



European Union
European Regional
Development Fund

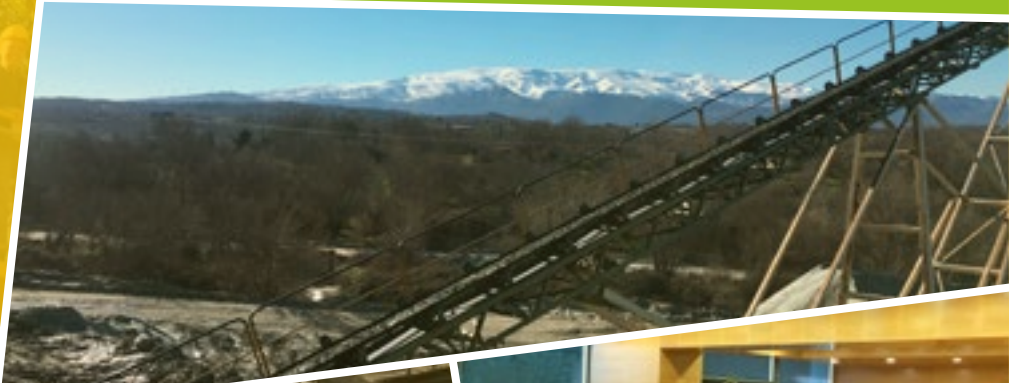


REMIX

Interreg Europe

Smart and Green Mining Regions of EU

PEER
REVIEW
VISIT
REPORTS



Research &
innovation

Leading the European policies
towards more sustainable mining
www.interregeurope.eu/remix

Contents

Go to the content by clicking the section title

Introduction	3
1st Peer Review Visit	5
Kemi, Lapland, Finland	
Annexes	8
2nd Peer Review Visit	9
Leoben, Austria	
Annexes	28
3rd Peer Review Visit	29
Prague, Czech Republic	
Annexes	35
4th Peer Review Visit	36
Wrocław, Lower Silesia, Poland	
Annexes	42
5th Peer Review Visit	43
Valladolid, Castilla y León, Spain	
Annexes	52
6th Peer Review Visit	54
Cornwall, UK	
Annexes	66
7th Peer Review Visit	67
Sterea Ellada, Greece	
Annexes	92
8th Peer Review Visit	93
Fundão, Centro region, Portugal	
Annexes	119
9th Peer Review Visit	120
Joensuu, Finland	
- North Karelia and Lapland	
Annexes	128

Introduction

The REMIX project Phase 1 which started in January 2017 and ended in June 2019 included 9 interregional meetings in the 9 mining regions represented in the project. A peer review was the key element of the interregional meetings supported by study visits and other supporting elements.

Peer review methodology applied in the REMIX project is developed by S3 Platform for reviewing specific elements of innovation strategies for smart specialisation and territorial development strategies as well as tackling the associated implementation challenges.

The purpose of the peer review in the REMIX was to provide the regions and countries an efficient methodology:

- To learn and explore ways in which each policy instrument addressed in the project can be developed to solve challenges pointed out in the REMIX application
- To establish an open and trusted learning environment where practical and conceptual aspects of Policy instrument can be discussed and explored
- To use the challenges and experiences of REMIX regions to develop necessary recommendations.

In addition, the peer reviews:

- Allowed the REMIX partners to meet others/peers from partner regions to discuss common issues and share best practices
- Allowed the regions and countries to peer-review each other's work on Policy Instrument by acting as critical friends providing the comprehensive analysis/feedback of good practices and points to develop.

The REMIX peer review workshops were conducted in 1 to 2 working days divided into two parts:

- The first part of the workshop contained studying the current situation through study visits, presentations, and preparatory materials and questions sent to the participants approximately one month before the meetings
- The second part of the workshop summarised the current situation presenting the regional challenges. After this, teams (4-6 people) representing people from different participating regions discussed the specific problems / questions identified by the region under review. These questions were part of the preparatory materials sent to participants before the meeting. The teams discussed the provided problems and questions following a specific peer review template:

- 1. What is the question behind the question?**
- 2. Policy suggestions how this new question could be addressed**
- 3. Lessons to take home for each region/country from each team**

After each Peer review workshop the hosting partner / region under review prepared a peer review report concluding the content and lessons learnt. These reports in question have been collected into this document you are about to read.

After each Regional Peer Review report there is an annex page with links to all presentations held at the event. Furthermore, the prematerials and the presentations can be found on the project website in the [Library section](#).

REMIX

Interreg Europe



European Union
European Regional
Development Fund



1st Peer Review Visit

Kemi, Lapland, Finland

The interregional meetings of the REMIX project were kicked off in Kemi, Finland 4-6.4.2017 hosted by the project lead partner Regional Council of Lapland.

The main purpose of the first meeting was to get the acquainted with all the project partners and get off to a good start with the project activities.

At the first meeting the REMIX consortium and stakeholders, total of 31 people, visited the Outokumpu, Kemi mine and learned about current status of mining in the Lapland region. In particular the focus was on the circular economy and industrial symbiosis in mining to which the REMIX work in Lapland closely links to. A newsletter was published about the 1st meeting in May 2017 from which you may read more about the event. The Newsletter can be found on the project website News section.

Some of the regional and national best practices were introduced to the participants:

- Artic industry and Circular Economy Cluster by the Cluster Manager Kari Poikela from Digipolis
- Artic Mining Cluster AMIC – project by Project Manager Laura Lauri from GTK Finland
- Finnish Network for Sustainable Mining by Eero Yrjö-Koskinen the Secretary General of Finnish Network for Sustainable mining

Based the presentations and mine visit the Peer Review method was practiced with a short exercise in which small groups discussed the following questions presented by the Lapland region:

1. What is the main feedback you would like to tell us “a critical friend”?
2. How to encourage the growth of micro level industries in mining value chains?
3. How to identify “the blind spots” in the development of our mining sector and the Arctic industry and circular economy cluster?
4. How to evaluate the impact of the process?

Without going into too much depth in the exercise some of the main lessons / conclusions from the group discussion on the questions were the following:

- Based on what was learnt about the Arctic Industry and Circular Economy Cluster feedback was that maybe Lapland should consider new facilitator roles within the cluster and define those roles as incubator, accelerator, financing & in-kind /expertise. Promoting how the corporations can trust the facilitator is very important. The purpose of the facilitator is to bring the SME companies together from competing each other to cooperating with each other.
- Furthermore, an outside view was that there seems to be a sort of group of “insiders” working all of the projects in Lapland. Should some new people be brought in?
- To tackle the challenge of SME growth; the working groups suggested as a key to provide market awareness and a platform for cooperation. Growing unitedly because growing alone is difficult. Furthermore, helping the SMEs to get the right contacts to “open doors” could be e.g. local government office’s role.
- Conclusion on the discussions about “the blind spots” in the development of the mining sector and Arctic Industry and Circular Economy Cluster was that, first of all, the relevant terms must be defined. To begin with; do the SMEs understand what circular economy means? Raising awareness about circular economy and what it entails. It is not just waste management!
- Moreover, as results on the discussions concerning “the blind spots” mines should present plans as to what happens after the closing of the plant already at the opening phase. Not only environmental plans, but also social aspects (relocating workers, training into new jobs etc.)

- Suggestions on indicators on how to evaluate the impact of the process were: the growth of companies, influence on policy making, new tools such as scoreboard and number of new cluster members.

As one of the follow-ups after the Lapland meeting was that the Arctic industry and Circular Economy cluster approached a 100 SMEs to inform them about the circular economy plans in the region. 45 of those companies took part in a work shop where the utilisation potential of different industrial side streams in Lapland were considered. In addition, the resources of the cluster have increased significantly during the REMIX project and the cluster has been at the core of the REMIX stakeholder group in Lapland in addition to industrial development intermediaries, public development companies and regional authorities.

The actual Peer Review for Lapland was organised jointly with partner 3, Business Joensuu in semester 5 as the last Peer Review in Phase 1.

1st Peer Review Visit Annexes

Stakeholder presentations on current status

Sustainable Resource Extraction in the Arctic

– **Finnish Network for Sustainable Mining** | Eero Yrjö-Koskinen

Impacts of fossil-free energy transition on natural resources demand

| Eero Yrjö-Koskinen

Kemi-Tornio region and Lapland: Arctic Hub of industrial symbiosis

– **Arctic Industry and CircularEconomy Cluster** | Kari Poikela

AMIC – Arctic Smart Mining Cluster | Laura S. Lauri

Partner presentations

Agency for Innovation, Business Financing and Internationalisation of Castilla y León | Beatriz Casado

Faculty of Sciences and Technology of Nova University of Lisbon

| Alexandra Ribeiro, José António de Almeida, José Carlos Kullberg

GeokompetenzzentrumFreiberg | Wolfgang Reimer, Kirstin Kleeberg, Martin Herrmann, State Mining Authority of Saxony

Regional council of Lapland

| Kristiina Jokelainen, Ilari Havukainen, Reetta Laakkonen

Joensuu Regional Development Company, JOSEK Ltd.

| Jarmo Kauppinen, Ilkka Nykänen

Marshal's Office of Lower Silesia

| Zbigniew Dynak, Ewa Król

Ministry of Industry and Trade of the Czech Republic

| Martin Vlastník

Montanuniversität Leoben | Alexander Tscharf, Bettina Mark, Peter Moser & Michael Tost

National Technical University of Athens– NTUA

| Antonis Politis

University of Exeter (Camborne School of Mines)

| Frances Wall, Elizabeth Adey, Kip Jeffery

REMIX

Interreg Europe



European Union
European Regional
Development Fund



2nd Peer Review Visit Leoben, Austria

Report of 2nd PRV at Montanuniversitaet Leoben

PP5 – Montanuniversitaet Leoben
Project Responsible Alexander Tschaf



1. INTRODUCTION AND BACKGROUND INFORMATION (PREPARATORY WORK)

1.1. BASIC FACTS OF ADRESSED POLICY AREA

Austria is a Federal State and land use planning is generally under competence of the nine different provinces (Vorarlberg, Tyrol, Salzburg, Carinthia, Upper Austria, Lower Austria, Burgenland, Styria, Vienna).

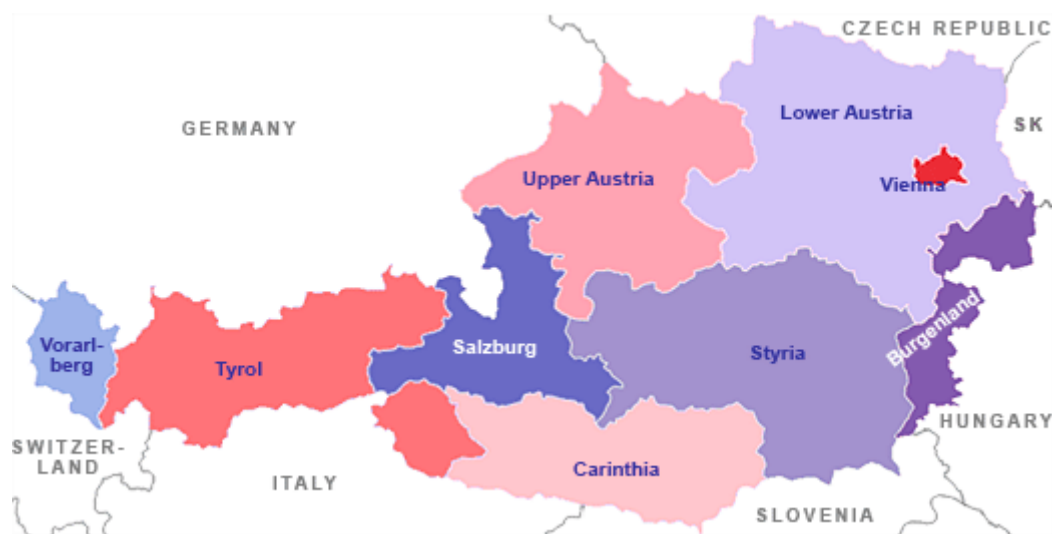


Abbildung 1: Provinces of Austria

Austria has a long history of mining and today the country may not be renowned as a mining country but it is rich with some deposits and mines like being a home for one of the largest tungsten mines in the world, as well as three magnesite mines and the headquarters of the global market leader for refractory. Austria’s high quality micaceous iron oxide is also used worldwide. As well Austria is rich in other minerals important for the construction and other industrial sectors. The economical and efficient use of natural resources is considered one of the key strategies in the sustainable development of Austria’s economy and society. The main challenge for the Austrian mining industry like in any EU country is to secure supplies of high quality mineral raw materials for the need of its industry. From the geological point of view, number of minerals particularly contraction minerals are abundant. The challenge lies in the current land use planning practices when it is becoming more and more difficult to access to the reserves.

REMIX | Report of 2nd PRV at Montanuniversitaet Leoben

Today there are number of conflicts how to utilise and treat reserves between sources of livelihood and other purposes like protection of groundwater and residential areas. In many areas, the extracting of minerals is out of the question and the actual available potential is small. Scarcity is not only due to the size of the deposit of the resource, but is in many cases a consequence of conflicting user interests in the society. This situation will directly influence in to the development of the economy in the national and in the regional level. The strategic thinking in land use planning in the relation of use of the minerals is not seen as a part of the responsibilities of the provincial land use planning practices. With the scarcity of the available land resources, the more holistic thinking is needed.

1.2. ADDRESSED POLICY INSTRUMENT

The Austrian Minister of Economy prepared the Austrian Mineral Resources Plan (AMRP) as a national master plan to secure supply of mineral resources and to serve as a planning basis for future mining innovations with the federal states and municipalities in relation to their specific needs to create new sustainable business. Many areas containing mineral occurrences are in contradiction with land use planning. Some occurrences, proved as worth to be protected to not coinciding with conflict zones in land-use and innovation. Without sustainable land use planning, there won't be innovations in mining and sustainable supply of raw materials. Distinguished mineral zones are to be declared as "mineral protection zones" for land use planning purposes to eventually create new sustainable innovations. Securing the supply of minerals is an issue of private enterprise. Considering this, the public administration within the framework of the AMRS performed the groundwork where AMRS encourage the collaboration between enterprises, academia and authorities. This is seen to be vital within the context of an active raw materials policy and innovations. The competitiveness of Austrian companies in mining innovation is a key issue in Austria and the whole of EU. It is largely dependent on the quality of activities in the fields of RDI of mining. It's important to promote investment in RDI and to create appropriate conditions for strengthening Austrian companies (particularly SMEs).

The "Austrian mineral Resources Plan" was identified as a "Best Practice Model" by the European Commission, as an example for an active minerals planning policy. With special regards to the Austrian Mineral Resources Plan the second pillar of the Raw Material Initiative calls for:

"setting up a land use planning policy for minerals that comprises a digital geological knowledge base, a transparent methodology for identifying mineral resources, long term estimates for regional and local demand and identifying and safeguarding mineral resources (taking into account other land uses)..."
(European Commission, 2011, p17)

The Austrian Mineral Resources Plan gives a methodological approach for identification and evaluation of the mineral occurrences, taking into account the different methodology for construction minerals and occurrences of metallic ores, industrial minerals or mineral fuels (except hydrocarbons). Special attention is payed to the systematic process to identify conflict reduced zones and the different safeguarding processes by the land use authorities of the federal provinces.

1.3. CURRENT STATUS ON IMPLEMENTATION OF POLICY INSTRUMENT (E.G OPERATIONAL PROGRAMME OR SMART SPECIALISATION IMPLEMENTATION ACTIVITIES, RELATED LOCAL, REGIONAL AND INTERNATIONAL PROJECTS)

At the time of March 2011 the nine provinces of Austria showed a different status of implementation of the above mentioned AMRS, but also their willingness to implement the ideas is not always given. According to the legal framework in Austria the implementation has to be done by the provinces, but therefor it is always a political issue too. Changes are only possible if all relevant stakeholders agree, and even then the success cannot be guaranteed.

The following overview tries to summarize the status 2011 in the different provinces:

- **Burgenland:** Implementation of AMRS is partly done or at least planned.
- **Carinthia:** Regional Development plans for all regions, considering the results of AMRS
- **Lower Austria:** Political opinion on implementation has not yet been finalized
- **Upper Austria:** Maintaining the principle of negative expulsion. So called “Kiesleitplan” defines where no raw materials extraction is to take place.
- **Salzburg:** The results of AMRS are to be taken into account as far as possible in regional land use planning
- **Styria:** The results of AMRS are integrated in the regional development plan. The way of protection was not clear in 2011, as well as if through negative or positive planning.
- **Tyrol:** “Gesteinsabbaukonzept” was developed in 2004. As art of this concept a full inventory of resources and production rates was carried out. This concept is the basis for decisions in the official approval process. Results of AMRs are included to the “Gesteinsabbaukonzept”.
- **Vorarlberg:** Results of AMRS are integrated to provincial laws. Resource areas are protected from land use conflicting with mining.
- **Vienna:** Political opinion on implementation has not yet been finalized

There are several other projects, which are linked – some strict, some loose – to the AMRS, whereas mainly Min-Guide, Minatura and Min-Land (at proposal stage) need to be mentioned.

The main focus of all activities (including REMIX) is on construction minerals, because for all other materials (ores, industrial minerals, ...) the Austrian MinroG gives enforcement rights to the authorities, whereby the regional implementation of AMRS is not the crucial point.

1.4. STAKEHOLDER GROUP AND STAKEHOLDER GROUP ACTIVITIES DURING THE PROJECT

The Austrian Stakeholder group is consisting of several parties, which are having interests in the interaction of land use planning and raw materials extraction, or rather :

- Federal Ministry of Science, Research and Economy, BMWFW
- Chamber of Commerce (Division Raw Materials)

REMIX | Report of 2nd PRV at Montanuniversitaet Leoben

- Geological Federal Institute
- Global 2000
- WWF
- Austrian Institute for Spatial Planning, OIR
- Environmental Advocacies of the provinces
- Land use authorities of the provinces
- Representatives of industry (construction minerals)

The role of the stakeholders mentioned above lies in their contribution (knowledge from permission processes, daily work experience) to elaborate the consequences of integrating the Raw materials planning and management at regional level in a compulsory way. They will provide input information into the model to be run to demonstrate the consequences for a sustainable raw materials supply.

Stakeholders have an important role in the development of the regional innovation chain and generating the smart specialisation in to the practise.

Stakeholder meeting per semester will be organised as stated in the approved REMIX project proposal. PP5 will organise these meeting and it is planned to link those meeting to common national events related to mineral extraction.

1.5. OBJECTIVES SET FOR THE IMPROVEMENT OF THE POLICY INSTRUMENT AND ACTIVITIES THAT WILL BE DONE TO ACHIEVE THE OBJECTIVES

To improve the "Raw materials planning and management at national and regional level" it is a compulsory to integrate this policy instrument in the regional (provincial) land use planning to create innovations. Sustainability of mining and successful innovation process starts from land use planning to improve exploration and extraction methods. Innovations could mean best practices in environmental protection, better environmental and social impact assessment, environmental remediation and protection, mining with no surface footprint, improvements in minerals processing.

The work will be done based on the development of the governance by engaging the stakeholders important for the land use planning. By developing the land use planning practices, involving different stakeholders from the very beginning and to develop the dialog are crucial factors to avoid the conflict situations. Integration of the Austrian Raw Materials Plan (AMRS) at a regional level by establishing a best practise pilot needs collaboration between enterprises, academia and authorities and will need to include also an element of innovation and learning from other REMIX PPs in order to improve the AMRS and future projects' acceptance.

1.6. ONGOING OTHER ACTIVITIES TARGETING TO THE IMPROVEMENT OF THE POLICY INSTRUMENT DURING THE PROJECT (E.G. PROJECTS, SUPPORT FOR GOVERNANCE, S3 LINKAGE/IMPLEMENTATION, STRUCTURAL CHANGE)

Min-Guide, Minatura and Min-Land (at proposal stage)

1.7. SME ENGAGEMENT TO REMIX/STAKEHOLDER GROUP ACTIVITIES DURING THE PROJECT

Through the contacts of the economic chamber, EIT Raw Materials and existing informal networks SMEs, should be integrated into the national stakeholder group, to allow them to benefit from the project activities and results.

The Chamber of Commerce is supervisor of interest for SMEs and industry in the region. Cities and municipalities are responsible for the direct operational environment for mining and act as the enablers for the ecosystems. Research and education institutes are the main actors of knowledge transfer activities for the SME benefits and lay important role in regional development.

1.8. CLUSTERS, INSTITUTIONS AND REGIONS LINKED TO REMIX PARTNER (OTHERS THAN REMIX PPS)

In addition to the already mentioned stakeholder group, foremost EIT RIC ESEE, EIT Raw Materials. EIT RIC ESEE has wide network and strong contribution to the provincial, national and European level raw material policy.

REMIX | Report of 2nd PRV at Montanuniversitaet Leoben

2. 26.-28.06.2017 2ND PRV LEOBEN

From 26. - 28.06.2017 2nd Peer Review Visit was held in Leoben. With a total of 33 participants, this event was a complete success. Apart from important findings for the region under review, the focus was on the standardization of future activities to guarantee that REMIX will positively influence the policy instruments and that learning for both sides (regions and peers) can be ensured.

2.1. AGENDA

Monday 26.06.2017 - Project Partner Meeting

17:00 – 18:30:

1. Industrial Modernisation Partnership
 - a. Thematic Smart Specialisation Platforms for Industrial Modernisation, Expression of Interest: Extractive industry and value chain, 1st draft (Ilkka Nykänen, JOSEK Ltd, Jukka Hyvönen, JOSEK Ltd)
2. Potential to change addressed Policy Instruments
 - a. Structural differences among partners
3. Discuss and Finalize Peer Review Process
4. Financial Reporting
5. Scheduling for the next project period
6. Agenda for the next days

19:00: Dinner at **Arkadenhof “Schwarzer Adler”** (at main square and own charge)



Tuesday 27.06.2017 – Peer Review Visit

- 08:00 – 09:00: Registration
- 09:00 – 09:30: Welcome words, Introduction to Agenda
- 09:30 – 10:00: Short presentation of participants
- 10:00 – 10:30: **Introduction to peer review process**

Coffee break

- 10:30 – 12:00: **“Input presentations”**
- Austrian Mineral Resources Plan
 - Current Status and Problems
 - Mag. Dr. Robert Holsteiner (Federal Ministry of Science, Research and Economy, BMWFV)
 - **Stakeholders view**
 - Dipl.-Ing. Dr. Erich Dallhammer (Austrian Institute for Spatial Planning, OIR)
 - Minerals policy governance in Europe: good practice examples in EU Member States (MIN-GUIDE, Alexander Tscharf on behalf of Andreas Endl)
- 12:00 – 13:00: Lunch
- 13:00 – 16:00: Discussion
- Discussion in table groups
 - One question per table
 - Creating Outputs
- 16:00 – 17:00: Summary and wrap up
- 19:00: Dinner

Wednesday 28.06.2017 – Peer Review Site Visit

07:00 – 13:00: Peer Review Site Visit at “Steirischer Erzberg”

- Mine tour
- Active mining and subsequent use
- Structural change of a region from industry to R&D as well as technology development and tourism
- Basis for development of Montanuniversitaet and R&D cluster in Leoben



Abbildung 2: Steirischer Erzberg (<http://www.erzberg-alpin-resort.at/de/abenteuer-erzberg-steiermark.html>)

2.2. INTRODUCTION TO PEER REVIEW PROCESS

Intro to peer review process by Wolfgang Reimer (GKZ, Freiberg; Saxony):

The ultimate goals of peer review visits are to achieve:

- Standards,
- indicators
- comparability

- Phase 1:** Preparatory measures (delivered to participants in advance)
- Phase 2:** Contributions by region under review for peer review (delivered to partners 2 weeks before)
- Phase 3:** The Peer review workshop
- Phase 4:** Post workshop follow-up

*More details on AP's Peer Review process presentation. (Available in Dropbox and REMIX webpage under Library)

Wolfgang Reimer



2.3. LEADING QUESTIONS FOR THE IMPROVEMENT OF ADDRESSED POLICY INSTRUMENT – BASIS FOR PRV

In the following, some preliminary Peer Review Visit questions are given as a guideline for the discussions in Leoben.

