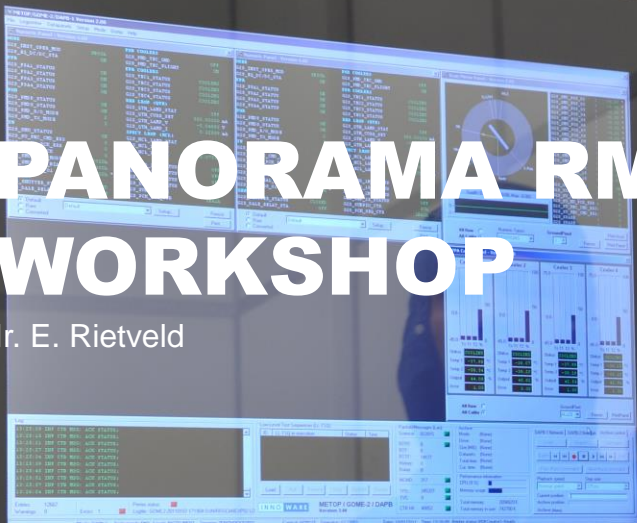


OME-Z DAPB

PANORAMA RMIS TECHNICAL WORKSHOP

Ir. E. Rietveld



Status & Control



Science

TNO innovation for life

INNO WARE

GOME DAPB HW Set 2
*** SW Set 1 !!!

PHYSICAL ACCOUNTS OF RAW MATERIAL STOCK AND FLOW INFORMATION SERVICE (PANORAMA)

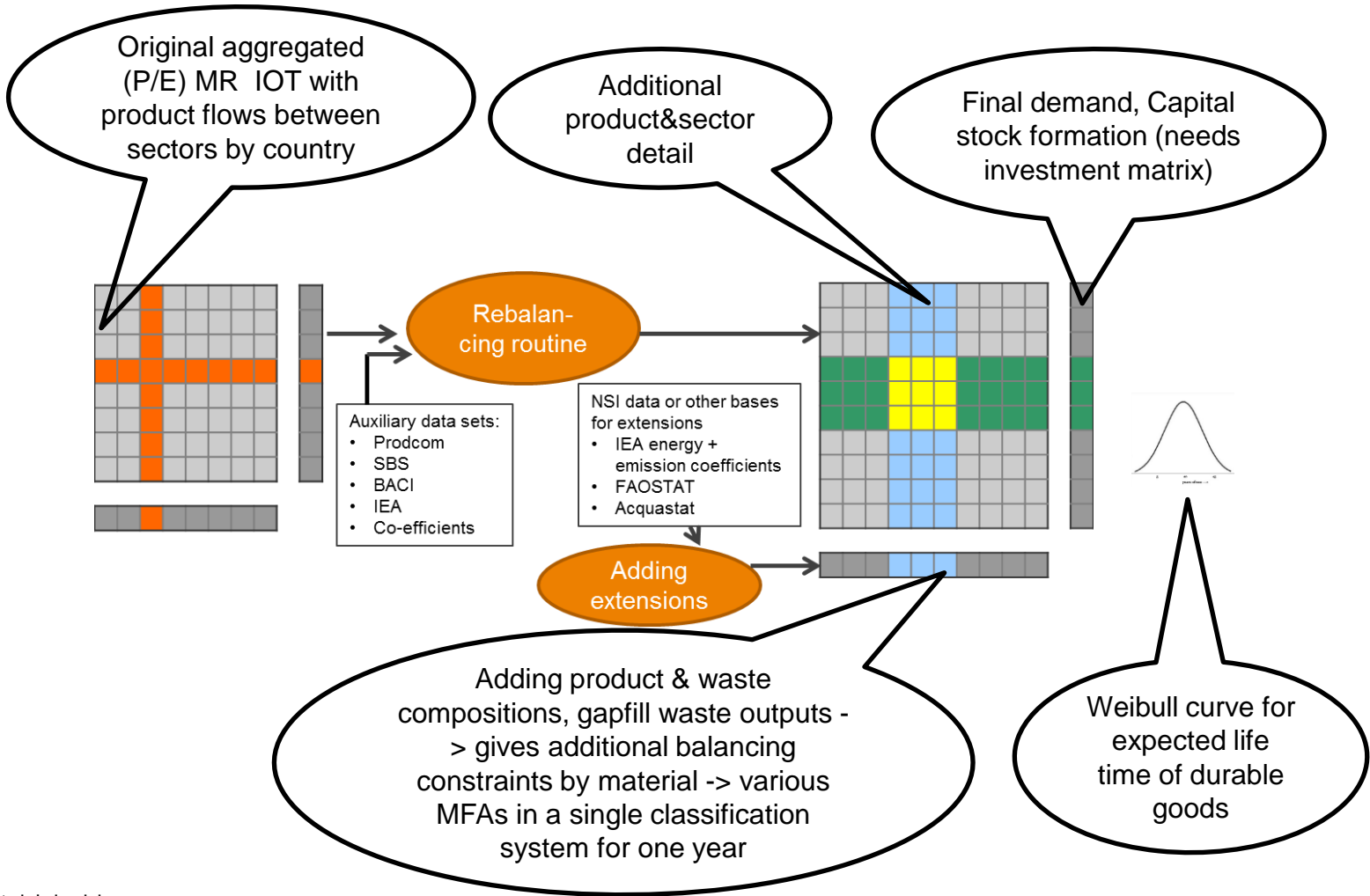
Objective of project

- › PANORAMA creates a framework for measuring the dynamics of the global material economy: explicit representation of CRMs in all production, use and end-of-life stages. This will allow a more detailed understanding of the material economy in Europe, specifically the threats of material supply disruptions and environmental impacts, while, at the same time, enhancing resource-efficiency, and circularity.

Who are the project partners:

- › Leiden University (NL) – Lead Partner
- › TNO (NL) – Commercializing Partner
- › Fraunhofer Gesellschaft (D)
- › BRGM (F)
- › GEUS (DK)
- › Ghent University (B)
- › University of Bordeaux (F)

Project duration: start date: 01/01/2019 and end date: 31/12/2021



TARGET AUDIENCE: ACADEMIA, POLICY MAKERS, LIFE LONG LEARNERS, CONSULTANTS

- › https://eitrawmaterials.eu/startups-portfolio/?field_input%5Bthematic_fields%5D=Circular+Economy&field_input%5Bclc2%5D=&tax_input%5Beit_startups_country%5D=0
- › <https://eitrawmaterials.eu/eit-rm-academy/lifelonglearning/>



Sus
Mooc

Crit

MOOC on
Sustainable
Management of
Critical
Raw
Materials

exiobase

HOME ABOUT EXIOBASE DATA DOWNLOAD TERMS OF USE PUBLICATIONS ABOUT US LOGIN

Extraction of copper ore

EU	4.2%
EU27	16.5%
EU28	17.3%
EU29	1.1%
EU30	0.1%
EU31	0.1%
EU32	0.1%
EU33	0.1%
EU34	0.1%
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EU36	0.1%
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EU90	0.1%
EU91	0.1%
EU92	0.1%
EU93	0.1%
EU94	0.1%
EU95	0.1%
EU96	0.1%
EU97	0.1%
EU98	0.1%
EU99	0.1%
EU100	0.1%

Consumption of goods and services

EU	22.4%
EU27	10.4%
EU28	10.4%
EU29	0.1%
EU30	0.1%
EU31	0.1%
EU32	0.1%
EU33	0.1%
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EU99	0.1%
EU100	0.1%

Copper footprint

When focusing on a specific ore, in this case copper ore, it can be seen from the accompanying graph that the main origin of extraction of copper and the destination of the bulk of embodied copper consumption are very different.

In 2007, a total of 1.8 Mt of copper ore was extracted. Latin America produced 38 % of this copper ore, mainly in northern Chile, but only 6 % was embodied in the final consumption of products and services in Latin America.

Welcome to EXIOBASE

EXIOBASE is a global, detailed Multi-Regional Environmentally Extended Supply-Use Tables (MR-SUT) and Input-Output Tables (MR-IOT). It was developed by harmonizing and detailing supply-use tables for a large number of countries, estimating emissions and resource extractions by industry. Subsequently the country supply-use tables were linked via trade creating an MR-SUT and producing a MR-IOTs from this. The MR-IOT that can be used for the analysis of the environmental impacts associated with the final consumption of product groups.



EIT Raw Materials is supported by the EIT, a body of the European Union

INNOVATION ENTREPRENEURSHIP ACADEMY PARTNERS NEWS EVENTS SUCCESS STORIES ABOUT



Home / Academics / Lifelong Learning

Working in close cooperation with our industrial partners, **Lifelong Learning** courses offer innovative professional training for individuals already working in the raw materials sector. Training draws on expertise from all three sides of the knowledge triangle to respond to the industry's changing needs and remains at the forefront of innovation. Courses are designed not only with the acquisition of skills and transfer of knowledge in mind, but also focus on tackling innovation challenges and the competitive pressures of new trends and technologies in the raw materials sector.



WEBSITE LIVE IN 2021, CO, IN, GRAPHITE, NB, W, CU, GE, TA, PD, PT, CE, LA, ND, DY, AL, FE

Home Page

About Panorama

Access Data

Methods

Deliverables

Education

Terms of use

By country

- Production
- Demand
- Stocks
- Main trading partners

By commodity

- Production & Production type
- Consumption
- Flows
- Evolution of demand

By product

- Production
- Consumption
- Final demand
- Flows
- Evolution of production and exchanges
- Composition

Material Flow Analysis

Summer School 2020

EXPLICIT CRM IN TRADE, SRM AND MSA DATA

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European Commission

EU SCIENCE HUB

Raw Materials Information System (RMIS)

European Commission > JRC > RMIS

OVERVIEW & NEWS

POLICY & LEGISLATION

TERMINOLOGY & LIBRARY

CRITICAL RAW MATERIALS

RAW MATERIALS SCOREBOARD & MONITORING

CIRCULAR ECONOMY & SECONDARY RAW MATERIALS

ENVIRONMENTAL & SOCIAL SUSTAINABILITY

ECONOMICS & TRADE

FORESIGHT, STRATEGIC VALUE CHAINS & MATERIAL FLOWS

RAW MATERIALS' PROFILES

EU COUNTRY PROFILES

RAW MATERIALS KNOWLEDGE GATEWAY

POSSIBLE LINKS TO RMIS

- › PANORAMA platform will be linked to RMIS in all scenario's. This is the default scenario where the consortium has to host and finance hosting itself.

- › Explicit representation of CRM in EEIO with global coverage could provide a valuable expansion to RMIS:
 - › metal content in commodity (raw, intermediate, final) trade flows
 - › Material System Analysis data
 - › SRM in industry sectors

- › Future developments of PANORAMA deliverables would be aimed at completing all critical and non-critical raw materials.

A nighttime photograph of a city street. On the left is a brick building with lit windows. In the center, a modern building with a curved facade and glass panels is illuminated. A long-exposure light trail of a green vehicle streaks across the scene from the right towards the center. The foreground shows a metal railing and a road with light trails from traffic.

THANK YOU FOR YOUR ATTENTION

Take a look:
[TNO.NL/TNO-INSIGHTS](https://www.tno.nl/tno-insights)

TNO innovation
for life

ORAMA, some key findings and their relevance to further development of RMIS

ORAMA project group

ORAMA

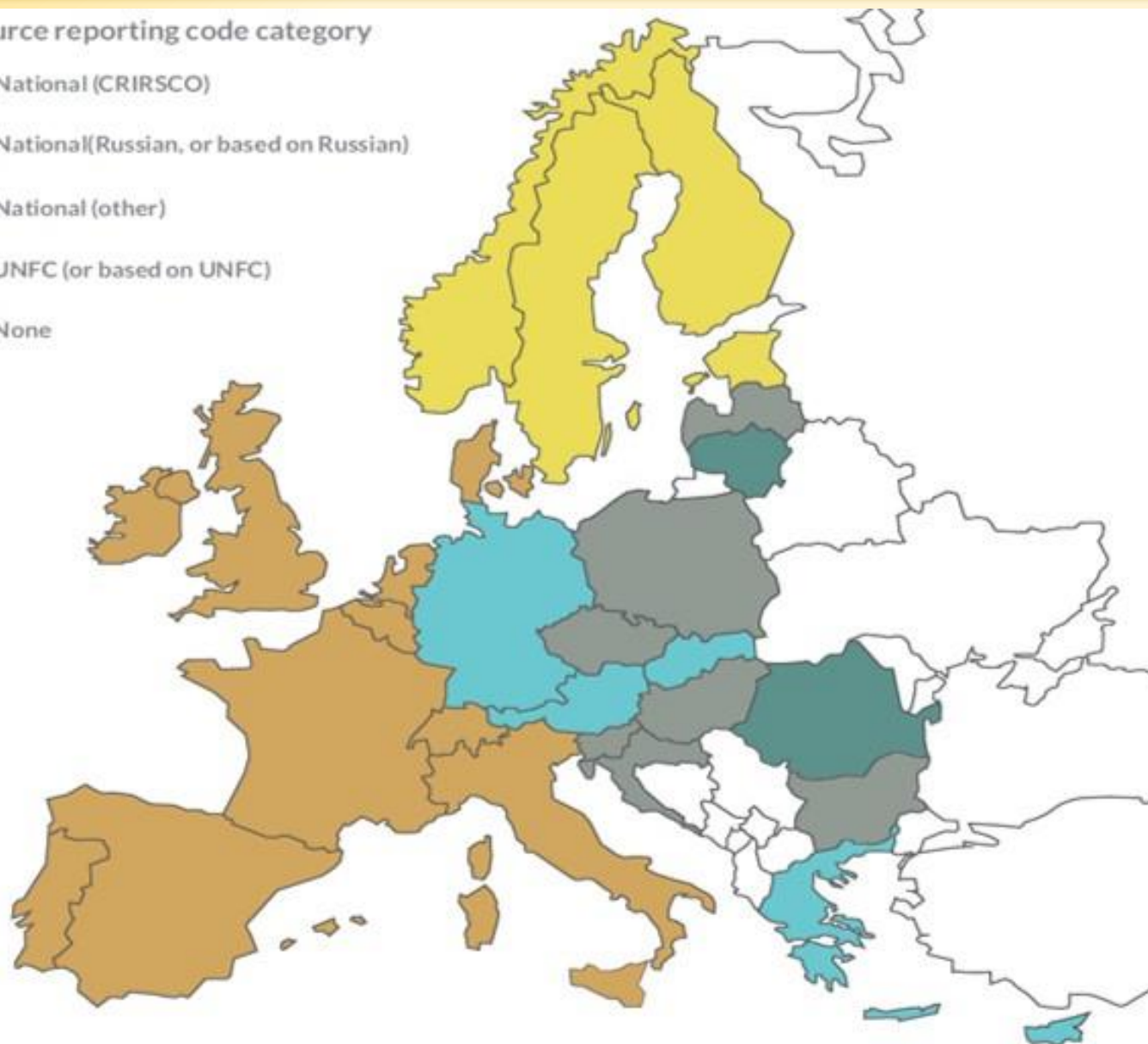
- Optimizing quality of information in Raw Material data collection across Europe
 - From 12/2017 to 11/2019
 - 16 partners, 14 countries
 - 9 geological surveys, 7 others i.e. SRM specialists
- High Level objectives:
 - Develop a clear strategy for improving the quality of collected raw materials (RM) data, and harmonise the data collected in accordance with the INSPIRE Directive
 - Ensure and extend the sharing of RM data, information and best practices in data collection at national and EU levels

Current state, primary raw materials

- Main problems:
 - Differences in reporting methods between member states
 - Plenty of known mineralizations without “modern” resource estimate
- European platforms have been developed
 - Eg. Minerals4EU, EURare, Mintell4EU RESEERVE. Results now available through the European Geological Data Infrastructure (EGDI), www.europe-geology.eu.
 - Compiled automatically by harvesting national databases
 - These differ in content, reporting system used, updating frequency etc.
 - -> adding up doesn't produce European resources/reserves

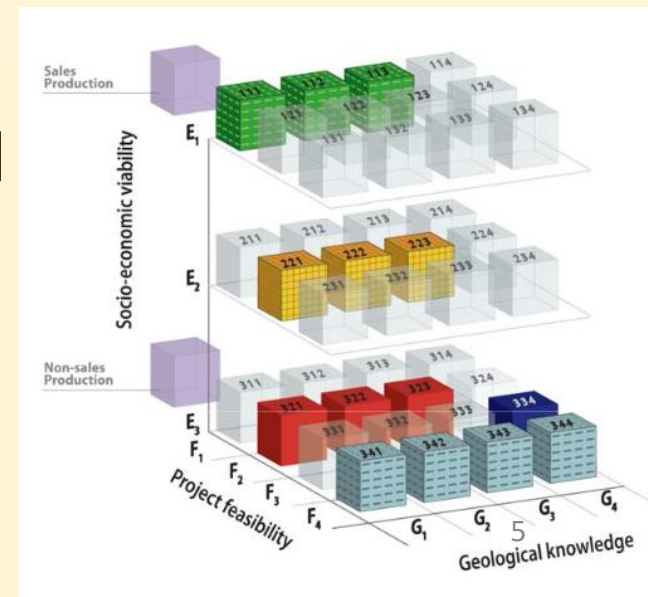
Resource reporting code category

-  National (CRIRSCO)
-  National (Russian, or based on Russian)
-  National (other)
-  UNFC (or based on UNFC)
-  None



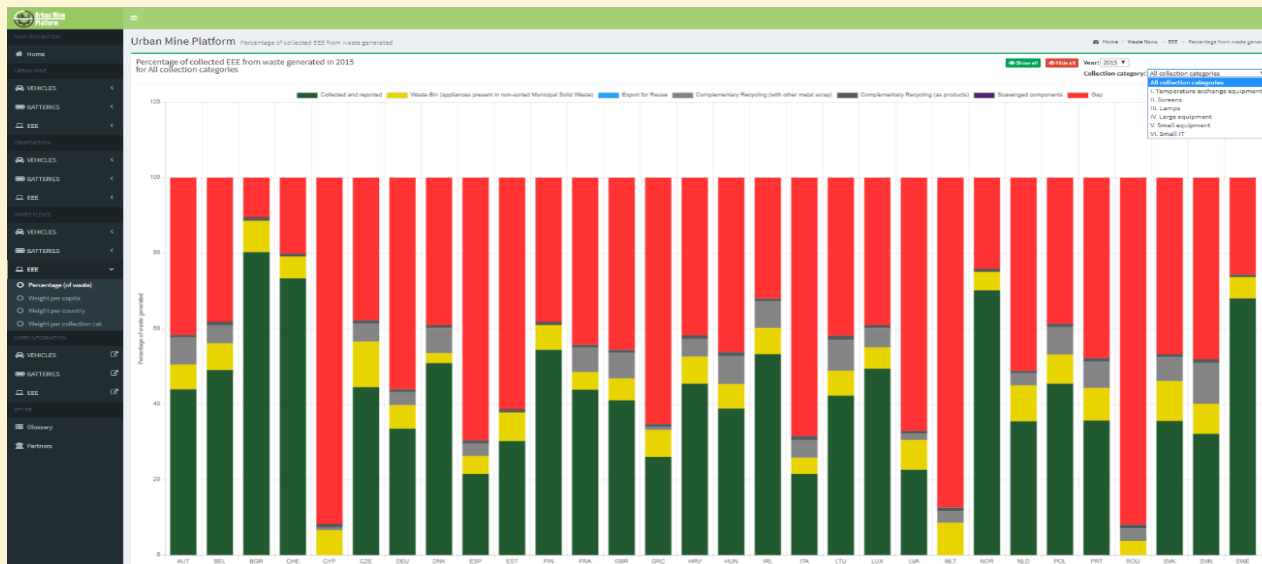
ORAMA recommendation: UNFC system

- United Nations Framework Classification
- Can deal with less constrained data
 - Better possibilities for “all there is” numbers
- Bridging documents from other systems exist and new ones can be compiled
- Widely known but not widely used
 - Benefit or drawback?
 - Plenty of extra work or fresh start?



