidising properties	Viscosity	Water solubility / Transformation Dissolution
Estimated cost (£)	**1,000**	**1,000**	**3,000**	**1,000**	**3,000**	**2,500**	**1,000**	**3,500**	**2,000**	
Estimated timing	**4 weeks lead in time; 6 – 8 weeks to conduct tests**									
Ag electrolyte	X	(X)	(X)	X					X	X
Flue dust, PM refining				X	X		X			X
Residues cementation and reduction, PM refining				X	X					X
Materials for reclaim, PM on bricks, crucibles, trays etc				X	X					
Materials for reclaim, PM production by-products				X	X					
Lead bullion, PM metal rich	X	(X)	(X)	X	X	X	X	X		

Boiling point and vapour pressure tests would only be required if melting point is <300°C

Water solubility

- For 2010 registrations the water solubility endpoint was completed using results from transformation / dissolution (T/D) tests
- T/D test results were also used to refine the classification of the refinables
- If required, T/D testing would take longer to conduct that the other phys-chem tests and could lead to a need for further dossier updates after submission

8.3. Selection of PM Refinables dossier to be submitted first

- List of refinables that have full phys-chem datasets:
  - Dore
  - Slags, PM refining
  - Slimes and sludges, PM refining
  - Matte leaching residue
  - Matte, PM refining
  - Materials for reclaim, PM with or without support
- Slags and slimes & sludges currently under discussion to be further split as these may be over-grouped

  -> start with the upgrades of the other 4

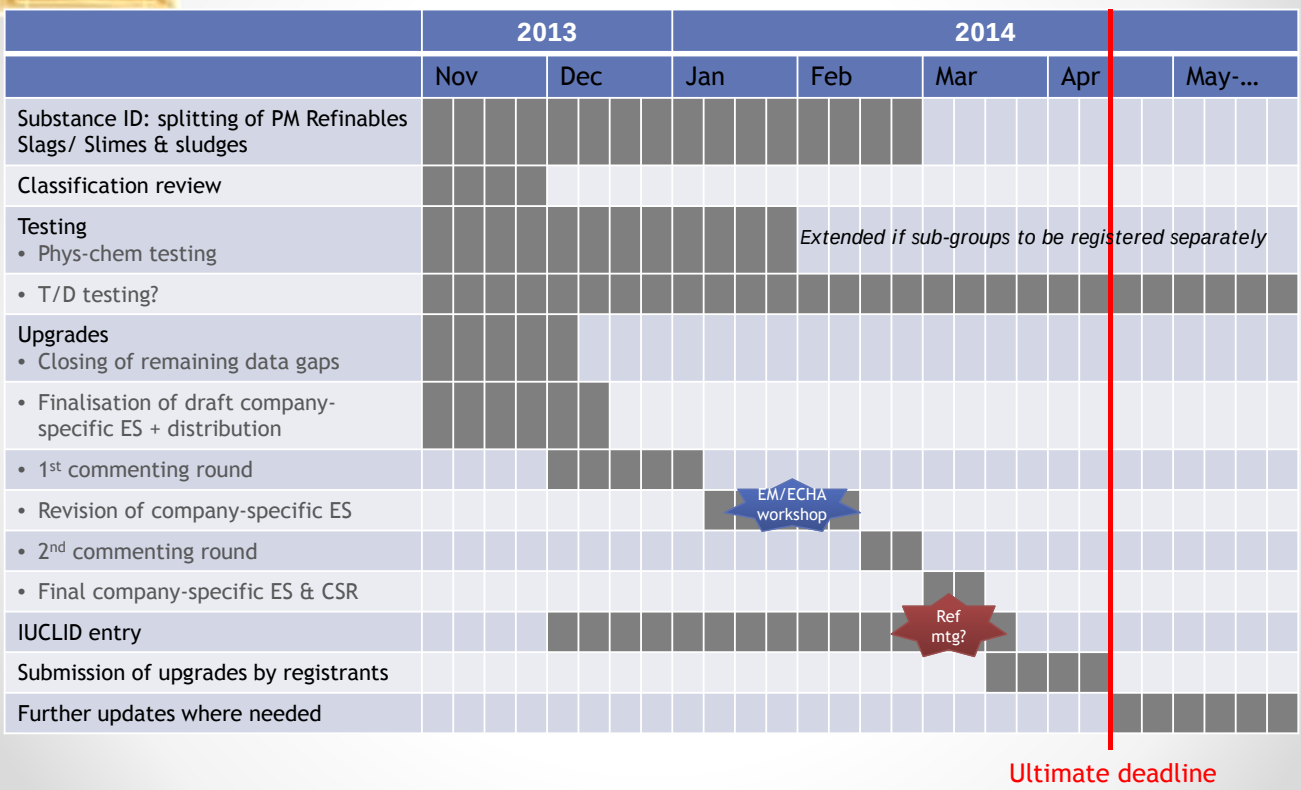
9. Next steps, AOB, next Meetings/Calls & Closing Remarks

Edwin BROEKAERT

9.1. TTIP TF

- Update from C. Braibant

Next steps & provisional timeline



Thank you!