1. General Feedback to the Austrian Mineral Resources Plan!

- What is your impressions of the presented Policy Instrument?
- In your opinion, is there something missing?
- Is it really a best practice example?
- ...

2. How can the area of conflict between different authorities be handled?

- Horizontal: Mining vs conflicting land use
- Vertical: Federal State vs. Provinces
- Are these conflicts really the major problem?
- ...

3. How can the results of the project be implemented?

4. How can political decisions be influenced?

5. What needs to be done, to guarantee success of REMIX project in relation to the Austrian Mineral Resources Plan?

2.4. INPUT PRESENTATIONS

The presentations given by Robert Holnsteiner and Erich Dallhammer can be found on REMIX Dropbox as well as on project website under Library.



Robert Holnsteiner



Interesting points mentioned:

- Survey made via phone: 2000 responded how they feel about mining. People living close to operating mines had much more positive view towards mining compared to those living far away.
- Horizontal measure: Austria has Mineral suppliers alliance in which the stakeholders meet regularly

Questions and comments by the audience:

- Dolores (ADE): National paper had an article that Austria is a leader in Circular economy in EU. How does this show in your aggregation exploitation.
 - Robert (BMWFW): Taken into account in the Pillar 3 of the mineral resources plan. → Resource efficiency action plan constructed.
- As answer to a question by Martin Vlastnik, Robert Holnsteiner explains the Austrian Mining Act with its 3 types of Minerals:
 - Minerals free for mining (protected by law),
 - Minerals that are property of the Federal State,
 - Minerals that are on the property of the landowner cannot be accessed through rights provided by law. → need to be protected by land use management



Mining and Spatial Planning

Erich Dallhammer

Erich Dallhammer
Leoben, 27.6.2017

Interesting points mentioned:

- Land use planning is a party in approval process for mining permits. Can appeal Mining authority decisions.
- Complex and difficult task for land use because they must take into account and listen all competitors wanting to claim the land.

3. DISCUSSION & FEEDBACK (RESULTS)

To launch the discussion Dr. Wolfgang Reimer (GKZ Freiberg, Saxony) gave a critical review on the REMIX policy paper input of Austria.

Wolfgang Reimer



His main points were:

- As a critical friend, Pointing out different issues on the Austrian policy instrument (e.g. smart specialisation not mentioned, raw materials in a minor role?)
- Who do we want to target with our policy instruments??? Who is competing with us with policies?
- How can aggregate mining contribute to Smart Specialisation”
- Spin offs at MUL need to be pointed out more clearly; Leoben is a region with strong relation to “Modern Mining”; this should be presented as innovative points

Discussion in full group started:

- Overarching role of different project in the region to be discussed (Robert Holnsteiner)
- What does the smart and green mean in the project?
- Ilari: the project Stem from the need to create a network between mining regions in EU. Clear need for discussion because all regions are different stages in their mining cycles. Yet, all have the need to increase self sufficiency. Smart and green can mean diff things in different regions depending on their situation and status.
- Liz’s commented on the experience from Cornish stakeholder meeting. Where people gave very different meanings to smart and green mining.
- Integration of SMEs is a major point for smart and green mining regions
- All agreed that Metallurgy needs to be integrated

REMIX | Report of 2nd PRV at Montanuniversitaet Leoben

Afterwards all separated into 5 small groups (5-6 persons) to discuss the leading questions given under 2.3. The results of these discussions were presented on flipchart by one rapporteur each group.

The main points are given below:

Group 1: Ilari

1. General Feedback

- Big, long and demanding work for the policy makers but where is the industry in it (their voice in it)? What are the terms you included in the process (update the status report in regards to this). Role of the regions in the future. What has happened after conflict free areas were established. How many mining companies have started to operate at those deposits?
- Mining association, chamber of commerce etc. and understanding the role of SME's in those networks? MUL role in all of this? Financial actors in the regions?
- Land use planning is a good channel to get all the "competitive" land users together.

2. Area of conflict

- Working with conflicts – Give the right amount of power to the people opposing the mining projects. Ownership to the communities...

3. Implementation

- How to make the project work: Make visible the benefits of sustainable mining. <- Also way to influence the political decisions. -> strengthening the influencing channels that already exists and we all have them
- Link/Alignment of Innovation and raw material policies in the future?

Group 2: Tiina

1. General Feedback

- Impression of the instrument: Good basis for further development
- What is missing; Social aspects – no toolbox.
- Benchmarking possibilities from projects f.ex in Finland: Network for sustainable mining (companies are well presented, stakeholders, administration, indigenous people etc. Sustainable mining and social acceptance are key issues bc without them there is no future in mining), Regina (win-win coexistence of mining and municipality, plan for Mining contract between municipality and the mining company, Mine Facts, AMIC (presented at Kick-off) enhancing the R&D, social licencing and EU collaboration, Arctic Geoinnovations project. All those projects tackle issues relevant to the situation in Austria.
- The policy instrument is just about accessibility and finding conflicting free areas for mining. No social impacts were taken into account.

2. Area of conflict

- Legal needs vs. social needs...Education and information to the public. Getting them involved in the process.
- Secondary materials and circular economy

REMIX | Report of 2nd PRV at Montanuniversitaet Leoben

Group 3: Liz

1. General Feedback

- Need the political will to make it legally binding to have all the provinces follow through with it. Make a stakeholder analysis and map out the diff stakeholders involved.
- Missing parts:
 - The fact that it is not legally binding.
 - Economic calculations of the deposits
 - Aspects of cost benefits, ecosystem services...
- Impressive land use management tool

Group 4: Antonis

- Group 4 had an open discussion:
 - History (Mining Act)
 - Industrial Role (lobby of industry is acting on the sideline)
 - Development of Mining law
 - Publishing of positive information about Mining (not so in Czech Republic)

Group 5: Kristin

Group 5 presented a full written answer to all questions by Wolfgang Reimer, which was the basis for their discussion and which is given below:

1. General Feedback to the Austrian Mineral Resources Plan!

What is your impression of the presented Policy instrument?

The Austrian Minerals Resources Plan (AMRP) appears to have been drafted in order a) to mainly avoid the overprint of raw material deposits and occurrences by regional planning and b) to cadastre the potential of spars and ores as well as of aggregates.

The AMRP has no linkage to the Austrian Innovation strategy and doesn't refer to the RIS3 documentation of the nut 0 region of Austria.

Interestingly the AMRP doesn't mention the wording of „smart“ nor „specialisation“ and „innovation“, except in the preface (reference is made to European Innovation Partnership on Raw Materials). In the same way the Austrian Innovation Strategy doesn't incorporate mining or raw material related sectors of the raw material value chain in context of innovation and innovation driving approaches.

The AMRP shows a strong focus on aggregates. The question is how much “innovation potential” can be deduced from aggregate mining in a European economy that is knowledge based and requires high-tech to compete with the global markets?

Is there something missing in your opinion?

Yes, the relation to the topic “smart specialisation” either by incorporating it into the AMRP in close connection with the mining sector related issues including “downstream” but also “up-

REMIX | Report of 2nd PRV at Montanuniversitaet Leoben

stream” in terms of research and start-ups from the exploitation of results, such as:

- *Valorisation of R&D results (patenting, start-up, JV)*
- *Public spending on raw material value chain (research, industry, administration)*
- *Clustering in generating value out of initiatives like EIT Raw Matters*
- *Maintaining metallurgical knowledge in the region as bridge-builder and prerequisite for a future circular economy*

The policy should give an outlook on measures of high priorities for the implementation of the policy (compare to: “Leitlinien” of the Saxon Raw Materials Strategy). These Leitlinien (focus areas) should be underlined by a budget and a time schedule according to the political empowering of a regional administration and – in the best case – exceeding this governance period in order to make the policy more “untouchable” at a change in the political landscape.

The regional Innovation Strategies of the nine Austrian states should be involved in the process of Peer Review and here especially those, closest to mining (see: Styria)

Is it really a best practice example?

In terms of the aim of the REMIX project: no

In terms of the cadastral evaluation of the mineral wealth and as a prerequisite to land planning: yes!

The last open question is: “what is the target group of a policy”

2. How can the area of conflict between different authorities be handled?

Horizontal: Mining vs conflicting land use

In my understanding this is not the principle issue of a reviewing of a policy with regard to “smart specialisation”

Vertical: Federal State vs Provinces Area these conflicts really the major problem?

See above

3. How can the results of the project be implemented?

- *As a recommendation to the responsible authorities how to further develop the AMRP and to link it with a Austrian Innovation strategy (revised the same way, see comments above)*

4. How can political decisions be influenced?

By influencing the voter’s attitude towards mining and exhibiting the attitude and behaviour of global investment managers as well as the meaning of global socio-economic challenges.

Raise of raw material awareness from bottom up (civil society to professionals)

5. What needs to be done, to guarantee success of REMIX project in relation to the Austrian Mineral Resources Plan?

REMIX | Report of 2nd PRV at Montanuniversitaet Leoben

To transfer our recommendations to the potential responsible administrative bodies of the AMRP and to finally carry out a final workshop during the second phase of the project to resume how these recommendations have been committed.

Leoben, 27.6.2017

Dr. Wolfgang Reimer

The group also added some suggestions to improve the next reviewing process:

1. Region under review provides main messages from its policy under review
2. Questionnaire to Region under review with questions targeting our aim of REMIX
3. Take the five questions / group work as a homework to be completed and send back by end of next week

4. ANALYSIS OF RESULTS → CONSEQUENCES FOR THE REGION UNDER REVIEW

The core of the given feedback was, that spatial planning is a good path to follow in the sense of security of supply, but in the sense of REMIX, with its focus on smart an green mining regions, this needs to be discussed in a broader way.

The following discussions within the Austrian stakeholder group took this into account, but nevertheless access to resources and fast and calculable approval procedures are seen as one of the most crucial points for success of a mining region. Additionally it might be better not to focus on whole Austria but on certain regions. The most prominent “mining region” in Austria is the area around Leoben, where the biggest mining operations (RHI Breitenau, VA Erzberg) as well processing industry (steel processing, refractories, micro chips), education (from low to high level), research (MUL, Sandvik,...) but also a touristic potential and some very specialized SMEs which are somehow “funded” or at least supported by the bigger industry, are located. It is known, that most of this positive effects just happened somehow accidentally throughout history, but the goal is to find out “WHY” this could have happened in this area. From this it might be possible to transfer this potential to other regions, where similar situations are found, and the existing potential could be strengthened as well.

Very shortly summarized the 3 main points, which lead to success in the region of Leoben are:

1. Know how (well-educated personell)
2. Resources
3. Energy

As fourth point for success the regional acceptance of mining or industry in general is very important, especially because this acceptance is not always given in Austria. Acceptance and awareness by the people and the regional authorities is crucial for approval and this is how the link to the existing spatial planning instrument could be built. The Austrian Mineral Resources Plan has the potential to create awareness and this can lead to fast and successful approval procedures, which furthermore leads to a sustainable supply with raw materials.

To put the identified points on a more quantitative basis a fundamental SWOT analysis of different regions in Austria is planned, starting with the good practice example of Leoben. The main focus of this analysis should be on the link of industry to SMEs as well as to the region in general, and on how this link could be enhanced and strengthened.

2nd Peer Review Visit Annexes

Preparation materials

A critical review on the REMIX policy paper input of Austria | Wolfgang Reimer

Mining and Spatial Planning in Austria | Erich Dallhammer

REMIX Workshop Leoben 26.-28.6.2017 answers on questions raised from PP10
| Wolfgang Reimer

The Austrian Minerals Plan, EU best practice – 7 years after | R. Holnsteiner

Presentations

Mining and Spatial Planning | Erich Dallhammer

The Austrian Minerals Plan, EU best practice – 7 years after | R. Holnsteiner

A critical review on the REMIX policy paper input of Austria | Wolfgang Reimer

REMIX

Interreg Europe



European Union
European Regional
Development Fund



3rd Peer Review Visit Prague, Czech Republic



European Union | European Regional Development Fund



REMIX – Smart and Green mining regions of the EU, Interreg Europe project Peer Review meeting

Wednesday 13. 9. 2017; 9:00 – 19:00

(15:00 – 19:00 guided tour)

Prague, Ministry of Industry and Trade of the Czech Republic

1. Opening of the meeting

Peer Review Meeting started by the presentation „Role of Ministry of Industry and Trade (CZ) in Raw Material Policy“ done by Martin Vlastnik. He briefly reminded the „Status report about the Raw Materials policy of the Czech Republic“ which was disseminated in advance to the participants one month earlier. There were mentioned basic facts about the Czech Republic, its raw materials resources and the newly adopted Raw Materials policy. Czech Stakeholder group composition and its' work was presented, followed by the objectives and tasks set in the Raw Materials policy.

Next presentation was done by Institute for Enterprise Competitiveness – Castilla y León (Ricardo González) in which he explained the importance of the European directives: 2003/54; 2009/72.

2. Peer Review discussion

All participants were divided into 4 groups that were established in the manner that participants from one country were divided in as many groups as possible.

Questions for Peer Review discussion (disseminated one month earlier):

1. your experience with the process of Raw Materials Policy preparation and approval
2. participation of Local Municipalities in the process of Mining Concessions allowance/issuing.
3. role of the State in mining industry (ownership of RM deposits, priority right of mining, etc.)
4. relations between Local Municipalities and mining companies including cross-border mining
5. relations between Local Municipalities and NGOs in the area of mining industry
6. your outlook on coal mining future in Europe

Summary of discussions in the groups:

Answers and suggestions varied very much in accordance with position of answering persons in the legislative/mining process.



Q1: Your experience with the process of Raw Materials policy (RMP) preparation and approval

RM policies are united in countries on national level, but there are regional specific deposits in some areas.

Municipalities are involved into the permission process; final decision is done by the Government.

It will be very useful to strengthen public involvement and NGOs into the RMP preparation.

It is very needful to develop public understanding and acceptance of mining. Some companies are looking for the way how to reach the social acceptance

Improve public awareness and education of need for RM - public perception of benefits. Effort for using European funds for that.

In some countries the majority of public supports mining from the primary steps (mainly northern countries with sporadic settlement).

Individuals makes more problems than associations

In many countries is bad experience with mining companies from the past.

Population is against the oil drilling companies – primarily supported by the government, but it has to be taken back.

They don't have special authority for protection of mining pollution in some countries.

Relation between municipalities, miners, NGOs is important to be active

Each country has different energy sources

Necessary to educate people about the advantages of mining

Q2: Participation of Local Municipalities in the process of mining concessions allowance/issuing

Vary on country, type of deposit (open-cast/underground), mineral type (metal/non-metal/energy/ construction).

Local municipalities should be involved in permitting procedures, but it is crucial to have a legal way to overcome local opposition without objective reasons.

Some regions are very independent, one of them supports mining, other is against, important is employment.

Municipal licenses depend on regional environmental and land use authorizations.

Involvement of Land Use Planning into decision process is very important.

Municipal permissions depend on local policy/situation.

Different stages during the project. Public acceptance can be changed, particularly media can influence position of many people (no publicity/promotion – less acceptance of projects).

Improve interest of local municipalities on RM – enhance communication and knowledge sharing.

There is big need to share experience in effective regulation and promoting public acceptance.

Need to improve overall stakeholder relations and conflict management.

Generally, construction materials have easier permission process.

Mining is relatively well accepted, if mining company is good for environment or supports tourism. Promote the income of RM sector to the regions is very important.



Q3: Role of the State in mining industry (ownership of RM deposits, priority right of mining, etc.)

Countries legislation should state the guaranteed priority rights.

Countries provide the legal framework and effective permitting procedures:

- the land belongs to the state – also the subsurface when land contains metals
- the most important minerals belongs to the state
- in some countries, competence for mining permits are at the regional level

Situation in some countries:

AT: State owned energetic RM should be mined by private companies – under special contract

GR: similar situation

FI: special position of uranium ore

PT: they have importance, but not the priority

CZ: all deposits belongs to the state with exception of lower importance deposits of construction RM, but all is mined by private companies with exception of uranium ore.

PL: Except for the construction RM everything belongs to the state and is mined by the private companies, construction RM belongs to land owner.

ES: State geological company has priority if state is interested in strategic material. Most important minerals /metals/ are owned by the state

Employment is not so interesting in smaller deposits (mine gives 80 – 100 jobs), there are other benefits: smart, green mining, underground mining

Big database of information gives possibility to be involved in the process of permission.

Q4: Relations between Local Municipalities and mining companies including cross – border mining

Communication is very important, especially at the beginning of the project.

Importance of education – where minerals come from and where they are needed (open days in mines, local support by mining companies)

Cross-border mining cluster is important to improve the collaboration and communication.

Re-establishing of ore mining in Central Europe needs cross-border cooperation „Central-Europe mining-cluster“

There is big data availability to enhance the cross-border relations.

EU lost competitiveness in mining and metallurgy during privatization of state owned (supported) mines.

Problem makes public funded prospection and later selling to private company (often) overseas to gain benefit.

Q5: Relation between Local Municipalities and NGOs in the area of mining industry

Communication is importance, each party has to be heard.

In CZ, engagement of a broader number of NGOs makes often problems.



In AT, NGOs don't have any special role in mining protection, some of them have good relations with municipalities, cooperation with Chamber of Commerce
In FI and GR, NGOs are more silent, have no campaigns against mining, mainly it do municipalities. NGOs fight against forestry, nuclear, hydro-power dams.
Necessity to set up an opposing group against NGOs (mining, energy,...)
Positive information about mining should be shared online. Big players have the internet support campaigns.
Possible solution should be to involve NGOs into the mining projects – different NGOs in different areas of project.

Q6: Your outlook on coal mining future in Europe

Main question: Do countries have alternative energy sources?
Important is sustainability of coal mining.
Renewable energy have to be promoted, but there where it is reasonable.
Europe should keep a strategic number of coal mines in operation, and go ahead in mining technology.
Future of coal mining depends partly on the ownerships – if the state is owner of unefficient mines, these mines can continue because questions of social aspects like unemployment of workers.
There are big social issues related to coal mine closure.
Mine closure implications/experience – always underestimated closure costs, necessity of social aspects solution.
Coal mining expects big conflict with EU regulations of CO₂.
Lignite mines are more sensitive regarding CO₂ emissions, but again it depends of possible substitution
Some countries has no coal deposit, imports it from abroad, or imports directly energy.
Lot of uranium underground, but no nuclear power plant.
Coal is essential for energy production in some countries.
Some regions try to increase coal production – for chemical and other use, not only for production of energy.
Once underground hard coal mines are closed, the mining finishes finally.
Problem of financing projects by banks according to the CO₂ emissions data



Conclusions and key lessons / ideas picked up from the questions discussed. *Have you progressed in implementing the best ideas and if so, how? Please describe how you are involving the stakeholders in the ongoing or planned process.*

It is necessary to improve communication, public awareness and education of need for RM, this would enable the public perception of benefits of mining and bring more public acceptance. Some companies are looking for the way how to reach the social acceptance, but it is not sufficient, the effort should be wider. There should be also an effort for using European funds for that.

Ministry of Industry and Trade have created the stakeholder group, leads regular meetings and supports the stakeholders to share experience and contacts among them and internationally on the Remix events. There are already international attempts to use the ERDF support to promote different aspects of mining (including innovation and tourism – mining heritage) on the international (cross-border) level.

Relation between municipalities, miners, NGOs and public is important to be active. Local municipalities should be involved in permitting procedures. It is important to improve the interest of local municipalities on RM – enhance communication and knowledge sharing for effective regulation and promoting public acceptance, which can be easily changed, particularly media can influence position of many people (no publicity/promotion – less acceptance of projects).

Mining is relatively well accepted in areas where mining company is good for environment or supports tourism. Promote the income of RM sector to the regions is very important.

Local municipalities and regional councils have a major role in promoting the importance of mining for the local community. Regional councils are also members of the Stakeholder group. Remix already brought a new contact and future cooperation in promotion of an important mining history as a touristic site of a cross-border importance.

Communication is one of the crucial problems during all stages of all projects. Each party has to be heard. As there is a strong group of opponents to mining led by NGOs, there was a proposal to create a strong opposing group against NGOs (mining, energy,...) using similar means of communication. Positive information about mining should be shared online. Big players have the internet support campaigns.

Future of coal mining in Europe is related to the sustainability of coal mining and innovation. The social aspects have to be taken into consideration.

One member of our SH group is working on this topic. Thanks to Remix gains the important information from other fields related to mining with implications to the social solutions.

3rd Peer Review Visit Annexes

Preparation materials

Status report about raw materials policy of the Czech Republic

Presentations

All presentations in a nutshell

Review of cross-border collaboration between Saxony and the Czech Republic within the framework of the Saxon Raw Materials Strategy and the EU Raw Materials Initiative and Saxon efforts on smart and green mining

| Wolfgang Reimer

Czech Republic Mining Association (Těžební unie) | David Póč

Vršanská uhelná a.s.

| David Lancinger

Vršanská uhelná a.s.

| Hana Lorencová

State Mining Administration

| Bohuslav Machek

Mineral Resources in Ustecky Region

| Martin Kabrna, Jaroslava Kuszniřuková

Raw Materials Policy of the Czech Republic – Brief history, experience during the process of modernization and current image | Pavel Kavina

Role of the Ministry of Industry and Trade in Modernization of Critical Raw Materials Sector in the Czech Republic | Martin Vlastník

Pegmatica mining company | Alexandra Carolino

Review of SN-CZ structural programmes 2007–2020 concerning smart and green mining | Dorothee Grünholz, Wolfgang Reimer

Revitalization of underground mines in Czech Republic

| Z. Adamec, V. Petroš, K. Novotný

Cooperation between municipalities and mining companies

| Jindra Tužilová

REMIX

Interreg Europe



European Union
European Regional
Development Fund



4th Peer Review Visit Wrocław, Lower Silesia, Poland



REMIX – smart and green mining regions of the UE

Interreg Europe Programme

Project Peer Review meeting, Tuesday, 12. 12. 2017

As a preparation for the peer review meeting, the participants were asked to answer questions, using an internet questionnaire, related to (mining) smart specialisations in their regions.

The status report of Lower Silesia with 5 questions concerning developing of the Lower Silesian smart specialisation was sent to the PRV meeting participants a month before the event.

The PRV participants could learn more about smart specialisation in Lower Silesia from the two reports (provided a month before the event):

“Strategic Framework for Smart Specialisations of Lower Silesia” (2015)

“Diagnosis and development trends of the Lower Silesian smart specialization on natural and secondary raw materials” (2017).