SRM challenges

- Data even more scattered than for PRMs
 - Different waste groups
 - National differences
 - Lack of compositional data, Partly due to confidentiality issues
 - Complimentary waste flows, etc. etc.





Vehicle Case study: Batteries in xEV in Norway

VW e-Golf

Mass: 1520 kg

Battery pack mass: 272-290 kg

Battery type: Li-ion NMC

Tesla Model X

Mass: 2390 kg

Battery pack mass: 530-625 kg

Battery type: Li-ion NCA

Two very different cars?

... not according to Eurostat



SRM, key points & way forward

- Low hanging fruits still available
 - E.g. redefining the weight classification for vehicles
 - Significantly improves estimation of battery masses on EU roads
- Lack of (reliable) data affects the meaningfulness of targets
- Need to constantly improve the classifications used
 - Evolving battery chemistries
- Data is crucial to understand circular economy potential in reuse and recycling for the EU in the future



ORAMA and RMIS

- JRC partner in project, ease of knowledge transfer
- ORAMA didn't come up with a "silver bullet"
- ORAMA work is taken forward in new studies and models, e.g.
 - Updates for Batteries (implemented) and ELV (upcoming) in RMIS's (Foresight, strategic values chains and materials flows tile)

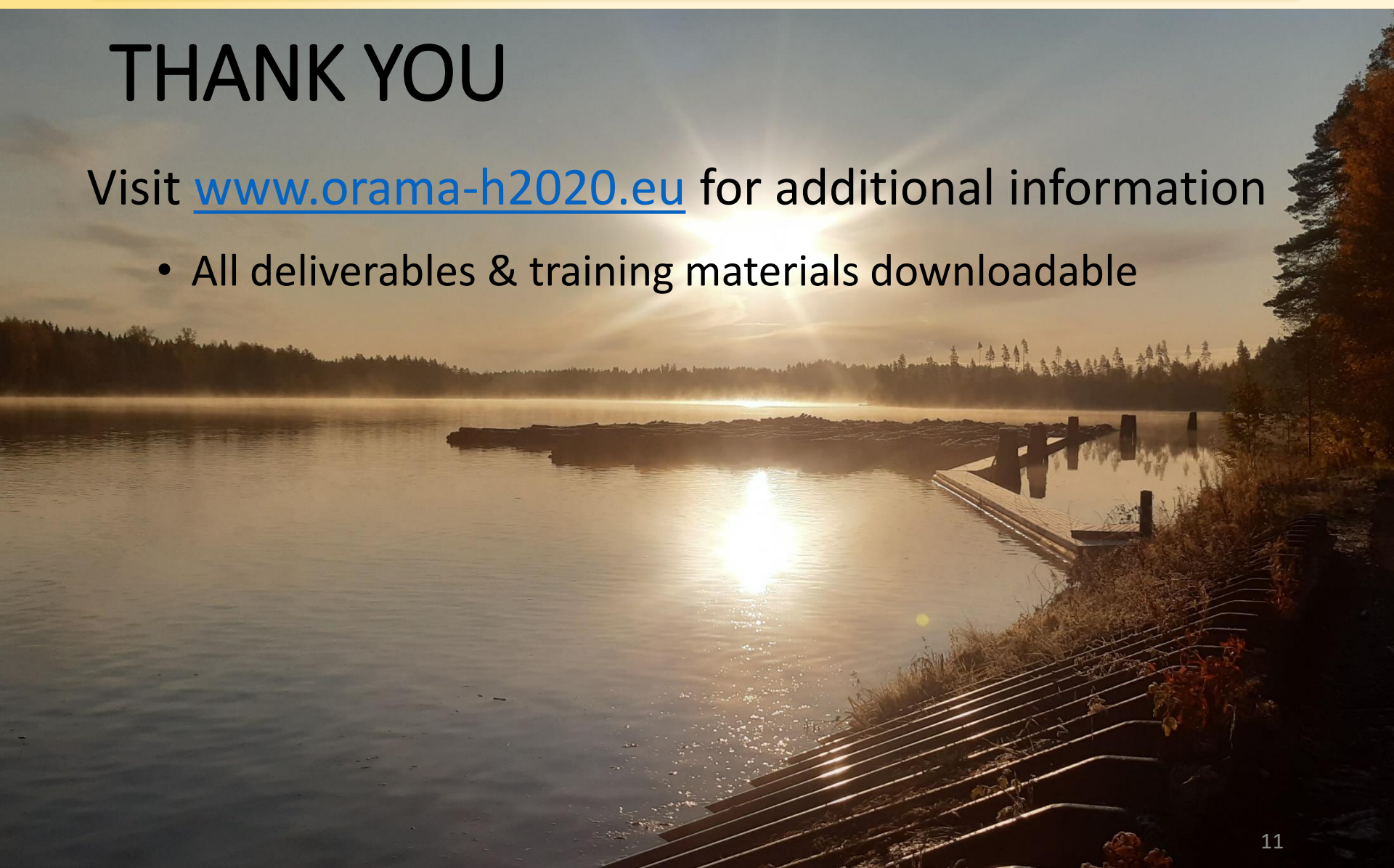


These are the parts where ORAMA's long term effect should especially be felt. "They should become alive."

THANK YOU

Visit www.orama-h2020.eu for additional information

- All deliverables & training materials downloadable





MinLand

Mineral Resources in Sustainable Land-Use Planning

Coordinated by Geological Survey of Sweden – Ronald Arvidsson, Nikolaos Arvanitidis

22 Partners

Industry
Land Use Authorities
Mining Inspectorates
NGOs
Mineral Policy Experts

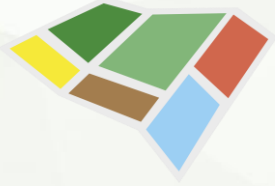
Linking Mineral Policies with Land Use Policies

Securing access to land for Prospecting and Mining
within EU

ronald.arvidsson@sgu.se
www.minland.eu

Photo: R Arvidsson, Kristineberg Mine, Sweden



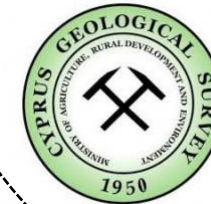


MinLand Team Partners and Third Parties

Coordinator

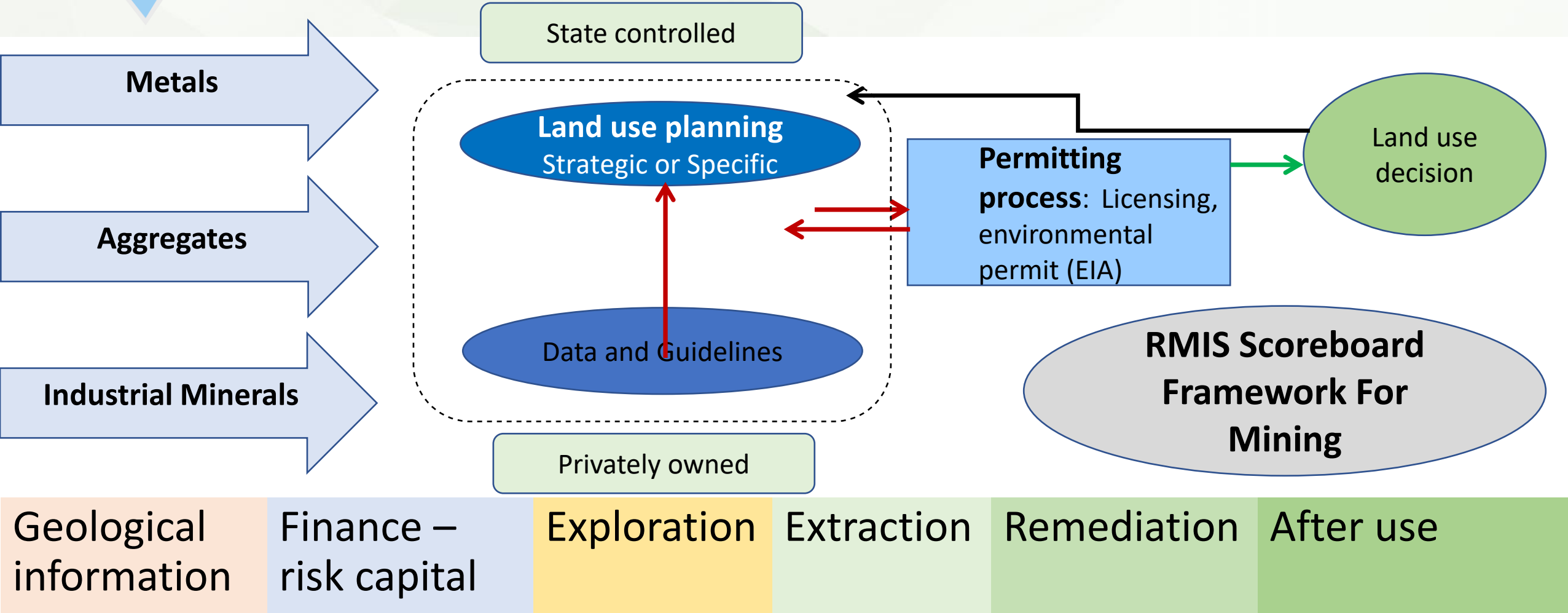


Third Parties





Land use planning and mineral resources D2.1





35 Deliverables summarized in final report

Deliverable	Title	Notes
D3.2	Case studies summary	MinLand mineral resource land-use case descriptions – input data
D7.6	Main conclusions of the Regional (or National or Local) Workshops	Good Practices and input
D4.3	Comparison of mineral land use vs. other land use and their integration	Good Practices
D5.2	Stakeholder involvement in applying a common framework on natural resources	High-level discussions, recommendations
D6.2	Final manual for good practice guidance	Good Practices
D8.3	Organization of events (Dissemination workshop at Final Meeting)	High-level discussions, conclusions and recommendations from the Final Conference

Final Report => RMIS Scoreboard Policy and Legislation Environment and Sustainability





Objectives of MinLand

1. Knowledge repository

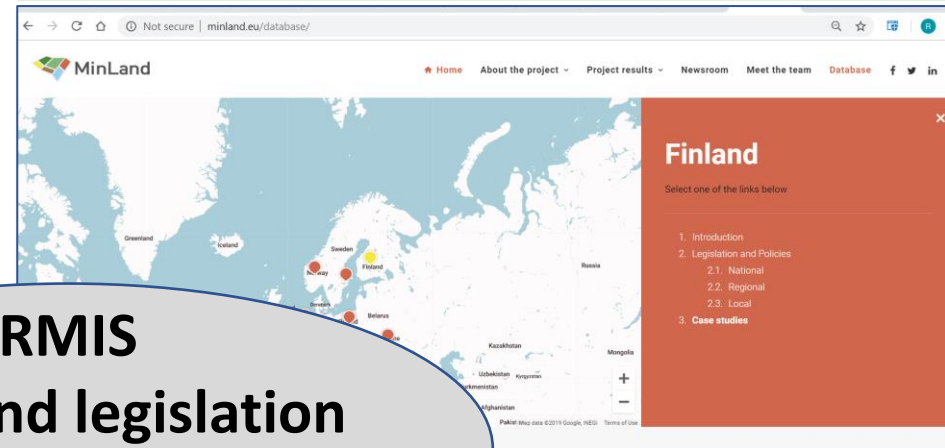
1. Case studies: 16 mining- and policy cases and consultations with informed stakeholder group
 1. Base information for outlining EU MS mineral- and land-use policy frameworks
2. Mineral policies and legislation

2. Facilitate minerals and land use policy making

3. Strengthen transparent land-use practices

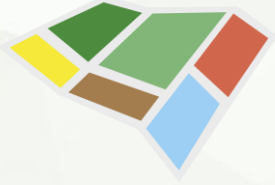
4. Foster networking

www.minland.eu

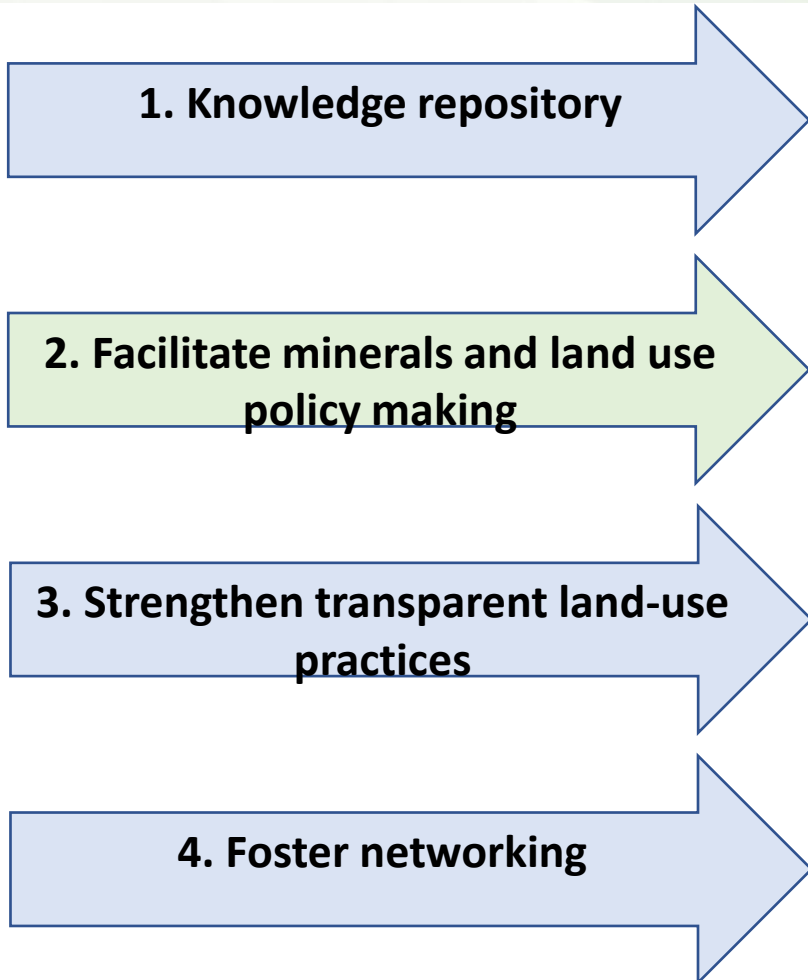


RMIS
Policy and legislation
Environment and
Sustainability





Objectives of MinLand



1. Access to high-quality data for minerals- and land-use planning
2. Safeguarding:
 1. Land use planning processes and instruments which allowed **weighing of interest and changes to land-use and zoning plans;**
3. Minerals assessed on par with other land uses
 1. Design and implementation of **methods that e** **minerals** and other land uses for a final design a given area.
4. Permitting

RMIS
Policy and legislation
Environment and
Sustainability



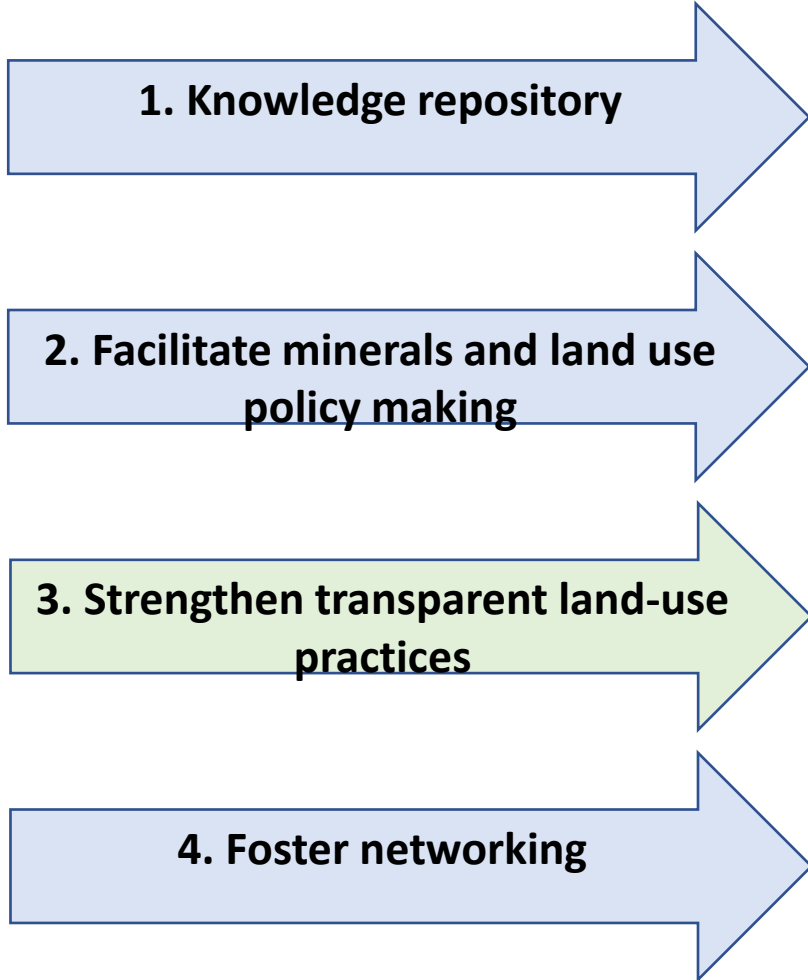
2018: Lisheen Tailings Management Facility - remediation almost complete. The cover material in the 2015 photograph have been used and the area re-vegetated. Note also removal of infrastructure (bottom centre). Photo credit: Vedanta zinc international





Objectives of MinLand

RMIS
Policy and legislation
Environment and
Sustainability

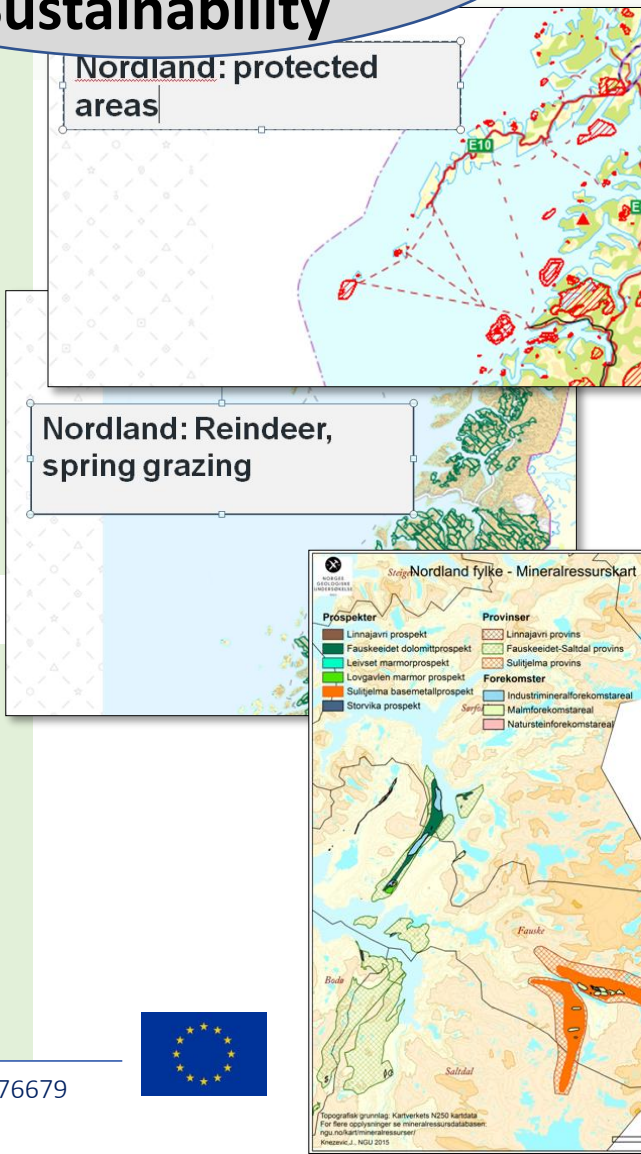


D6.2 Guidelines- ch 5: What can be done by public authorities and industry alike to **increase transparency in land-use planning and mining?**

- Provide a **clear planning process description**, based on the national planning system, and share this with all interested parties;
- Share **information regarding companies' spatial and environmental plans** with stakeholders;
- Include **stakeholders' input in planning** before submitting proposals to the authorities.

