Investment Opportunities in Chile's Mining Industry

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EU-Latin America Dialogue on Raw Materials: enhancing the co-operation

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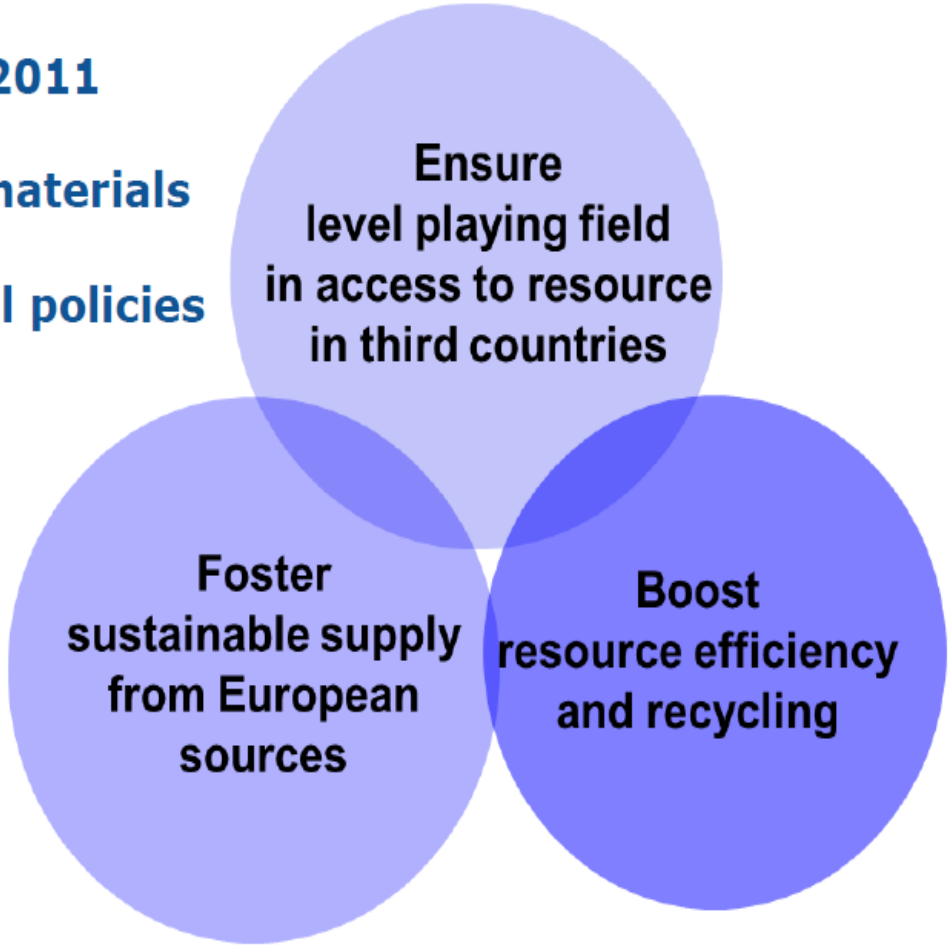
EU raw materials webpage:

- Securing a **sustainable supply of raw materials** is a **key priority for the EU.**
- Raw materials, such as **metals and minerals** or forest-based materials**,** have become **increasingly important** to the EU's **economy, growth, and competitiveness.**
- More than **30 million jobs** in the EU and many key economic sectors such as **automotive, aerospace, and renewable energy are dependent** on a **sustainable supply** of raw materials.
- Raw materials are **particularly crucial** for the development of **modern environmentally friendly technologies** and a **strong European industrial base.**

