

Investigating the state of knowledge of deep-sea mining

Day 2

This second day of the workshop focuses on the implications for the state of knowledge mining and the possible solutions.



Deep-Sea Mining

Selected terms (topical) are a much-needed source of specific words for risk and green technology projects.



Study carried out by Ecorys for the European Commission Directorate General for Maritime Affairs and Fisheries

ECORYS

Ecorys

- international independent research consultancy
- over 80 years old
- 300 people in 17 offices worldwide
- 2,000 projects
- working for governments, NGOs and the private sector in over 100 countries

Agenda of the day



Don't forget! EU Public consultation

Online now until 16 June

http://ec.europa.eu/eu-consultation/consultation_publication

Growing interest

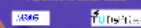
- 19 licenses issued or to be signed by the USA as of January 2014
- Additional 22 exploration licenses issued by national governments mainly by Pacific Island States and New Zealand



Partners in the environmental and geological analysis of deep-sea mining



Partners in other fields



Ecorys and Deep-Sea mining

- the study aims to present the state of play of DSM
- identify driver and challenges, including environmental, social, technological, economic and legal aspects
- identify what the EU could do on a policy level



We invite you to:

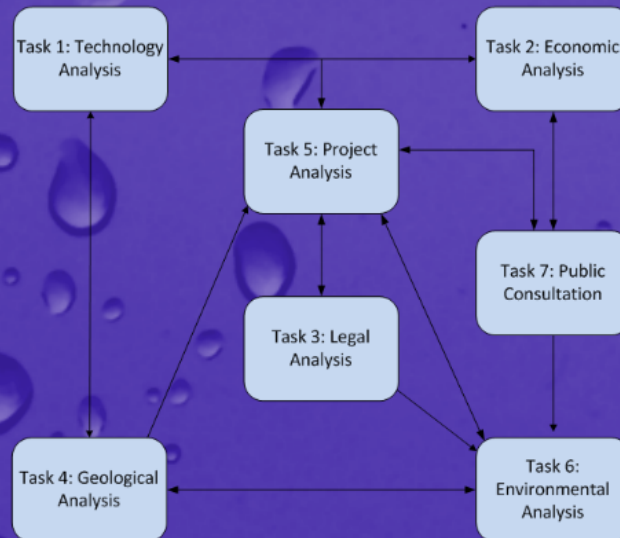
- ask questions
- participate in discussions
- give us feedback

