



MSP-REFRAM

Coordination and Support Action (CSA)

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First Workshop (state of the art)

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Summary

First Workshop (state of the art)

Approval

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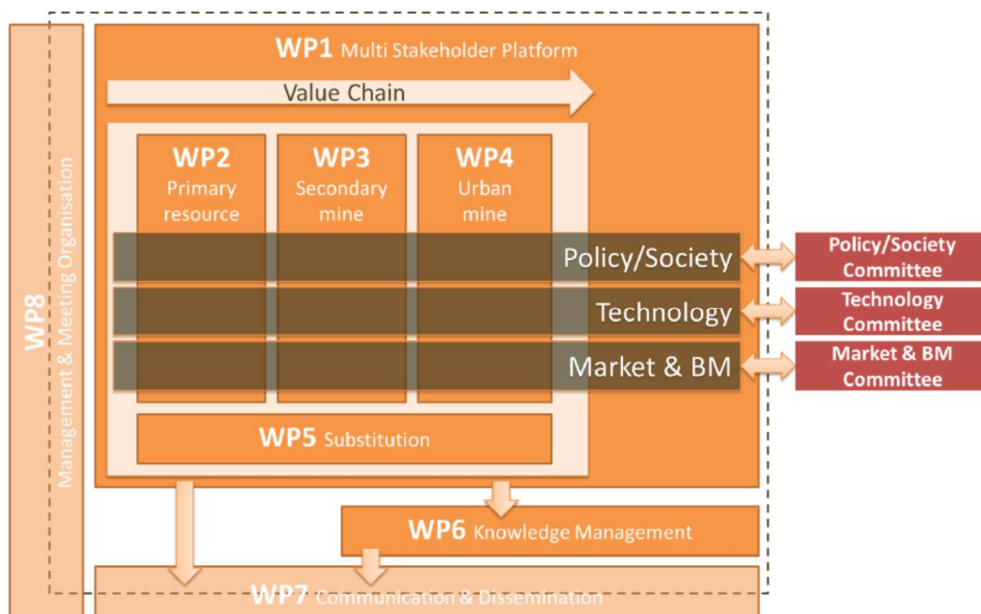
INTRODUCTION

Within the framework of the Multi-Stakeholder Platform for a Secure Supply of Refractory Metals in Europe (MSP-REFRAM) and in particular its work-package on the multi-stakeholder platform (WP1), the initial State of the Art workshop (WS1) was held on May 30th- 31st, 2016 in Barcelona involving the key stakeholders of the refractory metals value chain, including both partners of the project and members of the External Experts Committees (EEC).

The objective of this workshop was the presentation and discussion of all the gathered information regarding primary and secondary resources as well as the current production and usage of selected refractory metals in Europe.

In parallel with the work-packages on primary resources, secondary mine and urban mine and their associated deliverables and milestones, WP1 constitutes the platform where all the key stakeholders meet and address transversal issues of the refractory metals through a series of three workshops. Thus, after WS1 (The state of the art in primary and secondary resources; current production and usage and the entire value chain), WS2 (Presentation and discussion of innovative pathways: substitutions, product design and value chain) and WS3 (Feasibility of proposed innovations and adequacy of current standards and obligations) will be launched.

The graphical representation of the work-packages and EEC of MSP-REFRAM is as follows:



METHOD

The initial State of the Art Workshop (WS1) was held on May 30th- 31st, 2016 in Hotel Hesperia del Mar, Barcelona. The workshop consisted of one common session on mapping of primary resources and five sessions of two hours per metal (tungsten, rhenium, niobium, tantalum and molybdenum) split into the following issues:

- 1) State of the art on use, needs, demand
- 2) State of the art on Recovery from primary resources (including their processing, separation/purification)
- 3) State of the art on Recovery from industrial waste (including their mapping, processing, separation/purification)
- 4) State of the art on Recovery from urban mines/end of life (including their mapping, processing, separation/purification)