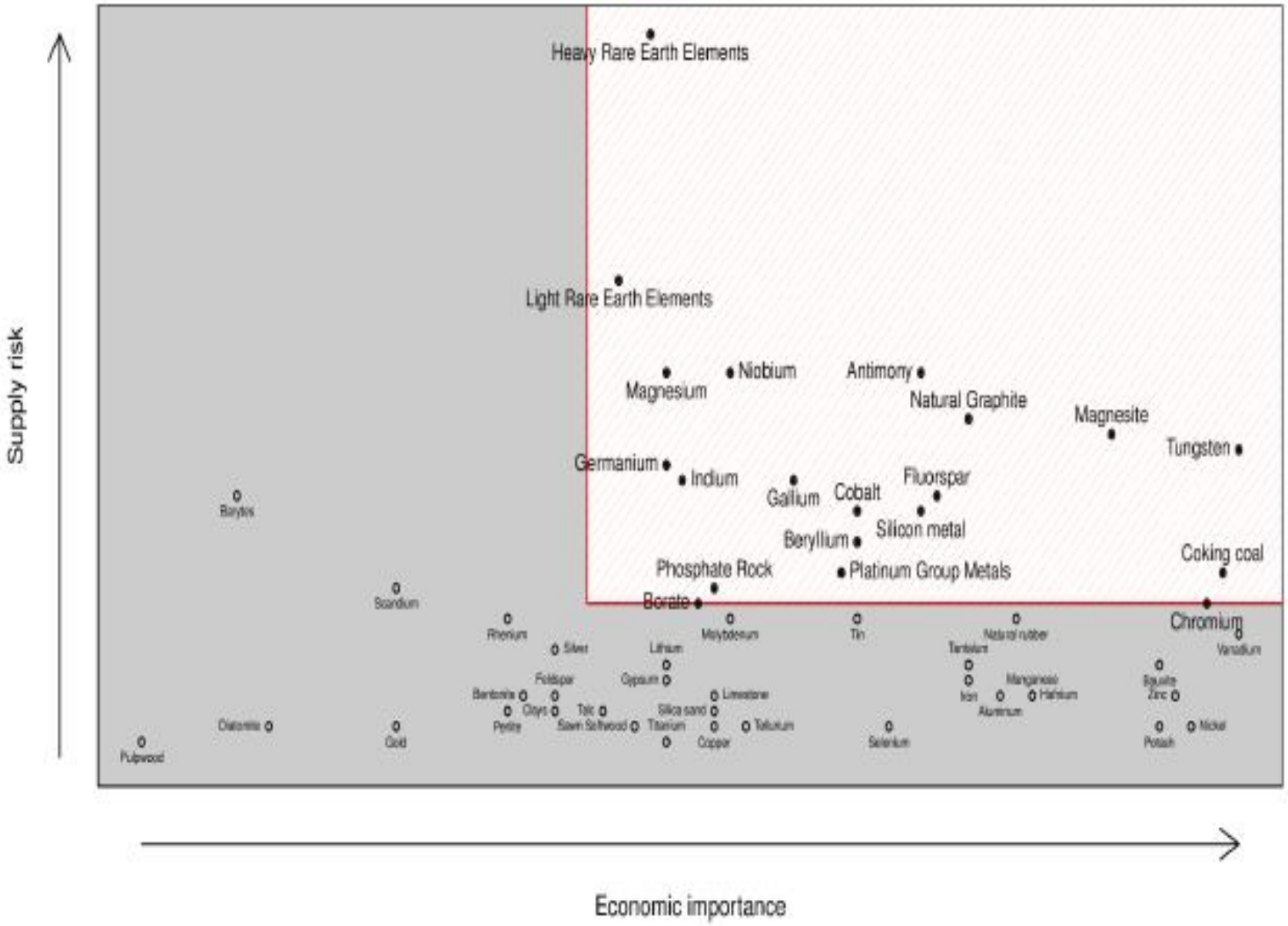
Workshop on Best Policies on Mining and Technology : EU/Díaz Pulido (2014)

EU "Raw Materials Initiative"

- **Aim:** securing sustainable supplies of raw materials
- **Launched in 2008, consolidated in 2011**
- **Non-energy, non-agricultural raw materials**
- **Connecting EU external and internal policies**
- **Integrated strategy (3 pillars)**
- **Introduced list of Critical Raw Materials (CRM) in 2010**



EU Raw Materials Iniative : Critical Raw Materials (2014)