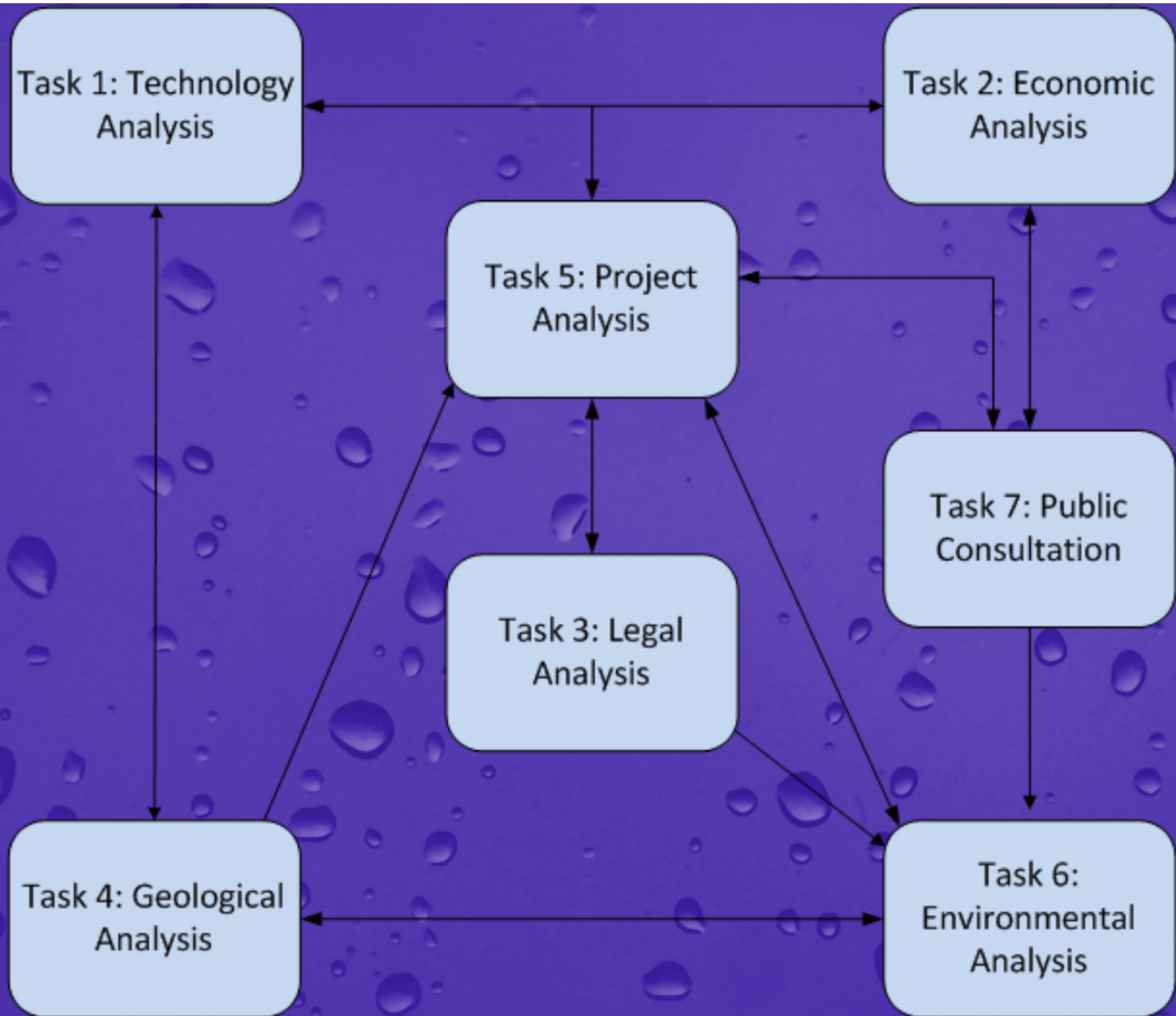
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The EC has identified a list of **14 critical raw materials** of which deposits and production are concentrated in countries outside the EU. Out of the 14 critical raw materials, 10 have primary deposits located in China.

	Sulfides/ Sulfates	Fe-Mn Crusts	Manganese Nodules
Antimony	G	--	--
Bismuth	--	G	--
Cadmium	G	--	--
Cobalt	--	G	G
Copper	G	L	G
Gallium	G	--	--
Germanium	L	--	--
Gold	G	--	--
Indium	G	--	--
Lithium	--	--	G
Manganese	--	G	G
Molybdenun	L	G	G
Nickel	--	G	G
Niobium	--	G	--
Platinum	--	L	--
REEs	--	G	G
Selenium	L	--	--
Silver	G	--	--
Tellurium	L	G	--
Thorium	--	G	--
Titanium	--	G	L
Tungsten	--	G	G
Zinc	G	--	--
Zirconium	--	L	--