The presentations given during the meeting introduced the main facts about the Lower Silesian economy, the RIS3 and issues related to: obtaining mining concession, environmental problems, post-mining reclamation, innovative methods and production, as below:

1. Basic facts on Lower Silesia - statistics, economy, natural resources, main actors – *Katarzyna Banaszekiewicz, Director of Economic and Investment Promotion Division*
2. Presentation of Lower Silesian Smart Specialisation Strategy – natural resources and secondary raw materials - history, today, future challenges – *Michał Frycz – Innovation and Competition Unit*
3. Concession application procedures for geological and mining operations in Poland – *M.Sc. Eng. Robert Podolski, Director of District Mining Authority in Wrocław*
4. Reclamation of post-mining areas – *PhD. Eng. Urszula Kaźmierczak, Department of Geoengineering, Mining and Geology of Wrocław University of Science and Technology*
5. Environmental impact assessment procedures in mining: environmental and social conflicts – *PhD. Eng. Jan Blachowski, Institute for Territorial Development*
6. Innovative production and companies in the field of raw material industry, Clusters & SMEs – *M.Sc. Eng. Krzysztof Skolak/ M.Sc. Eng. Jacek Major, Polish Stone Cluster*
7. Development and acquisition of raw materials from anthropogenic fields – *M.Sc. Eng. Wiktor Kowalczyk, mining expert*

After finding out basic facts about economic situation in Lower Silesia from given presentations, partners and stakeholders decided to join 5 group which discussed following issues:

- 1) Smart specialisation related to raw materials: importance, area, stakeholders, users, communication;
- 2) (Financial) effectiveness of instruments supporting S3 implementations;
- 3) Supporting of creating cooperation between institutions involved in RIS3 implementation;



- 4) Supporting of SMEs & clusters;
- 5) Management of RIS3 change;

Summary of discussions in the groups:

Q.1 Smart specialisation related to raw materials: importance, area, stakeholders, users, communication

The group consisted of representatives of England, Austria, Finland, Poland, Germany and the Czech Republic. Discussion already started at the stage of attempts taken to define "smart specializations". Each of the participants presented their position and feelings. There were statements that it was the key to the future of the mining industry (England); as well as unconventional thinking, resulting in the use of advanced technologies, e.g. using the digitalization method in Finland). For Austria, smart specialization is the way to achieve smart mining (green mining). For German representatives, it is, among others, participation in numerous projects (Fame, Seasand) which are the key to the development of innovation and, consequently, the mining industry. The Czech Republic underlined the close cooperation and support of the Ministry for the development of technologies and projects. For Poland, "smart" means using old, well-known materials in a new way. "Adding" modern technologies, increases the price of products, without increasing the costs of their production (which was mentioned during the cluster presentation. The price of a new product is a fuse to "drive" the development of smart specialization. There was also a conversation about the support of smart specialization - at what stage the "Smart" stage should start. All participants agreed that the process should start at the stage of universities or research centers, with the support of the ministry (government). In addition, everyone agreed with the statement that smart specializations are the basis for receiving EU funding, which is extremely important for their development.

Main conclusions from the discussion:

- RIS3 needed to get ERDF money (following EU policy: concentration funds, investment priorities, smart specialisation);
- Support for development of S3 in the field of: critical materials listed by the KE + industrial minerals needed on the state/regional/local level → sustainable mining → circular economy;
- Definition of smart specialisation: traditional materials or leading production or strength + something new (e.g. innovative technology);
- Innovative technology raise profitability (higher price but smaller production cost) – higher profit from bigger output despite less production expenditure;
- How regions want to use the innovation – financing smart specialisation areas enhances regional & local development (innovations are profitable for regional/local economy). As regions need innovation they have to support it using funds for RIS3 implementation:
 - managing regional strategies (incl. RIS3) & cooperation in region,
 - connecting research with regional funding for RIS3,
 - enhancing process & product innovation (add value) – needs good links to research + good educated graduates + knowledge of economic trends.
- The important question was raised in conclusion: how to link (international) projects: H2020, ETC, etc and measure their impact on the regional development?



Q.2 Effectiveness of instruments (financial) supporting S3 implementations

Effectiveness of instruments (financial) supporting S3 implementations depend on people involved in the process.

The most important factor in the implementation of RIS 3 is the involvement of representatives of various environments operating in a given area of smart specialization. Good cooperation within a working group dedicated to a given specialization guarantees to get to know and understand its problems and to integrate an environment interested in increasing innovation and development of a given field. Using the instruments supporting the implementation of RIS3, first of all, remember about communication. Communication is a guarantee of agreement between the actors involved in achieving the RIS3 goals and achieving consistent results.

RIS3 Innovative projects, especially international ones, need educated people who have unique interpersonal skills and understanding the problems that projects deal with. Such projects should contribute not only to solving identified problems or satisfying emerging needs, but also to create cooperation networks that enable the implementation of subsequent projects.

People, and hence, good communication is the basis for seeking effective ways of implementing RIS3.

Main conclusions from the discussion:

- EU legislation has to be taken into account;
- Motivation is important;
- Infrastructure is important;
- Integration of (scientific) institution is important;
- Communication is important:
 - there are different languages of the actors implemented S3 – the question is: how to communicate, how to overcome obstacles,
 - local people live in symbiosis with mining companies, sightseers and newcomers have problems with understanding specific local problems,
 - needs for neutral information about mining,
 - promoting mining traditions: open days in mining enterprises, closed mines transformed in tourist attractions,
- The working group related to the specific smart specialisation’s area – networking of different actors with knowledge, experience and motivation – should be an important body of S3 implementation;
- Innovative projects: financed from different resources, should integrate actors with different background, need educated people
- The good practice of KGHM Cuprum: science doctorates dedicated to the mining business (grants from mining companies for the purchase order Ph.G.)

Q.3 Supporting of creating cooperation between institutions involved in RIS3 implementation

Main conclusions from the discussion:

- It is important to note there are 3 sectors: administration, business, science.
- It is extremely difficult to bring together responsible actors. You have to clearly highlight to a company what the beneficial effects are – otherwise they will not get involved.
- Cooperating with bigger companies is not easy as they only take action whenever it suits them.



- The Remix is a wonderful example of a project to initiate cooperation.
- The Remix contacts will continue after project’s end – project managers’ databases of contacts will be updated to enable further cooperation but informal contacts are still important.
- Cooperation issues are national specific and regional (local) needs have to be taken into account. For example, some regions with no strong regional authority which results in less opportunities to affect policies without the state.
- Different sectors have different needs – there are obstacles to develop cooperation, communication is the problem.
- Danger – many institutions work under European projects only to get money for a staff.
- Potential cooperation-inducing activities:
 - association which then develops into a cluster (Portugal),
 - KIC Raw Materials – an option on European level,
 - innovation hubs,
 - projects modeled on the REMIX project,
 - thematic working groups including representatives of different sectors, meeting regularly to exchange ideas – activity managed by the authority.

Q.4 Supporting of SMEs & clusters

There are two main “mining” clusters in Lower Silesia: the “Walbrzych Raw Materials” cluster and the “Cluster of Stones” coordinated by the Bazalt Foundation in Strzegom. Representatives of the both clusters are the participants of the regional stakeholders group. In other countries represented in the group (Finland, Spain and Greece) there are no special clusters dedicated to mining but in all one can find different bodies representing this sector, e.g. Regional Mining Committee in Spain. All regions have experience in the field of cluster policy and have funds (of regional or national level) available.

Main conclusions from the discussion:

- **Forming a cluster – motivation:** bottom-up initiative, based on business; it is very important to inform on the early stage about the benefits (real profits) of taking part in a cluster and to overcome mutual distrust by demonstrating that a concept of cluster is based on a win-win situation;
- **Motivation language:** overcoming a gap between public institutions and business by communicating in a different language, indicating specific business benefits;
- **Networking:** using different databases and connections; communication on different levels (meetings, e-mails etc.); the “snowball” method; internationalization;
- **Complementarity:** including not only different types of institutions (business, science, local government units, business environment units) but also different businesses;
- **Financing:** there should be funds available to encourage a cooperation; funds should be used for an establishment of a cluster and for managing a cluster, but in the next fazes it should be a profit that keeps cluster going – successful cluster does not function because it has access to external financing (e.g. EU projects), but because it is profitable on business level – at this stage SMEs should finance their activities by themselves;
- **Leader:** the most important role in a cluster; leader must have specific skills, e.g. be good at networking, have many different connections, be a good manager, a lobbyist and be able to gain trust of SMEs and public institutions and at the same time to communicate to SMEs potential benefits of cooperation; best practice: a professional from outside the company / organization;



- **Involvement of SMEs in the RIS3 creation / change / implementation:** supporting SMEs by public institutions is a difficult task – best practice to involve SMEs in the process of creating, changing and implementing RIS3 is to include a “middle man”(intermediary) – someone who’s role is to communicate, consult and discuss with both public institutions and SMEs;
- **Closing the gap between public institutions and SMEs:** public institution must change the language used in the communication with SMEs (shorter and more substantial materials, more emphasis on benefits, less on obstacles and requirements), build trust and mutual understanding, extend network with new members;
- **Time and language:** needs to be taken into consideration – different bodies operate in different time perspectives and speak different “languages”; SMEs (due to the specifics) expect immediate results, but different processes needs time – in order to build trust, it must be clearly communicated; it also takes time to build a network, and later on to build trust, before real cooperation could start;
- **Added value of clusters:** an access to business, knowledge, new products and technologies; working together for a common goal; a more audible voice (greater impact on public policy).

Q.5) Management of RIS3 change

Main conclusions from the discussion:

- In the rapidly changing world management of S3 changes is a day-to-day job;
- There are 3 main activities which should be constantly carried on:
 - market observation and trends examination enable searching for new niches which can be exploited,
 - communication with society using promotional methods, esp. establishing a working group consists of representatives of main market players,
 - observation of S3 environment has to be connected with constant communication with market (customers) using the main actors group:
 - multilevel administration (regional, local, trade),
 - business support institutions (chambers, development agencies),
 - science (universities, research & development institutes),
 - business (clusters, SMEs, big enterprises);
- Aim’s updating should be taken into account as a result of RIS3 management activities.

4th Peer Review Visit Annexes

Preparation materials

Diagnosis and development trends of the Lower Silesian S3 | Andrzej Solecki, Łukasz Szkudlarek, Wiktoria Ryng-Duczmal, Waldemar Bernatowicz, Anna Jagiełło, Iwona Filipowska, Damian Marciniak

Final report (PRV preparation material) | Andrzej Solecki, Łukasz Szkudlarek, Wiktoria Ryng-Duczmal, Waldemar Bernatowicz, Anna Jagiełło, Iwona Filipowska, Damian Marciniak

Strategic Framework for Smart Specialisations of Lower Silesia

Status report of Lower Silesian Voivodeship

Presentations

Lower Silesia – introduction | Katarzyna Banaszkiwicz

Lower Silesian Smart Specialisation Strategy – natural resources and secondary raw materials | Michał Frycz

Concessions and applications procedures for geological and mining operations in Poland | Urszula Kaźmierczak, Miranda Ptak, Robert Podolski

Reclamation of post mining areas
| Urszula Kaźmierczak, Miranda Ptak, Robert Podolski

Environmental impact assessment procedures in mining
| Jan Blachowski, Miranda Ptak, Urszula Kaźmierczak

Environmental and social conflicts associated with mining – case studies from Lower Silesia | Jan Blachowski, Miranda Ptak, Urszula Kaźmierczak

Innovative production and companies in the field of raw material industry, Clusters & SMEs | Krzysztof Skolak, Jacek Major

Raw Materials from anthropogenic fields | Urząd Marszałkowski

Sudetic Foreland Geopark – increase of the tourist offer based on the of post-mining areas development

REMIX

Interreg Europe



European Union
European Regional
Development Fund



5th Peer Review Visit

Valladolid, Castilla y León, Spain



Peer Review – REMIX Valladolid, 20 March 2018

Castilla y León is the 3rd largest Region in Europe, 18,6% of the Spanish territory and the most populated city is Valladolid (301,876 inhabitants). Castilla y León is considered a "more developed" region, with a GDP per capita above the 90% of the European average. GDP (in PPS) (2015): 59,910 M€. GDP (in PPS per cápita) (2015): 24,300 €.

From the economical point of view Castilla y León specialization pattern components are:

1. Economic specialization pattern

- Food and agriculture industry
- Automobile industry. Components, and Equipment
- Health care and quality life
- Tourism, Heritage and Spanish Language
- Energy and Industrial Environment
- Habitat

2. Scientific specialization pattern

- Medicine
- Agriculture, Biology and Veterinary Sciences
- Chemistry and Material Sciences
- Earth and Environmental Sciences
- Engineering

3. Technological specialization pattern

- Advanced Materials
- ICT
- Biotechnology
- Advanced Processes and Manufacturing

Related with the mineral sector, Castilla y León has a very favorable and interesting mining potential:

- Wide geographical spread
- Wide geological diversity

The mineral production in Castilla y León in 2015 was 314 M€, which is approximately 0,7% of regional GDP (3rd national position with 12% of mining GDP, behind Andalucía and Cataluña), with 3715 direct jobs in 2015.

According with the “Operational program in the framework of the objective for investment and employment growth” the financial assignation of the 2014-2020 FEDER Operational Program of Castilla y León amounts to 314.403.219,40 € in terms of public financing and 628.806.439 € of total cost to which are added 15.000.0000 € of the contribution of Castilla y León to the SME initiative.

The 20th of March was celebrated in Castilla y León the peer review meeting where it had an opportunity for a mutual learning and knowledge dissemination. The peer review exercise allows reviewed region to examine our RIS3 strategy from the perspectives of other regions with an ultimate goal to improve our policymaking, employ best practices and follow verified standards in the R&I policy area. The outcomes of this peer review was used to prove Castilla y León`s R&I policy.



In order to organize the peer review section were prepared some documents. The documents were necessary to have a better understanding of the mining sector and R&I situation in Castilla y León and at the same time to focus the participants on our topic interest. Our main features of the policy instrument (objectives, characteristics, priority or measure concerned) is fostering of R&I and innovation.

The documents that were sent to all the partners of the project, contain informations related with:

RIS3

Peer Review Questions

ERDF Operational Programme of Castilla y León

Entrepreneurship, Innovation and Freelancers Strategy of Castilla y León

Status report Castilla y León

- Economic Structure
- Mineral sector
- Strategy of Mineral Resources in Castilla y León 2017-2020
- ERDF Operational Programme of Castilla y León 2014 – 2020
- REMIX Addressed Policy Instrument
- REMIX Stakeholder Group
- Contributing to the RIS 3 Objectives

During the meeting we had the following presentations in order to have an explanation of some documents which were sent before the meeting and give the assistants the possibility to make their questions and make clarifications:

- a) Beatriz Casado Sáenz – Head of Innovation and Entrepreneurship Department, Institute For Business Competitiveness of Castilla Y León (ICE), Castilla y León Government – *Castilla y León Entrepreneurship & Innovation*
- b) Ramón Cabrera – SIEMCALSA - Overview of the current mining activity in Castilla y León
- c) Santiago Cuesta López – General Director of the International Center for Advanced Materials and Raw Materials of Castilla y León (ICAMCYL) – *Clustering REMIX-MIREU*
- d) Ramón Cabrera – SIEMCALSA – *Overview of the current mining activity in Castilla y León*
- e) Institute For Business Competitiveness of Castilla y León (ICE), Castilla y León Government
- f) Cupa Group – María Pérez Ameneiro – *The value and sustainability of natural slate*
- g) Berkeley Minera España S.L. – Francisco Bellon and Lucía García Hernandez – *Research and Sustainable Development in Mining Projects. Case of Study: Retortillo Project*
- h) IGME – Virginia Rodríguez Gómez – *Mining-environmental Planning and Circular Economy in the framework of Sustainable Mining*
- i) PROMETIA – María Tripijana Serrano – *The importance of clustering for R&I*

Finishing the presentations and having a better understanding about mining sector in Castilla y León, were remembered the peer review questions. All partners and stakeholders were asked to decide in which group they prefer to be part of. The main issues of the groups were:



- 1. Feedback to the Castilla y León aids to promote R&I (particularly thinking in the mining sector)**
- 2. Knowledge transfer: Collaboration between Companies – Universities – Technological Centers**
- 3. Structures to facilitate sector R&I / R&I in the mining sector**
- 4. Sustainability (environmental, economic and social)**

Because the number of interested people on R&I in the mining sector was too small, finally was decided to join the group (**R&I in the mining sector**) with the fourth one (**Structures to facilitate sector R&I**) because many of the subjects were in general terms similar.



1. Feedback to the Castilla y León aids to promote R&D (particularly thinking in the mining sector)

It was necessary to select the most important policy suggested, focused on the necessity of public awareness:

- **Marketing & institutional** - knowledge of the value chain, by the real society, in the raw material sector.
- The **real implementation of the policy**. It was mentioned positively the new technological centre promoted by Santiago – so is important to have an implementation in different levels.
- Pressure of **adequate indicator**. The necessity to adapt the indicators to the mining sector. Is not exactly the policy instrument but is collateral with them.

The more relevant issues that were discussed were:

- Sustainability
- The recognition and awareness are necessary
- How to reach the necessity of R&I at high level positions. Important point in raw materials is the European positioning, it is really challenging

The conversation was also held around the aspects:

- Now the only added value is to sell the basic product; it is necessary to implement at regional level more steps of the value chain. More added value, not only the extraction, necessity to link the added value to the territory were raw materials are extracted.
- Talking among the main actors involved in the matter is essential to achieve what is planned. So we are also in the Communication subject.
- Positive way to do is important because with this spirit is possible to have good results and implement adequate policy.
- R&I and business are talking very different language. The point is how to transfer the thoughts from R&I to business and maybe the best way is through marketing.
- The dimension is also important in this point.
- In general terms the mining companies are a social problems, especially if the communication is not adequate.
- R&I and environmental exploitation could be a start point to have a different response from the social point of view.

Question: How to sell the regional aids in order to promote R&I?



2. Knowledge transfer: Collaboration between Companies – Universities – Technological Centres

Knowledge transfer: Collaboration between Companies – Universities – Technological Centres

The most important issue in Knowledge transfer is how to start a collaboration and how to keep it alive.

The discussion was around the subjects:

- The importance of picking the good ones and supporting them in order to compete (not “coffee for all”, but smart specialization).
- But at the same time it is important to nurture locally all possibly interesting initiatives (so the choice is pretty difficult).
- Different governance in regions across Europe
- Need for institution to “care” and support the transfer relationships, which otherwise risk to not happen.

The foundation of good collaboration has to be based on:

Trust: based on already existing contacts is easier for small companies, if we consider that the big companies are not competing for research because in general terms they collaborate.

Role of administration as catalyst: As trust is necessary, making network to start working together could be an important step. The need to make the first contacts may be solved through clusters, hubs, etc., and hence the need for support by the public administration. Depending on the region, differences in the governance of this subject were found. It seems that there are a lot of institutions and sometimes it is hard to know but at the same time it is interesting that there are.

Pay attention to possible different approaches: in the case of companies, size is important. The smaller ones have more difficulties to collaborate in H2020, but it's easier at regional level. SMEs don't have the research culture, and most of them don't have a department or even employees to be involved in a research project. On the other side, Research & Technology Organisations (including universities) are more interested in bigger projects than those that can be faced by SMEs.

Projects: It seems that it is not clear if H2020 projects solve problems more reason to think in this way if we take into account that the success rate is very low. Smallest projects can be more focused. This kind of projects must be financed by Regional Government. In general, the university is interested in big projects as H2020 projects because they provide more money and at the same time a kind of “stability” for some years. But companies need to solve and focus their research in “present situation” and not in basic research, so they prefer smaller projects with fast results even the amount of money is not so interesting as a big project.

University: offer to be a link to the Society. They have difficulties in contact with the companies because they are not interested in basic research and as we said previously the finality, the interests of a collaboration between universities and companies are completely different.

Communication of good practices is another important subject to discuss, as it may help some newcomers to “break the ice”, by showing the good aspects and results. We can say that is a transversal aspect for each point.

Research: if we want to raise the technology level the fundamental research is mandatory.

Question: How to start the cooperation and to keep it alive?



3. Structures to facilitate sector R&I / R&I in the mining sector

On this table it discussed about experience in R&I on different size of the companies. One of the comments and experience was that are two levels of R&I. The lower level is related with the local aspects, working directly with the local companies and policy interacting between them.

Then, it discussed about how to improve European production in raw materials. A public organization acting at national level or regional level to put efforts and dedication in the mining sector in European Union to avoid the results of the project to be exploited by Chinese companies can be a solution for that.

Clustering is one of the idea to facilitate the R&I finding a one word, one language that make sense.

We have to think also in the political decision. Who supports and how the R&I in mining sector.

One of the most important aspects is not yet achieved. In many strategies has to be defined exactly how much money is given for what purpose. The budget is a political decision taken by the government especially in terms of ideology. This aspect is a social challenge that makes difficult to change policies.

What can be done in this industry to take profit?. The R&I is independent of the political ideology.

A good lobby is another aspect to take into account. With the clustering industry it can get enough power. But if we look the amount of money in H2020 designated to raw materials, this is a small amount compared to the other challenges like climate, traffic, automotive, energy, the chemistry sector, etc.

Trust – Companies in the mining sector do not take advantage of the existing financing for R&I projects in most of the cases because they do not trust on it.

The social problem or impact is another reason to take into account in order to start or not an R&I project.

Size: Being small company could be a positive point of view in accordance to have the initiative and carry out an R&I project. In general terms the mining sector develops its activity in rural areas and, if is developed by too big companies, is not affordable.

Mining in this way is a subject to analyse by global condition and the investments can be attractive by achieving results but the market is growing. If we want to introduce or attract R&I is just a matter to select in a proper field, as New Technologies. Most of the investments are global and in many cases they have original local practices where they employ local people.

Even if the budget comes from national level the companies must apply with European rules in order not to destroy the competitiveness. But coming from the region level is easier than coming from national level.

R&I can be divided in lower or higher level. In Portugal for example, the mining companies are in fact production companies. They sell to make profit and all other issues are secondary for them. Involving mining companies in H2020 or any R&I project is extremely difficult first of all because they are taking time. All this take from production time because is necessary to assign people to European projects with a constant dedication if we want to have good results. But in some cases mining companies need R&I. They have negotiated with the directors of the minings who is in contact with the local government, let them know that they need to solve specific problem at the mine. Some problems are related with the minerals, others with computation of production. They have negotiated packages getting money to be paid for royalties, or to be used for contracting people,



for example in the case of Portuguese stakeholder for geological services, reporting at the end the results that they get. For R&I there must be financial for mining sector.

How can it be approached in Spain? In national level is possible to have this kind of projects, solving directly the problem, which in fact is what they need. The R&I gives the core business increasing the value of the project. But during a meeting with Spanish stakeholders, they have stated that if they have a problem they solve it asking one each other instead of starting with the university an R&I project, as the results are obtained normally faster. Mining is a very traditional sector, therefore this make it even difficult compared with the other sectors involvement of the R&I.

It also has to take care of the start-ups, the smaller companies which in certain way are working for big companies.

But it seems that mining sector is changing, looking for new technology and also for R&I projects although it will take time. It must be done step by step. It is a lot of space for R&I in small companies. For example the recycling process will became more important in a future.

In Spain are companies doing R&I with public money.

It seems that in some cases the results of a H2020 project can be exploited, and in another cases it cannot be done, because it is being done doing by Chinese companies.

In Germany there are also small companies attracted of H2020 project, some being already partners, but the problem is the long term of the project and that the exploitation is impossible because the marketing is working different sometimes, and the research activity could be successful or not.

Advices:

- Two level for financing R&I project
- Direct negotiation between the company and local government
- Distribution by grant

Question: How can be R&I promoted in mining sector?



4. Sustainability (environmental, economic and social)

The policy suggestion was focused in transparency, communication, involvement of stakeholders, and supervision of the operation.