D6.2 Ch 6: Challenges of societal acceptance and conflicting interests of stakeholders. **Early stakeholder involvement;**

- **Statutory public consultation** and public sector initiatives
- Allowing **co-existence of mining and other land uses**, through e.g. compensation measures.





Objectives of MinLand

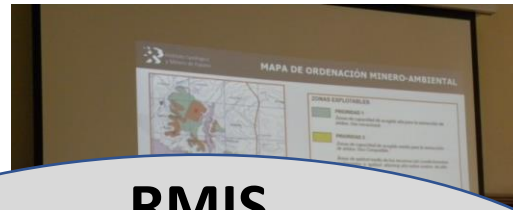
1. Knowledge repository

**2. Facilitate minerals and land use
policy making**

**3. Strengthen transparent land-use
practices**

4. Foster networking

1. MinLand Stakeholder Network => EuroGeosurveys
2. Local Workshops - 8 in total
3. Stakeholder Workshops
4. MinLand Final Conference - Brussels



RMIS
Policy and legislation
Environment and
Sustainability



COLLECTORS

WASTE COLLECTION SYSTEMS ASSESSED AND GOOD PRACTICES IDENTIFIED

2020 RMIS Technical workshop "Channelling knowledge from European projects into the Raw Materials Information System (RMIS)"
03/12/2020

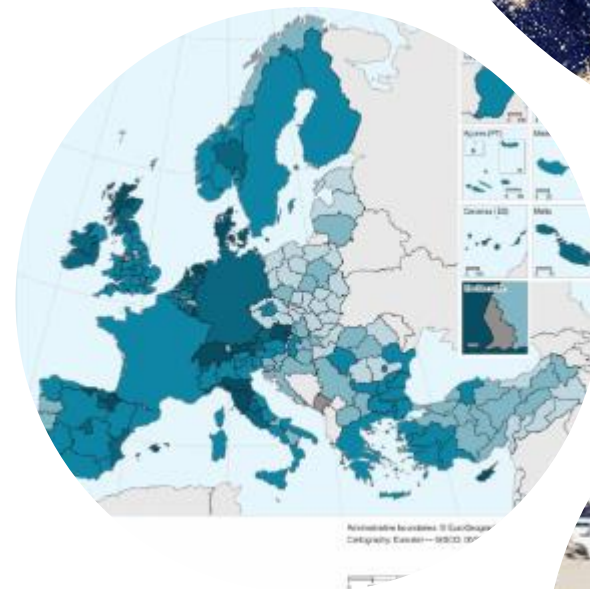
Tjerk Wardenaar & Twan van Leeuwen
PNO Consultants





COLLECTORS objective

The main objective of the COLLECTORS project is to harmonize and disclose available information on different waste collection systems; to gain insight into the overall performance of systems; and to support decision-makers in shifting to better-performing systems via capacity-building and establishment of implementation guidelines.



Identify

- Mapping of waste collection systems
- Analysis of selection parameters and criteria
- Selection of 12 case studies for further analysis
- Development of webportal

Assess

- Environmental analysis of 12 case studies
- Economic analysis of 12 case studies
- Value chain & societal analysis of 12 case studies

Inform

- Publication of guidelines for succesful implementation of waste collection systems
- Policy recommendations to EC

OUR WEBPLATFORM

- Almost 250 systems
- Three waste fractions
- Eight search criteria

CHARACTERISTIC OF THE REGION

Population: 0 inh to 672,000 inh

Density: 0 inh/km² to 7,000 inh/km²

GDP: 0 €/cap to 21,000 €/cap

Area characteristics: Inland - not remote

Waste fraction:

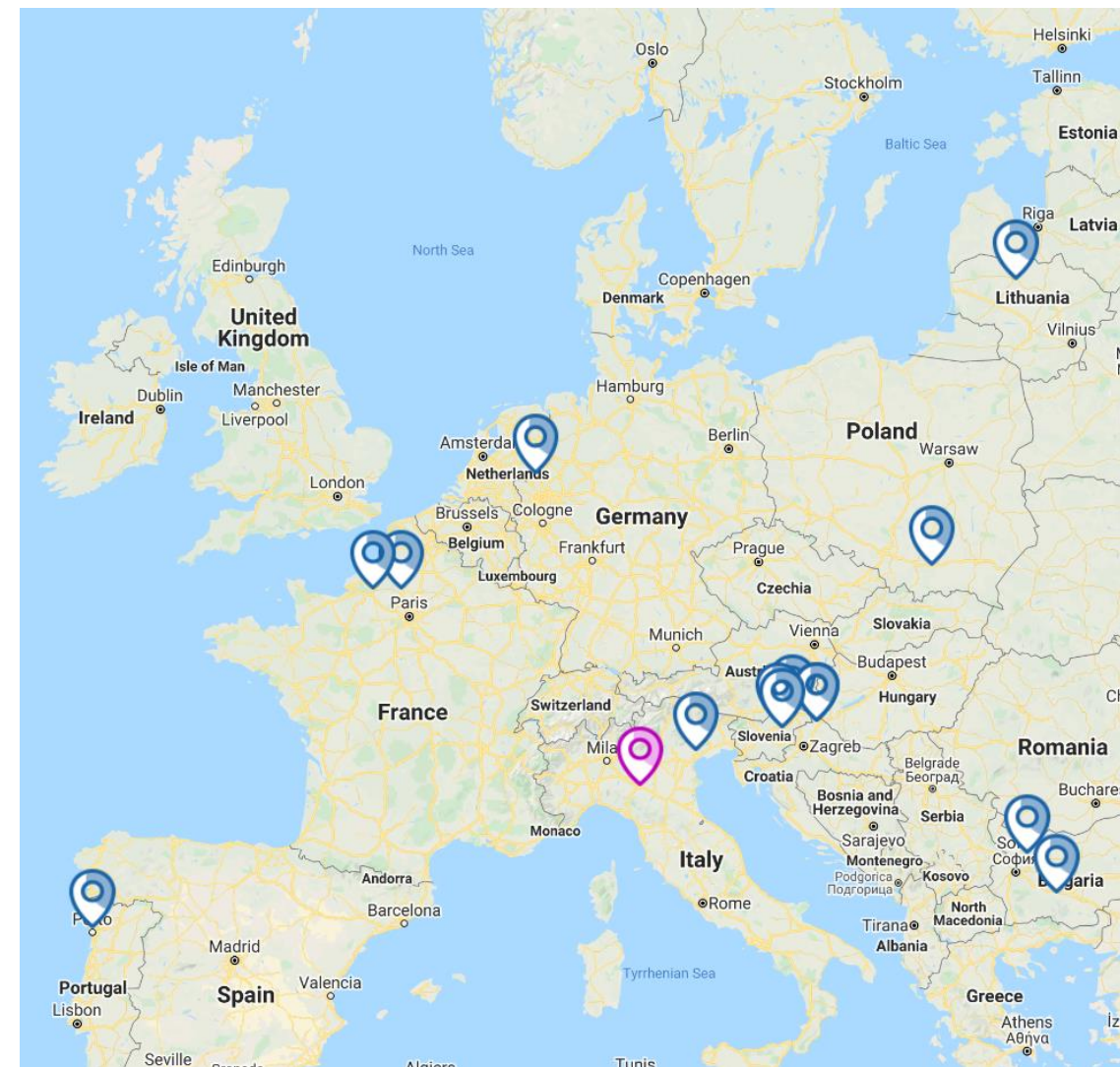
- PPW: Plastic packaging waste
- WEEE: Waste electrical and electronic equipment
- CDW: Construction and demolition waste

AVAILABLE INFORMATION

only display waste collection systems with available data on

- Waste fee
- Information on the costs
- Quality of sorted material
- Case study

SEARCH > ? 15 waste collection systems found



GENT (BE)

Population: 256,262 inh.
 Density: 1,640.8 inh./km²
 Share of multi-family houses: 82.00%
 GDP: 52,761 €/inh
 Additional information: city



For the waste collection system in Gent (BE), a detailed case study has been performed. You can find the case study summary by clicking the following link. Details regarding the collection system in Gent (BE) are presented below.

[Download case study summary](#)

DESCRIPTION OF THE WASTE COLLECTION SYSTEM

SCOPE OF MUNICIPAL WASTE

Household waste	Similar waste	Other
x	x	

Responsibility of collection: The intermunicipality of IVAGO serves both the city of Gent and the municipality of Destelbergen. IVAGO has its own collection equipment and waste to energy plant for residual waste. IVAGO is a public/ private association. For the treatment of other streams then residual waste the two private partners, Suez and Indaver are the key partners. Paper and cardboard is collected door to door once a month (correct but in the graph and other table it says every 2 weeks). Glass is collected door to door once a month, separately from P&C. Plastic and metal drinking packaging and beverage composites are collected together in one bag, once every 2 weeks. All fractions are also collected via bring containers, mainly for high rise buildings. Next to that there is also recycle parks. As of January 1st, 2020, other plastic packaging will be allowed in the same bag as the plastic and metal drinking packaging.

Implementation ongoing for: Composite

FEE SYSTEM

Pay-as-you-throw: Yes

Description of the waste fee: 2017

SEPARATION SYSTEM

	Single or comingled
Glass	Single
Paper and cardboard	Co-mingled
Composite	Co-mingled
Plastic	Co-mingled
Metal	Co-mingled

Deposit system: Glass packaging for soda, water and beer is covered by a deposit system.

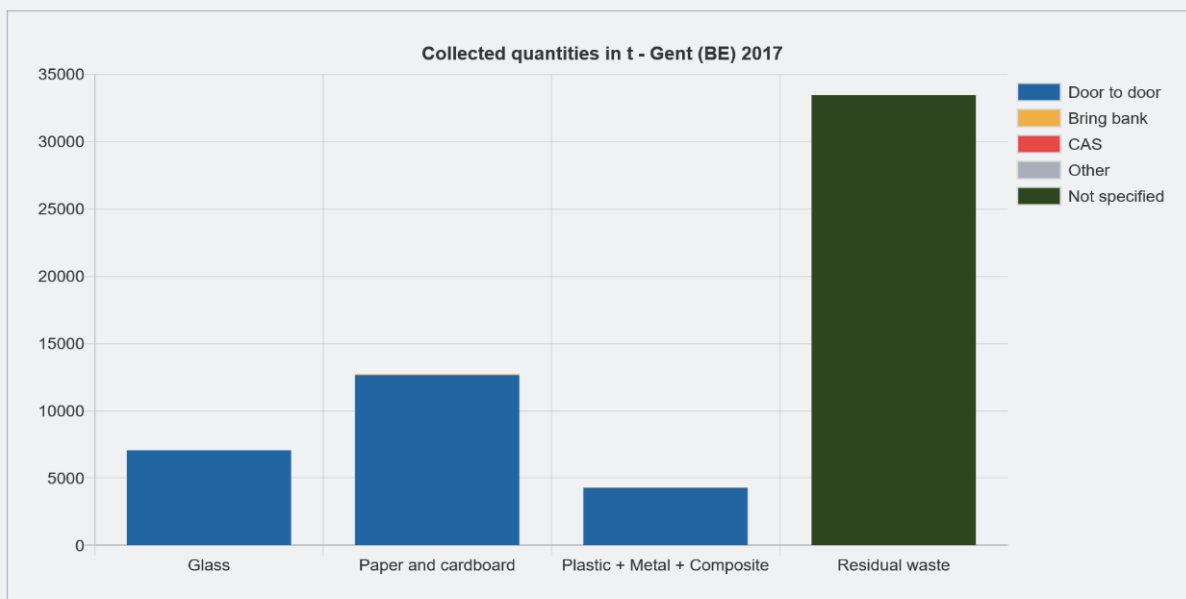
COLLECTION MODE

	Door-to-door	Bring bank	CAS	Other
Glass	7062.0			
Paper and cardboard	12636.0	77.0		
Plastic + Metal + Composite	4272.0	39.0		

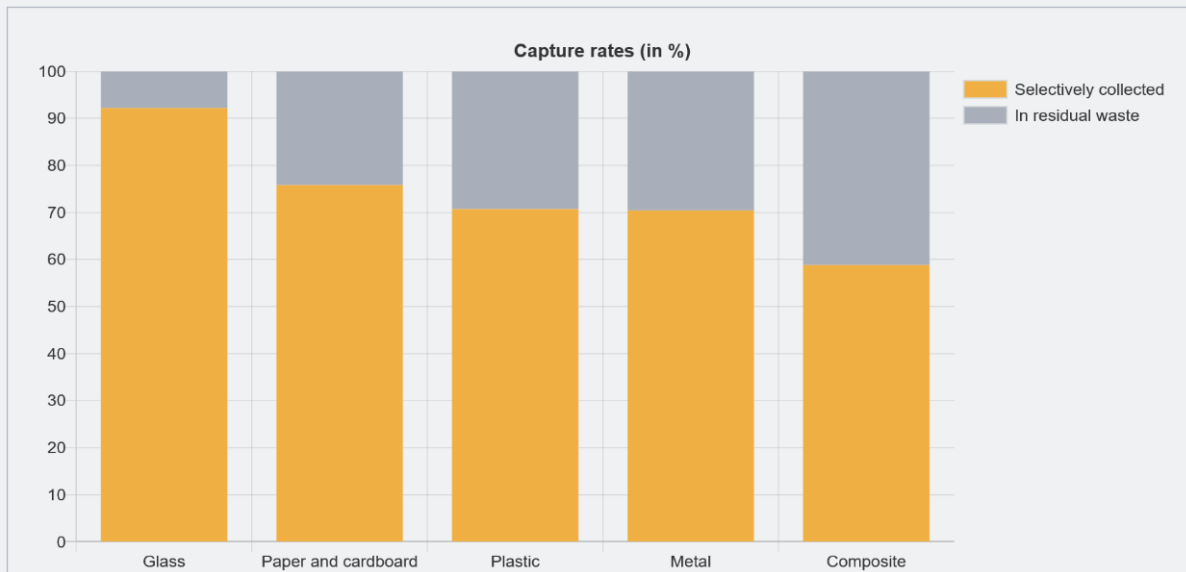
DOOR-TO-DOOR COLLECTION SCHEME

Waste Stream	Collection frequency	Collection coverage in %	Additional remark
Glass	once a month		
Paper and Cardboard	every 2 weeks		
Plastic	every 2 weeks		

PERFORMANCE OF THE WASTE COLLECTION SYSTEM



Residual waste: 130.5 kg/cap





High quality recycling relies on effective separate collection of waste. To help citizens, businesses and public authorities better separate waste, the Commission will **propose to harmonise separate waste collection systems**. In particular, this proposal will address the most effective combinations of separate collection models, the density and accessibility of separate collection points, including in public spaces, taking account of regional and local conditions ranging from urban to outermost regions. Other aspects that facilitate consumer involvement will also be considered, such as common bin colours, harmonised symbols for key waste types, product labels, information campaigns and economic instruments. It would also seek standardisation and the use of quality management systems to assure the quality of the collected waste destined for use in products, and in particular as food contact material.

Provide insight into the pathways between consumption and waste treatment – and the effects.

- Waste collection is performed at local / regional level; data is also generated & collected at this level (versus data on national level).
- Focus on level of the waste fractions (versus material (composition)).

OUR CONSORTIUM



RAMBOLL



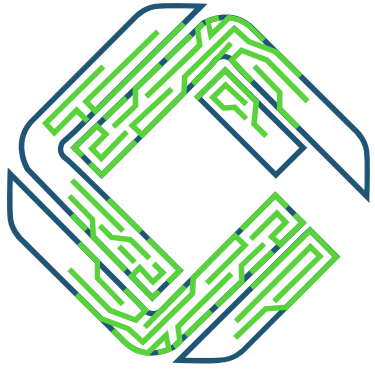
Thank you!

Tjerk Wardenaar & Twan van Leeuwen | PNO Consultants

tjerk.wardenaar@pnoconsultants.com

twan.vanleeuwen@pnoconsultants.com

www.collectors2020.eu



CEWASTE

CEWASTE Contribution to RMIS

JRC/EASME workshop "Channelling knowledge from European projects into the Raw Materials Information System (RMIS)"

Online Workshop, Thursday, 03 December 2020

Shahrzad Manoochehri

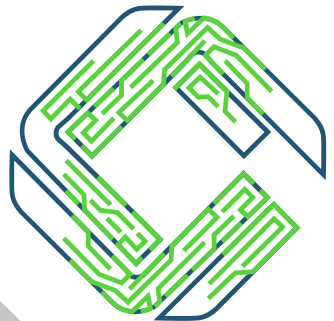


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 820859



Main Objective

The project “Voluntary Certification Scheme for Waste Treatment” (CEWASTE) aims to **develop and validate a voluntary certification scheme** for collection, transport and treatment facilities of key types of waste containing significant amounts of **valuable and critical raw materials (CRMs)**.