G = Good Potential

L = Longer term Potential

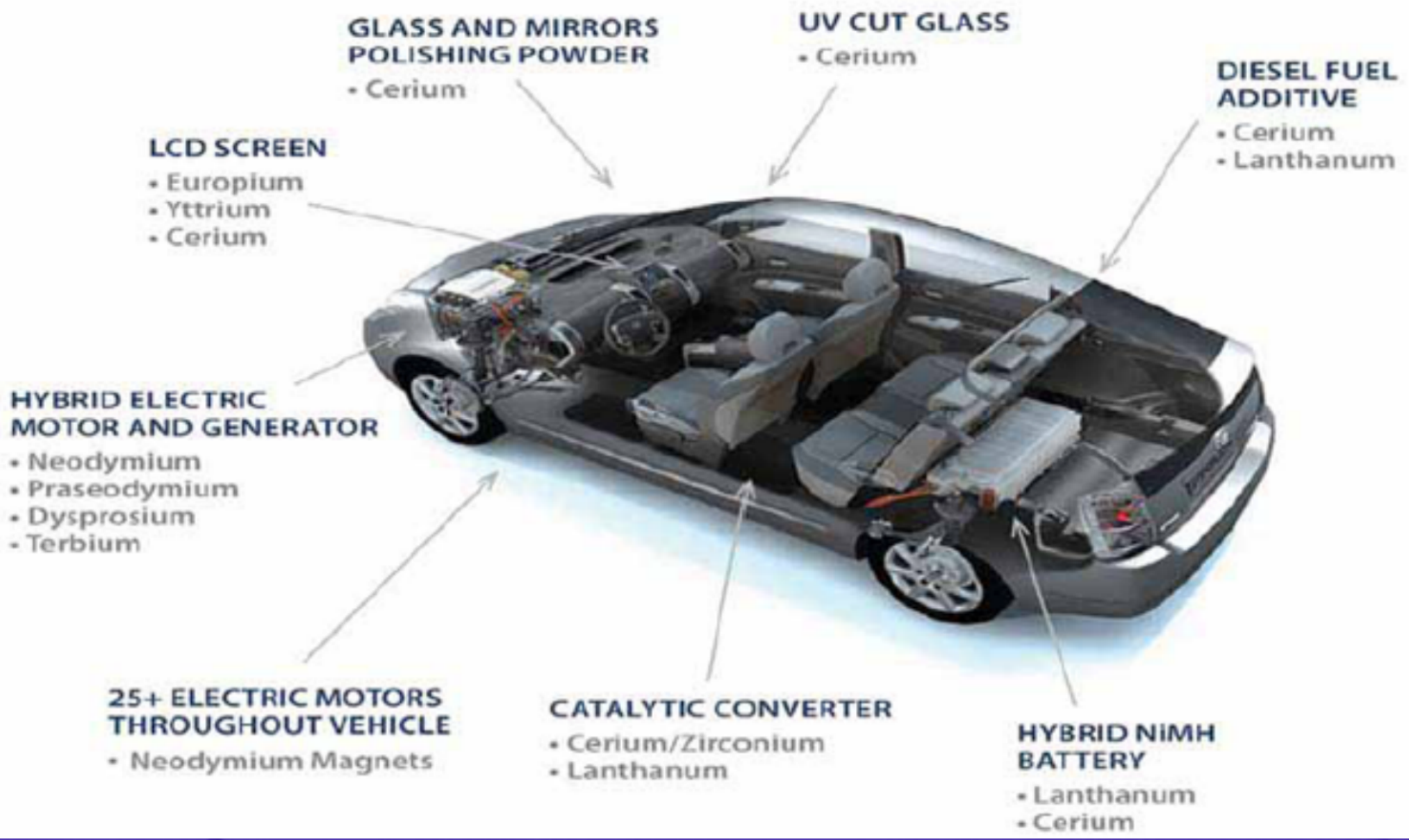


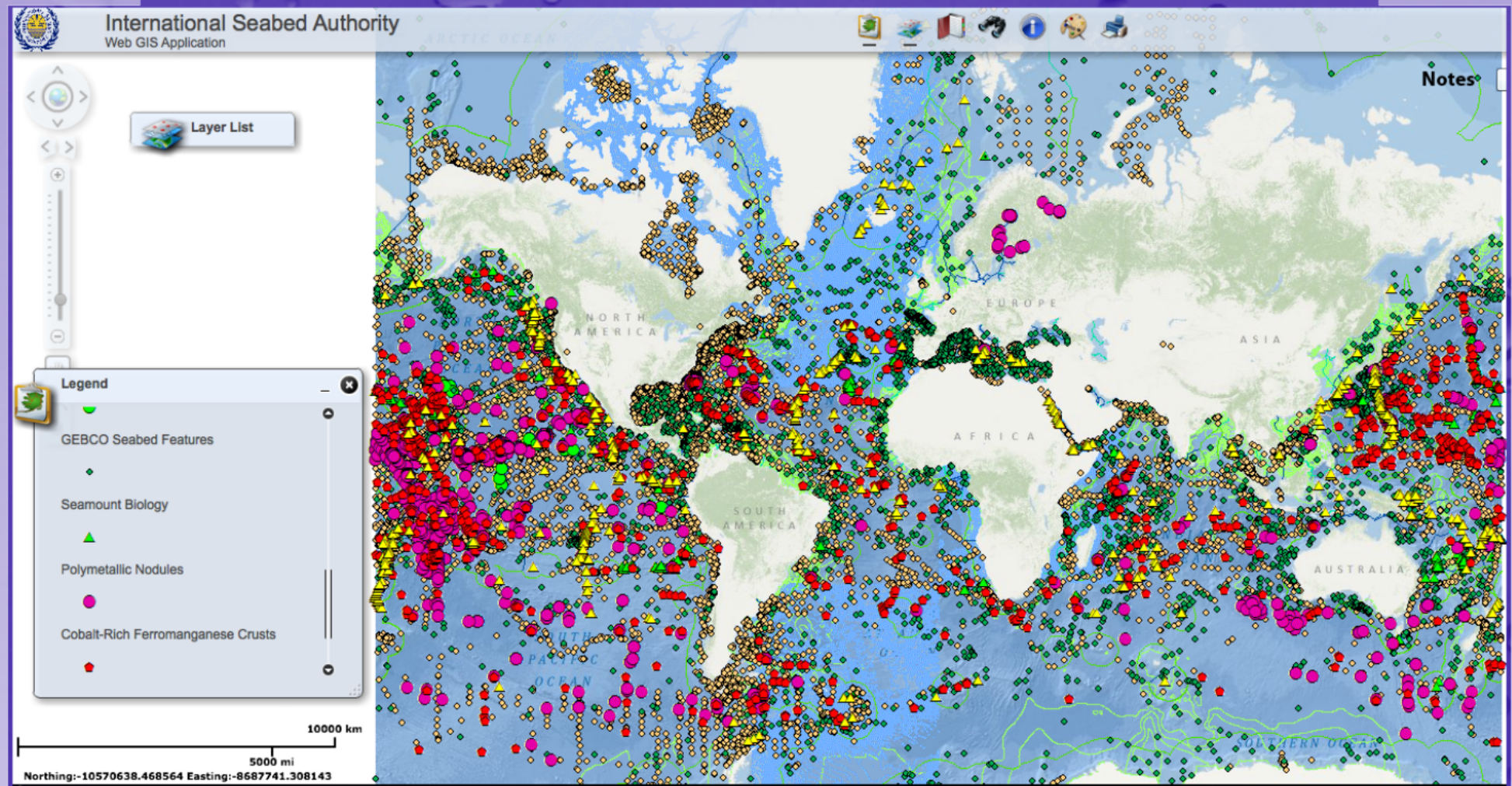
Table 1

Rare metals for emerging and next generation technologies.

Modified from Hein (2012) and Tasman Metals LTD website (2012).