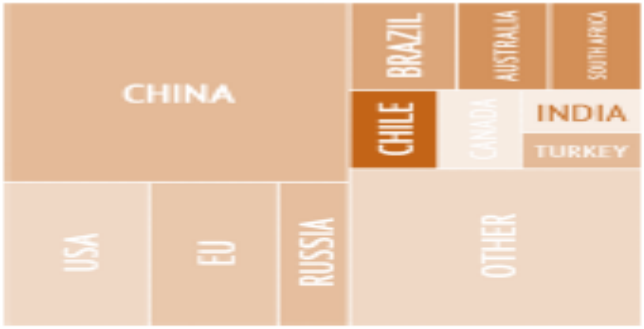


Report on Critical raw materials for the EU (2014)

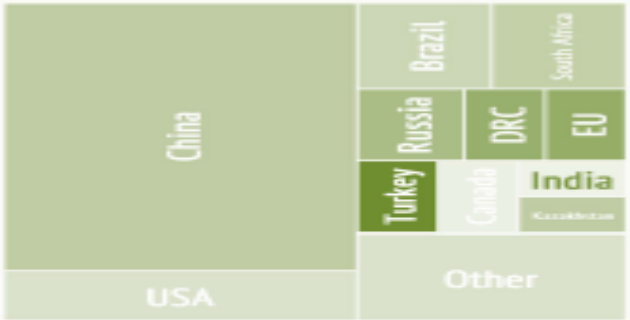
Country	Materials Produced*	Total % of supply	Country	Materials Produced*	Total % of supply
China	48	30%	**South Africa**	26	3.9%
USA	36	10%	**Chile**	18	3.4%
Russia	42	4.9%	**Canada**	30	3.2%
Brazil	36	4.6%	**India**	30	2.5%
Australia	34	4.0%	**Turkey**	25	2.1%

** Supply data from the 54 materials assessed in this report, sources in Annex C*

Antimony	**Beryllium**	**Borates**	**Chromium**	**Cobalt**	**Coking coal**	**Fluorspar**
Gallium	**Germanium**	**Indium**	**Magnesite**	**Magnesium**	**Natural Graphite**	**Niobium**
PGMs	**Phosphate Rock**	**REEs (Heavy)**	**REEs (Light)**	**Silicon Metal**	**Tungsten**	



World primary supply of the 54 candidate raw materials



World primary supply of the 20 critical raw materials

Raw materials important (51) for the EU´s economy (2014)

Aluminium	Antimony	Barytes	Bauxite	Bentonite	Beryllium
Borates	Coking Coal	Chromium	Clays (and kaolin)	Cobalt	Copper
Diatomite	Feldspar	Fluorspar	Gallium	Germanium	Gold
Gypsum	Hafnium	Indium	Iron ore	Limestone (high grade)	Lithium
Magnesite	Magnesium	Manganese	Molybdenum	Natural Graphite	Natural Rubber
Nickel	Niobium	Perlite	Phosphate Rock	Platinum Group Metals	Potash
Pulpwood	Rare Earth Elements – Heavy *	Rare Earth Elements – Light *	Rhenium	Sawn Softwood	Scandium*
Selenium	Silica Sand	Silicon Metal	Silver	Talc	Tantalum
Tellurium	Tin	Titanium	Tungsten	Vanadium	Zinc

* Rare Earth Elements are split in 3 categories: Light, Heavy and Scandium

Contribution to Global Primary and Critical Raw materials (EU report, 2014)

Country	Materials supplied (Out of 54)	Overall % contribution	Critical raw materials supplied (Out of 20)	% Contribution to CRM supply
China	48	30%	18	49%
USA	36	10%	9	9%
Russia	42	5%	16	4%
Brazil	36	5%	11	6%
Australia	34	4%	10	1%
South Africa	26	4%	9	6%
Chile	18	3%	2	1%

