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WP4: METHODS AND TOOLS FOR MINERAL INTELLIGENCE



• Objectives of MICA WP4:

Inventory and Assessment of Tools and Methods for providing Expertise to Stakeholders on Mineral Intelligence

- Two starting points:
 - What do stakeholders want to know?
 - What tools and methods are available?





Planning WP4

- D4.1 Factsheets methods / tools: month 10 (finished)
- D4.2 Methods/tools and stakeholder questions: month 14 (finished)
- D4.3 Case study reports: month 22

WP4: PLANNING

• D4.4 Recommendations for stakeholders: month 24



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- D4.1 uploaded in October 2016
- What tools and methods are available?
- Overview in WP4.1, described in fact sheets

WP4: METHODS – D4.1

- Main characteristics
- Range of relevant applications
- System boundaries
- Data needs, data
- Model used (if any)
- Classification in proposal: methods to
 - Identify and asses geological and urban mines
 - Assess society's metabolism and environmental impacts
 - Assess economic aspects
 - Forecast or estimate future resource supply and use



WP4: METHODS: D4.2



- D4.2 uploaded in January 2017
- Mapping methods on stakeholder questions
- Joint stakeholder / expert workshop of 27 september provides very important input
- List of 25 stakeholder questions (extracted from D2.1) confronted with list of methods of D4.1





Mineral Intelligence WP4 workshop "Methods and Tools for Raw Materials Intelligence" Mapping research questions to methods and tools

MICA workshop 27 September 2016



	and and	asses anthi	to ide s geo ropog tocks	logic	al	Methods to assess society's metabolism and its environmental impacts							Methods to assess the economic aspects of the use of resources							Methods to forecast or estimate future use of resources						
	Geological mapping	Remote sensing	Geochemical analysis	Ground investigation	Resource estimation	MFA - accounting	MFA - modelling	LCA	EE-IOA	RA and ERA	Footprinting	CBA	LCC	IOA	Criticality assessment	Econometrics	GEM and PEM	Forecasting (bottom up)	Forecasting (top-down)	Backcasting	Horizon scanning	Tech watch	Scenario storvlines			
 What is the estimated size of resources (economic, reserve base, ultimate earth crust) over the past 50 years and where are they located? 						•						•														
 What is the estimated size of resources in urban stocks (i.e. stocks-in- use) over the past 50 years and where are they located? 		•	•									•	•	•												
3. What was the extraction of raw materials over the past 50 years and where were they extracted?																										
4. How much raw materials come available from discarded products yearly and what is the End of Life Recycling Rate?					•	•	•	•																		
5. What are supply threats of critical materials for local businesses in the EU?					•																					
6. How can I, as a producer of electronics, identify conflict materials and exclude them from my production line?									•		•			•	•											
What are the cradle-to-gate environmental impacts of primary and secondary raw materials production for the present world demand?	•	•				•																				
							•	•	•	•	•															
8. What are risks of mining in different locations (land, sea, space)? 9. What is the demographic breakdown of mining employees in different countries for different commodities in terms of gender, age, income, education?																										
10. How many mine explosions have there been yearly during the past 25 years, where and how many casualties?												•														
11. How have prices of primary and secondary commodities changed over time?																										
12. What are possible substitutes for material x in product y and how will this influence the environmental impacts of the product?									•									•					•			
13. How will the extraction of raw materials develop in the next 50 years?																					•	•				
14. What are the environmental impacts of raw materials extraction of the future world demand?							•		•	•	•	•					•						•			
15. What will be the changes in energy use and efficiency of future mining and refining processes?							•	•						•												
16. What are promising future technologies to recover metals from waste and what are the costs?			•															•					•			
17. What is the consumption of raw materials in Europe and in which country is the raw material extracted?						•	•		٠																	
18. What is the monetary added value of mining sector x and what are the accompanying environmental impacts?										•																
19. What mix of policy instruments should be proposed to put a resource efficient circular economy in place?						•	•	•	•	•																
20. What are barriers towards a circular economy?																										
21. How many cases of land grabbing are related to mining projects during the past 20 years?																										
22. What recycling campaigns have been implemented in different countries during the past 25 years?																										
23. How much profit does a (mining) company make in each country and how much taxes does it pay on those profits?																										
24. What are the relative strengths and weaknesses of the national steel industry and how does this impact on national supply chains?																										
25. Which aspects of the national steel industry are well-placed competitively over the short, medium and long-term to meet current and emerging demands domestically and globally?																										





- Industrial ecology methods provide an essential addition to geological methods when addressing stakeholder questions, especially on supply chains, sustainability aspects, urban mining and circular economy.
- Some stakeholder questions require data, not methods, to be answered. The addition of applications (case studies) to the MICA platform can also be very useful for stakeholders.
- Stakeholder questions around policies, forecasting and social impacts are not very well addressed. Methods need to be developed and especially applied.
- Some methods are versatile, others are highly specific. This is no comment on their usefulness.
- The MICA platform will have to accommodate imprecise stakeholder questions.





- Combination of MFA and geological methods seems logical and fruitful
- The development of forecasting scenarios for resource use is essential for anticipating bottlenecks and formulating strategies and policies
- Global level tracking and tracing of raw materials throughout supply chains is essential for several stakeholder questions and related methods







- D4.3: Case studies
- Purpose: show use of methods, from stakeholder question all the way to answer
- Can also serve for development of flow sheets
- First meeting in september 2016, template developed, planning established
- Agreed on case studies using the following methods:
 - Material Flow Analysis
 - Life Cycle (Sustainability) Analysis
 - Top down forecasting
 - Economic equilibrium modelling
 - Criticality assessment
 - Urban mining inventory
 - Uncertainty analysis







- Preliminary case study reports discussed in WP4 meeting
- ... already something to mention...?
- D4.3 due end of November 2017, no delay expected



WP4: METHODS: D4.3



- Joint WP3/WP4 workshop tomorrow
- Using expert input to combine methods and data into flow sheets (recipes) that answer stakeholder questions
- Will be used
 - To signal gaps in data and/or methods included so far
 - To provide input into WP6
 - To establish links of data/methods to WP6 ontology





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THANKS FOR YOUR ATTENTION



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