The presentations followed main tasks developed and deliverables submitted by WP1, WP2, WP3 and WP4, in particular:

WP1 Multi-stakeholder platform	
Task 1.1 Current and future selected metals needs of European industry	
WP2 Primary resources	
Task 2.1 – Mapping of Primary Resources	D2.1 Mapping of the primary resources in the EU”
Task 2.2 Mining	D2.2 State of the art on the recovery of refractory metals from primary resources
WP3 Secondary resources (industrial waste, tailings)	
Task 3.1 Mapping of secondary resources	D 3.1 Mapping of secondary resources in the EU (mine tailings, industrial waste)
Task 3.2. Secondary mining	D 3.2 State of the art on the recovery of refractory metals from secondary resources
WP4 Urban mining	
Task 4.1. Tracing and tracking (detection) of the refractory metal containing waste products	D 4.1 Mapping of the secondary resources in the EU (urban mines)
Task 4.2 Collection and presorting of the waste/urban mining	D 4.2 State of the art on the recovery of refractory metals from urban mines

In addition to the sessions per metal, some extra presentations were included in the agenda i.e.:

- Common session on the mapping of primary resources (WP2).
- Electronic Content Collaboration Platform (WP6).
- Current needs of the EU industry in refractory metals (WP1).
- Next meetings,

The first workshop aimed at presenting all the information gathered per metal to all partners and members of the EEC in order to open discussion and obtain feedback.

The agenda and the list of participants are included in the Annex.

PRESENTATIONS

The following table shows the presentation titles and speakers that took place in each session. Presentation files are available at ECCP MSP-REFRAM:

<http://app.lgi-consulting.org/ecm/msprefram-folder-2302>

COMMON SESSION
<p>Task 2.1 – Mapping of Primary Resources</p> <p>D2.1 “Mapping of the primary resources in the EU”</p> <p>Guillaume Bertrand, Michel Bonnemaïson, Quentin Monge, Laura S. Lauri, Thomas Poitrenaud (BRGM, E-MINES, GTK)</p>
TUNGSTEN
<p>State of the art on the recovery from primary resources</p> <p>J. Xang (GTK)</p>
<p>Hydrometallurgy of tungsten – state of the art on recovery from primary resources</p> <p>Stefan Willersinn & Hans-Jörg Bart, UNIKL</p>
<p>Pyrometallurgy of Tungsten</p> <p>Guozhu Ye and Lena Sundqvist (Swerea MEFOS)</p>
<p>Tungsten recovery from: Old mine tailings, Industrial waste, Waste rock, Mill tailings, Grinding sludge, Dust/sweeps</p> <p>D31 and D32</p> <p>Stephan Willersinn (UNIKL)</p>
<p>Current uses and needs of tungsten</p> <p>J. Xang (GTK), S. Casanovas (Amphos 21)</p>

RHENIUM
Current uses and needs of tungsten S. Casanovas (Amphos 21)
Rhenium from secondary sources (WP3) T. Retegan (Chalmers)
D4.1 MAPPING THE SECONDARY RESOURCES IN THE EU D4.2 STATE OF THE ART ON THE RECOVERY OF REFRACTORY METALS FROM URBAN MINES W. Kurylak (IMN)
NIOBIUM
Mapping of secondary Nb resources (EoL products) S. Casanovas (Amphos 21)
Nb – Ta mining State-of-the-art David Arcos AMPHOS 21
The iTSCi Programme: successfully enabling tantalum supply from high risk areas by satisfying international expectations
Niobium processing/production from primary resources E. Andreiadis (CEA)
Extractive Pyrometallurgy of Nb from Primary sources Jean-Marie LAMBERT- ERAMET Research
Niobium State of the art on Recovery from secondary sources (WP3) D3.1 and D3.2 E. Andreiadis (CEA)
Recycling of Nb from urban mines Y. Yang (TU Delft)
TANTALUM
State of the art on the recovery of Ta from secondary resources G. Ye (MEFOS)
State-of-Art of recovery of tantalum from urban mines Ulla-Maija Mroueh, VTT Kathy Bru & N. Mennade, BRGM; Laurent Cassayre, LGC
WP2.2. Tantalum Processing F. Bourgeois INP-ENSIACET (LGC)
MOLYBDENUM
Molybdenum current needs S. Cuesta (ICCRAM)
State of the art on the recovery from primary resources