Lesson:

- Working with local people is inevitable
- To take precaution along the life of the mine from the very beginning of the mining project
- To make rehabilitation in a way to generate benefits for the local people, for the local community after the end of exploitation

Transparency - The lack of trust between the people and how the mining exploitation is done remain on top of the agenda throughout the world in general and in our region in particular. In some situations the sector is leading to more controversy – proper transparency can be uncomfortable. An idea is to focus on how to make transparency an integral and routine feature in regional government and company how has the exploitation of the mining. These reports must have a technical reason and be properly communicated to the people how live where the mining activity takes place.

Communication - as we said in Transparency point communication the real situation to the community is very important if it wants to coexist and get the maximum performance to the each situation. This is still challenging because sometimes the information is not in the public domain. But as we can see by the time is has become a reality and it can find companies which are taking the initiative to publish their own data online.

Involvement of stakeholders – local community - is very important in any sector but particularly in this one. Stakeholders are central to discussions surrounding new laws and regulations, and have helped to coordinate and shepherd legislation through. The stakeholders can give not only knowledge to the sector but at the same time can be able to push to outreach activities, pursue government action with recommendations, target reforms, and continue to carry out the operations events.

Supervision of the operation – to be sure that the whole operation is made according the laws, with the environmental aspects, etc. Ensure continued operations of production shifts through execution of the production plan and schedules. It is also important to ensure adherence to correct safety and operating procedures and compliance with appropriated regional and state laws and regulations. Environmental aspects and the exploitation according with the license obtained is also important to supervise during the exploitation and recuperation of the area.

Question: How to make mining acceptable and useful for people? (Benefits)

5th Peer Review Visit Annexes

PRV preparation materials

Operational programme of Castilla y León 2014–2020

Innovation and entrepreneurship strategy

Peer Review Questions

Status report, Institute for Business Competitiveness of Castilla y León, ICE, Valladolid | Ana Diez, Melania Istrate

PRV presentations

Castilla y León Entrepreneurship & Innovation: Peer Review Remix

| Beatriz Casado

International activities for clustering REMIX-MIREU | Santiago Cuesta-López

Overview of the mining activity in Castilla y León | Ramón Cabrera

The value and sustainability of natural slate – R&D and sustainability in the mining sector | María Pérez Ameneiro

Research and Sustainable Development in Mining Projects – Case of Study: the Retortillo Project | Lucía García, Francisco Bellón

Conference presentations

Strategy of mineral resources in Castilla y León | Ricardo González Mantero

EU Raw materials policy and initiatives | Manuel Gómez Herrero

From Policy to Implementation – R & I, instrument and opportunity
| Lydia González

Pan-European Research & Innovation Funding Programme on Raw Materials | Ana Diez

EIT RawMaterials: the world's largest network for innovation in metals and minerals | Pier Luigi Franceschini

Technology development to exploit more efficiently and sustainably the low grade, complex and polymetallic ores (INMETproject) | Francisco Sanchez

Mining-Environmental Planning and Circular Economy in the framework of Sustainable Mining | Virginia Rodríguez

Standardization for Sustainable Mining | Fernando Utrilla

REMIX – Objectives of Smart and Green Mining Regions of EU | Ilari Havukainen

Mining and metallurgy regions of EU – MIREU | Juha Kaija, Laura S. Lauri & MIREU Team

The Importance of Regions in the Research & Innovation Landscape – ERRIN Network | Ryan Titley

REMIX

Interreg Europe



European Union
European Regional
Development Fund



6th Peer Review Visit Cornwall, UK



REMIX – Smart and Green mining regions of the EU Interreg Europe

Cornwall Peer Review

Wednesday, 16.05.2018

*Camborne School of Mines, University of Exeter,
Penryn Campus, TR10 9FE*

1. Prior Background

Prior to the meeting all participants were sent background reading. This contained information on Cornwall's policies relevant to mining, historical mining and the current exploration/development projects, as well as information on Cornwall's economy and investment in the region. It also discussed CSM's presence in the region and its REMIX aims, along with a list of provisional questions for the peer review.

2. Attendees

Forty eight participants attended (Table 1), representing all project partners with a good mix of project participants and stakeholders. Local representative included University of Exeter project participant (and several colleagues who attended informally for part of the proceedings), Cornwall Council staff (i.e the regional authority) and representatives of a range of local companies. The signed attendance list is deposited on the REMIX dropbox.

1	Exeter PP	25	Panasqueira Mines (SH)
2	Exeter PP	26	Pegmatítica (SH)
3	Exeter MIREU	27	MIT, Czech Republic, PP
4	NTUA PP	28	MIT, Czech Republic, PP
5	NTUA PP	29	SH, Czech Republic, PP
6	General Secretariat of Industry/ SH	30	JOSEK PP
7	Ministry of Environment/SH	31	JOSEK PP
8	Region of Sterea Ellada/ SH	32	Regional Council of North Carelia SH
9	TernaMag/SH	33	JCYL
10	MUL PP	34	Siemcalsa SH
11	MUL SH	35	Oba Sachsen SH
12	RCL LP	36	GKZ PP
13	RCL PP	37	GKZ PP
14	RCL PP		<u>Additional U. Exeter</u>
15	RCL SH	38	Exeter SH
16	RCL SH		<u>Speakers</u>
17	GTK SH	39	Cornwall Council
18	Lower Silesia PP	40	Cornwall Council
19	Lower Silesia SH	41	Cornwall Council
20	Lower Silesia SH	42	Cornwall Council
21	Lower Silesia SH	43	Cornwall Council
22	FCT-NOVA (PP)	44	Petrolab
23	FCT-NOVA (PP)	45	Cornish Lithium
24	LNEG (SH)	46	Cornish Lithium
		47	Exeter PP
		48	Cornwall Council

3. Presentations

During the first part of the meeting there were presentations on a variety of topics to show the mining-related activities in Cornwall and the challenges and constraints, and to set Cornwall into context within the UK. The presentation titles were as follows:

1. *Welcome to Camborne School of Mines, - Head of CSM, Kip Jeffrey*
2. *Introduction to Cornwall - Frances Wall, Camborne School of Mines, University of Exeter (presentation based on background materials circulated previously)*
3. *Setting Cornwall in the UK Context – Tony Hartwell, Sustainable Material Engineering Ltd*
4. *Overview of Minerals in Cornwall from the Perspective of a Cornwall Councillor – Mark Kaczmarek, Cornwall Council*
5. *Minerals Planning Policy in Cornwall – Ellie Inglis-Woolcock, Cornwall Council, (including good practice example of mineral safeguarding policy)*
6. *Mineral Planning Principles and Overview of an Application – Tim Warne, Cornwall Council*

7. Cornwall Mining World Heritage – *Debora Boden, Cornwall and West Devon Mining Landscape World Heritage site. (Good practice in preserving and enhancing mining heritage and linking it to tourism, culture and current mining.)*
8. Petrolab: The Past, Present and Future)– *Chris Brough, Petrolab (Good practice example of a local SME with high export potential that benefits from regional and national (Department for International Trade) business support)*
9. Lithium Exploration Project – *Lucy Crane, Cornish Lithium (Good practice example of a exploration for a novel resource of an element in high demand for battery manufacture)*
10. Cornwall Geothermal – *Caroline Carroll, Cornwall Council (geothermal and mining are closely related and complementary, good practice example of policy and practical support to develop geothermal energy, aiming to generate electricity)*



Figure 1 Participants in the plenary session at the end of the peer review meeting

4. Peer Review and action points

After the presentations the stakeholders split into groups, each with a facilitator, to discuss four peer review topics. The topics were chosen to match the main Cornwall aims with respect to its policy instrument, which at the time of the proposal was the ‘Cornwall and Isles of Scilly European and Structural Fund Investment Strategy’ and is now called the ‘Cornwall and Isles of Scilly Integrated Territorial Investment Strategy’. The peer review discussions were arranged according to the normal REMIX procedure. Results were recorded onto flipcharts (Appendix one) and then each group was asked to distil these into the main ideas/action points that the project team could take forward. These points are shown below.

Topic 1 Digital Economy

REMIX aim for Cornwall partner - Enhance implementation of the Digital Economy smart specialisation

Question - How can mining-related businesses benefit from the digital economy? (facilitator Tony Hartwell)

Summary of outcomes:

1. Exploration – multiple uses of EO data, digitisation of existing data. Good to do at exploration stage – which can be done with public money and made available to all.
2. Life time monitoring of extractives by EO etc (Cornwall Mining Alliance could do)
3. Mining legacy management (Cornwall)
4. Database of mineral rights/mining leases (Cornwall)
5. Digital hub for mining (CSM and others)

Topic 2 Environmental

1. REMIX aim for Cornwall partner - Engage with innovation and best practice in environmental protection and resource efficiency

Question - What are the next innovations for environmental and social mining-related businesses? (facilitator Ed Glucksman)

Summary of outcomes:

1. Help companies make savings in terms of energy, water, resource efficiency, waste etc.
2. Initiative to improve transparency
3. Recycling or reworking old operations
4. Designing/ promoting innovative ideas for post closure use of mine sites
5. Using closing mine to test new technology, both for mining and beyond
6. Geothermal + other renewable energy generation on site
7. Water storage
8. Agricultural opportunities
9. Remote sensing: due diligence, monitoring etc.
10. Helping organisations gain better understanding of mining, e.g. NGO's, youth, public, regulators, governments

Topic 3 - SMEs

REMIX aim for Cornwall partner - Enhance the SME sector, e.g. via the Cornwall Mining Alliance, through a better understanding of how the sector can collaborate to boost individual businesses, using examples of good practice.

Question - How can SMEs collaborate to tackle large contracts? (facilitator Kathy Hicks)

Summary of outcomes

1. Identify and profile models of existing working clusters, from other sectors as well, looking at pros and cons, measures of success and applicability to Mining sector.
2. Start with clusters in REMIX regions. Also look at European Secretariat for Cluster Analysis database, which includes quality benchmarking.
3. Identify which cluster model would work best for us in Cornwall by framing results in a survey to CMA members to gauge opinion/support.

Topic 4 – Big initiatives for next regional policy

REMIX aim for Cornwall partner - Make policy proposals for consideration in post 2020 regional policy instruments.

Question - What are the big initiatives that Cornwall should take to expand mining related businesses? (facilitator Frances Wall)

Summary of outcomes

1. Open a mine!
2. A research training and innovation mine – uni and practical training. Business innovation, e.g. research hub/mining innovation centre. Co-location
3. Mineral rights (workshop to brainstorm)
4. Cornwall minerals framework strategy
5. PDAC - Cornwall - and other mining meetings
6. Look at reworking mine waste in Cornwall
7. Look at possibility of hydrometallurgy alongside mines and waste.

Site Visits, 17.05.2018 – South Crofty Mine, Heartlands and Wheal Jane

08.30 – 9.00	Steering Group meeting Free time for a beach walk in Falmouth for those not attending the steering group meeting.
10.00	Coach collection from Gylly Beach car park
10.30 – 13.30	South Crofty mine visit A former (tin and copper mine that closed in 1998 but is now undergoing dewatering and an exploration programme with a view to re-opening. Two groups of nine visited the upper underground workings. Courtesy of Owen Mihalop and colleagues, Strongbow.
13.30 – 14.30	Visit to Heartlands http://www.heartlandscornwall.com/visitor-info.php Heartlands is part of the Cornwall and West Devon Mining Landscape World Heritage site and is a museum, community and conference centre Lunch at Heartlands Red River Café
15.00	Visit to Wheal Jane site. Wheal Jane has been submitted as a good practice example. A former mine (closed early 1990s) has been redeveloped as an Earth Science Park business centre, with help from EU funds. It now combines rehabilitation of the old mining site and tailings dam, various consultancy businesses, jewellery manufacturing (using Cornish tin), and a solar energy park. Visit courtesy of Bernard Ballard, Wheal Jane Group.
16.30	Return to Falmouth on coach. Minibus from Wheal Jane site to Newquay airport for FlyBe 18:25 flight to London Gatwick
	The monthly 'Mining Sundowner' – an informal gathering of people who work in the mining and related industry was at the Chainlocker pub, Falmouth from about 17.30 to 20.00. Several project participants used the opportunity to meet other members of the local mining-related business community.



At South Crofty mine with host, Owen Mihalop of Strongbow, looking at the old mine plan



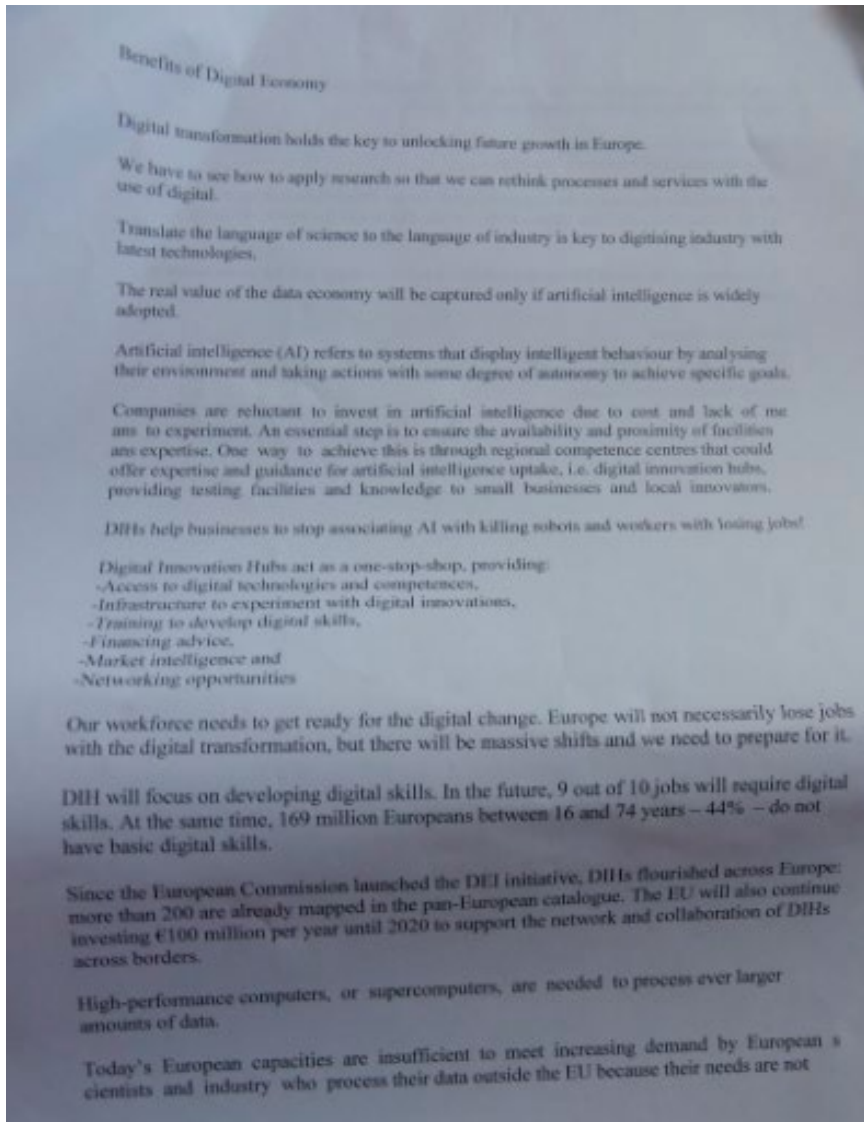
The group at Heartlands, part of the Mining World Heritage site



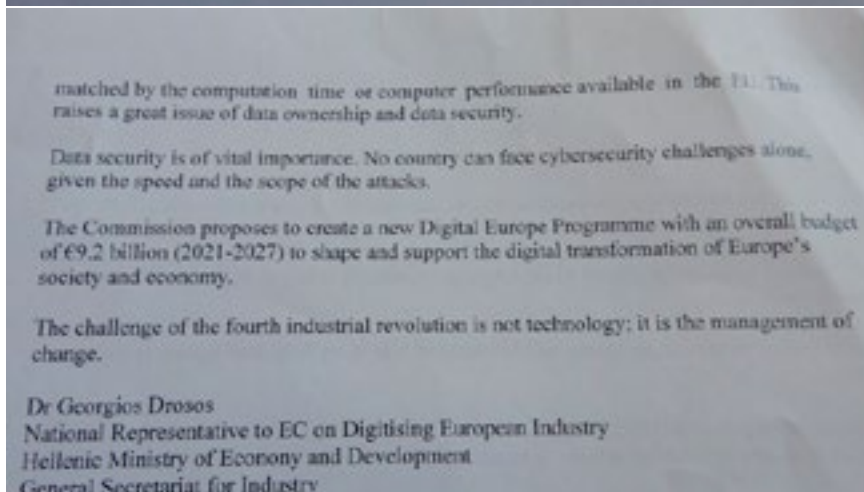
The group at Wheal Jane Earth Science park, example of post-mining regeneration using mining-related skills and facilities

Appendix 1

REMIX CORNWALL PEER REVIEW 16TH MAY 2018 – SUMMARY OF NOTES ON FLIP CHARTS 1. How can mining related businesses benefit from the digital economy?



- How to remotely control underground systems
- Data security
- Change management
- Smart robotics
- Machinery data – external analysis
- Geology data – internal analysis
- Need to change, don't digitalise existing operations
- Digital innovation hub
- Need for training digital skills
- Harness IOT



2. What are the next innovations for environmental and social mining related businesses

- Society's understanding of mining – negative impressions (illiteracy) and give information
- Reducing mining's impact on the public / environment
- Circular economy : e.g. turning waste into useful products but the 'circle is growing'
- Cumulative impacts: when two or industries compete e.g. land users vs. mining vs. tourism
- Cultural heritage v active industry. Both can be completed with operations.
- Temporal challenges : long term v short term and lack of closure planning
- Reuniting communities / families split between industry and the rest
- Defining SLO: not a license!
- Partial, continuous rehabilitation
- More local
- Discrepancy between requirements and making people care about env/soc impacts
 - Open, transparent process, make people feel involved
 - Education, as early as possible (both Suerday and the operators)
 - Temporal challenges : long term v short term and lack of closure planning

Business Perspective

- Initiative to improve transparency
- Financial perspective: savings in terms of energy / waste etc.
- Recycling or reworking old operations
- Improve reputation
- Improving / refining processes to be more efficient
- Improved strategy on E+S
- Old quarries: turned into activity park + active/mines require only signage (safari pets / photography etc.)
- Developing marketing strategy
- Using closing mine to test new technology, both for mining and beyond
- Digitalisation of the industry
- Geothermal + other reservable's on site
- Water storage
- Agricultural opportunities
- Awareness raising workshops for youth
- Using a 3rd party to explain benefits / spread information
- Remote sensing: due diligence etc.
- NGO's with better understanding of mining

3. How can SME's collaborate to tackle large contracts?

- Public funding
- Seed funding

- Strengthening the distribution of available information (special experiences and competencies) could be helpful, if regional partners don't know exactly what the other provide – meetings / newspapers
- Transparent selection for large contracts – quality benchmarks or member profiling based on experience etc.
- Quality benchmarking of services + commercial structure – competent person spearheading the alliance
- Branding/PR
- Matchmaking organised by university's and/or research organisations
- SME can overcome a critical site in respect to available man power if they have the option to collaborate with other SME (U staff leasing?)
- SME's can avoid competition in their alliance only if they don't offer / produce a service/products competitive to other members of the alliance
- Once the company becomes to be competitor to other member of the alliance it leaves the alliance
- Combination of membership subscription and commercial projects to fund alliance admin
- Matchmaking event with big mining companies and SME's - what investments they have coming up to which they need SME services for

4. What are the big initiatives that Cornwall should take?

- Open another mine
- To do this – education (mining/raw materials) / travel, languages
- Local needs for raw materials
- Cornwall minerals framework strategy
- Streamline planning and permitting – Poland – complicated / Germany – one stop shop in Saxony / UK – Planning clear. Min rights unknown, regional agency in CC rather than Land Reg.
- Consultation process
- Go to Global meeting e.g. PDAC

Fundamental resource exploration – regional

- Idea – 'strategic', 'critical', - for Cornwall as well as national / international
- Resource cadastre (e.g. in Saxony) BGS?
- Plans for waste-markets
- Environmental and social
- Geophysics and other tech

Re-work mine tailings

- Li-mica dams
- What else? Coltan?
- Permitted in minimum safeguard – others not (needs research project)



- Consider legislation / heritage
- Marine minerals
- Crown estates – issuing licences – this is national / crown estates admin

Expand use of CSM Graduate expertise

- Innovation centre / hub of excellence
- Cluster approach
- Improve infrastructure (e.g. trains) so attractive to live and work in Cornwall
- Automation Robotics (integrate WHS – to show modern mining)
- Metallurgy – recycling and mining
- Hi tech processing – hydromet (SME) (KGHM waste)
- Start ups
- Link to innovation centre
- Policy alongside mine development

6th Peer Review Visit Annexes

Preparation materials

Cornwall peer review background material

| Frances Wall, Kathy Hicks, Nathan Cudmore

Status report of the University of Exeter

| Elizabeth Adey, Frances Wall, Kip Jeffrey

Presentations

Mineral Planning Policy in Cornwall | Ellie Inglis-Woolcock

Mineral Planning Principles and Overview of an Application | Tim Warne

Cornish Mining World Heritage | Deborah Boden

Cornish Lithium | Lucy Crane

Cornwall's energy future | Caroline Carroll

Cornwall peer review background FW talk | Kip Jeffrey

Questions for the Cornwall peer review

REMIX

Interreg Europe



European Union
European Regional
Development Fund



7th Peer Review Visit Sterea Ellada, Greece



National Technical
University Of Athens

REMIX -Smart and Green Mining Regions of EU

Reporting on the
7th Peer Review Meeting of Remix Project
Region of Sterea Ellada
16-18 October 2018

Organizing Committee:

Professor Ioannis Paspaliaris, Scientific Responsible

Dr. Chrysanthi Panagiotopoulou, Senior Researcher

Dr. Asimina Katsiapi, Senior Researcher

Irene Tsertou, Junior Researcher

December 7th, 2018



Synopsis..... 3

Policy Instrument 8: Regional Operative Program of Sterea Ellada..... 8

Regional Development in terms of innovation and environmental protection
- Connection with the Raw Material Sector 12

*Section 1, National RIS3, Circular Economy and EIT Education initiatives as
means of Regional and National development..... 12*

*Session 2, Innovation and Environmental protection as drivers for the
development for Greek Mining Industries..... 13*

Session 3, Networking Potential of Regions..... 14

Session 4, European projects: innovation in the service of civil society..... 14

Peer Review Session 15

Remix Workshop -Round Table Discussions..... 19

Feedback from Peer Review Workshop..... 19

 Roundtable #1#..... 20

 Roundtable #2#..... 20

 Roundtable #3#..... 21

 Policy suggestions and lessons to take home..... 21

 Roundtable #4#..... 21

 Policy suggestions and lessons to take home..... 21

Remix Site Visit 23



Synopsis

Smart and Green Mining Regions of EU (REMIX) encourages resource efficient production of raw materials and environmentally and socially acceptable production of raw materials, including critical raw materials. Growth and competitiveness of European industry is currently limited by the state of play in these two areas and policy instruments have been set up across Europe to address these important topics. REMIX brings together 9 partners and 1 advisory partner from 9 countries to work on 8 policy instruments, 5 of them are structural funds.

These regions are at different stages in the mining cycle and have complementary resources and profiles. The project will advance innovation in their regional mining value chains, of large and small scale companies. Regions rich in mineral resources have an important strategic role in Europe. Collaboration between EC and regional policy makers is needed to develop complementary approaches, which will boost EU competitiveness and stimulate sustainable development, growth, jobs and new SME industries. The project contains regional meetings to involve all the key stakeholders. Five in-depth international workshops will be targeted to specific topics and two teams will be formed to carry out 9 peer review study visits.