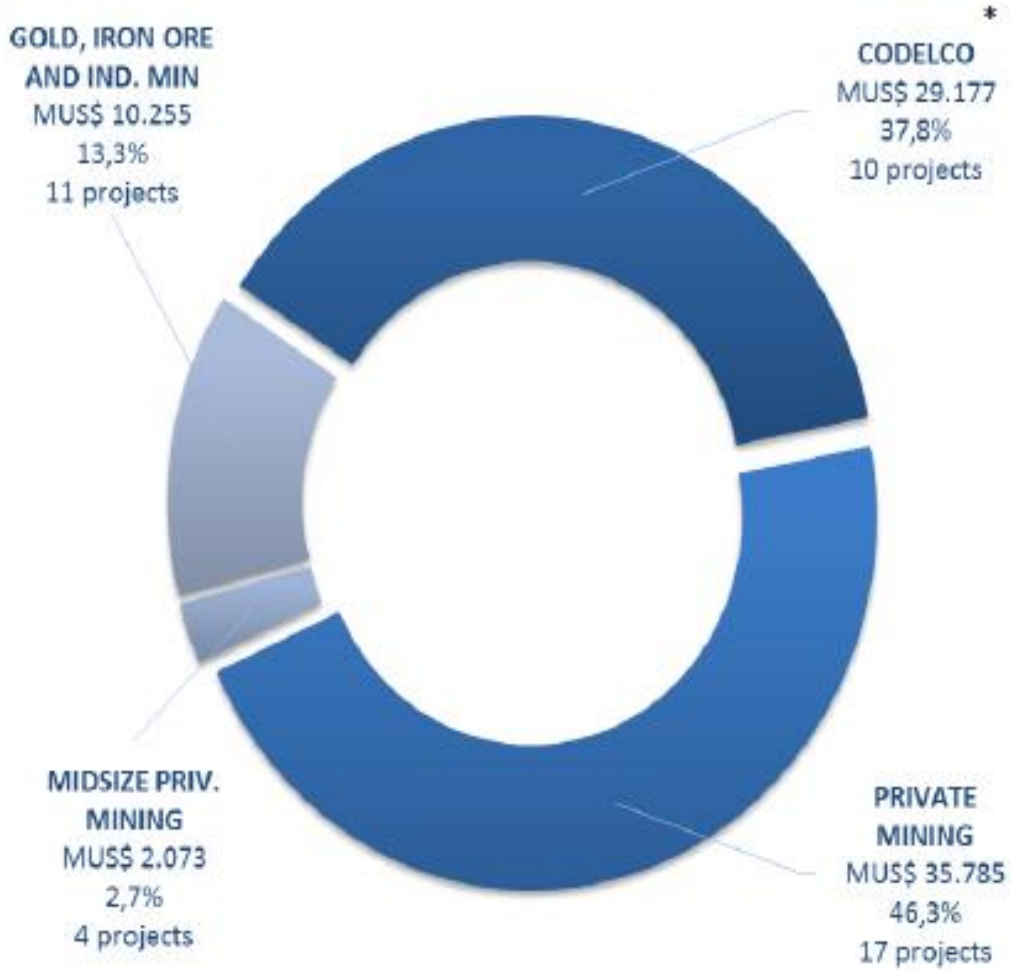
Raw materials important for the EU´s economy (2014) : 20 produced and additional 6 existent in Chile .

- Barite
- Borates
- Clays
- Copper
- Diatomite
- Feldspar
- Gold
- Gypsum
- Iron ore
- Limestone
- Lithium
- Manganese
- Molybdenum
- Perlite
- Phosphate Rock
- Potash
- Rhenium
- Silica sands
- Silver
- Zinc

Chromiun
Cobalt
Fluorspar
Rare Earths
Titanium
Tungsten

Mining Projects Portfolio (Cochilco, 2015)

Investment by type of company



Source: COCHILCO
(*) CODELCO investment includes metallurgical plants, other development projects, information projects and five structural projects

Opportunities – General Overview.

Value Chain

There are **five core stages in the Chilean mining value chain**.

Stage/Process	Opportunities
Geoscience	Research and Development (R&D)
Exploration	Exploration, joint venture, R&D, Mining Equipment, technology and Services (METS)
Developing Projects	Partnership agreements, R&D, METS
Mining	New projects development,Mergers, product purchase and sale, R&D productivity, METS
Processing (ore purchase and product upgrade for premium sales)	R&D productivity and saleability, METS

Opportunities – General Overview.

