



European Institute of
Innovation & Technology

EIT HEI Initiative

Innovation Capacity Building
for Higher Education



Funded by the
European Union

The innovation projects' importance for social acceptance
of mining activities and the raw material industry



European Institute of
Innovation & Technology



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HEI4S3^{RM}

Who and how does mine if we don't mine



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Universidad de Oviedo

University of Oviedo

- Founded by Bishop Fernando Valdés Salas, started its activities in 1608 after papal (Bull of 1574) and royal permission (Royal Decree of 1604)
- Actually is the only higher education institution in the Principality of Asturias



Universidad de Oviedo

Main figures:

20.000 students

2.000 lecturers & researchers

1.000 administrative staff members

57 Undergraduate Degree programmes

50 Master's Degree programmes

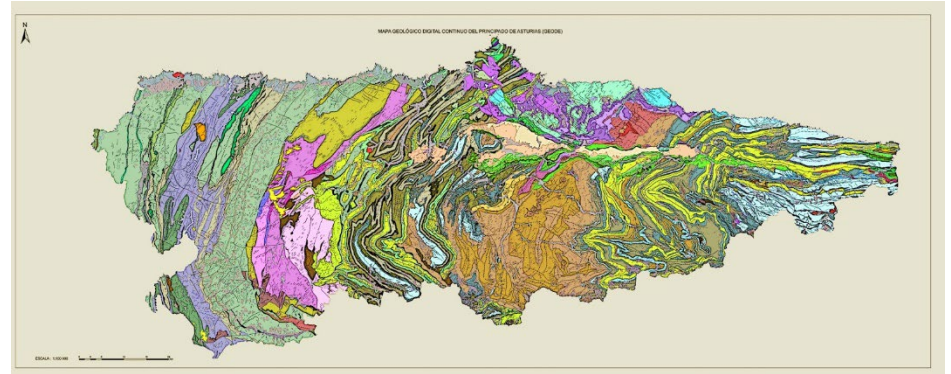
6 Erasmus Mundus Master's programmes

24 PhD programmes

17 Faculties & Schools, 38 Departments

+200 M€ annual budget

University of Oviedo



CASTILLA Y LEON

10km



Polytechnic School of Mieres



- First School of Engineering in the Principality of Asturias
- Founded by Wilhelm Schulz as a School of Mines in 1854
- The new campus (EU funded) was inaugurated in 2002





+30 million jobs depending on the availability of raw materials

A real NEED

2008



Raw Materials* Initiative

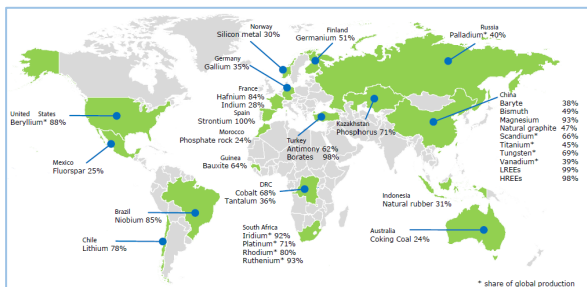
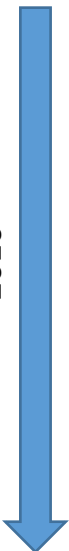
* RM: all raw materials except materials from agricultural production and fuels

Fair and sustainable supply of RM from global markets

Resource efficiency and supply of 'secondary RM'

Sustainable supply of RM within the EU

2010



CRM definition

2011 – 2014 – 2017 – 2020

2020

CRM Action Plan

2023

- Resilient value chains for EU industrial ecosystems
- Reduce dependency on primary CRM
- Strengthen domestic sourcing of RM
- Diversify sourcing from third countries