Project Partners

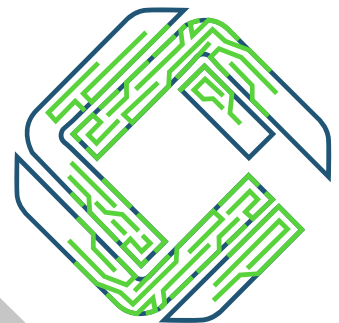
PROJECT PARTNERS



LINKED THIRD PARTIES

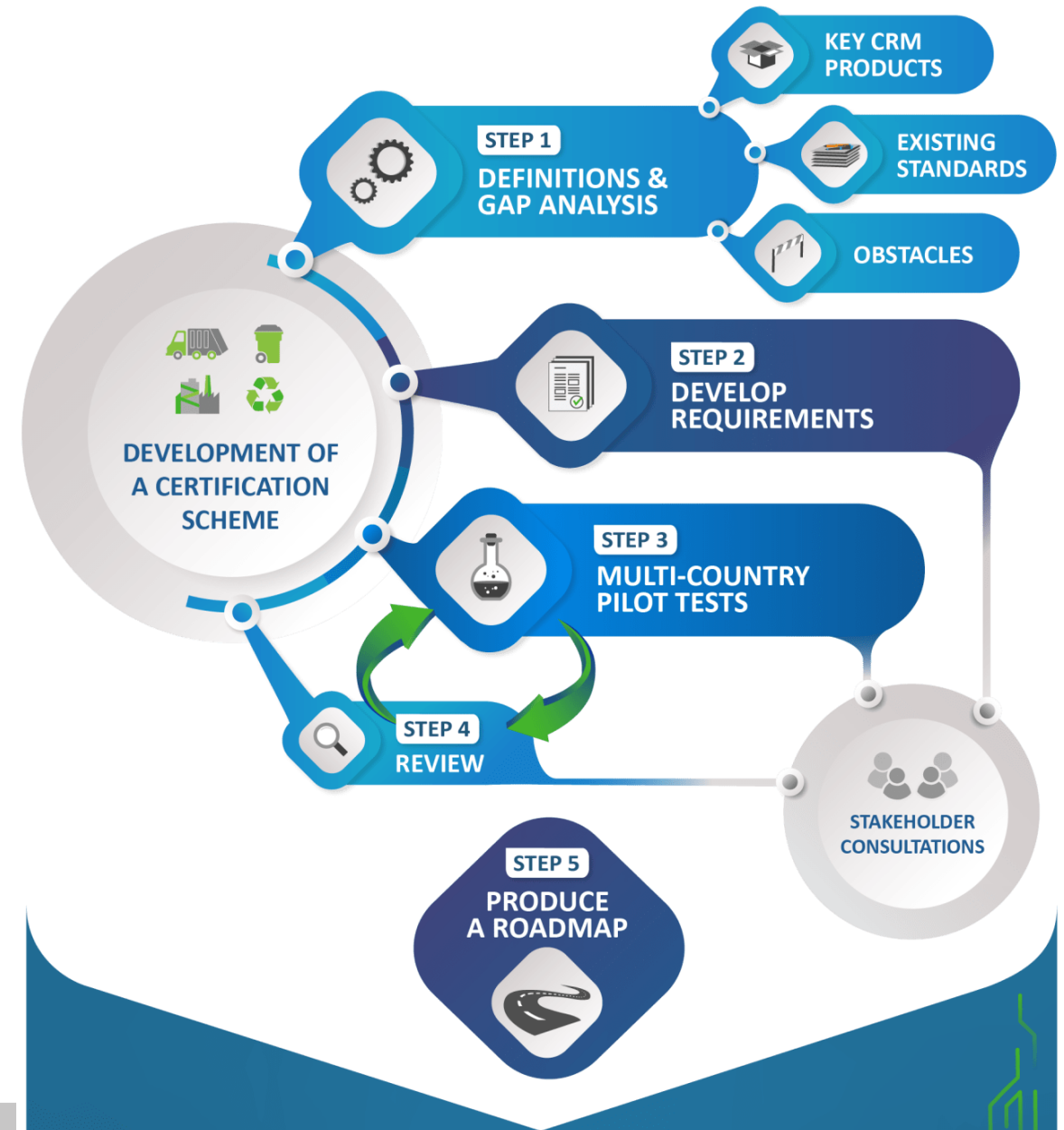


It starts here.



Approach

- Conduct a **Baseline analysis** to understand existing recovery practices, standards and verification schemes
- Develop **new requirements for CRM recycling**
- Develop an **assurance system and related verification procedures**
- Validate the new voluntary scheme through **pilots audits**
- Develop a **roadmap** for long term sustainability of the scheme
- Perform a **transparent stakeholder process**



Key Outcomes: Baseline Analysis

Deliverable 1.1 – Baseline and Gap/Obstacle Analysis

- Analysis of:
 - Content and concentration of CRMs in WEEE and waste batteries → Data from other H2020 projects (SCRREEN and ProSUM) and Umicore (recycling company)
 - Technical and economical feasibility of the recycling process → Data from literature review, other H2020 projects (e.g. SCRREEN, ReproMag, ...) and Umicore
- Mapping of existing legislation, guidelines, standards and verification mechanisms → Literature review

	WASTE TYPE	CRMs	Required/Viable Input for End-processing	Current Business Practice
PCBs Desktop computers, professional IT Laptops Mobile phones Tablets External CDDs/ODDs, devices with internal CDDs/ODDs	WEEE		PCBs (shredded and unshredded), CuPM granulates, mobile phones w/o. batteries	✓
LI-ION BATTERIES Laptops Mobile phones Tablets Li-ion batteries in other WEEE BEV, (P)HEV	WEEE ELV		Batteries	✓
LEAD-ACID BATTERIES Uninterruptable Power Supplies Other WEEE (e-scooters without seats, ride-on toys,...) Cars containing IABs, other vehicles (e-scooters with seats, ...)	WEEE ELV		Batteries	✓
FLUORESCENT POWDERS Fluorescent lamps CRT monitors and TVs	WEEE		Fluorescent Powder	✗
Nd-MAGNETS Temperature exchange equipment (engine, compressor) Large household appliances other than temperature exchange equipment (motors/drives) Laptops (HDD) Desktop computers, professional IT (HDD) BEV, (P)HEV (electro engine)	WEEE ELV		Magnets	✗



Key Outcomes: Normative Requirements

Deliverables 2.1&2.2 – Normative requirements

- The document has the structure of a “standard” document
- Reference to EN50625-series (approved by CENELEC)* as far as possible, and other normative requirements to fill gaps
- A set of new managerial, environmental, traceability and **technical** requirements for recycling of CRM from WEEE and waste batteries

*European Standards on Collection, Logistics and Treatment Requirements for WEEE (EN 50625 standard series) approved by CENELEC (European Committee for Electrotechnical Standardization) on 2014-63 01-27.

Example of the new normative requirements (Draft version)

5.2.5 NdFeB-MAGNETS TREATMENT OPERATORS (NEW)

Pre-treatment operators separating magnets from WEEE shall have non-magnetizable receptacles available for their storage to ensure the magnets can be easily cleared from the receptacles for further pre- or end-treatment steps.

5.3 HANDLING (30625-2-1)

The handling of WEEE and waste batteries containing CRM and valuable materials, including the loading, unloading and transport shall apply the general requirements in clause 5.3 of EN 50625-1.

Refer to clause 5.3 of EN 50625-1

5.3.1 HANDLING AT COLLECTION FACILITIES (30625-4)

In addition to the requirement in clause 5.1.4 of TS 50625-4, consider the following:

- When batteries can be removed without tools, they shall be removed

Refer to clause 5.1.4 of TS 50625-4

5.3.2 HANDLING OF FLUORESCENT LAMPS DURING TREATMENT (30625-2-1)

Refer to clause 5.3 of EN 50625-2-1



Key Outcomes: Assurance and Verification system

Deliverables 3.2 and 3.3 – Design of Verification Procedures

- Auditing procedures, checklists, protocols and manuals:
 - Audit plan template
 - Audit report template
 - Checklist assessment tool (excel file)
 - Assurance manuals (for the operators)
 - Verification manual (for the auditors)



AUDIT PLAN

CEWASTE CERTIFICATION SCHEME

Operator name and address Applicant / certificate holder	DRAFT
Address and contact persons	
Date and place	
Assessment team, their area of expertise, contact details	
Other participants and their roles	



AUDIT REPORT

CEWASTE CERTIFICATION SCHEME

Date of the report: _____

OPERATOR

Company: _____
Business ID: _____
Address: _____
Contact person: _____
Representative(s) of the operator present during the audit: *Note: first name, LAST NAME* _____

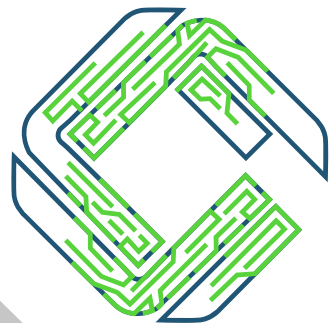
CEWASTE CERTIFICATION BODY AND AUDITOR



Key Outcomes: Piloting and Roadmap

Deliverable 4.4-Roadmap for long-term sustainability of the scheme (**Work in progress**)

- Economic and environmental benefits of the implementation of the scheme
- Recommendations for improvements of legislative/financial framework conditions, e.g. financing mechanisms relevant to products, resources and waste
- The outline of a plan for a future large-scale roll-out
- The roadmap will also analyse options to integrate the key outcomes of the scheme into the RMIS database

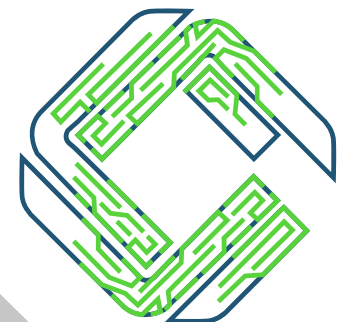


Project Outputs for RMIS

Where in the RMIS could the CEWASTE project's outcome be linked:

- “Circular Economy & Secondary Raw Materials” → “SRMs in the CE Action Plan” → “From Waste to Resources”

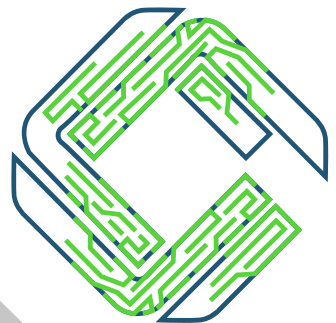
The screenshot displays the RMIS website interface. The main content area is divided into six panels: 'OVERVIEW & NEWS' (top-left, with a globe), 'POLICY & LEGISLATION' (top-middle, with the EU flag), 'TERMINOLOGY & LIBRARY' (top-right, with a word cloud), 'CRITICAL RAW MATERIALS' (middle-left, with mineral samples), 'RAW MATERIALS SCOREBOARD & MONITORING' (middle-middle, with a circular dashboard), and 'CIRCULAR ECONOMY & SECONDARY RAW MATERIALS' (middle-right, with a green arrow pointing to it). Below these panels are four navigation buttons: 'SRMS IN THE CE ACTION PLAN', 'MONITORING SRMS: DATA, INDICATORS AND TOOLS', 'SRMS IN PRIORITY AREAS OF THE CE AP', and 'SRMS IN SPECIFIC INDUSTRY SECTORS'. At the bottom, a text block states: 'As stated in the 2015 Communication "Closing the loop - An EU action plan for the Circular Economy", the European Commission aims to further develop the Raw Materials Information System (RMIS) to improve the availability of data on secondary raw materials and support EU-wide research on raw materials flows. RMIS aims to cover Secondary Raw Materials (SRMs) generation, use, applications, trade, end-of-waste, and any related aspects along the value chain. This section provides an overview of (1) the relevant definitions and European policies related SRMs (policies and definitions), and (2) the actions proposed in the Circular Economy (CE) action plan that will contribute to boosting the market for secondary raw materials, focusing on each step of the value chain, from production and consumption to waste management, including reuse, repair and remanufacturing, and SRMs that are fed back into the economy (from waste to resources)'. At the very bottom are four navigation buttons: 'POLICIES & DEFINITIONS', 'PRODUCTION & CONSUMPTION', 'WASTE MANAGEMENT', and 'FROM WASTE TO RESOURCES'.



Project Outputs for RMIS

Recommendations for future further development of certain RMIS sections based on the CEWASTE project's knowledge/outputs:

- A section on **standards** under “Policy & Legislation”, “Critical Raw Materials”
- A section on **Access to secondary CRMs** under “Critical Raw Materials”: a selection of projects and their results that have a focus on recycling of CRMs



Contact Us for More Information



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www.cewaste.eu



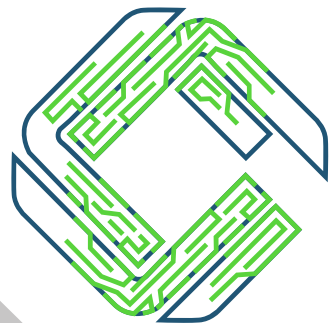
@cewaste1



CEWASTE Horizon 2020 project

To join the CEWASTE Network visit:
<https://cewaste.eu/get-involved/>

Project Coordinator:
World Resources Forum
Lerchenfeldstrasse 5
9040 St.Gallen, Switzerland
www.wrforum.org





INTERMIN: YOUR SPECIALIZED PORTAL OF GLOBAL RAW MATERIALS TRAINING

Prof. Manuel Regueiro y González-Barros

Antonio Alonso Jimenez

Geological Survey of Spain



1. Creating a self-sustainable long-term lasting **international network of training centres for professionals**.
2. Map skills and knowledge in the EU and the third countries. Identify key knowledge gaps and emerging needs.
3. Develop a roadmap for improving skills and knowledge, establish common training programmes in the raw materials sectors.
4. Create common metrics and reference points for quality assurance and recognition of training, to develop an **international qualification framework** for technical and vocational training programs on mineral raw materials' topics, based on present and future requirements by employers.
5. Develop a **comprehensive competency model** for employment across the primary and secondary raw materials sector.

PILLAR 1. THE PROFESSIONALS

- European Federation of Geologists (EFG) **(WP3)**
- American Geological Institute (AGI)
- Polish Association of Mineral Asset Valuers (PAMAV)
- Young Earth Scientists Network (YES Network)

PILLAR 3. THE TRAINING AND EDUCATIONAL ORGANISATIONS

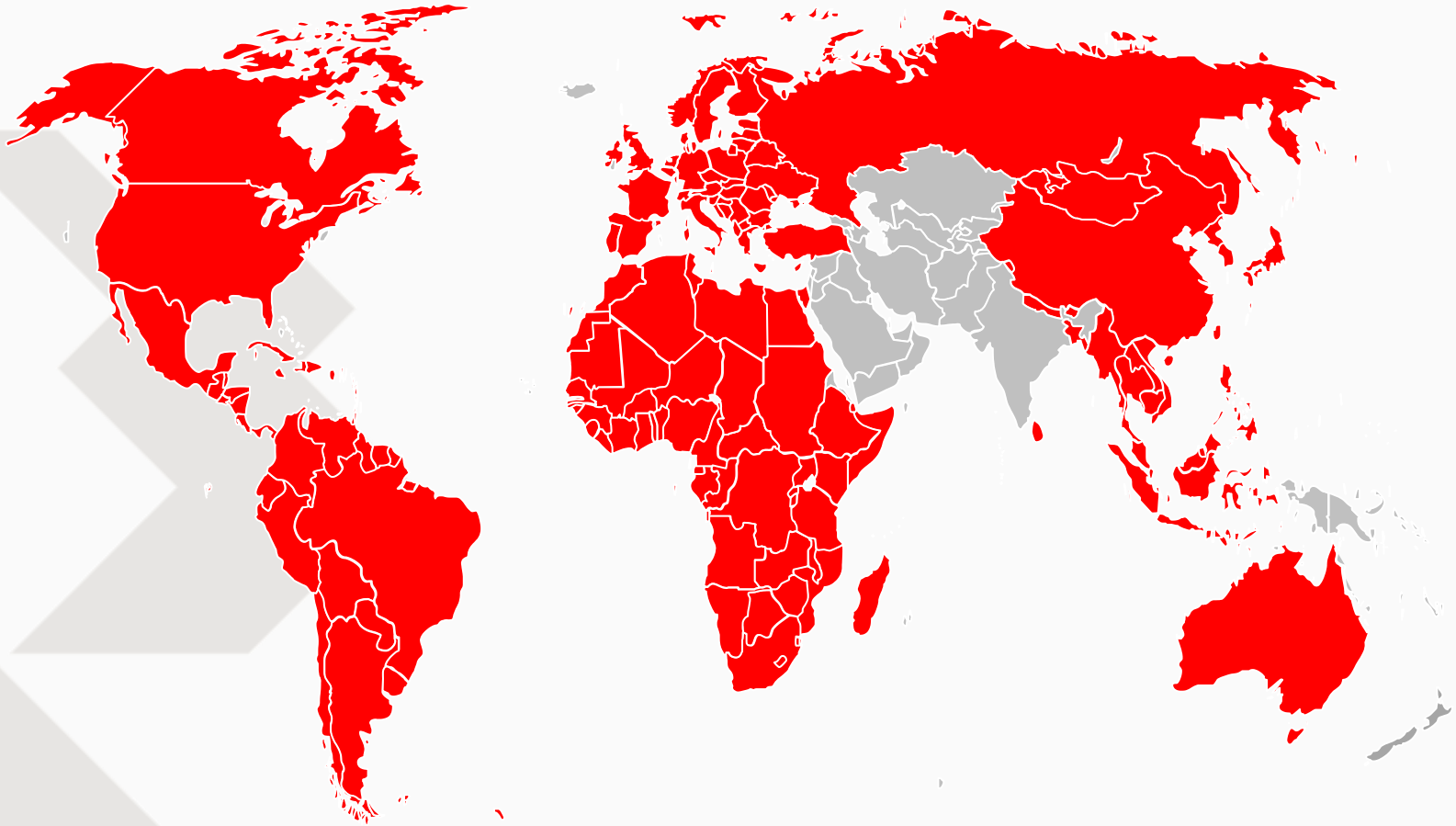
- Leoben University **(WP1)**
- Polytechnic University of Madrid **(WP4)**
- Universities of Queensland and Western Australia
- La Palma Research Center **(WP2)**
- Coordinating Committee for Geoscience Programmes in East and Southern Asia (CCOP)

PILLAR 2. THE EMPLOYERS

- EuroGeoSurveys **(WP5)**
- Association of Iberoamerican Geological and Mining Surveys (ASGMI)
- Geological Survey of Spain (IGME-SP) **(WP6) (WP7)**
- Geological Survey of Greece (IGME-GR)
- Geological Survey of Hungary (MFGI)
- Geological Survey of Portugal (LNEG)
- Geological Survey of Sweden (SGU)
- Geological Survey of France (BRGM)
- Czech Geological Survey (CGS)
- GeoInform of Ukraine (SRDE)