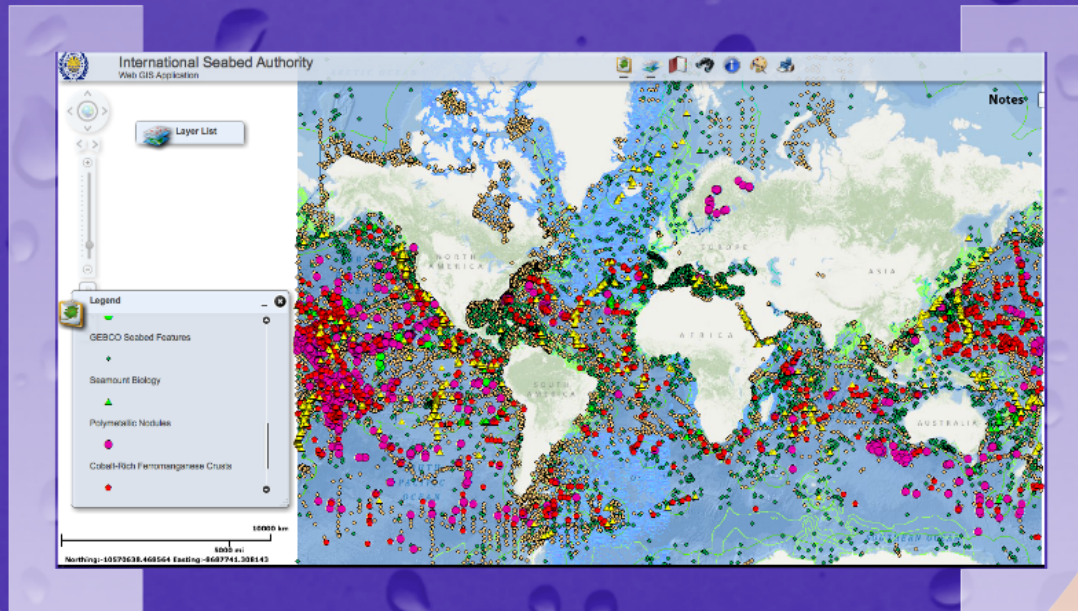
Metal	Application
Tellurium	Photovoltaic solar cells; computer chips; thermal cooling devices
Cobalt	Hybrid & electric car batteries, storage of solar energy, magnetic recording media, high-T super-alloys, supermagnets, cell phones
Bismuth	Liquid Pb–Bi coolant for nuclear reactors; bi-metal polymer bullets, high-T superconductors, computer chips
Tungsten	Negative thermal expansion devices, high-T superalloys, X-ray photo imaging
Niobium	High-T superalloys, next generation capacitors, superconducting resonators
Platinum	Hydrogen fuel cells, chemical sensors, cancer drugs, flat-panel displays, electronics
Yttrium	Compact fluorescent lamps, LEDs, flat-screen TVs, medical applications, ceramics
Neodymium	Hard disk drives, medical applications, portable electronics and small motors, high-strength permanent magnets
Praseodymium	Flat screen TVs, portable electronics and small motors, hard disk drives, magnets, lasers, pigments, cryogenic refrigerant
Cerium	Catalysts, metal alloys, radiation shielding, phosphors for flat screen TVs
Scandium	Super alloys, light aerospace components, X-ray tubes, catalysts
Gadolinium	Magnetic resonance imaging contrast agent, memory chips
Lanthanum	Batteries, optical glass, camera lenses, catalysts for petroleum refining, catalytic converters
Europium	Liquid crystal displays, fluorescent lighting, LEDs, red and blue phosphors for flat screen TVs, portable electronics and small motors
Terbium	Green phosphor for flat screen TVs, lasers, fluorescent lamps, optical computer memories, medical applications