J. Yang (GTK)
Hydrometallurgical routes for Mo Prof. Tuomo Sainio, LUT Dr. Sami Virolainen, LUT Prof. Hans-Jörg Bart, UniKL M.Sc. Mojtaba Fallah Fini, LUT
Pyrometallurgy of Mo Metallurgy (WP2) G. Ye (Swerea MEFOS)
State of the art on the recovery of Mo from secondary resources Based on contribution from partners in WP3 Lena Sundqvist Ökvist and Guozhu Ye (Swerea MEFOS AB, Luleå, Sweden)
WP4-Secondary Resources (Urban mining) Molybdenum Dr. Rocío Barros García (ICCRAM-UBU) Dr. Santiago Cuesta-López (ICCRAM-UBU)
EXTRA PRESENTATIONS
Current needs of the EU industry in refractory metals D. Hartmann (CEA), G. Lefebvre (BRGM)
ECCP Applications M. Macías (IDENER)
Next meetings S. Bourg (CEA)

CONCLUSIONS

Based on the information gathered by tasks and deliverables presented during the workshop, the following considerations were provided by the participants:

- Some discrepancies between databases were identified regarding primary sources of refractory metals. The use of the latest data available was recommended.
- In general, figures on refractory metals in the EU were found to be limited and/or inaccurate. Information gaps were particularly identified regarding current and future needs of the EU industry. Roskill services were proposed for providing valuable knowledge on supply chain and future outlook if no further data were gathered from this first workshop.
- The work on industrial processes in the EU industry was recommended to be more accurate by considering the Best Available Techniques (BAT) reference documents, the so-called BREFs, particularly information on inputs/outputs (life cycle assessment

approach). The BREFs may constitute a common base to compare different industrial processes.

- Consultation with Industrial European networks was recommended, as some of them are very active.
- An approach focused on the supply chain was recommended to avoid overlaps, i.e. a deeper look into metals flow and the identification of companies concerned in each of the steps of the supply chain.
- Identification of particular case studies by metal was also recommended.
- Although a large amount of data was collected for the first workshop, further analysis should be done in the next steps.
- The use of the ECCP: Electronic Content Collaboration Platform was encouraged for the exchange of information among project partners and experts.