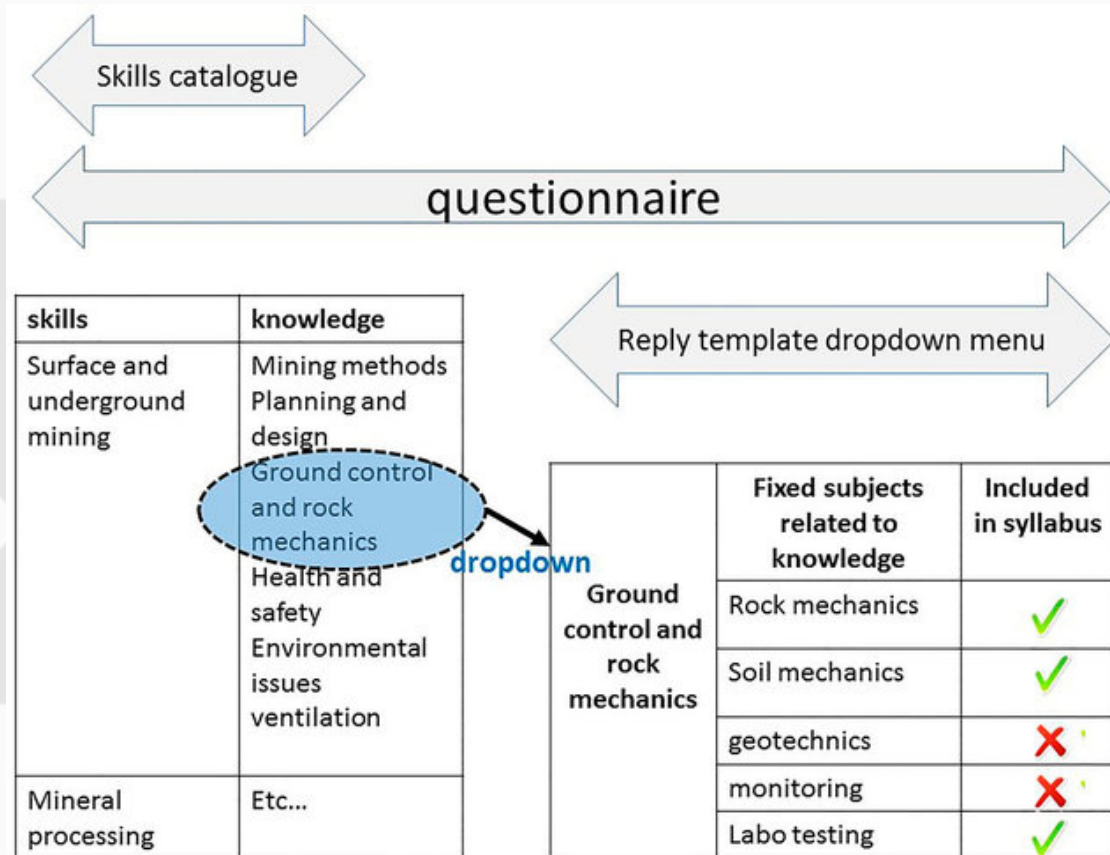
ADVISORY BOARD

- International Association for Promoting Geoethics (IAPG)
- European Technology Platform on Sustainable Mineral Resources (ETP SMR)
- IndustriALL Global Union
- European Association of Mining Industries, Metal Ores & Industrial Minerals (Euromines)
- Anthropogenic Resources Working Group UNECE
- The United Nations Environment Programme (UNEP)
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- United Nations Development Programme (UNDP)
- United Nations Economic Commission for Africa (UNECA)
- International Union of Geological Sciences (IUGS)



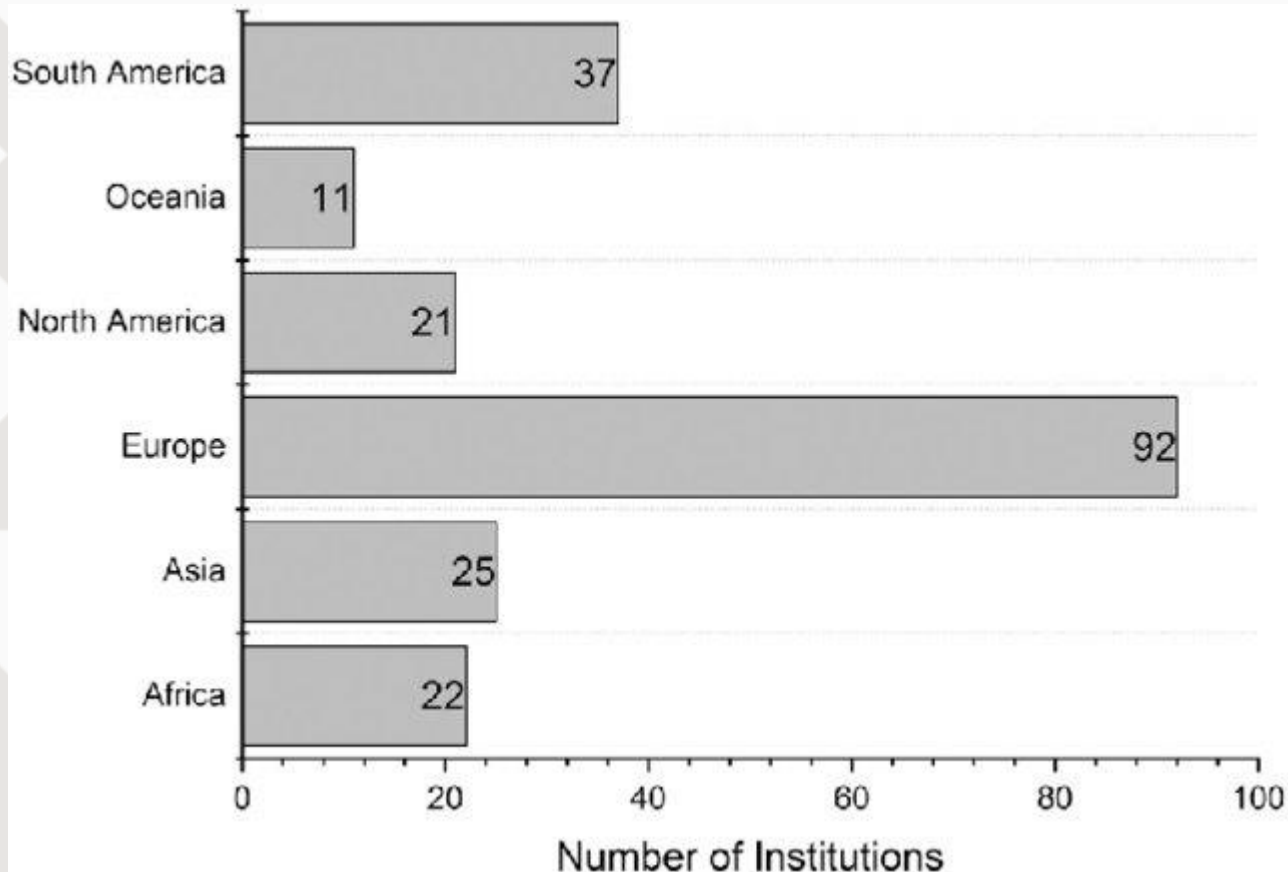
**GLOBAL AUDIENCE OF APPROXIMATELY 550 000 PROFESSIONALS FROM
5 CONTINENTS**

1. Skills catalogue for the raw materials sector



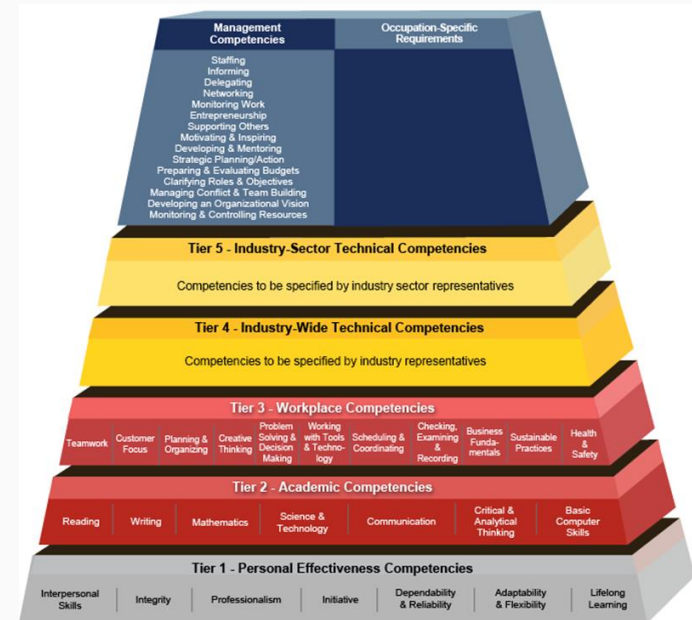
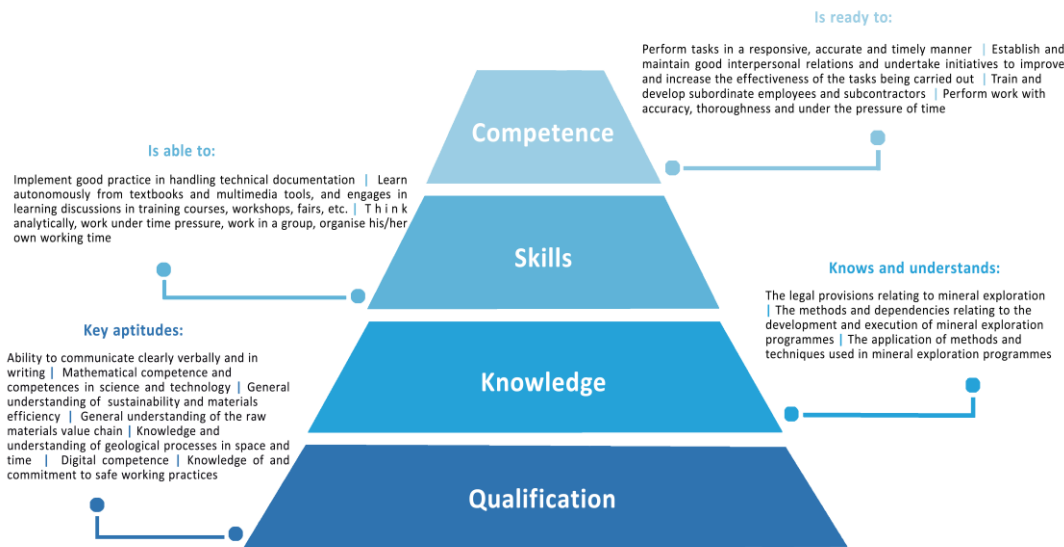
https://www.researchgate.net/publication/341710699_A_comprehensive_skills_catalogue_for_the_raw_materials_sector_and_the_structure_of_raw_materials_education_worldwide

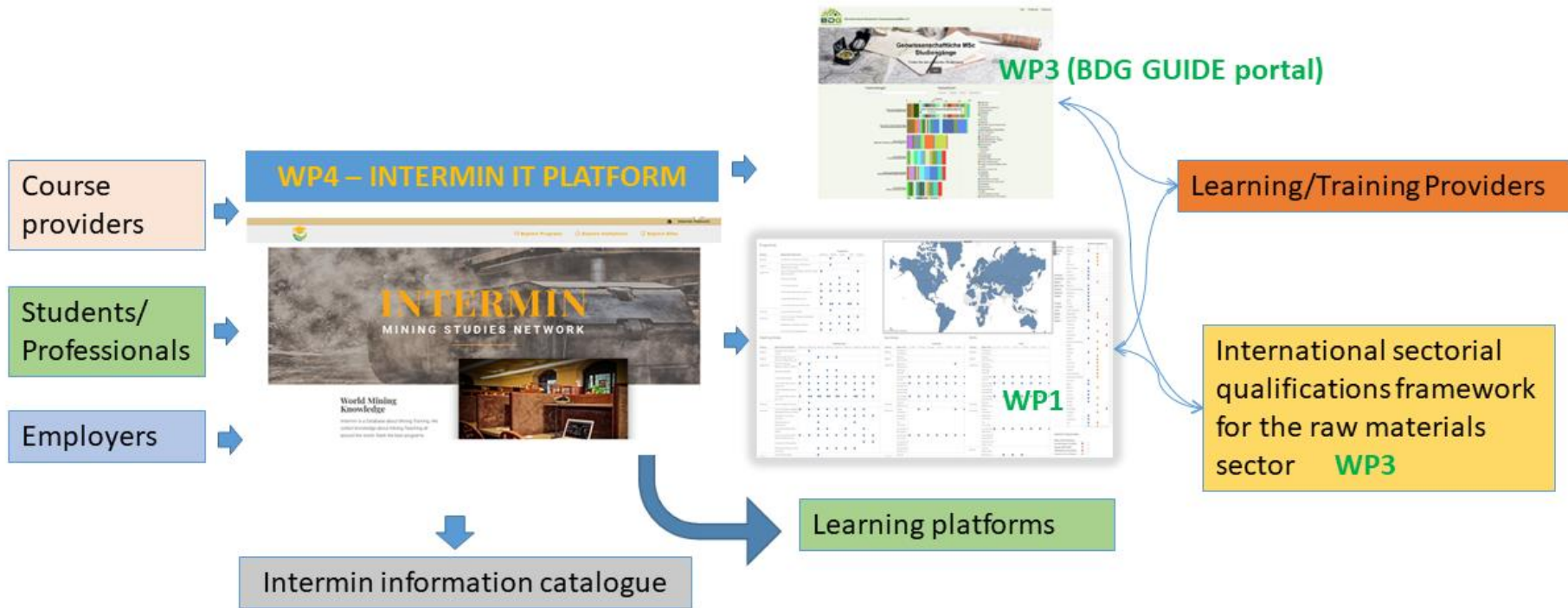
2.- International repository of existing training courses for the raw materials sector by **collection of primary data** (surveys, interviews) and **secondary data** (desk research and benchmarking)



3.- Definition of a 'International Qualification Framework' for the raw materials sector

Level 5 - Mineral Exploration





IT infrastructure of the INTERMIN portal.

World Mining Knowledge

Intermin is a Database about Mining Training. We collect knowledge about Mining Training all around the world. Rank the best programs.

EXPLORE PROGRAMS

568 STUDY PROGRAMS | 360 INSTITUTIONS | 185 SKILLS OF 46 AREAS | 95 COUNTRIES

Select study areas fit best your interest

(click areas for filter an add to ranking below)

BUSINESS MANAGEMENT	GEOLOGY EXPLORATION RESOURCES & RESERVES	MINING GEOMECHANICS & TECHNICAL MINE DESIGN
1.1 Mining in a global environment	2.1 General Geology / Geography	3.1 Modelling, analysis and design
1.2 Production analysis and mine optimisation	2.2 Applied Geology	3.2 Implementing designs and plans
1.3 Organisational structures	2.3 Exploration and sampling	3.3 Integrated mine design
1.4 Financial operations and production costs	2.4 Mineral deposit modelling	3.4 Mine rehabilitation and closure
1.5 Managing mining operations – Monitoring and compliance	2.5 Mine feasibility studies	3.5 Monitoring ground stability
1.6 Management		3.6 Drilling, blasting and rock cutting/Explosives
1.7 Risk management		

MINING METHODS	MINING EQUIPMENT & SYSTEMS	MINING SERVICES
4.1 General mining methods	6.1 General Mining equipment and systems	6.1 General services and planning
4.2 Surface mining methods	6.2 Electrical systems	6.2 Dewatering and Mine drainage and storage systems
4.3 Underground mining methods	6.3 Loading systems	6.3 Water treatment
4.4 Fill systems	6.4 Hoisting systems	6.4 Ventilation
4.5 Reclamation	6.5 Mining software	6.5 Power supply systems
		6.6 Communications systems
		6.7 Surveying

MINERAL PRODUCTION & PROCESSING	GENERIC, HEALTH AND SOCIAL TASKS	SOCIAL PERFORMANCE
7.1 Feed systems and planning	8.1 Environment	8.1 Acquiring and using social data and baseline information
7.2 Grade control	8.2 Workplace health and safety	8.2 Monitoring and evaluating social projects
7.3 Comminution and sizing	8.3 Communication	8.3 Engagement with indigenous peoples
7.4 Concentrator processes	8.4 Creative thinking, problem solving and research	8.4 Grievance management/Prevention & management of conflict
7.5 Further treatment	8.5 Sustainability	8.5 Cultural heritage management
7.6 Recycling and secondary mineral raw materials. Circular Economy	8.6 Self-management	8.6 Community engagement
	8.7 Working with people	8.7 Agreements & implementation
		8.8 Resettlement & influx management
		8.9 Regional development
		8.10 Local employment and workforce development
		8.11 Community enterprise development

93 Programs best matching areas

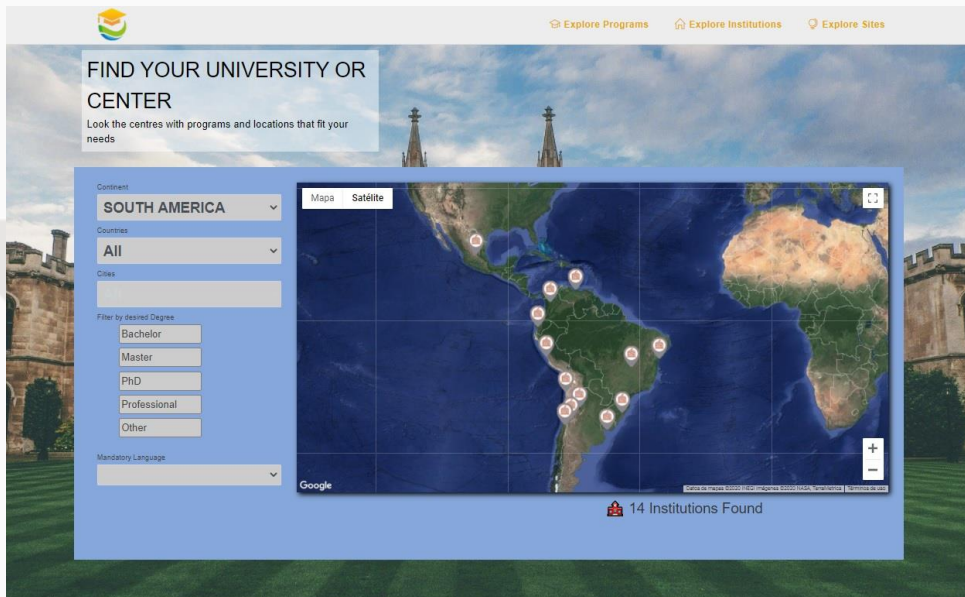
RANKING OF PROGRAMS BY AREAS



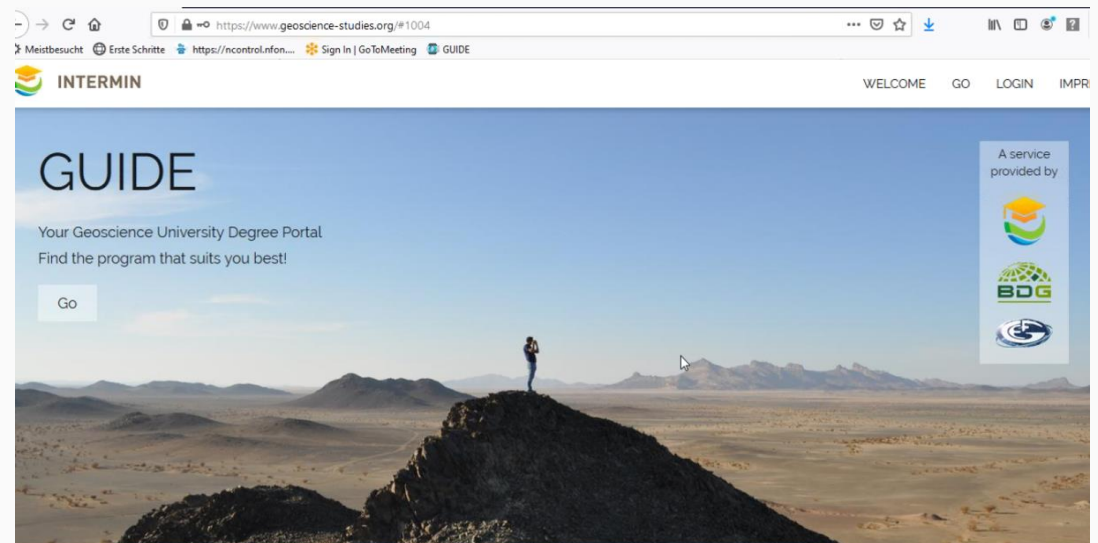
Continent: All | Country: All | City: All

WORLD WIDE TEACHING INSTITUTIONS 360





The portal will also be linked to a dedicated webpage detailing university programmes (Bachelor and Master) offered by European Universities (GUIDE)



1. **INTERMIN could cover a gap in RMIS**: raw materials training, by generating a feasible, long-lasting international network of technical and vocational training centres for raw materials' professionals.
2. INTERMIN is part of the Raw Materials Initiative and covers one of the objectives of the EIP on Raw Materials: establishing and maintaining strong and sustainable relationships with the leading training institutions in the relevant countries.
3. INTERMIN will increase the EU competence and expertise in the field of the primary and secondary raw materials by improving the availability of qualified and skilled workforce leading to higher competitiveness of the EU raw materials industry
4. INTERMIN will enhance the possibility for new cross-sectorial innovation and foster international cooperation;

THANKS VERY MUCH !!