The 7th Remix Peer Review Meeting was held in the European Cultural Center of Delphi, Focis Prefecture. In total, 85 persons participated in the Remix Peer Review processes that comprised

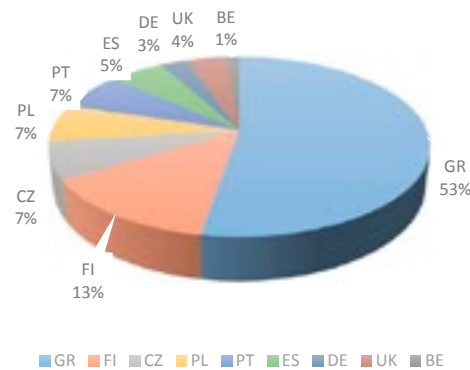
- ✓ presentations of the Region of Sterea Ellada as a whole, presentations of the Regions' industrial network and presentations of the framework conditions behind policy making
- ✓ the round table discussions and,
- ✓ clustering with other projects.



Approximately 40 persons were partners and stakeholders of the visiting Remix Regions, as well as representatives of Associations from other European Regions. The hosting delegation had a strong presence consisting of several high level professionals representing Greek key sectors, such as:

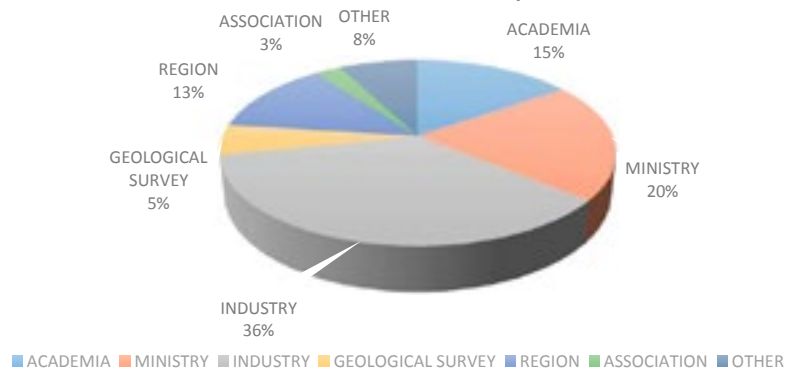
- ✓ Region of Sterea Ellada
- ✓ Academia
- ✓ Ministries and appointed Secretariats
- ✓ Mining industries
- ✓ Metallurgy industries
- ✓ Materials Industrial Research and Technology Development Centres
- ✓ Energy providers

REMIX 7th PRM Overall Participation



The final destination of the 7th PRM was to outline the significance of mining and metallurgical activity in the Region of Stera Ellada and, at the same time, to promote exchange of experience so as to enrich the good practices guideline. The results of the meeting will be used to improve Policy Instrument 8, complying with the Project's objective to enhance the sustainable mining and related industry targeting to positive impact on sustainable development.

REMIX 7th PRM Greek Participation



National Technical University of Athens was responsible to design and implement the 7th Peer Review Meeting. The basis of its content was provided by four stakeholder meetings during semester 2,3 and 4. The vivid engagement of diverse key stakeholders from Ministries (i.e Greek Ministry of Environment, Ministry of Development), Academia, Geological Surveys and Mining and Metallurgical Industries (Aluminium of Greece, Delphi Distomon SA, Imerys SA, GMMSA Larco, TernaMag SA etc) allowed NTUA to deploy a scheme of work aiming to the effective implementation of the PRM.

Ultimately during the 2-day meeting, significant issues were discussed such as the challenges and prospects for the mining and metallurgy sectors, the framework conditions that may favor or inhibit the development of raw material sector in the Region of Sterea Ellada as well as the funding opportunities for innovation and development.



The Remix Peer Review Meeting in Delphi, was structured in the following way:



Tuesday October 16th

10.30-11.00	Registration
11.00-11.45	<p>Conjunction: REMIX-MIREU Networking Regions within the field of "Regional Development in terms of innovation and environmental protection - Connection with the Raw Material Sector"</p> <p>Section 1: "National RIS3, Circular Economy and EIT Education initiatives as means of Regional and National development"</p> <ul style="list-style-type: none"> • "The National Smart specialisation Strategy synergies with the regional level", <u>Dr. Agnes Spilioti</u>, General Secretariat for Research and Technology • "Circular economy as a business opportunity", <u>Dr. George Drosas</u>, Head of Business Innovation Policy Support Department, National Representative to the EU for Digitising Industry, Ministry of Economy and Development • "Educational strategy of EIT: How can the raw material sector benefit through educational initiatives", <u>Professor Katerina Adam</u>, Regional Centre Greece- EIT/ NTUA
11:45-12:30	<p>Section 2: Innovation and Environmental protection as drivers for the development for Greek Mining Industries</p> <ul style="list-style-type: none"> • "Challenges and opportunities in the mining and metallurgical sector", Athanasios Kefalas, Greek Mining Enterprises Association • "Valorising the bauxite residue in the frame of industrial symbiosis - Prospects and Challenges", Efthymios Balomenos, Metallurgical Engineer, PhD, Residue Valorization - External associate at Aluminium of Greece
14.00-15:00	<p>Section 3: Networking potential of Regions</p> <ul style="list-style-type: none"> • <u>Dr. Chrysanthi Panagiotopoulou</u>, NTUA, MIREU WP Clustering • <u>Dr. Wolfgang Reimer</u>, GKZ Freiberg, MIREU WP Networking Regions <p>Greek Regions: Region of Sterea Ellada</p> <p>Invited European Regions:</p> <ul style="list-style-type: none"> • <u>Regions of Lapland/ North Karelia</u>: "Finnish sustainable mine network" • <u>Region of Castilla y Leon</u>: "Raw Materials strategy at Castilla y Leon region & the Iberian sustainable mining cluster", <u>Dr.Santiago Cuesta-Lopez</u>, ICAMCyL General Manager
15:00- 16.30	<p>Clustering Session: European projects: Innovation in the service of civil society</p> <ul style="list-style-type: none"> • Regional Centre Greece/ EIT Raw Materials, <u>María Tziolarchou</u>, National Technical University of Athens • MIREU, <u>Kaisa Turunen</u>, Geological Survey of Finland • MinLand, (presentation title and presenter TBC) • CICERONE, <u>Dr. Wolfgang Reimer</u>, GKZ Freiberg <ul style="list-style-type: none"> • Removal, Scale, EURARE, ENEXAL: "Industrially lead research in raw materials- Past and ongoing projects in Mytilineos SA", <u>Efthymios Balomenos</u>, Metallurgy Engineer, PhD, Residue Valorization -External associate • MinGuide, (presentation title and presenter TBC) • VERAM, "VERAM Vision and Roadmap for European Raw Materials in 2050", <u>Rafael Sclap</u>, Analysis, Legislation and International Cooperation Manager, Lawyer – Project Manager, President of ETP SMR nominated by KGHM.
16.30- 18.30	REMIX Steering Group Meeting (REMIX Partners)

Wednesday October 17th

09.00 - 09.30	<p>Welcome speech by:</p> <ul style="list-style-type: none"> • Region of Sterea Ellada • NTUA, <u>Professor Ioannis Paspaliaris</u>
09.30 - 10.10	<p>Introduction of the Region of Sterea Ellada</p>
10.10 - 10.30	<p>Regional Operative Programme ROP of Sterea Ellada 2014-2020- Presentation of specific targets- <u>Konstantinos Mavetis</u></p>
11.00 - 11.30	<p>"New provisions of the licensing process for quarry minerals and ores", <u>Diamantoula Lamboou</u>, Ministry of Energy and Environment</p>
11.30 - 11.50	<p>"Digitising Industry - Industry 4.0", <u>Dr George Drosos</u>, General Secretariat for Industry- Ministry of economy and development</p>
11.50 - 12.10	<p>"Financing opportunities for R&I activities in the fields of raw-materials and environment through the Operational Programme Entrepreneurship", Competitiveness and Innovation 2014-2020, <u>Dr Antonios Gypokis</u>, General Secretariat for Research and Technology</p>
12.10 - 12.30	<p>Educational, Research and Innovation Potential of the Region- The Regional Centre Greece- <u>Maria Tavlarachou</u>, National Technical University of Athens</p>
14.00 - 14.15	<p>"Innovative mining for minimum landscape and environmental harm helps being accepted" - <u>Havaliampos Telmopoulos</u>, Head of production for Delphi-Distomon SA Mines</p>
14.15-14.30	<p>"Evolution and improvement of rehabilitation methods and practices in bauxite mines"- <u>Aristoteles Ksilikakis</u>, IMERYS SA</p>
14.30-14.45	<p>"Operations of Mining and Metallurgical Company LARCO & Sustainable Practices" - <u>Ypochi Kiriilidi</u> GMM SA LARCO</p>
14.45-15.00	<p>"TERNA MAG: The revival of a world famous Greek magnesite activity"- <u>Filippos Bourkas</u>, Head of Technical Support and R&D, TERNA MAG SA</p>
15.00-15.15	<p>"Mytilineos SA - Metallurgy Business Unit"- <u>Asterios Dellapapas</u>, Director of Environment, Health, Safety and Continuous Improvement, Mytilineos SA, Metallurgy Unit / Aluminium of Greece plant</p>
15.15 - 17.15	<p>Peer Review Workshop (Parallel Round table Discussions) Round Tables:</p> <ul style="list-style-type: none"> ➢ Innovation and research as development drivers in Mining and Metallurgy ➢ Institutional and framework challenges and opportunities for the development of the raw material sector ➢ Digitizing Mining and Metallurgy Industries - Prospects, Benefits and Challenges ➢ Education in the Raw Materials sector <p>To be performed in three consecutive rounds:</p> <ul style="list-style-type: none"> ✓ Round 1: What is/are the question(s)/behind the questions posed by the region? ✓ Round 2: Policy suggestions; how the new question could be addressed? ✓ Round 3: Lessons to take home for each region/country at each table
17.15 - 17.45	<p>Synthesis of Peer Review Findings</p>

Thursday October 18th

Site Visits

- Guided tour in Vagonetto Focis Mining Park
- Visit to the Aluminium of Greece Industrial Plant



Policy Instrument 8: Regional Operative Program of Sterea Ellada

Based on the PA (Partnership Agreement for the Development Framework) 2014-2020 architecture and the resulting allocation resources and actions, the promotion of the region of Sterea Ellada development strategy is dependent to a large extent by effective and targeted activation of their resources sectoral OPs, as well as complementarity between national and EU programs regional actions.

TO 1: Strengthening research, technological development and innovation

Investment priority	Comments
<p>1a Actions enhancing research and innovation infrastructure and development capacities of excellence in research and innovation and promoting centers of competence, in particular European interest centers</p> <p>1a.1 Specific target of investment priority: Upgrading and expanding public research structures for smart specialization</p>	<p>-In the Region of Sterea Ellada, R & D infrastructures are limited. Also, the percentage of related of expenditure in respect of regional GDP is far from the target of 3% set by the EUROPE 2020 Strategy but also from national target of 1.2%.</p> <p>- The target of the country is the incensement of national R & D expenditure to 1.2% of GDP by 2020.</p>
<p>1 b Actions promoting business investment in research and innovation, developing links and synergies between businesses, research and development centers and higher education, particularly by promoting investment in product and service</p>	<p>-Private businesses of the Region, especially the SMEs, lag behind related to technology and do not have the same infrastructure for research and development. There is a poor interface and cooperation between public research centers and universities. Therefore,</p>



<p>development, technology transfer, social innovation, eco-innovation, in public service applications, to encourage demand, networking in clusters and open innovation through smart specialization and supporting technological and applied research, pilot projects, rapid ratification product actions, advanced manufacturing capabilities and first production, especially in key technologies, and dissemination of enabling technologies</p> <p>1β) Specific target of investment priority: Increasing the participation of private enterprises in RTDI (Research, Technological Development and Innovation) activities</p>	<p>the technological support, cooperation and technology transfer are necessary at all the levels.</p> <p>-It should be strengthened the innovative content of selected branches RIS3 while at the same time is a necessity to set up new business with technological orientation.</p> <p>-There are not innovation business networks in Region.</p>
---	--

Priority 1α

With the above mentioned actions intended to enable the research potential and the acquisition of laboratory equipment suitable for carrying out applied research. Also, these actions concern local scale projects complementary to the actions targeting larger scale projects of the EPANEK (Operational Program Competitiveness, Entrepreneurship and Innovation 2014-2020). These actions are primarily targeted at research organizations, as beneficiaries of the region (academic institutions). Direct beneficiaries are the research staff and the businesses in the region of Sterea Ellada. It is noted that no call for investment will be published under the investment priority if the regional and national smart specialization strategy is not completed.

Priority 1 β

Primarily, it is intended to increase the cost and investment in RTDI activities of privately owned businesses in the region, which are particularly low. It also promotes co-operation for RTDI between enterprises on the one hand and research institutions on the other. Through the implementation of the actions, greater mobilization of the private sector in RTDI actions is expected as well as the development of the endogenous technological capacity of the



enterprises concerning the targets proposed by Research and Innovation Strategies for Smart Specialisation (RIS3). The technological upgrading of companies will enable their operations through improving, diversifying or devising new products and processes resulting in the increasement of competitiveness and extroversion of both the business itself and the whole of the regional economy. At the same time, the development of a new culture of innovation, as well as the dissemination of the results will be achieved through the synergy and cooperation in the field of RTDI.

TO6: Preserving and protecting the environment and promoting resource efficiency

Investment priority	Comments
<p>6z. Support for industrial transition to an economy with efficient use of resources, promoting green development, ecology innovation and management of environmental performance both public and private sector.</p> <p>6 ž Specific target of investment priority: Expansion of eco-innovation applications</p>	<p>-There is need for protection and support industrial activity in Region with terms eco-innovation and achievement of environmental objectives</p> <p>-In this direction, development needs for the region of StereaEllada constitute the implementation of Spatial Planning and Urban Planning Design and the effective strengthening of policy and legislation mechanisms, through and aiding the administrative authorities' structures.</p>

Priority 6ž

The desired effects are to increase investment in the rational management of resources, to save material flows and to recover them, as well as the development and use of new materials will reduce production costs contributing to the protection of the environment, expansion and enhancement of local development. Furthermore, the development of "green" entrepreneurship, research and eco-innovation will have positive effects in the .the economy and the environment of the region. Last but not least the employment will be increased and residents' quality of life will be improved.

Efficient use of resources, both for the protection of the environment and for the improvement of economic efficiency, is one of main objectives of the Strategy for Europe 2020 as well as of



Regional Strategy for Sustainable Development. The accomplishment of the target will take place through:

- ✓ Strengthening of investments for the rational management of resources, saving inputs and recovering them, use of new materials.
- ✓ Promoting investments in "green" development and environmental technologies.
- ✓ Collaboration between research units and businesses to promote eco-innovation projects.

Priority Axis	Funding	Region category	Thematic Objective	EU contribution (euro)	National contribution (euro)	Total (euro)
1	European Regional Development Fund	Transition	Strengthening research, technological development and innovation	2.770.516	2.770.516	5.541.0320
6	European Regional Development Fund	Transition	Preserving and protecting the environment and promoting resource efficiency	6.511.398	6.511.398	13.022.796



Regional Development in terms of innovation and environmental protection - Connection with the Raw Material Sector

Section 1, *National RIS3, Circular Economy and EIT Education initiatives as means of Regional and National development*

Dr Agnes Spilioti (Head of R&DI Policy Planning Directorate, General Secretariat for Research and Technology), presented the National Smart Specialization Strategy and the Synergies at Regional Level. Dr Spilioti started her presentation by giving an overview of the business sector in Greece. She highlighted that research sector is relatively small regarding R&D personnel as % of labour force but, at the same time there is a highly competitive human research potential regarding the EC financial contribution and the citation impact of publications. In addition, Dr Spilioti stressed out that Greece is a moderate innovator despite the good performance in academic scientific indicators. Furthermore, the competitiveness gap between knowledge and low cost economy is the initiative for addressing major policy challenges (i.e. new business models, combat brain drain, create favorable framework conditions of the research potential etc.). As an ex-ante conditionality (precondition) for the activation of Partnership Agreement 2014-20 Greece has developed 1 National and 13 Regional Smart Specialisation Strategies. Dr Spilioti explained in detail the National Strategy and the distribution of funds stating that the budget for the implementation of the Thematic Objective 1: Fostering of Research, Development and Innovation for Region of Sterea Ellada is risen to 5.54 m euro and is distributed to the all regional specificities (Agrofood, Tourism, Metal Value Chain, Green Energy). Dr Spilioti acknowledged herself as the appointed GSRT representative for providing information with regards to the ROP of Sterea Ellada.

Dr George Drosos (Head of Business Innovation Policy Support Department, National Representative to the EU for DITISING Industry, Ministry of Economy and Development), presented the Circular Economy as a business opportunity and explained why the circular economy is an opportunity and a need for Greece. Dr Drosos stressed out that the new economy model (from linear to circular economy) is a "catalyst" for efficient reconstruction and has a clear regional dimension because it is based on the proper use of resources, the idea of recycling - reuse and the model of industrial co-existence. Furthermore he underlined that the circular economy encourages the use of secondary materials and waste as productive resources and useful materials, giving a sustainable dimension to the productive model. A key strategy to that direction is to strengthen the Circular Entrepreneurship by encouraging the idea of eco-design, long-life products, repair, refurbishment, reuse, restoration, industrial co-operation (clusters, innovation parks, incubators, the promotion of innovative entrepreneurship models (e.g. sharing economy), support for the organic economy, the promotion of green and circular public procurement, supporting use of secondary materials. Dr Drosos also presented the National Initiatives and Actions for the implementation of circular entrepreneurship for the next two years by the Ministry of Economy and Development.

Katerina Adam, Assoc. Professor in School of Mining & Metallurgical Engineering, National Technical University of Athens, made a presentation focused on the Educational Strategy of the European Institute of Innovation and Technology- EIT Raw Materials. Professor Adam gave an overview of the vision and the mission of EIT, explaining why Learning & Education are major pillars of its activities. A detailed analysis on how the Raw Material sector could benefit from educational initiatives was given just before Professor Adam elaborated on the value of NTUA and other Greek organizations' (IGME, GMEA, UOA) active involvement in the Greek Raw Material Sector. At the end of her presentation, Mrs. Adam highlighted the contribution of NTUA in EIT RM education projects (such as participation as key partner in summer schools for raw materials or providing online courses etc.).

Session 2, Innovation and Environmental protection as drivers for the development for Greek Mining Industries

The inaugural presentation for Session 2 was made by **Mr Athanasios Kefalas**, President of Greek Mining Enterprises Association. Mr. Kefalas began his presentation by stressing out the importance of minerals in industry and everyday life and underlined the competitive advantage for the Greek economy due to its significant various resources (lignite, magnesite, perlite, laterite, bauxite, aggregates, marble, bentonite, gypsum). Another point indicated by Mr. Kefalas was the role of Greek Mining Industry during the recent economic crisis. He highlighted the numbers contribution of mining sector to the growth, extroversion, employment and investments in the country. In addition Mr. Kefalas mentioned that the Greek public opinion embraces the mining industry as a driver of growth and competitiveness but there is a common debate between mining and tourism sector. In that frame Mr. Kefalas described various examples which made clear that the successful symbiosis both mining and tourism is possible. Digitalization is definitely an opportunity according to Mr. Kefalas and he argued that the efficiency and the growth are drivers for the industrial and commercial excellence; innovation and strategy; pilot programs.

Dr Ethymios Balomenos, Metallurgy Engineer represented Aluminium of Greece, the leading industrial producer of alumina and aluminium in S.E. Europe. AoG owns the largest vertically integrated bauxite, alumina and aluminium production in European Union. Dr Balomenos, after presenting briefly the lifeline of the plant explained the formation of bauxite residue and the compatible methods of management of this kind of waste and he described in depth the activities for the residue valorization. In 2006 the first filter press was installed in order to remove the water content from the slurry. The 100% dry disposal of all bauxite residue from alumina refinery has as a result the safe legal deposition in-land and the easy transportation in other industrial facilities for re-use. Dr Balomenos highlighted that the Filter Press Process is considered as BAT and he described the process in more details. Even though the deposition in land is safe, the big volumes of deposition are a challenge for the company. Various utilizations of bauxite residue are implemented such as alternative for REE, aluminosilicates as raw materials for building products (cement, insulation materials etc.). However there is not a feasible utilization of valorizing 100% of produced BR.

Session 3, Networking Potential of Regions

Session 3 was dedicated to the exchange of experience between European Regions. The Coordinator of Remix Project, Mr. Ilari Havukainen on behalf of Regional Council of Lapland presented the Finnish sustainable mine network and Dr. Santiago Cuesta-Lopez ,General Manager of ICAMCYL Foundation spoke about the Raw Materials strategy at Castilla y Leon region and the Iberian sustainable mining cluster.

Session 4, European projects: innovation in the service of civil society

The main goal of this session was to highlight the strong correlation between European Projects and civil society challenges and to explain the way these challenges are addressed through project implementation.

- ✦ Maria Taxiarchou (Assist. Prof., National Technical University of Athens) presented the Regional Centre of Greece/EIT Raw Materials
- ✦ Kaisa Turunen (Geological Survey of Finland) presented the MIREU project.
- ✦ Chrysa Panagiotopoulou (Senior Researcher, National Technical University of Athens) gave presentation for the MinLand project.
- ✦ Dr. Wolfrang Reimer (GKZ Freiberg) presented the CICERONE project.
- ✦ Dr Panagiotis Davris (Mytilineos S.A) presented the Removal, Scale, Eurare, Enexal projects, past and ongoing projects in Mytilineos S.A
- ✦ Eirini Tsertou (Junior Researcher, National Technical University of Athens) briefly introduced the MIN-GUIDE project.
- ✦ Rafal Szkop (Analysis, Legislation and International Cooperation Manager, Lawyer-Project Manager, KGHM) presented the VERAM project.

Peer Review Session

The Peer Review Meeting for the region of Sterea Ellada took place following the Project's guidelines

Georgios Zacharis (Region of Sterea Ellada) introduced the Region of Sterea Ellada, providing economic and policy information which constitute the context of the Region. The Region of Sterea Ellada owns the 4.64% of the country's Gross Domestic Product, it is the 6th among the 13 Greek regions and it is the 2nd in Greece for expenditures on R&D in business sector. In his conclusion, he presented the key research organizations players (Universities and Research Centres) of the Region such as the University of Thessaly, the Technological Educational Institute of Central Greece and Materials Industrial Research & Technology Center (MIRTEC) S.A.

Konstadinos Meletis (Region of Sterea Ellada) spoke about the Regional Operative Programm (ROP) of Sterea Ellada and presented the specific targets. Creating local and overseas partnerships to promote research and innovation as well as reorientation of primary sector towards extroversion, competitiveness and innovation are priorities of the Operational Program of the region. Konstadinos Meletis continued his presentation by explaining the funding sources such as Partnership Agreement 2014-2020, Rural Development Program 2014-2020, Operational Program Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPAnEK), Juncker Program, European Programs.



In addition, Mr Meletis focused on Dynamics sectors inside the region and he stressed out that Metals Sector employs 41.4% of the human resources of manufacturing and 45% of exports. Also, he gave emphasis in developments, which should be done for strengthening the competitiveness of metal businesses, and in efforts for joining in European innovation networks.