ANNEX

MSP-REFRAM Workshop n°1 – 30-31 May 2016

Agenda

Monday 30 May

13h00 - 14h00: Lunch

14h30 - 16h30: 1st session on Tungsten

16h30 - 17h00: coffee-break

17h00 - 19h00: 2nd session on Rhenium

21h00: Dinner at restaurant Racó de la Vila

Tuesday 31 May

8h30 - 10h30: 3rd session on Niobium

10h30 - 11h00: coffee-break

11h00 - 13h00: 4th session on Tantalum

13h00 - 14h00: Lunch

14h00 - 16h00: 5th session on Molybdenum

16h00 - 16h30: coffee-break

16h30 – 16h40: Presentation of the new features of the ECCP

16h40 - 17h30: Conclusion

21h00: Dinner at restaurant Cal Pinxo

List of participants

Title	First Name	Surname	Organisation	Comment
Mr.	Pedro	ACEBES	Partner 4 - CARTIF	
Mr.	Eugen	ANDREIADIS	Partner 1 - CEA	
Mrs.	Rocio	BARROS-GARCIA	Partner 9 – ICCRAM	
Ms.	Anaïs	BAUDRIER	Partner 20 – LGI	
Mr.	Guillaume	BERTRAND	Partner 3 – BRGM	
Mr.	Michel	BONNEMAISON	Partner 6 – E-MINES	Member of EEC
Mr.	Stéphane	BOURG	Partner 1 – CEA	MSP-REFRAM Coordinator
Mr.	Florent	BOURGEOIS	Partner 15 – LGC	
Mrs.	Kathy	BRU	Partner 3 – BRGM	
Mr.	Jordi	BRUNO	Partner 2 – AMPHOS 21	
Mr.	Ramon	CABRERA	SIEMCALSA	Member of EEC
Ms.	Susanna	CASANOVAS	Partner 2 – AMPHOS 21	
Ms.	Chloé	CHAVARDES	Partner 20 – LGI	
Mr.	Roland	CHAVASSE	Tantalum-Niobium International Study Center (T.I.C.)	Member of EEC
Mr.	Andrzej	CHMIELARZ	Partner 11 – IMN	
Mr.	Patrice	CHRISTMANN	Partner 3 – BRGM	Member of EEC
Mr.	Daniel	CIOS	Waste Management and Recycling Cluster	Member of EEC
Mr.	Francisco	CORONA ENCINAS	Partner 4 – CARTIF	
Mr.	Santiago	CUESTA-LOPEZ	Partner 9 – ICCRAM	
Mrs.	Eimear	DEADY	British Geological Survey	Member of EEC
Mr.	Patrick	D’HUGUES	Partner 3 – BRGM	
Ms.	Ana	DIEZ	Partner 12 – ADE	
Mr.	Bastien	DUPLANTIER	Partner 20 – LGI	
Mr.	Dag	ERIKSEN	Primus.inter.pares AS	Member of PROMETIA SAB
Mr.	Oscar	FADON	SIEMCALSA	Member of EEC
Mr.	Fidel	GRANDIA	Partner 2 – AMPHOS 21	
Mr.	Antti	HAKKINEN	Partner 14 – LUT	
Mr.	Didier	HARTMANN	Partner 1 – CEA	
Mrs.	Liesbeth	HORCKMANS	VITO	Member of EEC
Mr.	Jorge	IZQUIERDO	Partner 12 – ADE	
Mr.	Jukka	JOUTSENVAARA	Lapland University of Applied Sciences	Member of EEC
Ms.	Päivi	KIVIKYTÖ-REPONEN	Partner 19 – VTT	Member of EEC
Mr.	Kamil	KOZUB	Metraco	Member of EEC
Mr.	Harri	KULMALA	FIMECC	Member of EEC
Mr.	Wolfgang	KUMMER	MoReW	Member of EEC
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Mr.	Jean-Marie	LAMBERT	Partner 7 – ERAMET	
Mr.	Gaétan	LEFEBVRE	Partner 3 – BRGM	
Ms.	Marion	LENOIR	Partner 7 – ERAMET	
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Mr.	Quentin	MONGE	Partner 6 – E-MINES	
Ms.	Ulla Maija	MROUEH	Partner 19 – VTT	
Mr.	Martin	OCZLON	Tasman Metals LTD	Member of EEC

Mr.	Christophe	POINSSOT	Partner 1 – CEA	
Mr.	Antonios	POLITIS	Partner 17 – NTUA	
Mrs.	Teodora	RETEGAN	Partner 5 – CHALMERS	
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Ms.	Alexandra	RIBEIRO	CENSE	Member of EEC
Mr.	Tuomo	SAINIO	Partner 14 – LUT	
Mr.	Julien	SCHIETTECATTE	Atlantic Strategy	Member of EEC
Mrs.	Lena	SUNDQVIST ÖQVIST	Partner 16 – MEFOS	
Mr.	Rauno	TOPPILA	Lapland University of Applied Sciences	Member of EEC
Mr.	Antonio	VALERO	CIRCE	Member of EEC
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Mr.	Yongxiang	YANG	Partner 18 – TU Delft	
Mr.	Xiao Sheng	YANG	Partner 8 – GTK	
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