Source: Mining Market in Chile 2015 , VEDP

Specific areas where the Chilean mining market needs support include:

- Environment-related products and services (tailing management, water treatment plants)
- Research and Development : Geology, Mining, Metallurgy, etc.
- Renewable energies & Energy infrastructure
- Communities
- Underground mining and specialty block-caving
- Safety in mining
- Automation and robotics
- Land rehabilitation and mine closure
- Sea Water use
- Education and training for the industry

Opportunities : Training.

(Source : Foreign Investment Committee)

- **TRAINING .**
- At present , large-scale mining companies devote approximately **US$ 35 million** to training.
- **Need for skilled work force:** More than 27,000 jobs are estimated to be generated by the mining industry in the near future (2016-2023).

- Market without leadership.

- **Value of the Opportuntity.**
- Training in the sector will be worth over **US$ 200 million** on 2014-2020.

Market-Specific Issues

Challenges, competitive situation, operative models

Expertise in closing down mines: New requirements were introduced in 2011 for closing down mines. In 2014 more than 100 mines submitted their closure plans which add up to **US$12.2 billion.**

Smelters must be upgraded: New emission standards were introduced in 2013. In order to meet the regulations, the smelters require major investments in their acid plants and infrastructure. There are seven smelters with production of 1.6 M tons of anode.

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Analysis & Recommendations:

Development areas & concerns

- **Productivity needs to be improved.**

Innovation development is urgently needed to generate solutions.

- **Future Projects.**

Current prices are requesting re-evaluations of several projects.

This is creating a need for very fine engineering assessments. New and different solutions are searched.

- **High technology will increase in the sector, which requires a skilled workforce.**

Training presents an opportunity for European institutions.

- **High energy costs**

One of the main barriers to expanding existing projects; as well as for new future projects.

Renewable energy is considered as one solution for tackling the problem.

- **Need for water.**

Several mines are located in an extremely dry region and the need for water is growing, estimated to be four times the current supply.

- **Other development areas**.

Tailings and slag exploitation, recycling and drilling equipment.

New exploration methods,

Investment Opportunities Summary: Chile´s view.

- **Strategic center for mining production globally , with 33% of the world's copper production, 53% of rhenium, 15% Molybdenum, 7% gold and 5% silver.**
- Mining was worth **US$42 billion in 2014**.
- **Mining investment portfolio stands at over US$74 billion for** (period 2015 to 2024/Cochilco)**.** And **42 mining projects** that are in progress or undergoing review by the authorities .
- Products demanded will reach **US$2,4 billion** by the end of 2016, and services up to **US$3,2 billion.**
- The sector **employed 240,000 people** in 2013-14, (9.7% of employment) .
- **1100 mines currently are in operation in Chile**, (2015).
- **I**s a natural resource-based economy with long mining traditions and history.
- The country seeks to diversify its mining sector to also cover services, and is on the **edge of the transition period**. This offers clear business opportunities.
- Chile has a **good understanding of its challenges** and is actively working on the issues.
- **Key challenges for the future Chile´s mining are:** productivity, energy, efficient use of water, innovation, training human capital, communities

Investment Opportunities Summary : UE´s view

- Most of **Critical Raw Materials** used in the **UE** obtained from **China/Africa.**
- **UE (RMI)** signed in 2011 a **Letter of intent** with **Chile** (among other 9 countries). Previously a **UE/Chile Association Agreement** was established (2002).
- **UE** could actively participate in the **evaluation and development** of **non produced** minerals Raw materials : **Chromiun , Cobalt, Fluorspar , Rare Earths, Titanium & Tungsten**
- **UE Technology** could growth its share in Chile´s mining industry by addressing different challenges, especially increasing productivity.
- **The Horizon 2020 Initiative** could implement the **Research and Innovation** currently and urgently needed in the Chilean mining industry.

THANKS

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