Dr Diamantoula Lampou (Directorate General for Mineral Raw Materials, Ministry of Environment and Energy) presented the "New provisions of the licensing process for quarry minerals and ores ". Dr Lampou structured her presentation around the Mining activity in Greece (265 quarries of marble natural stones, 158 quarries of construction minerals (aggregates), 67 quarries of industrial minerals, 52 mines (lignite excl), 15 mines of lignite (electricity generation)). She continued her presentation by explaining mining and quarrying facts (87 environmental permits and licenses (2015), 40 new licenses-exploration/exploitation

Dr Diamantoula Lampou (Directorate General for Mineral Raw Materials, Ministry of Environment and Energy) presented the "New provisions of the licensing process for quarry minerals and ores ". Dr Lampou structured her presentation around the Mining activity in Greece (265 quarries of marble natural stones, 158 quarries of construction minerals (aggregates), 67 quarries of industrial minerals, 52 mines (lignite excl), 15 mines of lignite (electricity generation)). She continued her presentation by explaining mining and quarrying facts (87 environmental permits and licenses (2015), 40 new licenses-exploration/exploitation



(2015), 18,000 employees (2015), 120 public servants directly related to minerals exploitation/exploration, 110 Institute of Geology and Mineral exploration (IGME) researchers (2015). Dr Lampou also informed the participants about the legislative framework for quarry mineral and ore exploration, as well as for the administrative tool business notification. In addition, Dr Lampou pointed out that the digital environmental registry of quarrying and mining projects optimizes the environmental permitting processes by transforming the current permitting status in a fully digital processing platform and workflow. Last but not least, Dr Lampou presented the access tools to Information such as annual mineral reports, administrative actions and decisions, environmental impact assessment licenses, etc .

Dr George Drosos (Head of Business Innovation Policy Support Department, National Representative to the EU for Diting Industry, Ministry of Economy and Development) gave presentation entitled "Digital Metamorphosis of Industry -Industry 4.0". Dr Drosos started his presentation with the impact of the fourth industrial revolution. He highlighted that there is no doubt that digital metamorphosis redefines jobs and creates the need for new skills. According with Dr Drosos, attention should be given in four points: (1) Be responsive: train and upskill those already in the labour market with jobs of medium and lower specialization [that are expected to be more affected by automation], in order to mitigate social disparities. (2) Be



proactive: prepare the workforce for the future skills – both digital and more generic soft ones. One of the major challenges is the growing gap between the skills mastered today with those expected to be in need tomorrow, Dr Drosos said. (3) Ensure a conducive environment for research and effective links with the Industry. (4) Engage in an active dialogue industry and social partners. In addition, Dr Drosos presented the Digital Europe Program for the next programming period (2021-2027) as well as National Initiatives for

the Digital Transformation of Industry. The Ministry of Economy and Development announced in June 2018 two initiatives, "Digital Step" and "Digital Jump" (NSRF 2014-2020), with a total budget of 100 million Euros (50 million Euros each). The Ministries of a) Digital Policy, Telecommunications and Media and b) Economy and Development plan a new initiative, the "Greek Industry 4.0", with a budget of approximately 20 million Euros. Last but not least, a company's profits from the sale of a product, for the production of which an internationally recognized patent (in the name of the same company) is used, are exempt from income tax for three consecutive years. Dr Drosos concluded that the challenge of the digital age is not the technology is the management of change.

Dr Antonios Gypakis (Planning and Programming of Policy Actions for R&I Directorate, General Secretariat for Research and Technology) gave presentation entitled 'Financing opportunities for R&I activities in the field of raw-materials and environment through the Operational Programme Entrepreneurship, Competitiveness and Innovation 2014-2020'. Dr

Gypakis started his presentation with financial information. In continue he analyzed the main implementations instruments of the National RIS3. He explained in details the goal of promotion of research activities between business and academia and he highlighted the "Materials and Constuction" Priorities. In addition, Dr Gypakis presented the actions which take place for the support of innovation intermediaries such as the development of Competence Centers and Innovative Business Clusters. He continued with the analysis of the actions (Bilateral RDT Collaboration, ERANETs /JU /JPIs etc.) for the international collaboration and he presented the "new" Research and Innovation Programme on Raw Material to foster Circular Economy, ERAMIN 2. Dr Gypakis presented also the "EquiFund" which is a new initiative for Greece. Dr Gypakis mentioned lastly how the research infrastructures will be developed. "The existence of a multi-annual plan for budgeting and prioritization of investments" is an important initiative that will contribute to the above mentioned goal.

Assist. Professor **Maria Taxiarchou** from National Technical University of Athens presented the activity of the newly established Regional Center of Greece (EIT Raw Materials HUB - RCG). EIT Raw Materials is the world's largest raw materials community with the primary goal of turning raw materials into a strategic force for Europe, boosting the competitiveness, growth and attractiveness of the raw materials industry - through radical innovation, new approaches to education and guided entrepreneurship. Professor Taxiarchou emphasized that the EIT Raw Materials Regional Innovation Framework (EITRIS) of Regional Innovation Scheme (EITRIS) aims to help strengthen the innovation potential of countries and regions with moderate and low performance in innovation such as Greece. In this context, the RCG Regional Center will be a local entity that will act as an "interaction point" between EIT RM and the Hellenic Raw Materials Community to mobilize and internationalize local and regional networks.

Haralampos Tzimopoulos, Head of production for Delphi-Distomon SA Mines elaborated on the challenges meet the Greek mining sector ie heavy bureaucratic procedures, land use planning legislation etc. Mr Tzimopoulos explained the new mindset in worksite designing and analyzed in details the benefits *stay underground and be invisible the longer possible; harm as less as possible new surface area*. Nevertheless, this has also risen new challenges. For example, in order to expanded and complex drift network with long transportation there was a need for installation of modern communication system which was portable, wireless and provided simultaneous communication all around the mine and with the mining center. In any case, the underground mining trend has proven efficient, reliable and provider of continuous improvement.

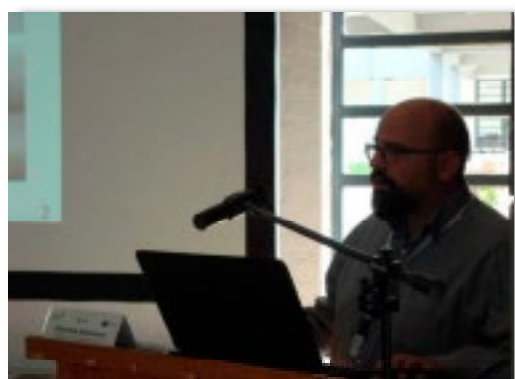


Aristotelis Ksilikakis, Director of Imerys mines presented the "Evolution and improvement of rehabilitation methods and practices in bauxite mines", introducing the company's responsibilities and the challenges during the bauxite mines rehabilitation. For the accomplishment of rehabilitation, Imerys has collaborated with various organizations such as the Institute of Mediterranean Forest Ecosystems and Forest Products Technology, Aristotle University of Thessaloniki (Department of Forestry and Natural Environment), University of Athens (Department of Biology-Botany area), University of Patras (Geology Department), Research Center FIB (Finsterwalde Germany), University of Thessaly, Goulandris Natural History Museum.

Ypatia Kirilidi as the representative of LARCO General Mining & Metallurgical CO. SA presented the operation and sustainable practices of LARCO Company. Mrs Kirilidi focused on the issues of land occupation & rehabilitation per year as well as in the limitations which the company has to face. In addition Mrs Kirilidi explained in detail the implemented sustainable practices of the company. Mrs Kirilidi closed her presentation explaining the next actions and targets in the Larymna Plant.

Filippos Boukas, Head of Technical Support and R&D for TERNA MAG SA presented "The revival of a world famous Greek magnesite activity". Mr Boukas introduced the company and its activities to the participants. During his speech, Mr Boukas made clear that the mining permits issues, the relationship with the local community and the difficulty to find skilled workers are the main challenges that company has encountered. Mr Boukas ended his presentation by analyzing the sustainable practices of TERNA MAG regarding the water management, the rehabilitation, the utilization of old stockpiles as well as the utilization of beneficiation fines.

Dr Eftymios Balomenos gave an overview of the Business Unit the production capacity as well as the main use of Aluminium of Greece's products. Health and Safety have been classified as top priorities for AoG. In order to accomplish the zero accidents-policy, the



appropriate training should be provided to the AoG personnel. The most efficient strategy for the successful health and safety management has proven to be the active involvement of the personnel. Consequently Dr Balomenos presented the Environmental Protection scheme of of AoG. He described in details the environmental policy of the company and he finished his presentation by stressing out the importance of involvement of local community.

Remix Workshop -Round Table Discussions

This session featured four parallel break-out groups, one for each of the following topics: (1) Innovation and research as development drivers in Mining and Metallurgy, (2) Institutional and framework challenges and opportunities for the development of the raw material sector, (3) Digitising Mining and Metallurgy Industries - Prospects, Benefits and Challenges, (4) Education in the Raw Materials sector

Feedback from Peer Review Workshop

In the different break-out groups the participants had the task to answer the "question behind the question", to come up with policy suggestions and to summarize the lessons which they would take home. The feedback from the roundtables was given by the respective moderator

Round Table	Moderator	Questions
Innovation and research as development drivers in Mining and Metallurgy	Dr Eftymios Balomenos	<ol style="list-style-type: none"> 1. How can the innovation potential of a Region be strengthened? 2. Which are some strategies and measures that can enhance the research and innovation potential of mining and metallurgy industries? How can the cooperation between universities and industries be transformed into a leverage for the improvement of competitiveness and innovation? 3. To your knowledge, are there any recent innovation & research initiatives that have assisted or could potentially assist the development of mining and metallurgy projects in your Region or company?
Institutional and framework challenges and opportunities for the development of	Anastasio Kladis	<ol style="list-style-type: none"> 1. How it is possible to improve the coordinated application of different laws so as to benefit the development of raw materials sector? 2. Opposition and reactions to mining and metallurgy activities. Lessons learnt. 3. Problems in the cross-section between industrial research and licensing: how can they be solved? 4. What are the actions that can assist the "safeguarding" of raw materials?
Digitising Mining and Metallurgy Industries - Prospects, Benefits and Challenges	Dr George Drosos	<ol style="list-style-type: none"> 1. How can the new IT and digital technologies be incorporated into traditional mining and metallurgy? 2. What can be the benefits for the introducing these technologies into the industrial sector?
Education in the Raw Materials sector	Professor Katerina Adam	<ol style="list-style-type: none"> 1. Mining and metallurgy professions and specializations that have been "fiset": is it a common problem? What can be done (or has been done) to remediate it? 2. Is education connected to the social acceptance of mining and metallurgy? 3. Can education and training be a means of development for the raw material sector but also for the Region? How? 4. How easy is the collaboration of educational institutions with the industry? How can this collaboration be strengthened? 5. What actions can be taken to cover the education and training deficiencies in the Raw material Sector?

Roundtable #1#:

Summarized observations

- Understanding what is 'innovation' in raw material sector; It is not only groundbreaking technology, it is also the ability to do something 'anew'. Such innovation makes the sector attractive to the public and brings new people
- Industry and Academia work together but there is need more in-between brokers/consultants / innovation hubs that help bridge gaps and bring innovation to market. Perhaps innovation consultants is a business model suitable to EU (in contrast to spin-offs, unicorn start ups, etc which is the innovation model practiced for example in USA)
- There is need for more industrially driven RTD

Policy suggestions and lessons to take home

- Clear need for *long term vision for mining*. This should be regulated at Regional rather than a national level (closer to the local community)
- Deployment of decision- making strategies which will enable the *Regions to have an active role in licensing and monitoring procedures*, given the fact that well-trained professionals are included in the local authorities' staff.
- *Incentives to the industry* for hiring more young and highly educated people. Use of social funds from the region or use of the knowledge transfer system (UK)
- *Popularization of science and RTD*
- *Branding the mineral wealth of each region*: Greek Marble, Spanish Litium, etc so as to bring back pride to the local community
- EC needs to protect the raw material sector: Need of a separate raw material research agenda (distinct calls)

Roundtable #2#:

Summarized observations

- Importance of circular economy
- Focus on health and safety
- New approach for licensing
- Innovation and business development of Greek mining industries

Policy suggestions and lessons to take home

- Building a culture of trust and communication overlooking public acceptance
- Engaging stakeholders in the process of establishing meaningful communication with local communities in order to regain and retain trust and, furthermore, the SLO
- Establishing working groups/fora for issues related to Raw Materials' Sector under different philosophy: trans- professional, trans- ministerial and trans-regional which will secure a working balance between the implementation of environmental and mining legislation

Roundtable #3#:

Summarized observations

- The fourth industrial revolution extends to the whole of the economy, affecting in radical mode the raw material industry

Policy suggestions and lessons to take home

- The benefits of digital transformation need to be accessible by all enterprises, including SMEs that have limited capacity to invest in innovation and skilled workforce;
- Inclusiveness also in terms of regions, by securing the necessary funding to avoid major disparities;
- Finally and most important, social inclusiveness, both in terms of skills and also in terms of building trust in the society by securing high standards of data protection

Roundtable #4#:

Summarized observations

- Mining, metallurgy and raw material sectors remain conservative and, thus, the communication with civil society remains difficult
- In many cases, the absence of mining procedure in a particular area is responsible for the low or no relevant interest amongst young people who could be the future students and professionals of this sector. Social acceptance is, also, hard to achieve when mining is inactive or is surrounded by antagonistic factor that incubate hostility
- Mining and raw materials status does not depict the current situation in basic studies and engineering, while it is rather common for senior executives no to keep up with innovative developments even within their own field of action
- Highly qualified professionals that could transfer knowledge and experience to the new generations of professionals can be scarcely found

Policy suggestions and lessons to take home

- *Strong government policy* is fundamental and will secure and safeguard the future of mining
- *Active communication between government, industry and academia:* It is most crucial to update academia curriculum when relevant governmental policy changes are implemented. At the same time industry and academia have to help restore a balance



between the training time to prepare new professionals and the actual time these professionals are asked to meet the markets' needs.

- Skills of relevant professions have to be adapted and updated to current technologies through *life-long education*. It is, now, commonly accepted that life-long education can create a strong and vital link between educative framework and industry.
- Education is unanimously the answer behind questions and problems that surround the raw material sector. A syllabus connected to relevant sciences in primary education level can ensure a fair and understanding and allow impartial discussion among sector representatives and civil society. Lack of confidence can be confronted by trained professionals of the raw material sector who can act as ambassadors and promote the sector's extroversion towards society.



Remix Site Visit

On the last day of the PRM, the agenda involved two visits in places of interest in the Region of Sterea Ellada, namely the *Focis Mining Park-Vaggoneto* and the *Aluminium of Greece* plant.

The first visit was made in the Focis Mining Park-Vaggoneto, an interactive mining museum that was established in one of the oldest bauxite underground mining tunnels in the Ghiona area, namely Tunnel 850. Since the late ninety's, the once obsolete gallery has been transformed into an important touristic and mining heritage destination, devoted to secure the timeline for bauxite mining past, present and future.



The second visit was performed in the industrial complex of MYTILINEOS SA, a modern vertically integrated production plant of alumina and aluminium, comprising one of the few active smelters within Europe.

Dr Thymis Balomenos, Dr Panagiotis Davris and Mr Asterios Delipaltas, the latter Director of Environment, Health, Safety and Continuous Improvement, Mitilinaios SA, Metallurgy Unit / Aluminium of Greece plant) welcomed the participants. The hosts gave a presentation about the overall operation of the Metallurgy plant as well as the rest of the Mytilinaios Group activities. After the presentation the visit continued and ended with a bus tour in the alumina and aluminium plant which enabled the participants to follow AoG's flowsheet in real time, monitoring procedures from ore to metal.





7th Peer Review Visit Annexes

Preparation materials

Draft Schedule for REMIX Steering group meeting and peer review visit in the Region of Sterea Ellada

Round tables – Questions for the peer review process

Presentations

Circular Economy as a Business Opportunity | George Drosos

Remining Bauxite Residue – Handling Practice and Valorisation research in Aluminium of Greece | Efthymios Balomenos

Research Activities for Residue Valorization

Challenges and opportunities in the mining and metallurgical sector
| Athanasios Kefalas

Region of Central Greece – Introduction of the region | Zacharis Grigorios

Regional Operative Programme (ROP) of Sterea Ellada 2014–2020 – Presentation of specific targets | Konstantinos Meletis

TERNA MAG – The revival of a world famous Greek magnesite activity
| Filippou Boukas

REMIX

Interreg Europe



European Union
European Regional
Development Fund



8th Peer Review Visit

Fundão, Centro Region, Portugal



8TH PEER REVIEW

**MEETING OF THE REMIX PROJECT AT
CENTRO REGION, PORTUGAL**

10 -12 DECEMBER, 2018



PP6 - FACULTY OF SCIENCES AND TECHNOLOGY OF NOVA UNIVERSITY OF LISBON

Organizing Committee:

- Prof. Alexandra Ribeiro, Scientific Coordinator
- Prof. José Almeida, Senior Researcher
- Prof. José Kullberg, Senior Researcher
- M.Sc. Frederico Martins, REMIX research fellow
- M.Sc. Vanda Lopes, REMIX research fellow

JANUARY 31ST 2019





I.	INTRODUCTION	2
II.	MINERAL RESOURCES IN PORTUGAL	5
III.	POLICY INSTRUMENT: CENTRO 2020 OPERATIONAL PROGRAMME	6
IV.	PEER REVIEW SESSIONS	8
V.	PEER REVIEW WORKSHOP	16
	SESSION 1. EDUCATION AND SOCIAL ACCEPTANCE OF MINERAL RESOURCES EXPLORATION AND MINING	16
	SESSION 2. CIRCULAR ECONOMY	16
	SESSION 3. INNOVATION AND TECHNOLOGY IN MINING AND VALUE CHAIN	16
	SESSION 4. THE IMPORTANCE OF GEOLOGICAL KNOWLEDGE	17
VI.	REMIX WORKSHOP – OUTPUTS	17
	SESSION 1	17
	SESSION 2	18
	SESSION 3	20
	SESSION 4	22
VII.	MINE VISIT	23

I. INTRODUCTION

The 8th Peer Review Visit (PRV) meeting of the project REMIX - Smart and Green Mining Regions of EU (INTERREG Europe, PGI02400) was held in Fundão, a village located in the Centro Region of Portugal, between the 10th and 12th of December 2018. This event was only possible due to the active involvement of the Project Partner (PP) 6, Faculty of Sciences and Technology, Nova University of Lisbon, our consortium partners, stakeholders and interested entities that enriched the event with knowledge and experiences, creating messages to take home.

The 8th PRV was carefully prepared in advance with the aim of achieving the best results possible. PP 6 compiled and shared relevant information with the project partners and stakeholders. The information documents were related to several themes including tourism, policy, industry and resources from the Centro Region:

- Agenda 8th PRV Remix
- RIS 3 Centro reports A, B and E
- Centro Region Portugal
- RIS 3 and RIS 3 Centro, Portugal
- Status report of Centro Region, Portugal
- The Panasqueira mine at a glance (Information document)
- Peer Review Background information
- Questions for the Peer Review

The event was hosted at Edifício Casino, Fundão City Hall, both the PRV (December 11th) and the Steering Group (SG) meeting (December 12th). On the December 12th before the SG meeting the participants travelled to the Panasqueira mine located near Fundão and visited several facilities (mining plant, museum and minerals shop) hosted by Almonty Industries – Beralt Tin and Wolfram (Portugal) staff.



The total number of participants in the 3 days event was of 66 persons, from 9 countries (Figure 1), representing different institutions from academia to industry (Figure 2).

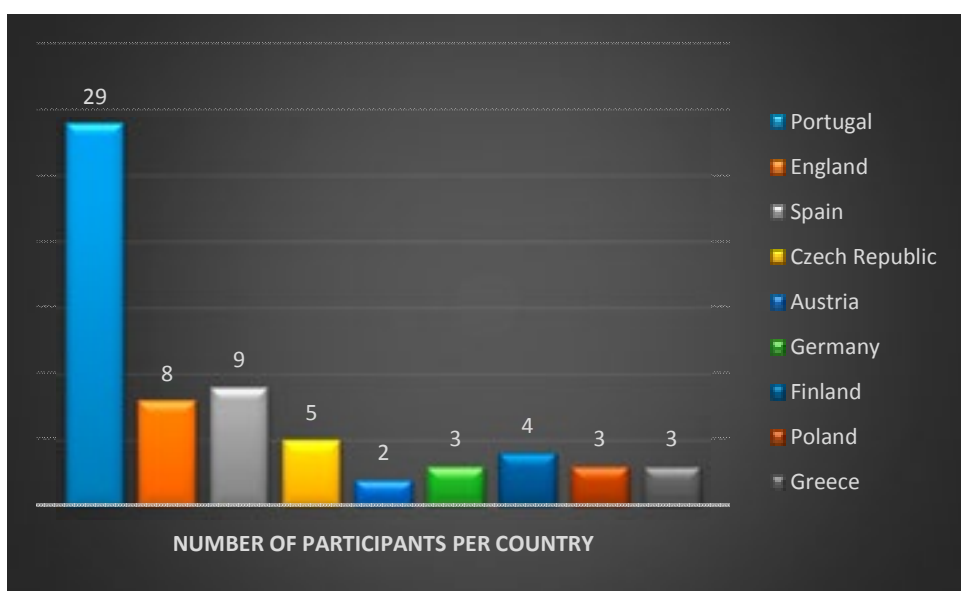


Figure 1 – Number of participants per country in the 8th Peer Review Visit, Centro Region, Portugal

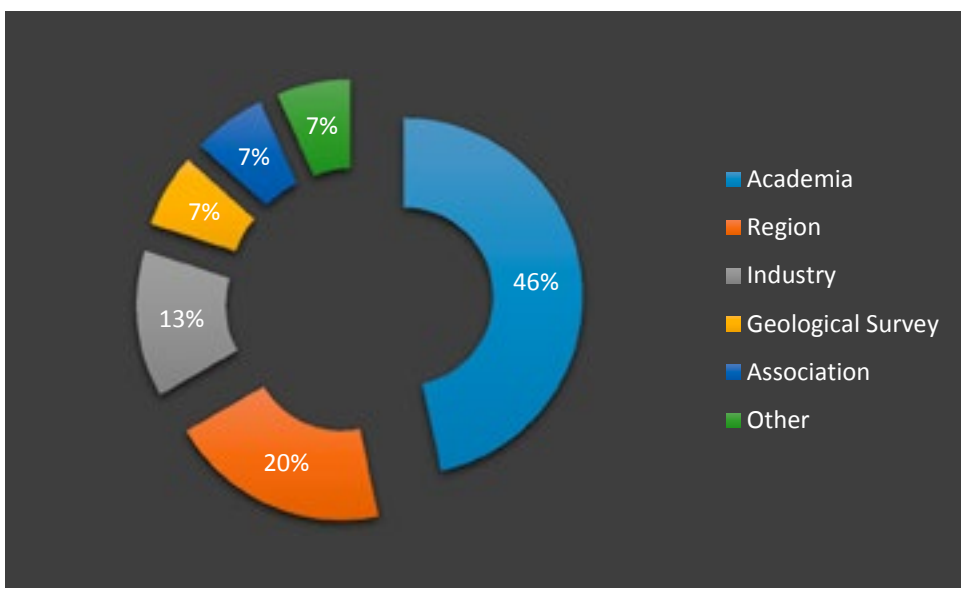


Figure 2 – Portuguese participation per sector (%) in the 8th Peer Review Visit

The event agenda was the following:

Monday, December 10th

19:00	Dinner at “Restaurante Anjo”. Tv. das Oliveiras 12, 6230-453 Fundão
-------	---