Strike with thy rod while thou beg to thy God



Instituto Geológico
y Minero de España



RE-SOURCING

A Global Stakeholder Platform for Responsible Sourcing
Scope & RMIS integration pathways

2020 RMIS Technical workshop “Channelling knowledge from European projects into the RMIS”, 3 Dec 2020

Andreas Endl

Vienna University of Economics and Business,
Institute for Managing Sustainability

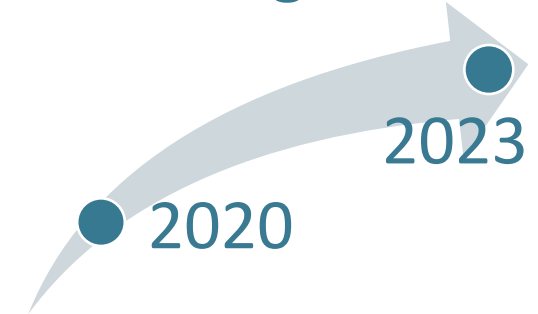
“Building a Global Stakeholder Platform for Responsible Sourcing”

EC project



- Diverse set of expertise & stakeholder representation
- **Balanced view**, but responding to important **societal challenges**
- **Independent & open dialogue**

Running from



“a facilitator for the agenda on Responsible Sourcing”



Our Goals

- Establish common Responsible Sourcing (RS) visions for EU industry
- Increase uptake of RS practices by business & public policy
- Foster global advocacy for a common definition of RS
- Build a well-connected & diverse global RS community

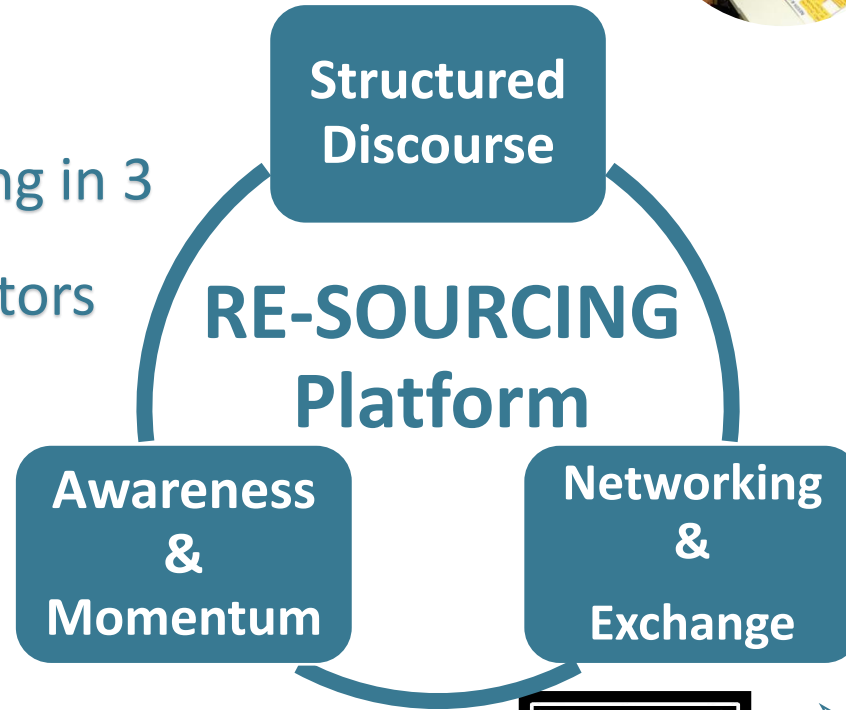


Key project outputs

- Roadmaps for Responsible Sourcing in 3 key EU industry sectors



- Good Practice “Manuals” and Guidelines for business & policy good solutions



- Innovative story-telling, conferences, webinars

Some reflection for future RMIS integration pathways

- ✓ Find your spot on RMIS & expert contact
- ✓ Early & regular coordination and communication



- ✓ Identify outputs: RE-SOURCING knowledge repository
- ✓ Develop outputs together & find common areas: feedback and insight into RMIS development as well as RE-SOURCING knowledge repository



RE-SOURCING relevant outputs

Information on Responsible Sourcing challenges & solutions in Europe

- Sector-level (renewable energy, mobility & Electronics) mapping of industry & policy challenges
- Individual business & public policy solutions: Reports on objective examination of practice & How to (Good Practice Guidelines)
- Responsible Sourcing online knowledge repository
- Common Definition & Key principles for Responsible Sourcing

Thank you & Welcome to RE-SOURCING



Coordinated by:
Vienna University of Economics and Business,
Institute for Managing Sustainability
Email: info@re-sourcing.eu

www.re-sourcing.eu





MIN-GUIDE:

Innovation-friendly minerals policy framework

2020 RMIS Technical workshop “Channelling knowledge from European projects into the RMIS”, 3 Dec 2020

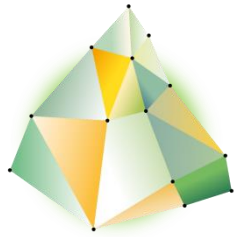
Andreas Endl

Institute for Managing Sustainability,
Vienna University of Economics and Business



This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 689527





Innovation-friendly minerals policy framework

The two MIN-GUIDE Narratives

A policy framework facilitating innovation needs to address certain challenges

- I. **Governance challenges** – Incoherent / conflicting policies, transparency/legitimacy in policy-making

Narrative I

What are policies & mechanisms facilitating good governance?

- II. **Industry sector challenges** – more sustainable exploration, extraction, processing, waste management & mine closure

Narrative II

What policies are facilitating industry innovation?

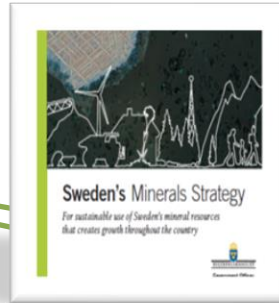


Output: A Platform for information & synthesis

Minerals Policy Guide

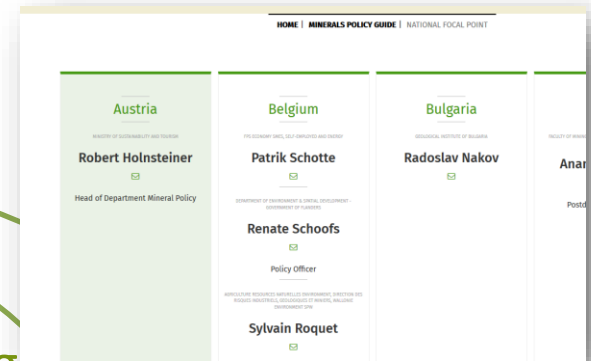


... finding out about user needs



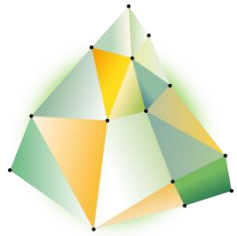
... data compilation

... consolidating existing information



Governance & Policy instruments





Output: Processes & reports for learning

Policy Labs & Good Practice reports



... finding out what are the challenges



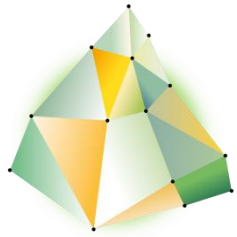
Federal Ministry
Republic of Austria
Sustainability and Tourism

... how to make change to resolve these challenges



... engage in learning actions





RMIS integrated project outputs

Data on policy instruments & governance

Policy Governance

- Commitment & long-term orientation
- Collaboration of different resorts
- Stakeholder involvement
- Revise & adapt policy

Policy instrument framework

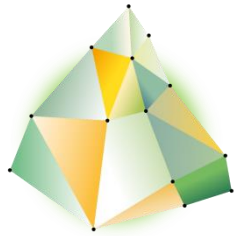
- Apply policy mixes
- Avoid policy duplication
- Consistent legal provisions

Permitting & Licencing

- Responsible authorities
- Availability of information
- Short time frames & length



Channelling knowledge from European projects into the RMIS, 3 Dec 2020



RMIS integrated project outputs

Data on policy instruments & governance

The screenshot shows the RMIS website with the following sections:

- EU SCIENCE HUB
- Raw Materials Information System (RMIS)
- Navigation menu: OVERVIEW & NEWS, POLICY & LEGISLATION, TERMINOLOGY & LIBRARY
- Content categories: CRITICAL RAW MATERIALS, RAW MATERIALS SUPPLY AND MONITORING, CIRCULAR ECONOMY & SECONDARY RAW MATERIALS, ENVIRONMENTAL & SOCIAL SUSTAINABILITY, ECONOMICS & TRADE, FORESIGHT, STRATEGIC VALUE CHAINS & MATERIAL FLOWS, RAW MATERIALS PROFILES, EU COUNTRY PROFILES, RAW MATERIALS KNOWLEDGE GATEWAY
- Member States Legislation section with flags for: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

Minerals Policy Country Profile
DENMARK

A map of Europe with Denmark highlighted in yellow, indicating its focus.

Minerals Policy Country Profile
AUSTRIA

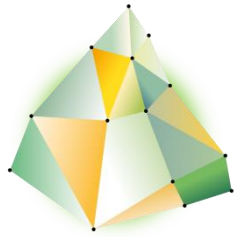
A map of Europe with Austria highlighted in yellow, indicating its focus.

Permitting & Licencing

- Consistent
- Responsive
- Availability of information
- Short time frames & length

A collage of three images:

- A group of people wearing yellow hard hats, likely miners or workers.
- A large yellow mining truck.
- A document titled "Sweden's Minerals Strategy" with the subtitle "For sustainable use of Sweden's mineral resources that creates growth throughout the country".



A call for informing practitioner decisions

Project outputs relevant for RMIS & Why

A lot of practitioners are concerned with making sense of data & finding data informing their decisions

... identifying where the problems are...

... finding a solution...

... and what now?





Thank you for your attention

Andreas Endl

andreas.endl@wu.ac.at

Institute for Managing Sustainability,
Vienna University of Economics and Business



removal

removing waste from alumina production





Removing
the waste streams
from the primary
Aluminum production
in Europe

RED MUD FACTS



The Bayer process has a high bauxite residue yield

For each tonne of alumina produced, **0.9-1.5 tonnes of solid bauxite residue** are generated, depending on the initial bauxite-ore grade and the alumina's extraction efficiency



Bauxite residue is not utilised industrially

Although zero-waste processes have been successful in the lab, **only 3% of the annual bauxite residue** production is industrially utilised worldwide



Bauxite residue is stockpiled on land

The limited land availability for bauxite residue disposal, threatens the longevity of established alumina refineries





Aluminum production in Europe creates
6,850kt of bauxite residue (red mud) yearly

is Europe stuck in the mud

RemovAL overcomes the barriers of economic viability by pooling together and integrating proposed stand-alone solutions, while adhering to the following principles:



treat waste
with waste



recover valuable
critical metals



develop marketable
products



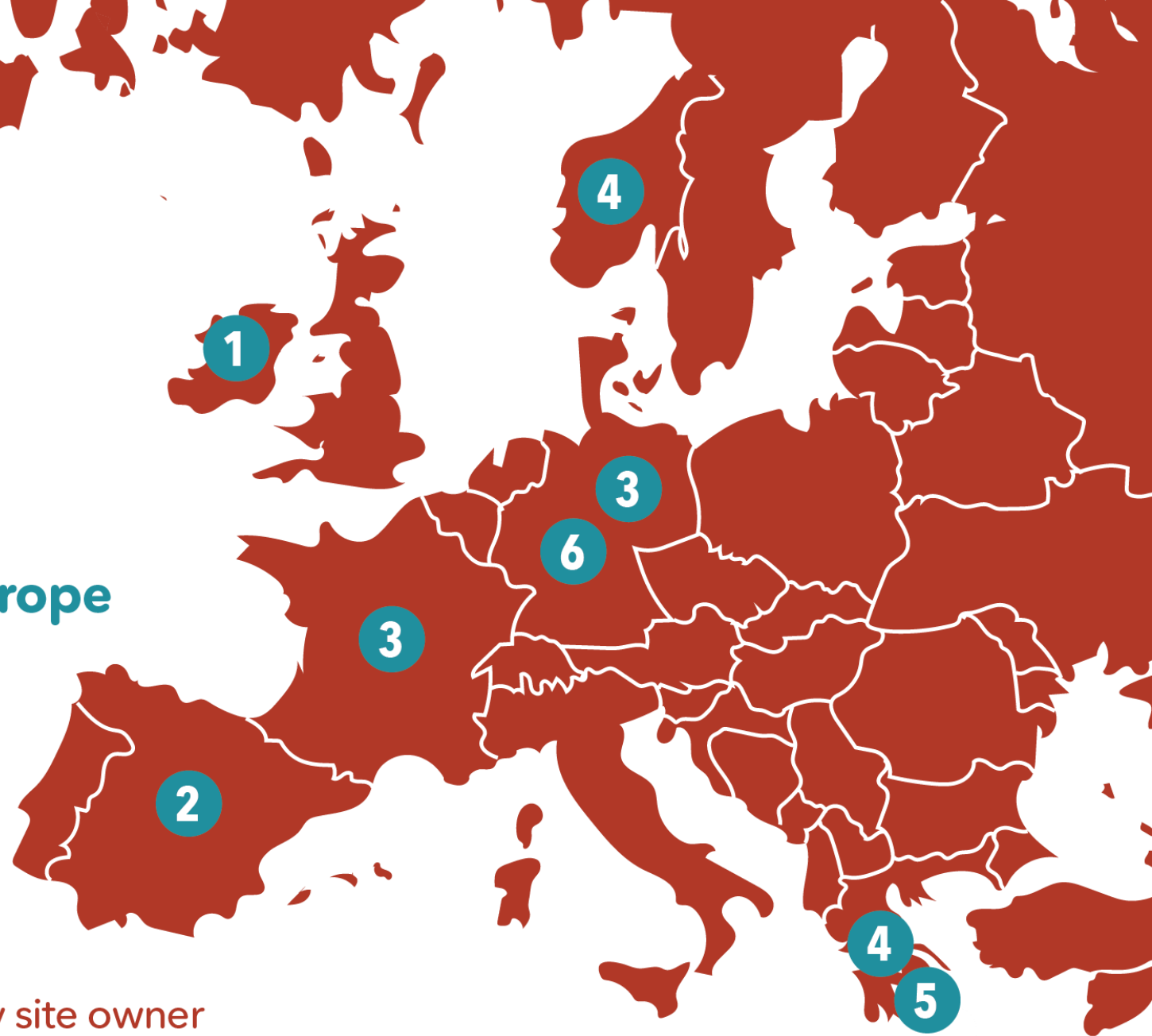
customise the solution to the industrial
ecosystem of each alumina plant

near zero-waste processing, near break-even flowsheets

6 innovative pilot plants across Europe

Combined they will form a **network of technological nodes**, enabling optimum processing flow sheets for valorising the produced bauxite residue

The validation will be done for 3 European alumina producers (representing 44% of the European alumina production) and one legacy site owner



1 de-alkalization

Demonstrate at pilot scale the de-alkalization technology to remove alkali content from bauxite residue at levels below 0.5% wt, making it suitable for various applications

At least 40 t of bauxite residue will be processed by AAL at a mobile pilot plant in IRELAND

2

Demonstrate the use of processed bauxite residue as green soil stabilizer for civil works applications, though the stabilization of bauxite residue with other industrial by products

At least 800 t of bauxite residue will be processed and used by ACCIONA as a raw material for the construction of a road in Spain

green soil stabilizer

Demonstrate at pilot scale the production of lightweight aggregates and high performance binders, through different thermal treatments of bauxite residue

lightweight aggregates & high performance binders

At least 10 t of bauxite residue will be processed in the RIO TINTO Pilot plant in France

Demonstrate at pilot scale the production of ferro-silicon alloy from Electric Arc Furnace (EAF) co-processing of bauxite residue with other industrial by-products, like Spent Pot Lining (SPL) from aluminium primary production

ferro-silicon alloy

At least 50 t of Bauxite Residue will be processed in the AoG Pilot plant in Greece and in the ELKEM pilot plant in Norway

4

5

microwave furnace

Demonstrate at a prototype microwave furnace the production of metallic iron from processing bauxite residue with other industrial by-products

At least 250 kg of Bauxite Residue will be processed in CEINNMAT's mobile prototype plant in both Spain and Greece

6

hydrometallurgy

Demonstrate the production of REE concentrate, Ga concentrate, alumina/soda solution and rutile concentrate from the hydrometallurgical processing of engineered slags/sinters produced in RemovAL pyrometallurgical pilot plants. Ga is co-extracted both from the slag and the Bayer liquor

At least 500 kg of slag and 100 lt of Bayer liquor will be processed at RWTH/MEAB pilot plant in Germany



Demonstrate the production of new, marketable building products from the building materials produced in the pilot demonstrations

A demo house 25 m² will be built exclusively with bauxite residue building products in the housing settlement next to the AoG alumina plant



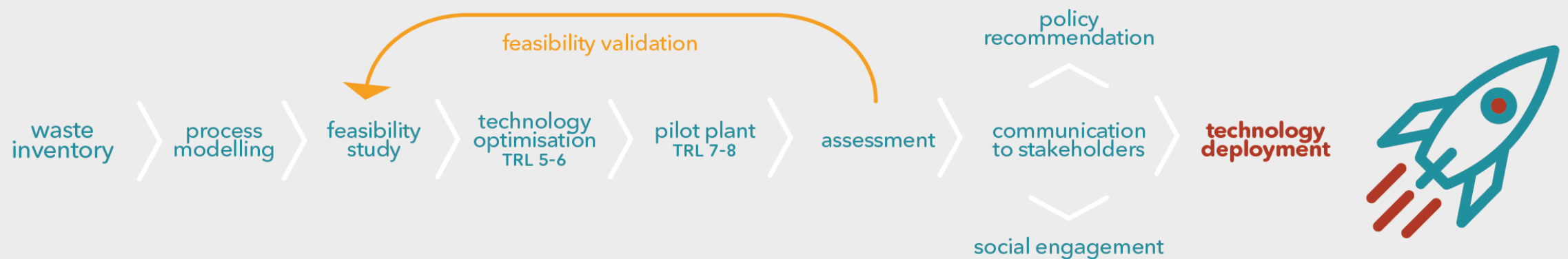
feasibility studies

for each of the 3 alumina producers and the 1 legacy site owner, detailing the optimum processing flow sheet for valorising the produced bauxite residue along with other industrial by-products, taking into consideration:

- waste characteristics
- logistics and
- symbiosis with other plants in the geographical vicinity



the method



Connection to RMIS

- RemovAl is looking to integrate other secondary / waste material in its flowsheets.
- To this a crude industrial waste inventory has been compiled (focusing on by-products/tailings with high Si, Ca, Al content).
- The RemovAl focuses on optimizing solutions to local industrial ecosystem.
- An EU wide primary and secondary raw materials database (with information especially in low grade ores, mining tailinigs and industrial residues) would help replicate the RemovAl methodology in future projects and other sectors.