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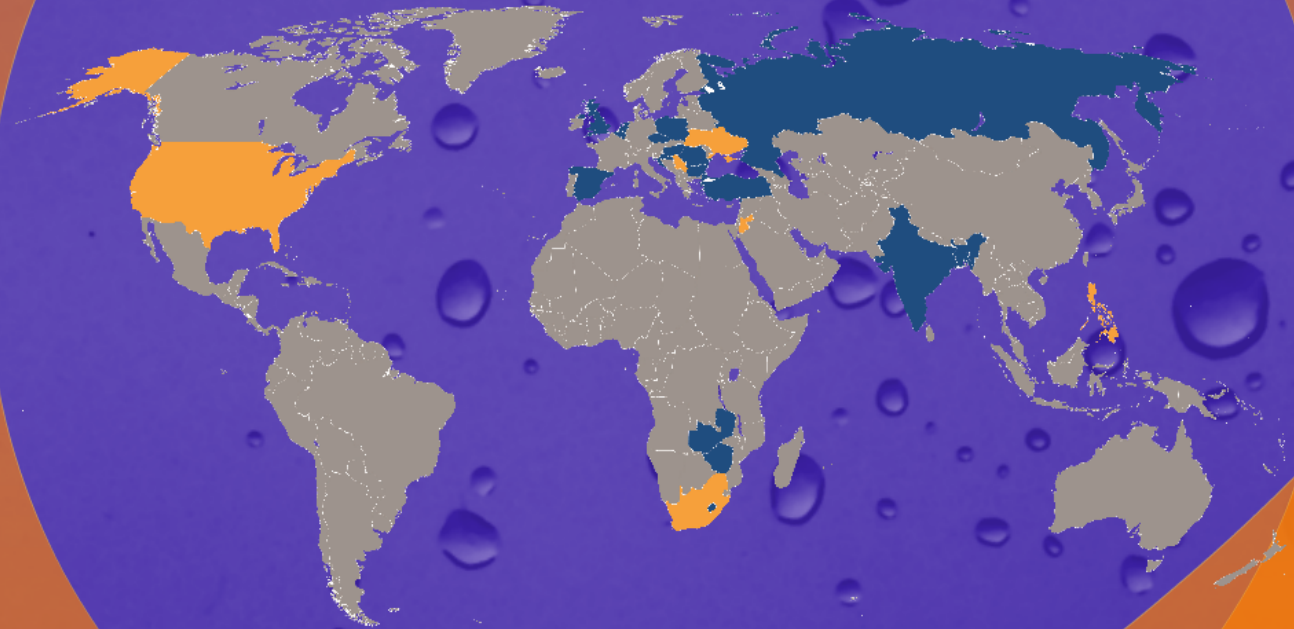
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Ecorys coverage



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Agenda of the day

WORKSHOP ON THE ENVIRONMENTAL ASPECTS OF DEEP-SEA MINING

Hotel Bloom! Brussels
30 April 2014



10.00 - 11.00	REGISTRATION
11.00-11.30	Welcome and Introduction to the study (Presenter Roelof-Jan Molemaker)
11.30 -12.00	Highlights of the environmental analysis (Presenter Yannick Beaudoin)
12.00-12.30	Land-based mining vs. Seabed mining: environmental perspective (Presenter Charles Roche and Mike Buxton)
12.30-14.00	LUNCH
14.00- 16.00	Knowledge gaps questionnaire: Live expert elicitation session (Facilitators: Yannick Beaudoin, Phil Weaver, and Allison Bredbenner)
16.00 - 16:15	COFFEE/TEA BREAK
16.15 - 16.30	Summarizing the knowledge gaps session: What actions are needed now? (Presenter Yannick Beaudoin)
16.30-17.00	Moderated discussion on: good practices (Presenter Phil Weaver and Sven Petersen)
17.00- 17.15	Emerging findings (Roelof-Jan Molemaker)
17.15 - 18.00	Wrap-up cocktail

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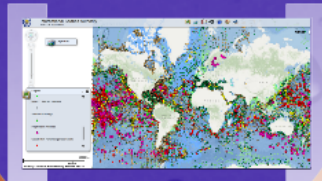
Deep-Sea Mining

Seabed mineral deposits are a much needed source of metals needed for high and green technology products.



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