Tuesday, December 11th

8:30 – 9:00	Registration
9:00 – 9:55	<p>Welcome speech – <i>Paulo Águas, City Councillor of Fundão</i></p> <p>Framework of the region Centro, Portugal – <i>Veiga Simão, Vice-President, respectively, of Centro Regional Coordination and Development Commission (CCDR Centro)</i></p> <p>Brief REMIX presentation and introduction to Agenda – <i>Alexandra Ribeiro, FCT NOVA</i></p>
9:55 – 10:15	Reflection on the mining sector and suggestion on sectoral policies – Carlos Caxaria, Geological & Mining Eng. College, Engineers Professional Board
10:15 – 10:35	R&D, sustainability and inventory of resources in the mining sector – <i>Daniel de Oliveira, National Laboratory of Energy and Geology (LNEG)</i>
10:35 – 11:00	Coffee break + with poster session (regional/national projects)
11:00 – 11:20	The importance of clusterization: Portuguese examples in circular economy and in land use planning – Luís Martins, LNEG
11:20 – 11:40	Environmental remediation of old mining areas in Centro Region, Portugal – Edgar Carvalho, Empresa de Desenvolvimento Mineiro S.A. (EDM)
11:40 – 12:00	UNESCO Naturtejo Geopark best practices in sustainable development and geotourism – Carlos Neto Carvalho, UNESCO Naturtejo Geopark
12:00 – 13:50	Lunch at “Moagem d’Avo”, Av. da Liberdade 45, 6230-398 Fundão
14:00 – 15:00	<p>Clustering Session: European projects</p> <ul style="list-style-type: none"> • MIREU current status and cooperation with REMIX – Santiago Cuesta Lopez, International Center for Advanced Materials and Raw Materials of Castilla y Leon and Ilari Havukainen, Regional Council of Lapland • e.THROUGH H2020-MSCA-RISE – Alexandra Ribeiro, FCT NOVA • REMINE H2020-MSCA-RISE – João Castro Gomes, University of Beira Interior
15:05 – 17:00	<p>Peer review workshop</p> <p>Round 1: What is/are the question(s)/behind the questions posed by the region?</p> <p>Round 2: Policy suggestions for how this new question could be addressed</p> <p>Round 3: Lessons to take home for each region/country at each table</p> <p>Coffee break served</p>
17:00 – 18:00	Synthesis presentation from groups and discussions
19:00	Dinner at “Restaurante Hermínia”, Av. da Liberdade 123, 6230-338 Fundão

Wednesday, December 12th (Site visit)

8:30	Bus departure from Praça do Município, Fundão, to mine site visit
9:30-10:00	Arrival at Panasqueira – S. Jorge da Beira (Covilhã) Reception at the Panasqueira Clubhouse – Welcome drink Visit to Panasqueira old mine facilities
10:00-12:00	Return to Barroca Grande – Aldeia de S. Francisco de Assis (Covilhã) Panasqueira Mine introduction – Manuel Pacheco, Almonty Industries – Beralt Tin and Wolfram (Portugal) SA. Guided tour to the tailings disposal facilities and the mine entrance Visit to the Mining Museum and Minerals shop Visit to the ore treatment Plant (limited number of visitors)
12:00-13:30	Lunch at “O Gasómetro”. Rua Eng. Manuel Silva Daniel C32, 6225-051 Barroca Grande - Minas da Panasqueira, 6225-051 Aldeia – Covilhã
13:30-14:30	Return by bus to Fundão, Praça do Município
14:30-16:30	REMIX Steering Group Meeting (REMIX Partners) In: Sala Museu da Imprensa, Edifício Casino, Praça do Município, Fundão

II. MINERAL RESOURCES IN PORTUGAL

Portugal is a country with a strong tradition in mining but nowadays only a few mines are active in the country for metallic commodities such as tungsten (EU critical raw material), copper, zinc and lithium. In the Centro Region of Portugal the Panasqueira tungsten mine is an example of struggling and perseverance, this active mine is exploiting for over 120 year. In addition from tungsten, Panasqueira also extracts tin and copper concentrates with less relevance. In the Alentejo region, world class mines for copper and zinc, Neves Corvo and Aljustrel, are located in the Iberian Pyrite Belt, this belt continues to Spain and along that extension many giant deposits are found. Given the nature of the geology in the Centro Region (predominance of granites and metasedimentary rocks to the east, and sedimentary rocks to the west), there is a great potential for metals like tungsten, tin, gold, lithium and also uranium. This potential can be converted in numbers: in the Portuguese Geological Survey mineral database, the Centro Region has registered 409 mineral occurrences of uranium, 153 of tin, 116 of tungsten and 51 of gold. On the other hand, non-metallic resources like quartz, kaolin, clay and ornamental stone (limestone and granite) are also very important to the economy of this region. Uranium exploitation was very significant until the beginning of the XXI century, Urgeiriça was the main site of transportation and transformation of ore but this activity ended in 2001. Nevertheless, Portugal still has one of the largest reserves in Europe. The existence of tungsten-tin, gold, lithium and uranium belts express the great potential of the country for this kind of substances but for others too, examples are niobium and tantalum (EU critical raw materials), that can coexists with some of the previous mineral associations, mainly tin and lithium. Other critical raw materials are present in the area with less relevance, which are beryllium, manganese

and barium. To increase the knowledge and potential of these resources more exploration is needed, by national or international companies.

III. POLICY INSTRUMENT: CENTRO 2020 OPERATIONAL PROGRAMME

PRIORITY AXIS 1 - RESEARCH, DEVELOPMENT AND INNOVATION

The axis 1 has the main goal of reinforcing the research, the technological development and innovation. The promotion of research and innovation (R&I) infrastructures and capacities, the promotion of competence centers, the promotion of business investment in research and innovation and the development of links and synergies between companies, R&D centers and higher education (technology transfer) will be the priority investments in this axis (which should be aligned with the Regional RIS 3).

Thematic objective	Investment priority	FEDER
OT 1. Reinforce investigation, technological development and innovation	IP 1.2. the promotion of business investment in R&D, the development of links and synergetic between companies, research and development centers and the higher education sector, in particular the promotion of investment in the development of products and services, in technology transfer, in social innovation, in eco-innovation, in applications of public interest, in the stimulation of demand, in networks, clusters and open innovation through smart specialization and the support of technological and applied research, pilot lines, early actions of product validation, advanced production and first production capabilities, particularly regarding key enabling technologies, and the dissemination of general interest technologies.	169

Specific Objectives to be achieved

- Enhance the scientific production of internationally recognized quality
- Reinforce the scientific and technological knowledge transfer to the corporate sector
- Enhance the corporate investment in R&D by reinforcing the connection between companies and other regional entities of the R&I system
- Reinforce the network for innovation and internationalization of companies
- Enhance the corporate investment in innovative activities

Types of projects that can be supported

Support for R&D projects

- Support for strategic R&D projects, within the lines of an institution
- Support the participation in R&D programs financed by the European Union

Investments in Research, Development and Innovation (RDI) infrastructures and equipment

- Investment in RDI infrastructures and equipment contained within the RNIIE - National Infrastructure roadmap of strategic interest.

Support to the technology transfer

- Support to knowledge transfer projects directed to the companies, promoted by entities in the Scientific and Technological System
- Support for the patenting and licensing of industrial property
- Support for projects to develop prototypes and/or processes oriented to a specific market and/or industrial sector
- Support for investment in common infrastructures and equipment for the expansion of Science and Technology Parks

Support to business activities in RDI

- Support to RDI projects by companies, either individually or in co-promotion (corporations and entities consortia and network in association with actors within the Scientific and Technological System)
- Creation and dynamization of R&I teams in enterprises
- Support to participation in other R&D programs financed by the European Union
- Support to participation of companies in industrial R&D projects on a European scale, in particular EUREKA initiative
- Support to simplified R&TD projects

Support to collaborative network

- Support to demonstrative activities of the economic potential of R&TD results
- Support the creation of new clusters within the priority areas of RIS 3
- Support the promotion of cluster's activities
- Support of cluster projects to implement international affiliations, particularly in the RIS 3 innovation field

Business investment in innovative actions for non-SMEs

- Support for innovation in products, processes, organizational methods and marketing

Entities that can apply

- Public research sector
- Entities of the non-business Scientific and Technological System
- Other public or private entities that carry out R&D&I activities
- Companies

- Business associations

IV. PEER REVIEW SESSIONS

The opening of the Peer Review started with a welcome speech by the City Councillor of Fundão, **Paulo Águas**, who emphasized the importance of a sustainable and environmental friendly mining industry, not only in the region but in the country and Europe.

Veiga Simão, Vice-President of CCDR Centro, presented the framework of the Centro Region in its most relevant industries like technology, tourism, agriculture and natural resources. The worldwide known Panasqueira tungsten mine is inserted in the region and there is potential for other European Union critical raw materials like antimony, beryllium and the previously mentioned tungsten. The Centro Region also offers quality of life and has several education institutions, transfer centres, business incubators, science and technology parks and over 200,000 companies.

Alexandra Ribeiro as project coordinator of REMIX from Nova University of Lisbon (PP6) introduced REMIX project goals as well as the peer review agenda.



Figure 3 – Paulo Águas (City Councillor of Fundão), Veiga Simão (Vice-President of CCDRC) and Alexandra Ribeiro (Portuguese coordinator of REMIX) (from left to right)

Carlos Caxaria, president of the geological and mining engineering college, and a mining engineer himself, who worked for decades in the mining industry talked about the

present and future of this industry in Portugal and Europe. Focused on the legislation but also in other themes like investment in the industry and exploitation of raw materials. Presently the mining activity in Europe is low and this reality can be partially explained by three activities: knowledge, services and public. Regarding knowledge, there is a need for increasing it in areas with low information, revaluation of potential areas, development or application of new techniques for both exploration and exploitation and research in the recovery of minerals, abandoned mining sites/tailings. The development of expertise in services is crucial to produce efficiency, sustainability and results in the entire mining activity value chain, these include for example, geological mapping, mineralogical and chemical analysis, geophysics, among others. One of the crucial problems that affect this industry worldwide is social acceptance that can only be solved or increased by transparent communication and presentation of positive aspects that can come from this sector at local, regional and national level, by specialized personnel. Solutions pass from funding programs/schemes in the EU especially for junior companies to work in exploration but also for increasing knowledge of mineral potential in territories and also build and give free access to a national database that contain all the information about mineral resources and past and present mining projects.



Figure 4 – Carlos Caxaria (Geological & Mining Eng. College, Engineers Professional)

“Research and development, sustainability and inventory of resources in the mining sector” was the theme of the presentation made by **Daniel Oliveira**. Daniel is a geologist (Ph.D.) from the National Laboratory of Energy and Geology (LNEG) and he is head of the mineral resources and geophysics research unit in the same institution. His presentation was oriented to Portuguese geology and its mineral resources. From north to south, Portugal is rich in variety and quantity of mineral deposits, in the north and centre, tungsten (Panasqueira), tin and gold are the most important metallic resources, base metals (copper, lead, zinc and iron) are more relevant in the south. Neves Corvo and Aljustrel mines are main producers of copper and zinc in the Alentejo region, more

specifically in the Portuguese sector of the Iberian Pyrite Belt, host of many giant metallic deposits. LNEG is involved in many projects related to geology and energy and during this presentation several were mentioned, from palynostratigraphy to the production of new magnetic, radiometric and geochemical (copper) maps in the south region of Portugal. This institution is also responsible for the creation of the national database with information of geoscientific, technical and economic on Portuguese mineral resources and mapping of the country.



Figure 5 – Daniel Oliveira (LNEG)

After the previous presentation the participants were invited for a coffee break. A poster session was also in place with several regional or national projects (Figure 6). Regional universities/polytechnics (Coimbra, Guarda and Beira Interior) contributed with 4 projects.

- A. *Reuse of mining waste into innovative geopolymeric-based structural panels, precast, ready mixes and in situ applications* (**João Gomes, University of Beira Interior**) – This project resulted in the foundation of the eCO2blocks (spin-off of Beira Interior University) which won the ClimateLaunchpad 2018 competition with this innovative blocks;
- B. *Environmental risk assessment in old mines, before and after rehabilitation, The Urgeiriça mine (Central Portugal) as a case study* (**Alcides Pereira, University of Coimbra**)
- C. *Bio(micro)technologies Environmental Microbiology Group* (**Paula Morais, University of Coimbra**)
- D. *Geology as the basis for quality of life. The sustainability of lithium in the village of Gonçalo* (Guarda, Portugal) (**Ana Antão, Polytechnic Institute of Guarda**)

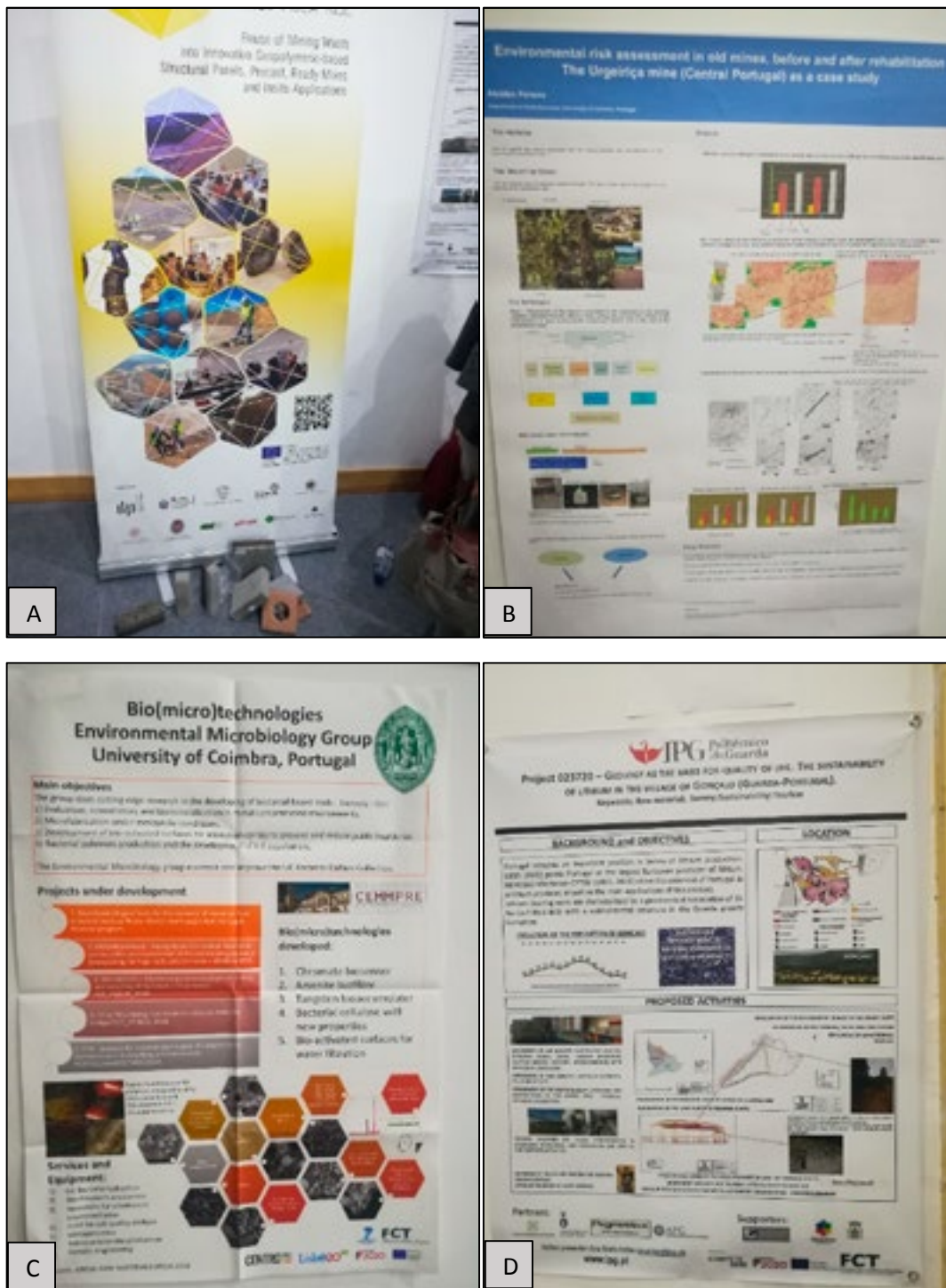


Figure 6 – Posters presented during the Peer Review

Still during the morning sessions, three more sessions took place:

Luis Martins is a geologist with an extensive career in mining and currently works in LNEG and he is also President of the Cluster Portugal Mineral Resources. His presentation focused on the importance of clusterization in Portugal describing examples related with circular economy and land use planning. The Cluster Portugal

Mineral Resources is a partnership between small and medium-sized enterprises, sectorial associations, universities, R&D institutes and a regional public institution, and it started with non-metallic resources, mainly ornamental stones, but it increased the diversity including metallic minerals and industrial minerals more recently. Portugal is very active in projects that also include other European countries, examples are FAME, MINATURE, UNEXMIN, ENVIREE projects, creating networking, development, promoting valuable synergies therefore enabling better results. In the Centro Region of Portugal, a land use planning project in *Maciço Calcário Estremenho*, was the example presented to the group. The site has very important resources of dimension stones (limestone) but it is also rich in fauna and flora, with meadows areas, small forests and bushes, landscape heritage, karstic environments and paleontological heritage. After great effort and local studies in the area it was achieved a proper use of land during exploitation with added economic value as well as assuring parity and compatibility between mineral resources and other natural resources.



Figure 7 – Luís Martins (LNEG/Cluster Portugal Mineral Resources)

Edgar Carvalho is an environmental engineer and responsible for the environmental and technical area at *Empresa de Desenvolvimento Mineiro, S.A* (EDM). EDM is a public company that has exclusivity in the remediation and rehabilitation of old mining areas in Portugal apart from the environmental area it also, by itself or in joint-ventures, develops exploration activities of mineral resources. The company currently has a few ongoing projects, several in the Centro Region of the country. In the north and Centro Region the larger number of old mines are related to radioactive minerals (exploited before the XXI century), followed by tungsten-tin and gold. The main capital for these operations come from cohesion funds and from mining operators royalties. The example of Urgeiriça and others less relevant were presented to the group, the Urgeiriça area was once the main site of uranium treatment in Portugal and a place for exploitation and transportation of radioactive ore. High volume of tailings are a source of contamination of water, air and soils and affected deeply the locals and personnel that

worked in the mine and facilities. After several years and more than EUR 33 million the contamination has strongly diminished, the infrastructures and local were rehabilitated, and is nowadays a place for leisure, sports and other activities. The company is also active in participations of European projects, mainly research and development, the ERAMIN, BIOCRITICAL METALS, UNEXMIN were mentioned.



Figure 8 – Edgar Carvalho (Empresa de Desenvolvimento Mineiro, EDM)

Carlos Neto de Carvalho from Unesco Naturtejo global geopark presented some of the practices in sustainable development and geotourism. Belonging to a great net of global geoparks the Naturtejo offers great diversity and richness of fauna, flora, activities, and geology, among others. There are many geosites that can show different singularities related to the geological evolution of the region including mining. Activities such as education, food, sports and culture are the main attractions of this Naturtejo geopark.

The morning sessions ended with the previous presentation.

After lunch, the clustering sessions started with presentations about the MIREU, REMIX, e.THROUGH and REMINE projects.

Santiago Cuesta López, General Manager at Fundacion ICAMCYL-International Center in Advanced Materials and Raw Materials of Castilla y Leon, Iberian sustainable mining cluster, spoke about the importance of the project MIREU - Mining and Metallurgy Regions of EU (H2020-SC5-2017-776811) for Europe and its connection with REMIX project. MIREU has two Portuguese partners in the consortium NOVA and Alentejo region, the latter well known for its copper, zinc, iron and manganese resources. At the end of his presentation, he invited the REMIX group to participate in the High-Level Meeting Governance and Policy within Mining and Metallurgy EU Regions to be held in Léon, Spain, on January 15th, 2019.



Figure 9 – Santiago Cuesta López (MIREU/ FUNDACION ICAMCyL)

Ilari Havukainen from Regional Council of Lapland (lead partner) also mentioned the REMIX-MIREU connection and the value of synergies between regional programmes and strategies. Future actions and meetings were communicated to the project partners and stakeholders for semester 5.



Figure 10 – Ilari Havukainen (REMIX coordinator, Regional Council of Lapland)

Alexandra Ribeiro from NOVA University of Lisbon, presented the project e.THROUGH - Thinking Rough Towards Sustainability (H2020-MSCA-RISE-2017-778045) that she coordinates. Similar to REMIX and MIREU, this project tackles European critical raw materials by developing knowledge and training of researchers through international and inter-sector mobility. The consortium has 8 partners from Europe and United States of America, both universities and SMEs. Some of the ongoing work is related to cobalt and tungsten recovery, through electro-based technologies, in the latter case from Panasqueira mine residues.



Figure 11 – Alexandra Ribeiro (e.THROUGH coordinator, Nova University of Lisbon)

The last presentation of this group was about the project REMINE - Reuse of Mining Waste into Innovative Geopolymeric-based Structural Panels, Precast, Ready Mixes and In situ Applications (H2020-MSCA-RISE-2014-645696), coordinated by **João Castro Gomes**, from University of Beira Interior. This consortium has 10 European partners, both universities and SMEs. João and his team successfully produced great results from Panasqueira mine tailings. The project consisted in the manufacture of a cement by alkali activation that is more resistant and cheaper for construction purposes. The results were very positive and they created a spin-off named eCO2blocks that won the Climate KIC 2018 ClimateLaunchpad Global Grand Final: unlocking green business potential, in Edinburg, at the beginning of November 2018. The main advantages of this material is that it has no CO₂ emissions, does not require drinking quality water, has the same resistance and its production is ten times faster and cheaper.



Figure 12 – João Castro Gomes (REMINE coordinator, University of Beira Interior)

V. PEER REVIEW WORKSHOP

The workshop was organized in four groups that discussed four different themes previously sent to the participants (Questions for the peer review document). They were the following: **1. Education and social acceptance of mineral resources exploration and mining; 2. Circular economy; 3. Innovation and technology in mining and value chain; 4. The importance of geological knowledge.**

The peer review workshop is based on 3 iterations / rounds:

- A. What is/are the question(s)/behind the questions posed by the region?**
- B. Policy suggestions for how this new question could be addressed**
- C. Lessons to take home for each region/country at each table**

SESSION 1. EDUCATION AND SOCIAL ACCEPTANCE OF MINERAL RESOURCES EXPLORATION AND MINING

Moderator/Facilitator: José Carlos Kullberg¹ / Lídia Martins²

- I. How to increase awareness through educational subjects from an early stage in different learning contexts, i.e., primary and secondary education?*
- II. What can be the role of mining heritage in the transmission of knowledge between generations?*
- III. How to increase public awareness and social acceptance?*
- IV. How to engage regional and local communities in new mining projects?*

SESSION 2. CIRCULAR ECONOMY

Moderator/Facilitator: Paula Morais³ / Alexandra Ribeiro¹

- I. The recycling potential for metals exists but it is low. What are the bottlenecks? What is the importance of knowledge concerning the recovery and recycling of materials to increase resources availability? New sorting technologies? New technical solutions for reuse?*
- II. How could we improve primary, secondary and tertiary resources compatibility? Waste framework legislation? Cascading use?*
- III. To what extent does circular economy trigger new business models opportunities?*

SESSION 3. INNOVATION AND TECHNOLOGY IN MINING AND VALUE CHAIN

Moderator/Facilitator: José Almeida¹ / Manuel Pacheco⁴, Vanda Lopes¹

- I. How important is the creation of mineral resources value chains in existing and in future projects? What are the constraints?*
- II. Energy and Eco Efficiency – how do companies face the paradigm shift from a carbon-dependent society? And on efficient water management?*
- III. Partnerships between companies and R&D institutions and universities to develop pilot projects – how to boost?*
- IV. How could innovation and technology influence the nowadays mining exploitation paradigms?*

SESSION 4. THE IMPORTANCE OF GEOLOGICAL KNOWLEDGE

Moderator/Facilitator: Luís Martins⁵ / Frederico Martins¹

- I. In what way can new technologies – geological, geophysical, geochemical – be useful to find mineral deposits at greater depths?*
- II. Are public policies important to increase knowledge in mineral resources?*
- III. How important is data supply related to exploration, research and exploitation of previous mining projects to interested entities?*

A moderator in each group was responsible to open the discussions, focus on key aspects and communicate to other groups the conclusions that were reached. The facilitator aided mainly in the gathering of the information provided by the moderator and the round table participants. Each individual group treated the questions in different ways and the results presented below will represent that diversity.