BR data from Industry

BR data from alumina refineries of RemovAL's consortium

Alumina Refinery	Annual Production Rate	Disposal Method	Utilization	Trace elements of potential concern	Classification
AoG	750,000 t	Landfill	10-20% in cement industry	Cr (<0.04 w/w)	Non-hazardous
Rio Tinto (legacy site)	600,000 m ³ of BR over 5 ha	Landfill Closed BR disposal area	Not possible until now due to current French regulations	Cr, V, As	Non-hazardous
AAL	1.5 Mt	Dry stacking combined with mud farming	None	N/A	Non-hazardous
ALUM S.A.	490,591 t (in 2017)*	Thickening, using a thickener equipment, installed at the site, with flocculant addition	Cement industry & corn field tests to improve soil acidity	N/A	Non-hazardous

*By the end of 2016 about 8.2 million tons have been accumulated in the pond that BR is disposed

BR data from other European alumina refineries

Alumina Refinery	Annual Production Rate	Disposal Method	Utilization	Classification
Alteo (France)	350,000 t	BR is stored on BRDA/BR is pumped to 2 Filter Presses	Waste covering & soil remediation	Non-hazardous
AOS (Germany)	N/A (depends on the bauxite source)	Pumped to an own BRDA (landfill)	None at the moment	Non-hazardous

Initial Findings from Removal's Waste Inventory

- Besides BR & SPL plenty of valuable wastes available in EU can be valorized by RemovAL's Pilots

- Fly Ash & Steel Slag → WP2 → Production of soil stabilizer (road construction in Spain)

- Ferronickel Slag
- Perlite Industry Wastes
- Marble and Limestone Powder Wastes
- Construction and demolition wastes
- Agricultural Wastes



Rich in SiO₂ or CaO



Possible utilization



- ✓ WP4 (Residue Smelting for the production of Si-rich pig-iron and Fe-Si alloy) as reducing agents
- ✓ WP3 as SCMs for the production of High Strength Inorganic Binders
- ✓ WP2 for soil stabilizers production
- ✓ CRM Extraction

www.removal-project.com



The research leading to these results has been performed within the REMOVAL project and received funding from the European Community's Horizon 2020 Programme (H2020/2014-2020) under grant agreement n° 776469.



RioTinto



vimetco
alum

CCC
EUROPEAN ALUMINIUM



KU LEUVEN

NTNU

RWTH AACHEN
UNIVERSITY



SINTEF

Elkem

ceinmat

MEAB



ZaaK
step towards sustainability.



Geovalin
functional materials

HEIDELBERG
CEMENT



ROCKWOOL

AdMiRIS



WAVESTONE



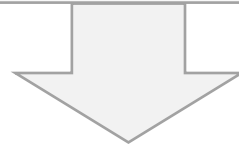
Recovery of Tungsten, Niobium and Tantalum occurring as by-products in mining and processing waste streams

EU H2020 project "TARANTULA"

EC DG-JRC/EASME Technical Workshop "Channelling knowledge from European projects into the Raw Material Information System (RMIS). 3rd December 2020.

The TARANTULA project has received funding from the European Union's EU Framework Programme for Research and Innovation Horizon 2020 under Grant Agreement No 821159 - <https://h2020-tarantula.eu/>

Challenge: exploit potential of W, Nb, and Ta entrapped in complex low-grade resources within EU territory.



TARANTULA

“Recovery of Tungsten, Niobium and Tantalum occurring as by-products in mining and processing waste streams”

TARANTULA focuses on three W, Nb and Ta-bearing EU resources:

- Process residues from the carbide cycle
- Waste from tungsten mining
- Mining & smelting residues from tin (Sn) primary production

Goal?

Reduce EU dependence on refractory metal imports by valorizing unconventional European resources. Novel metallurgical technologies are developed to increase the recovery rates and selectivity to finally unlock the metals from resources that are currently considered as waste.

How?

- Establish strategic industrial partnerships and build a broad overview of W, Nb and Ta-bearing EU resources (WP2)
- Develop a toolkit of novel, efficient and flexible metallurgical technologies for sustainable W, Nb, and Ta recovery (WP3-5)
- Strengthen citizen trust in mineral processing (WP6-8)

WP1. Project Management

WP2. Identification of European Resources of refractory metals

WP3. Supply, characterization and pre-processing

WP4. Extraction and recovery of W, Nb and Ta as oxides or salts

WP5. Novel production routes for metals (M), carbides (MC), alloys (A) and metal oxide (MO) coatings

WP6. Sustainability assessment and selection of optimal flowsheet

WP7. Prototype validation of most promising routes at kg level

WP8. Communication, dissemination, exploitation & clustering

WP9. Ethics requirements

WP2 - Identification and exploration of European resources of refractory metals

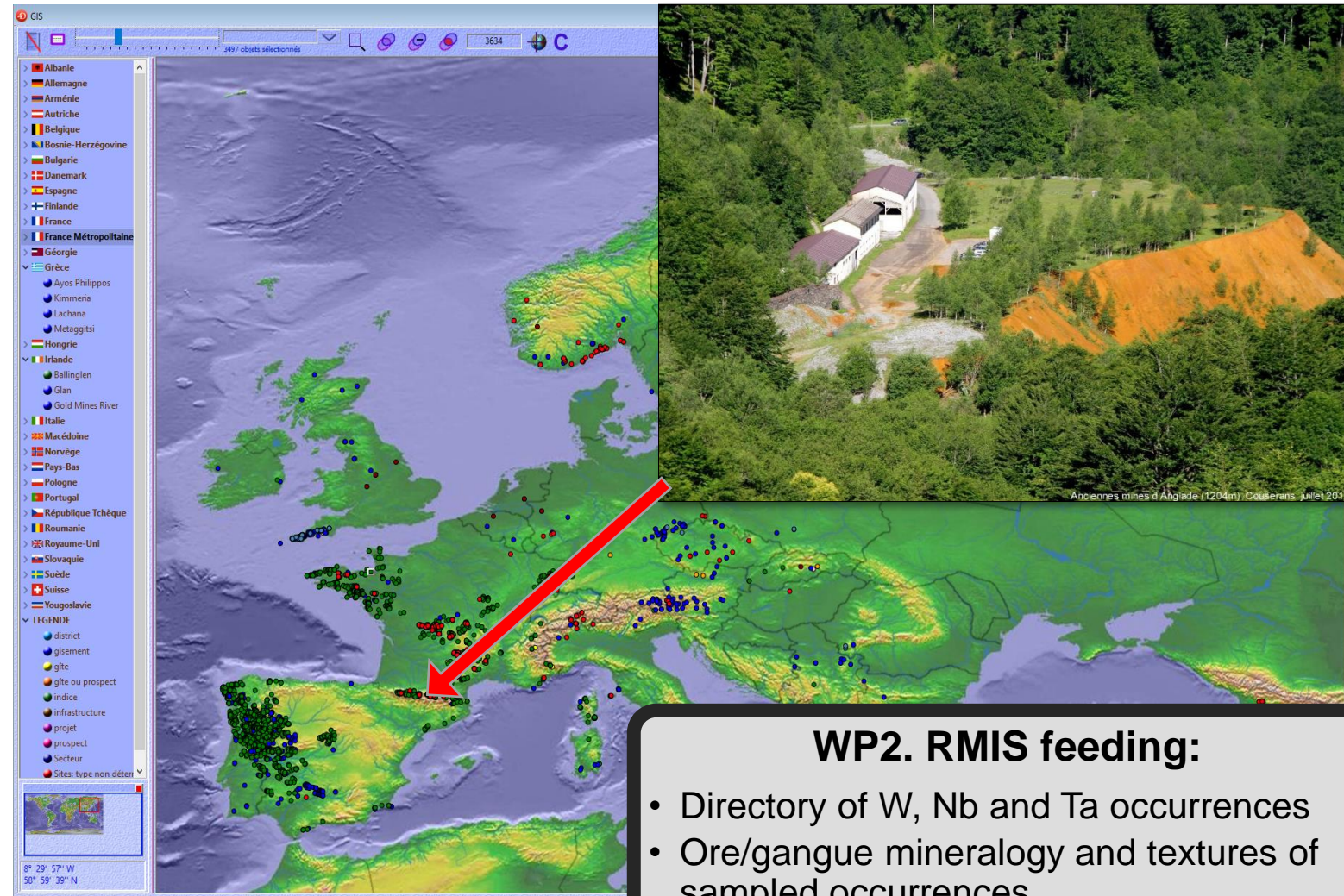
More than 3000 occurrences for W, Nb, Ta known in Europe.

Characterization and selection of the best targets, using:

- Mining databases
- Mineralogical databases
- GKR software

Provide samples and data on the tailings of the Salau mine

- 1 Mt
- 0.4 – 0.6% WO_3
- 1 – 3 g/t Au

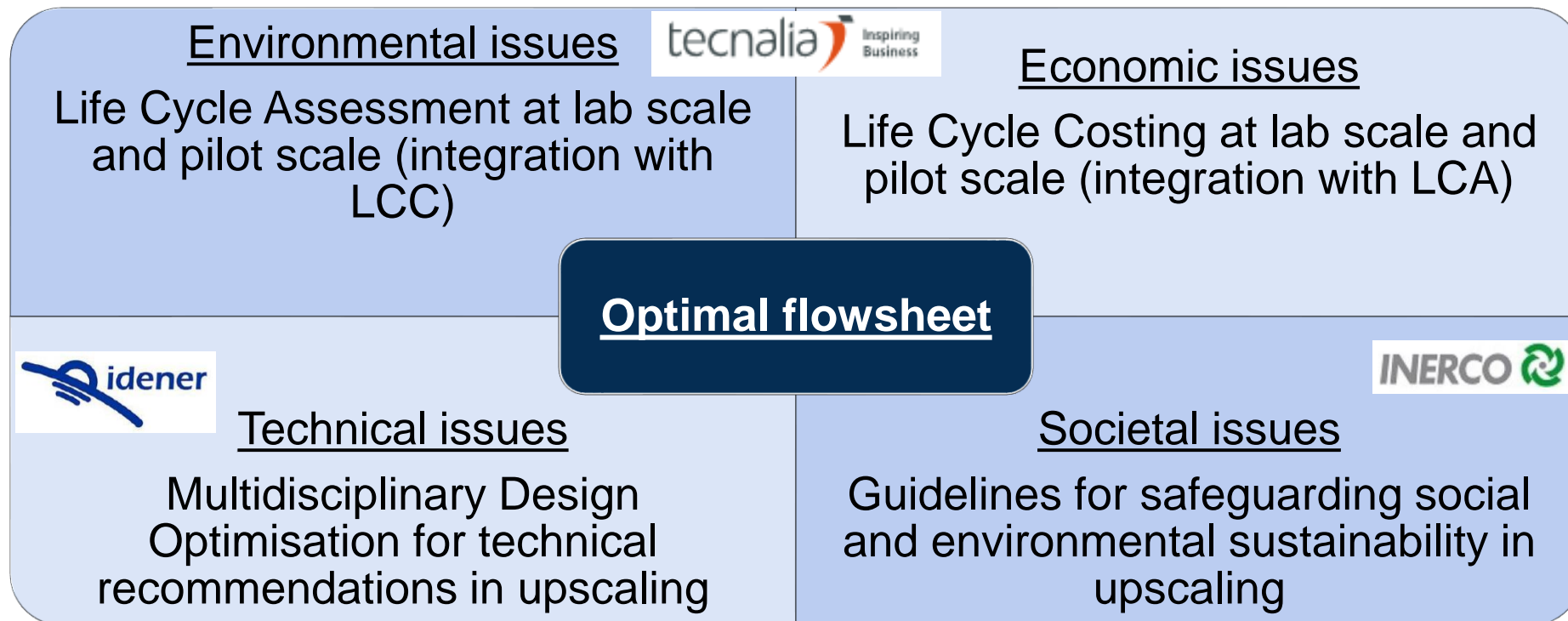


WP2. RMIS feeding:

- Directory of W, Nb and Ta occurrences
- Ore/gangue mineralogy and textures of sampled occurrences

WP6 - Sustainability assessment and selection of optimal flowsheet

Main goal: assure that technical, environmental, economic and societal issues are appropriately addressed in the upscaling of TARANTULA technologies.



WP6 RMIS feeding:

- Guidelines for safeguarding social and environmental sustainability in future comercial upscaling

WP8 - Communication, dissemination, exploitation & clustering

Goal: Pro-active engagement of relevant stakeholders for obtaining and maintaining the Social License to Operate, and to disseminate results in view of maximum exploitation.

Stakeholder analysis

Market analysis and Exploitation

Communication and dissemination

Civil society engagement

Workshops targeting industrial audiences

Clustering

Private sector

Government



WP8 RMIS feeding:

- Exhaustive identification and updating of related projects in view of clustering and SLO activities within TARANTULA
- TARANTULA's clustering activities with other EU H2020 ETN/RIA/IA projects, with a specific focus on SLO and LCA methodologies
- TARANTULA training activities targeting industrial audiences

- Project Coordinator: Dr. Amal Siriwardana (TECNALIA)
- Amal.Siriwardana@tecnalia.com

<https://h2020-tarantula.eu>



www.icamcyl.com



europa@icamcyl.com



The TARANTULA project has received funding from the European Union's EU Framework Programme for Research and Innovation Horizon 2020 under Grant Agreement No 821159 - <https://h2020-tarantula.eu/>



GeoERA – Raw Materials Mintell4EU project

Lisbeth Flindt Jørgensen [GEUS] & Špela Kumelj [GeoZS]



JRC/EASME workshop on the Raw Materials Information System (RMIS), 2020 Dec 3rd



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731166



The main vision of Mintell4EU is to provide easy web access to useful and reliable mineral intelligence for all of Europe.

Integration of the results in the European Geological Data Infrastructure platform (EGDI):

- Minerals inventory, i.e. occurrences and mines
- eMineralsYearbook



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Could be – mines ?

GeoERA - Raw Materials



For desktop GIS: WMS WFS

Base layers

Layers

Layer search...

Mineral Resources

Mineral occurrences

Mines



Commodity:

- All commodities
- Aggregates
- Alumina
- Aluminium
- Aluminosilicate
- Alunite
- Amazonite

CTRL + click to select more than one entry.

Operational status of the mine:

- All operational statuses
- Under Development
- UnderDevelopment
- Feasibility
- PendingApproval
- Construction
- Operating status

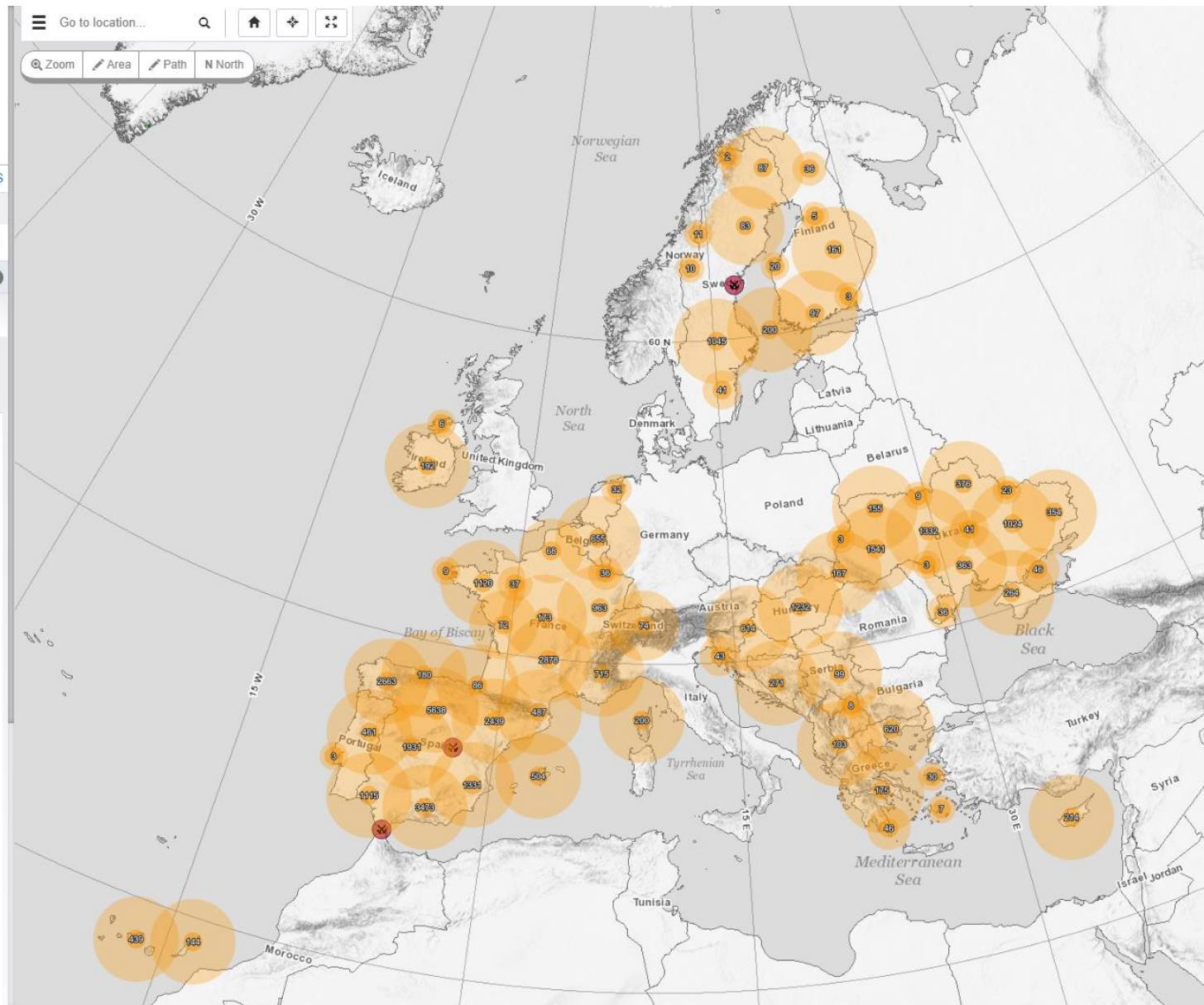
CTRL + click to select more than one entry.