¹ Faculty of Sciences and Technology, Nova University of Lisbon

² Centro Regional Coordination and Development Commission (CCDR Centro)

³ Faculty of Sciences and Technology, University of Coimbra

⁴ Beralt Tin and Wolfram, Almonty Industries

⁵ National Laboratory for Energy and Geology

VI. REMIX WORKSHOP – OUTPUTS

SESSION 1

Regarding the first theme **“EDUCATION AND SOCIAL ACCEPTANCE OF MINERAL RESOURCES EXPLORATION AND MINING”** each of the questions was discussed in detail and the policy suggestions and lessons to take home are displayed below:

I. How to increase awareness through educational subjects from an early stage in different learning contexts, i.e., primary and secondary education?

- ✓ Demonstrate the importance and necessity of mining for the daily life
- ✓ Increase the formation of teachers (“train the trainers”)
- ✓ Focus on good examples of mining
- ✓ Identification of issues on the promotion/divulgateion/formation to the public (for everybody) if there is no common syllabus on schools
- ✓ Informal training (ie, museums, geoparks, etc)

II. What can be the role of mining heritage in the transmission of knowledge between generations?

- ✓ Take “old” examples of mining activities and use them as terms of comparison with modern examples (“old vs new”)
- ✓ Importance of the role of active mines on showing the present-day good practices

- ✓ The relevance and the presence of “ambassadors” from the industry to communicate with the general public (including schools)

III. How to increase public awareness and social acceptance?

- ✓ Put effort in order to aware the media to transmit the correct message about the mining industry
- ✓ Demonstration of transparency on all processes involved in the mining activity
- ✓ Involvement of people from areas where the mining activity is well accepted with people from potential mine sites, as communicators

IV. How to engage regional and local communities in new mining projects?

- ✓ Clearly communicate the process of mining activities from the exploration, to exploitation and mine closure
- ✓ Identify and establish main points among the industry and stakeholders and manage expectations

The social acceptance issue is definitely one of the most important that the mining industry is facing nowadays and to diminish this negative perception only expert personnel are able to inform correctly and present the importance of natural resources in the day-to-day life. This is a direct consequence of poor education in earth sciences from a young age and the lack of perception of people related to the mineral resources role in the world. Current mining companies have a relevant role as positive examples on how to responsible and increase the economy at local, regional and national level.



SESSION 2

The second theme “**CIRCULAR ECONOMY**” was discussed and the follow up of the questions were differently handled comparing to the first theme, ie, not question by

question but related to specific topics (bottlenecks, materials and processes), inside the questions.

Related to bottlenecks:

- ✓ Characteristics of the wastes to be reused: chemical, size, scale
- ✓ Database will help
- ✓ Financial incentive
- ✓ New business models with the associations as companies to complete a new value chain
- ✓ Require for research
- ✓ Lack of information (How to reuse? Not public)
- ✓ Lack of new processes and business models

Related to materials:

- ✓ Chemical composition and characteristics of the waste
- ✓ Transportation: The way it is transported; The costs; The distance
- ✓ The knowledge about the composition and quantity of the waste
- ✓ Scale problem

Related to processes:

- ✓ The need for more research (interaction between companies and universities)
- ✓ Infrastructures
- ✓ New concepts that include the waste processing in the production

After a strong debate the main conclusions were reached:

- ✓ Business association to solve problem (cascading use by different companies)
- ✓ Database to solve the problem related with the access to information
- ✓ Virtual market to support/help the new business models
- ✓ Government financing (Prices guaranty; Subsidies for research/infrastructures development; Reduction of taxes (recycled materials))
- ✓ Open innovation for technology problems
- ✓ Market studies for alternative products
- ✓ Research

The recycling of metals is a subject that requires the existence of specific conditions, the compliance of diverse methodologies and be economically viable in order to be sustainable. There is still a strong lack of knowledge and information in this area, from their composition to their end use. The solutions presented focused on business associations, financing and research.



SESSION 3

Theme number three **“INNOVATION AND TECHNOLOGY IN MINING AND VALUE CHAIN”** followed the three iterations proposal, i.e., the question behind the question was found and after the policy suggestions and lessons to take home.

RELATED TO QUESTION NUMBER ONE

The question behind the question:

- ✓ Does a value chain promote mining?
- ✓ Are the policies proper for creating value chain?

Policy suggestions and lessons to take home:

- ✓ Alternative products and flowcharts
- ✓ Better use of tailings and waste.
- ✓ Public perception
- ✓ Social acceptance
- ✓ New and modern applications of mining products can bring new companies

RELATED TO QUESTION NUMBER TWO

The question behind the question:

- ✓ Will a company gain social acceptance with a better use of energy and be eco-efficient?

Policy suggestions and lessons to take home:

- ✓ Incentives to replace energy source (e.g. to wind, solar, geothermal)
- ✓ Regulations to green energy use and produce
- ✓ Report carbon footprint
- ✓ Create incentives to attain goals

RELATED TO QUESTION NUMBER THREE

The question behind the question:

- ✓ How to do the match-making between companies, R&D institutions and universities?

Policy suggestions and lessons to take home:

- ✓ Technical courses promoting specialization in the mining areas
- ✓ Creation of cooperative platforms/clusters
- ✓ Funding for projects
- ✓ Different level of cooperation (grants, consulting, solve problems)
- ✓ Improve technical background

RELATED TO QUESTION NUMBER FOUR

The question behind the question:

- ✓ What do we expect of the mines of the future?
- ✓ How to make mining safer?

Policy suggestions and lessons to take home:

- ✓ Incentives for digitalization and automation
- ✓ New regulation for under water mining and marine mineral deposits
- ✓ Reduce costs, improving/optimizing production
- ✓ Automatize maintenance of machines

Both innovation and technology are hand by hand linked to the mining industry evolution. Not only for the discovery of new mineral deposits but to maximize existing resources (primary and secondary); improve energy use and efficiency while gradually transitioning to clean energy sources; the knowledge associated to this area and importance of synergies between universities and industry; the gradual implementation of Industry 4.0.



SESSION 4

As for the last theme **“THE IMPORTANCE OF GEOLOGICAL KNOWLEDGE”** it followed the same structure as theme number one, results were presented to each question after careful discussion and exchange of ideas.

I. In what way can new technologies – geological, geophysical, geochemical – be useful to find mineral deposits at greater depths?

- ✓ New metals (high tech, for EV, etc) in explored/ exploited deposits (Past→Future)
- ✓ Geological modelling will always have a determinant role
- ✓ Use of multidisciplinary techniques will be crucial (geophysics, etc)

II. Are public policies important to increase knowledge in mineral resources?

- ✓ Promotion and financing of mineral resources knowledge using both royalties and structural funds (and others)
- ✓ Improvement of public acceptance (not only a responsibility of private companies)
- ✓ Renovation of high-specialized human resources and the improvement of synergies between academia, governmental institutions and industry (networking, clusterization)

III. How important is data supply related to exploration, research and exploitation of previous mining projects to interested entities?

- ✓ Data should be transformed into information, friendly for the end users. Have a national database updated with various types of information (geology, geophysics, geochemistry)
- ✓ The previous information should be public available and for free
- ✓ Data (including samples) should be delivered in a friendly and standardized way to the mining authority / geological survey
- ✓ Raw data should be delivered facilitating its future processing / reprocessing

The major superficial deposits have already been exploited and consequently the challenge that mining companies face nowadays is to find deep to very deep mineral deposits. This reality means that companies must invest more into exploration and here geosciences and engineering, can together, play a key role. With the transition into electric vehicles and the demanding for specific metals present and past mining projects should reevaluate their potential on suppliers of these metals. The national and international investment in mining projects, especially in Europe, is low, therefore promotion, divulgation and synergies of such projects can possibly trigger more economic movements into regions and countries. Easiness and access to data were a main topic discussed during this session.



VII. MINE VISIT

The final event before the REMIX Steering Group meeting, programmed for the afternoon of December 12th of 2018, was the visit to the Panasqueira old mine facilities. Panasqueira mine is one of the main assets of Beralt Tin and Wolfram (Portugal), a subsidiary company of Almonty Group Industries (owner of the mining concession). Staff from the company welcomed the participants and gave a brief resume of the mine past and present, followed by the tour to the tailings disposal facilities and the mine entrance. The group gathered at the mine theatre where experts from Beralt lectured about the long history of the mine, the technical work involved in the extraction of ore and the importance of the mine for the region and local community. Next followed visits to (1) ore treatment plant, (2) mining museum and (3) minerals shop. Due to the high number of visitors the group was divided in three that visited the places separately.



Figure 13 – REMIX group photo at Panasqueira underground mine entrance.



Figure 14 – REMIX visit to Panasqueira facilities

Beralit Tin and Wolfram has several partnerships with universities to mainly study the tailings produced by tungsten exploitation for over 10 decades. This material occupies a high volume of land and the company is trying to turn it into a resource (added value), one example is the reuse of those tailings for road construction.

The agenda of this 8th Peer Review ended with the Steering Group meeting in the afternoon of December 12th.

Acknowledgements

The authors would like to thank all those who have helped in carrying out this work.



8th Peer Review Visit

Annexes

Preparation materials

The Mineral Potential in Centro Region of Portugal: Geology, Industry and Challenges

| José A. Almeida, José C. Kullberg, Frederico Martins, Vanda Lopes, Alexandra Ribeiro

Round tables – Questions for the peer review process

Status report of Centro Region, Portugal | José A. Almeida, Alexandra Ribeiro

The Panasqueira mine at a glance | Alfredo Franco, Romeu Vieira, Robert Bunting

Presentations

The Centro Region of Portugal – A brief framework | António Veiga Simão

Brief REMIX presentation and introduction to Agenda | Alexandra Ribeiro

Reflection on the mining sector and suggestion on sectoral policies

R&D, sustainability and inventory of resources in the mining sector

| Daniel de Oliveira

The importance of clusterization: Portuguese examples in circular economy and in land use planning

Environmental remediation of old mining areas in Centro Region, Portugal | Edgar Carvalho

UNESCO Naturtejo Global Geopark Best practices in sustainable development and Geotourism | Carlos Neto de Carvalho

MIREU current status and cooperation with REMIX | Santiago Cuesta

REMIX –Smart and Green Mining Regions of EU | Ilari Havukainen

e. THROUGH – Thinking rough towards sustainability | Alexandra B. Ribeiro

REMINE H2020 – MSCA-RISE | Joao Castro Gomes

REMIX

Interreg Europe



European Union
European Regional
Development Fund



9th Peer Review Visit

Joensuu, Finland
– North Karelia and Lapland



REMIX – Smart and Green mining regions of the EU

Joensuu Peer Review

*Wednesday, 13.3.2019
Joensuu Science Park, Länsikatu 15*

1. Background

The REMIX project meeting held in Joensuu, Finland 12-13.3.2019 covered two of the partner regions; North Karelia and Lapland. The two regions were combined into one meeting because they are both regions of Finland and they both address the same policy instrument in the project: the Operational Programme, Sustainable growth and jobs 2014-2020.

On Tuesday 12.3 the participants of the Joensuu event heard presentations on the current status of mining and the challenges in the nation as well as in the regions under review North Karelia and Lapland. The Tuesday presentations in addition to the pre-sent materials set the scene for the peer review held on Wednesday 13.3. The preparation materials contained information such as Smart Specialisation strategies (RIS3) from both regions, introduction of the OECD Outokumpu case study from North Karelia, The North Karelia Regional strategic programme 2018-2020, The Arctic Smartness concept and work done in Lapland, Challenges of industrial circular economy in Lapland and introduction of the circular economy centre established in Kemi-Tornio area in Lapland. Links to all of the pre-materials and presentations held in Joensuu can be found in the ANNEX at the end of this report

2. Participants

During the course of the 2 day event total of 59 people participated at the Joensuu event. All of the project partners were present with a good representation of their stakeholders as well. The participants mainly represented regional authorities, ministry representatives, R&D organisation and business development companies.

3. Presentations

During the first part of the meeting on Tuesday 12.3 at the Joensuu Science park the representatives of the regions North Karelia and Lapland presented the regions, the mining related activities and connection to the smart specialisation goals in the regions. Policy context for mining in Finland was introduced by Riikka Aaltonen from Ministry of Economic Affairs and the Employment. Furthermore, active mining operations in Finland were presented by Pekka Suomela from Finnish Mining Industry, Finnmin Industrial Policy.



All the presentations from the morning session can be viewed below linked to the presenters:

1. *Risto Poutiainen, Regional Mayor of North Karelia*
2. *Päivi Ekdahl, Development Director, Regional Council of Lapland*
3. *Harri Palviainen, CEO of Business Joensuu*
4. *Eira Varis, Development Director, Regional Council of North Karelia*
5. *Kristiina Jokelainen, Director for International Relations and Smart Specialisation, Regional Council of Lapland*
6. *Riikka Aaltonen, Senior Adviser, Mineral Policy, Ministry of Economic Affairs and the Employment*
7. *Pekka Suomela, CEO, Finnish Mining Industry, FinnMin Industrial Policy*

The second part of the day was spent on a study visit to the old mining town of Outokumpu and the industrial park. Before visiting the actual facilities: Outotec Turula – Factory, Geological Survey of Finland, Mintec –laboratory and The Old Mine – Mining Heritage Center, short presentations were given on the background of the area:

1. OECD case study - *Ilkka Nykänen, Business Joensuu and Chris McDonald, Policy Analyst, OECD, Regional Development and Tourism Division, Centre for Entrepreneurship, SMEs, Regions and Cities*
2. Outokumpu Industrial Park - *CEO, Juuso Hieta*
3. Case FinnCobalt – *CEO, Markus Ekberg*

4. The Peer Review and Conclusions

Wednesday 13.3.2019 was the active participation part of the Joensuu meeting; the Peer Review facilitated by Chris McDonald, Policy Analyst from the OECD. Before dividing the participants to small groups to tackle the questions set by the regions under review, Seppo Ahola from Digipolis, Kemi gave a short update on the status and work of the Arctic Industry and Circular Economy Cluster already presented by Kari Poikela at the Kick-off meeting in Kemi, Lapland 4/2017.

The questions set by the regions were delivered to the participants beforehand together with the pre-materials. During the peer review sessions the small groups rotated through all of the discussion tables where the different questions were presented. At the end, all groups presented the outcomes of their discussions at each table.

Questions by North Karelia & Outokumpu mining camp were:

1. **In your opinion, what are the competitive advantages of North Karelia in mining value chains based on what you have learnt and heard so far?**



- High qualified skills of mining related working organisations located in Outokumpu such as, Geological Survey of Finland, Outotec Ltd, Mining Heritage Center of Outokumpu, working mines Boliden and Mondo Minerals and mine project FinnCobalt
- All of them are located near each others
- Regionally strong metal industry
- Attitude towards mining is positive

2. What are the future growth and development opportunities in North Karelia? What are the bottlenecks and barriers to realising these opportunities?

- North Karelia has more potential in tourism but needs to clarify its target markets, better link destinations to retain tourists for longer, and leverage the brand of Outokumpu
- The Cornwall Mining Alliance was cited as a good example of how to strengthen expertise within an ex-mining region through collaboration between government, universities and local SMEs
- Key is reducing barriers to entry for innovation and business support programmes (less red tape), and using intermediaries (universities and development companies) to engage with SMEs and overcome coordination failures
- There is potential to strengthen the innovation system related to mining in North Karelia, GTK is a key asset for mining innovation, and is not fully utilised for this at the moment
- “Outokumpu Mining Camp” process with S3P “ Mining industry and global value chain” initiative can be an opportunity for future growth in North Karelia
- Lack of mining related business people can be a bottleneck for future development

3. What could be the priority actions for increasing mining competitiveness and growth?

What could help us deliver these actions?

- North Karelia needs a coherent strategy to secure “social license to operate” through engagement with local stakeholders (NGOs, local municipalities, universities, industry)
- North Karelia have to create a clear strategy on, how to exploit the mining industry global value chains
- Implementation of the strategy is a key factor for the success. The main question is how to commit the relevant stakeholder into the strategy and long term cooperation
- Regions also need a coherent strategy to secure “social license to operate” through engagement with local stakeholders (NGOs, local municipalities, universities, industry)
- The circular economy can help strengthen social license to operate (by reducing environmental impacts)

Questions by Lapland - Arctic Industry and Circular Economy Cluster were:

1. Industrial circular economy

- a. What are the current industrial level circular economy activities in your region?
- b. How are you or your organisation involved?
- c. What are the materials/side-streams/industries you work with?
- d. Any particular products your region is developing or producing from mining/metallurgy side-streams?
- e. Is there any industrial scale pilots going? How are the pilots funded or how they should be funded?
- f. Who is responsible for overall management of circular economy? What is the role of (1.) SMEs and (2.) large companies?

Conclusions:

- Key is identifying the resource, and sometimes this requires coordination with multiple mine sites within a region (regional authorities and universities can play the coordination role)
- Universities can play a key role in the circular economy – as a broker, and in terms of research and development (they also provide institutional continuity)
- funding is needed to de-risk circular economy projects
- *Logistics define the price of the processes. Side-streams should be easily available*
- *Portuguese colleagues have developed construction materials. Leading innovation is called “eco bloc”. Panasqueira mine offers lots of potential for new research. Arsenic in tungsten slag makes processing difficult and expensive. Almonty could buy the separated tungsten.*
- *REMIX played crucial role for establishing the contacts with university and companies*
- *Potential innovations can lead patents and spin-offs from university*
- *Czech Republic: lignite mining for energy, flying ash waste, potential products: bricks, but contain heavy metals and radioactive hazardous metals.*
- *Greece: circular economy is seen very attractive, but needs to be further defined*
- *Castile and Leon: regional authority supporting companies for “eco-design” product development from waste.*



- *At ICAMCyL clusters and European level Smart specialisation thematic partnerships are seen as key vehicles for circular economy development for EU level cooperation*
- *Cornwall: environmental aspect of mining and mining waste is rising.*
- *For EU cooperation: How to solve the lack of cooperation? Core business is core business, but how to make circular economy as core business for some SMEs? New ventures have new type risks. Research and innovation have major role. One market entry: sufficiency on building roads? In addition, targeting to something with higher value, Who takes care of marketing of the products?*
- *Classification of waste from mining and metallurgy in the EU*

2. SMEs support services for innovation in mining value chain

- a. How are your region's SMEs supported to develop innovation?

Conclusions:

- Universities in mining regions can be a platform for skills and SME development linked to mining and extractive industries, including mining and technology services
- Often difficult to engage with SMEs on cluster development and internationalisation, they cannot absorb the administrative burden and costs of applying for funds, and sometimes are scared of losing an innovative idea
- Key is reducing barriers to entry for innovation and business support programmes (less red tape), and using intermediaries (universities and development companies) to engage with SMEs and overcome coordination failures
- There is also potential to enhance partnerships between local mining clusters within Finland to leverage complementarities and build scale in relation to accessing funds, and technological innovation

3. Shortage and miss-match of skills* (including topics of digitalization and training/education)

- a. What are the actions in your region for skills development for mining and metallurgy?
- b. Is there any kind of training or education available in your region? If yes, what kind?

*Skills can mean: new technology or mineral specific knowledge (for instance valorization or exploration, digitalization) or business/export skills and orientation in whatever part of the value important to your region.

Conclusions:

- Collaborative partnerships between industry and higher education and vocational education institutions enable pathways for young people into local jobs, and improve work readiness
- Migration also plays an important role in addressing labour market needs, regions need to make sure they provide an attractive offer for skilled migrants (in terms of amenities, public services)
- Recognition there is a need to improve data about local labour markets (supply of skills, and current/ future demand for skills)
- Example from Cornwall: Educational trust to study mining or to cover work experience expenses
- Mining companies provide scholarships to mining students in North Karelia.
- Language and work permit policies in Finland create a problem to offer jobs to international students graduating from Finnish schools.
- In Spain specific centers to train the technical workers for mines. Publicly funded plus the companies invest in training their own work force. Unemployment is high in Spain so, getting people in the programme is not difficult.
- York Potash in UK is linked up with university to make centers to teach miners for the specific skills required at the any given time.
- Consulting Alexander Tscarf about the educational programme he does with the local high schools to educate the young on mining industry? -> results in high volume of students applying/advancing to MUL.
- For SME missing the crucial data and knowing what their specific needs are.
- Boom-bust problem with the mining industry. Companies provide the educational institutions with skill requirement needs for the future. New people are trained for the required force and then the markets drop and they are no longer needed.
- Companies need to provide services to families relocating to the mining town. Job possibilities for the spouses and services for the everyday living in the area.
- The bottom line problem in addition to “Boom-Bust” problem is the appeal of the industry among the younger generation. How can we raise the interest!?!? – Digitalisation, automatization etc. Informing the youth that the industry is not the same as it use to be, in fact its today more “clean office job”. Very WELL paid jobs. Involves lots of modern technology which requires highly educated and skilled



**BUSINESS
JOENSUU**

J **WITH** E



workforce, engineers etc. It is not hands dirty / face dirty job that the image might be → Connection to GREEN economy, which is to the interest of the younger generation. The value in working in the field that provides environmentally better future. Company values, ethics and the use of end products has more importance today in the minds of the workers. They must fit the person's own values.

9th Peer Review Visit

Annexes

Preparation materials | North Karelia

Smart Specialisation in North Karelia

POKAT 2021: North Karelia's Regional Strategic Programme for 2018–2021

Outokumpu Mining case study

Preparation materials | Lapland

Arctic Smartness Excellent News

– Success stories of the Lapland's Smart Specialisation

Lapland – An Arctic and International Highflier:

The strategic priorities for international and smart specialisation 2018–2022

Towards a low-carbon and resource-efficient circular economy in the Arctic:
Case example of industrial circular economy flows in Kemi Arctic region

Challenges of industrial circular economy

Presentations

Business Joensuu Oy – Supporting companies to grow and become international,
providing expertise to help to invest and relocate | Harri Palviainen

Smart Specialisation Platform for Industrial Modernisation, Mining Industry
and global value chains partnership | Katja Sukuvaara

Lapland – Economy, natural resources, main stakeholders,
challenges of mining sector | Kristiina Jokelainen

Case Finland – An industry perspective on the future
of the Finnish mineral industry | Pekka Suomela

North Karelia as a mining region | Eira Varis

Outokumpu Mining Camp – Introduction

Welcome to Outokumpu Industrial Park | Juuso Hieta

New Era of Natural Resources in South Karelia | Risto Poutiainen

Exploration and mining in Finland – Facing new challenges | Riikka Aaltonen