Mining activity:

- All mining activities
- BoreholeMining
- DredgeMining
- InSituRecovery
- OpenPitMining
- Quarrying
- SubsurfaceMining

CTRL + click to select more than one entry.

Hold CTRL + Left-click and drag to select multiple points in a cluster on the map.



Could be - Precious metals ?

GeoERA - Raw Materials



For desktop GIS: WMS WFS

Base layers

Layers

Layer search...

Mineral Resources

Mineral occurrences



Commodity deposits importance:

- All deposit sizes
- Very large deposit
- Large deposit
- Medium deposit
- Small deposit
- Occurrence / Not specified

CTRL + click to select more than one entry.

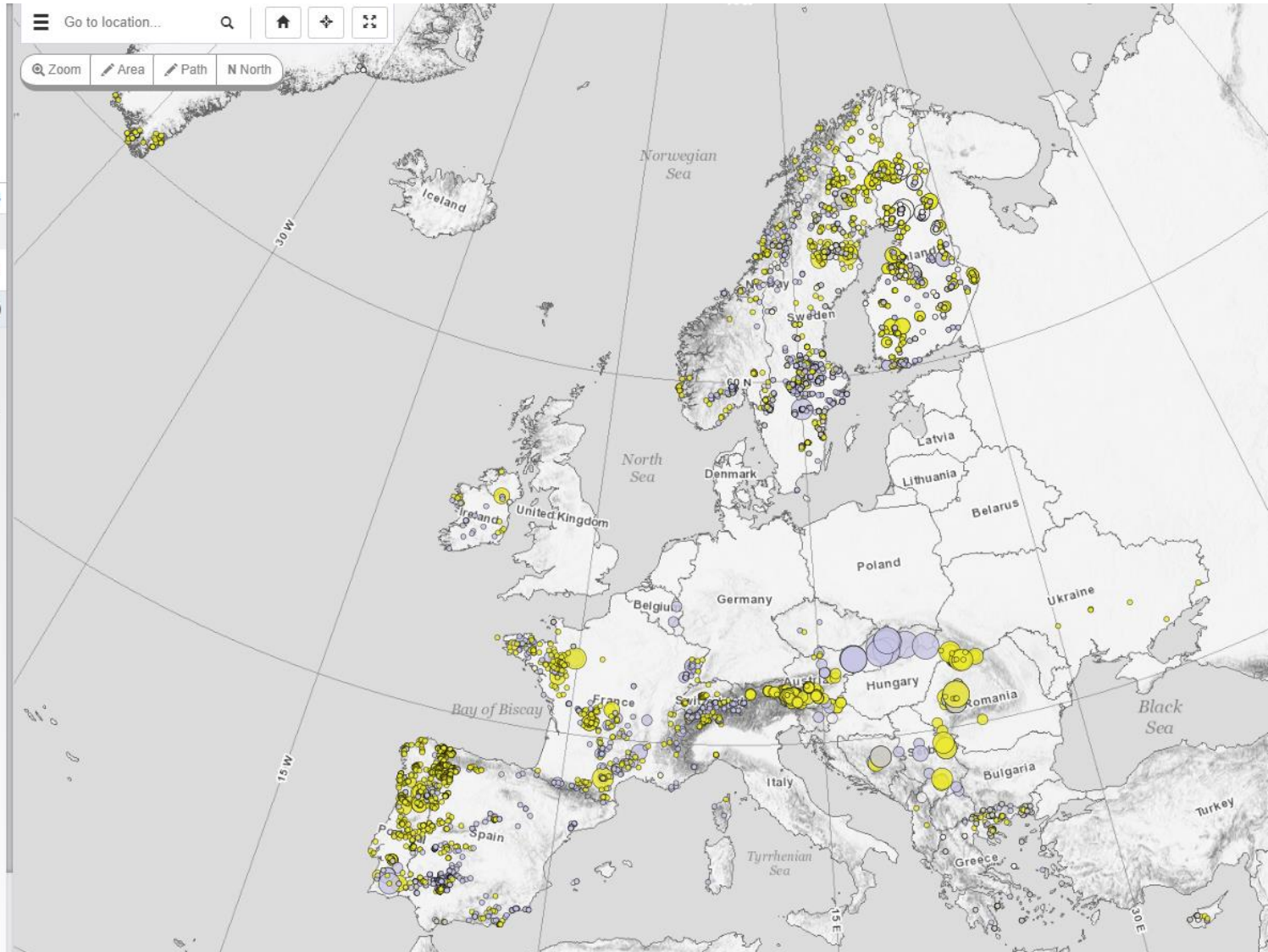
Commodity group:

- Fertilizer minerals
- Iron and ferro-alloys metals
- Minerals for chemical use
- Precious and semi-precious gemstones
- Precious metals**
- Special and rare metals
- Specialty and other industrial rocks and mine

CTRL + click to select more than one entry.

Commodity:

- All commodities
- Aggregate
- Aluminium
- Aluminosilicate



Or could be – all commodities at occurrence level ?

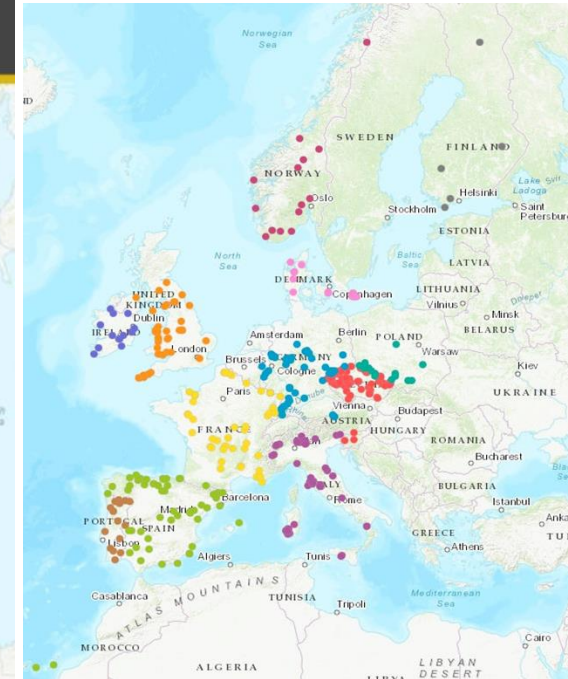
The screenshot displays the GeoERA - Raw Materials web application interface. On the left, the header includes the 'GeoERA - Raw Materials' title and the 'INTELL4EU' logo. Below the logo, there is a note 'For desktop GIS: WMS WFS' and a 'Base layers' section. The 'Layers' section features a search bar and a list of layers, with 'Mineral Resources' and 'Mineral occurrences' checked. At the bottom left, the 'MINERALS4EU RESEERVE' logo is visible, along with a dropdown menu for 'Commodity deposits importance' showing options like 'All deposit sizes', 'Very large deposit', and 'Large deposit'. The main map area shows a map of Europe with numerous colored and shaped markers representing mineral occurrences. A legend titled 'Mineral occurrences' is overlaid on the map, detailing symbols for various mineral types such as Base Metals, Rare Earth Elements, and Precious Metals. The legend includes symbols like squares, triangles, stars, and circles, each associated with a specific mineral or metal. The map interface also includes a search bar at the top, zoom controls, and navigation icons.

Or could be – historical mines with touristic interest?

Mintell4EU Historic Mine Sites Information For Visitors

Europe has a rich and important mining history. Many historic mine sites have been preserved and are open for the public to visit.

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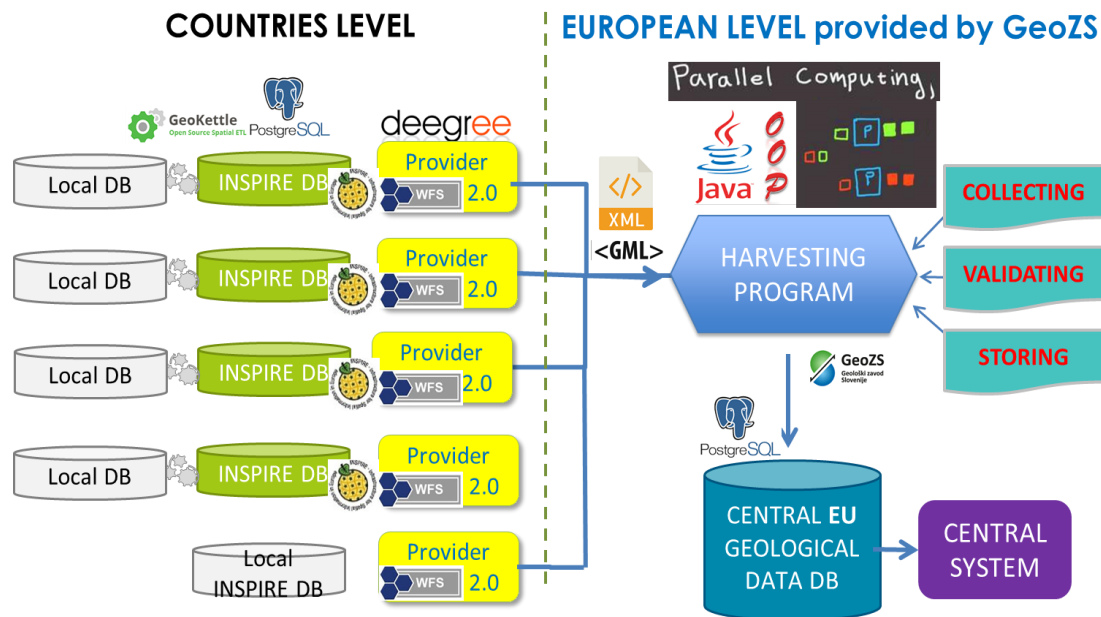


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Collection of national data by harvesting routines:

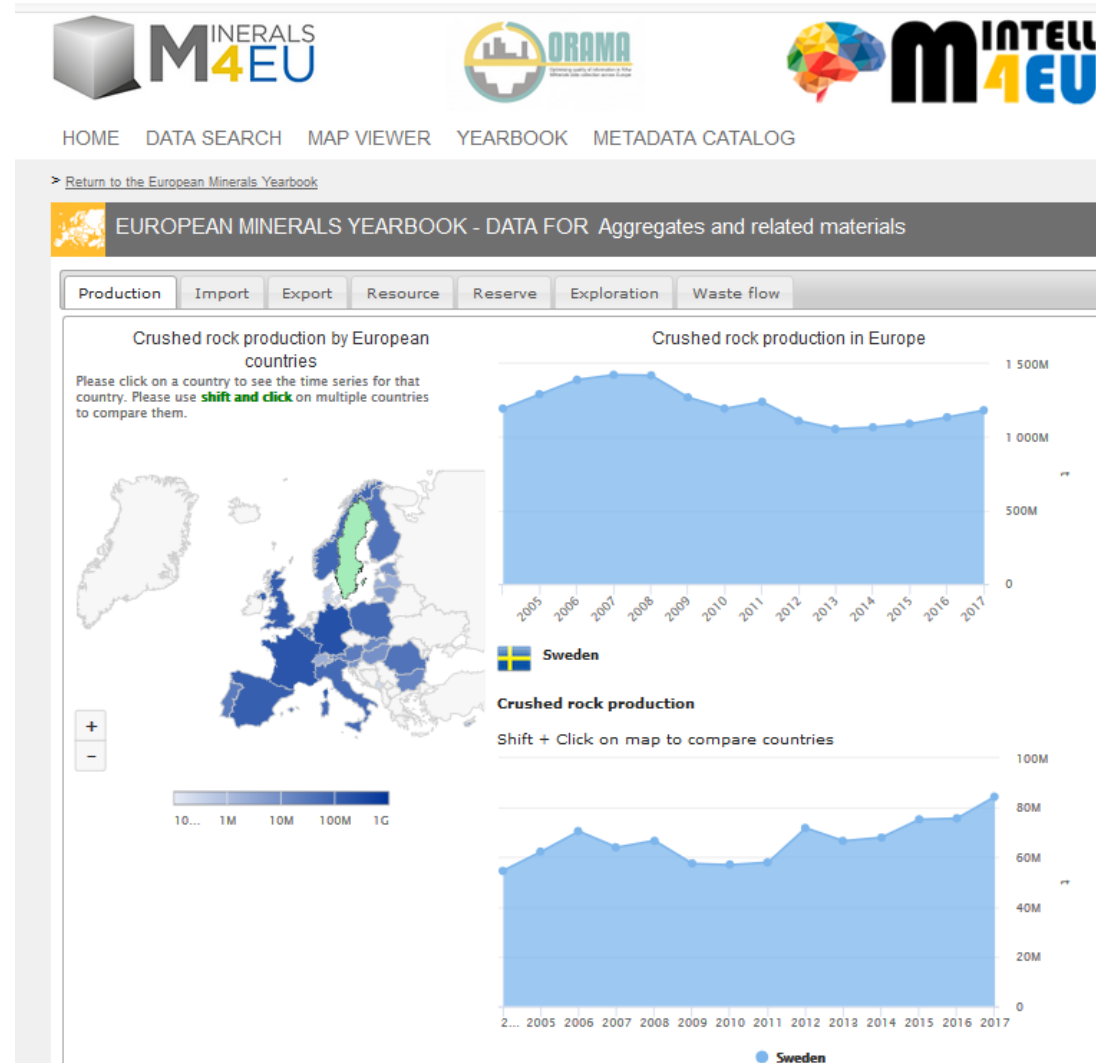
- So far 29 countries + 2
- Updated database structure and code lists (MIN4EU)
- Guidances and support material easily available
- Constant support for data providers, e.g. feedback after harvesting
- Tools for Quality Control



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Production and trade
(import and export)
data.

Aggregated numbers
per country from
2004 – 2019/2018



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Collection of resources, reserves and exploration Aggregated numbers per country per commodity







Log in

Welcome to **Mintell4EU** Input form for resources, reserves and explorations

Thank you for accepting the invitation to take part in this survey. The purpose of this survey is to obtain the data necessary to update the online [European Minerals Yearbook](#), created in 2015 by the Minerals4EU project.



In the following pages you will be asked to provide statistical data relating to the mineral resources and reserves for your country at a single point in time (31 December 2019). These data should represent as complete a picture as possible within your knowledge, including any estimated figures as well as data reported by companies. The data themselves can be of any age, in other words they could be estimates or reported figures from earlier years, if you believe these resources still exist but more recent data are not available. The resources and reserves data can be compliant with international systems of reporting (e.g. PERC, JORC, UNFC, etc.), or compliant with your country's national reporting code, or estimates which are not compliant with these systems. The system of reporting will also be recorded where there is one.

You will also be asked to provide information regarding mineral exploration activities in your country during the calendar year of 2019. You will have the option to record these activities according to the following metrics: exploration expenditure, number of active licences, number of new licences issued, area covered by exploration activities and number of companies undertaking exploration.

In addition, should you wish to do so, you can also provide data relating to mineral production using this survey form. Any mineral production data you provide using this form will be supplied to the British Geological Survey (BGS) and may be used in their annual publication World Mineral Production in addition to the update of the online European Minerals Yearbook.

By providing your country's data, of all types, using this survey form you are also providing your consent for these data to be handled, processed and used by GeoZS, BGS and Mintell4EU consortium partners for the purposes of updating the online European Minerals Yearbook. These statistical data may also be utilised by the European Geological Data Infrastructure (EGDI) and the Raw Materials Information System (RMIS). More information relating to these uses can be obtained from: (add e-mail address)

Your personal data collected during the survey, will be stored securely by the Mintell4EU consortium partners and will only be used for the purposes of this survey.


Thank you for taking part.





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Collection of resources, reserves and exploration Aggregated numbers per country per commodity








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You will also be asked option to record these activities according to the full activities and number of companies undertaking exploration

In addition, should you wish to do so, you can also provide data supplied to the British Geological Survey (BGS) and the European Minerals Yearbook.

By providing your country's data, of all types, using Mintell4EU consortium partners for the purposes of Infrastructure (EGDI) and the Raw Materials Information System (RMIS).

Your personal data collected during the survey, will be stored securely by the Mintell4EU consortium partners and will only be used for the purposes of this survey.

Thank you for taking part.

Online survey form:

Open for input:
December 2020 – March 2021

Surveys will be invited to add data



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- Around 30 test cases (local, regional, national)
- UNFC code list have been developed

- A need for harmonization of approach, understanding and methods
- That data availability and responsibility for geological surveys differs from country to country

EFG Code



...the European Union's funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731165

Zoom Area Path N North

- Why the projects' outputs are relevant for the RMIS?
Follow up: Minerals4EU, ProSUM, ORAMA
- Where in the RMIS could they be linked/attached to?
Provide data to RMIS Website, Factsheet, RM profiles, Country profiles, Scoreboard 13, 14, 16 and 124
- Do you see options for future further development of certain RMIS sections based on the project's knowledge/outputs?)

Links to European Geological Data Infrastructure (EGDI) platform (visualization on viewer, creating maps)

Tyrrhenian Sea

Black Sea



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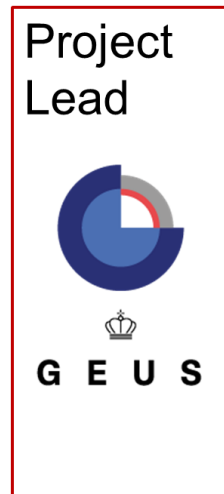
Thank You

Lisbeth Flindt Jørgensen
Geological Survey of Denmark
Mintell4EU project lead

lfj@geus.dk

Špela Kumelj, Geological Survey of Slovenia

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