EIP-RM
(The European innovation partnership on RM)
Stakeholder platform

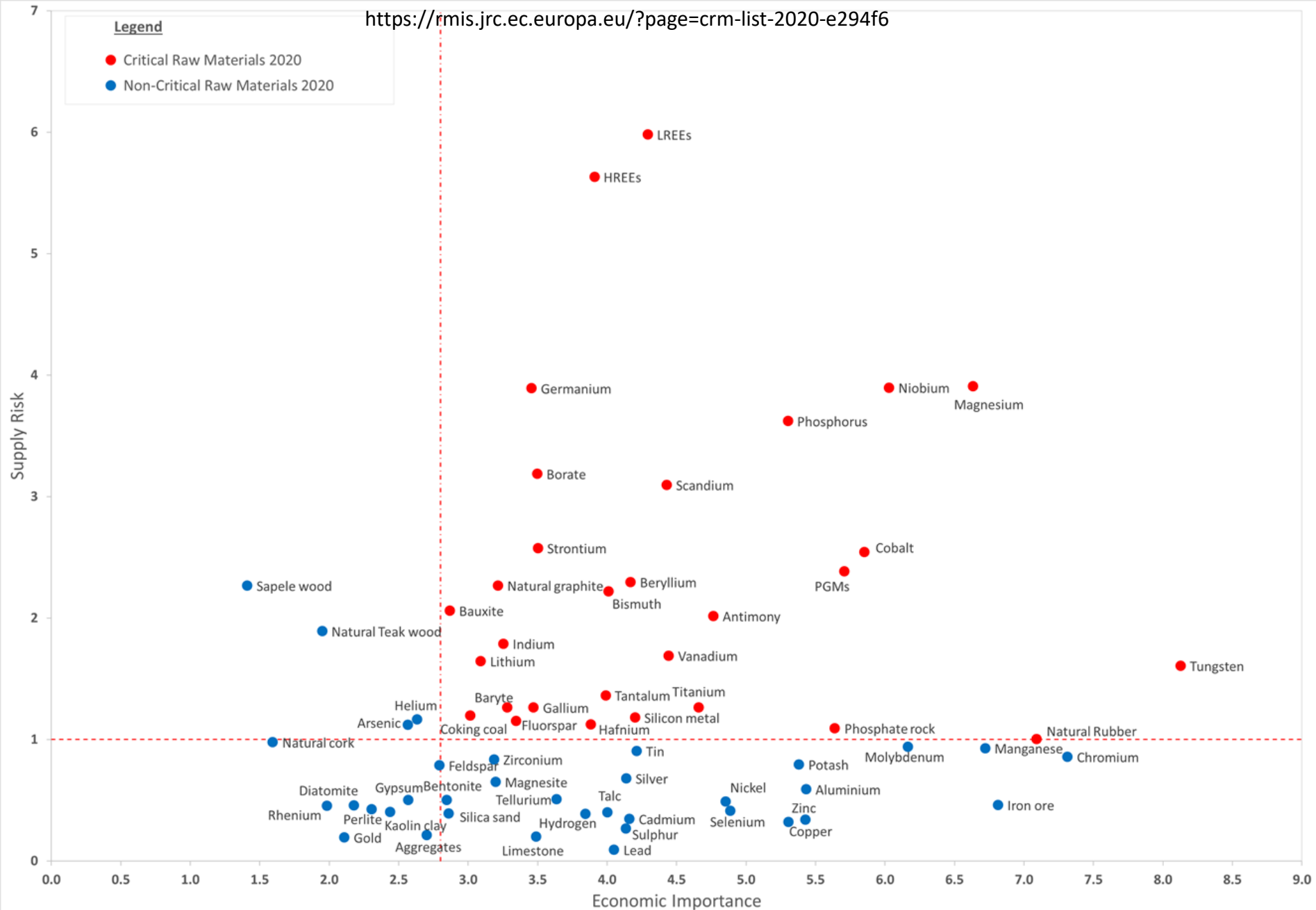


SIP
Strategic implementation plan

EU Critical Raw Materials Act

EU CRM 2020 report

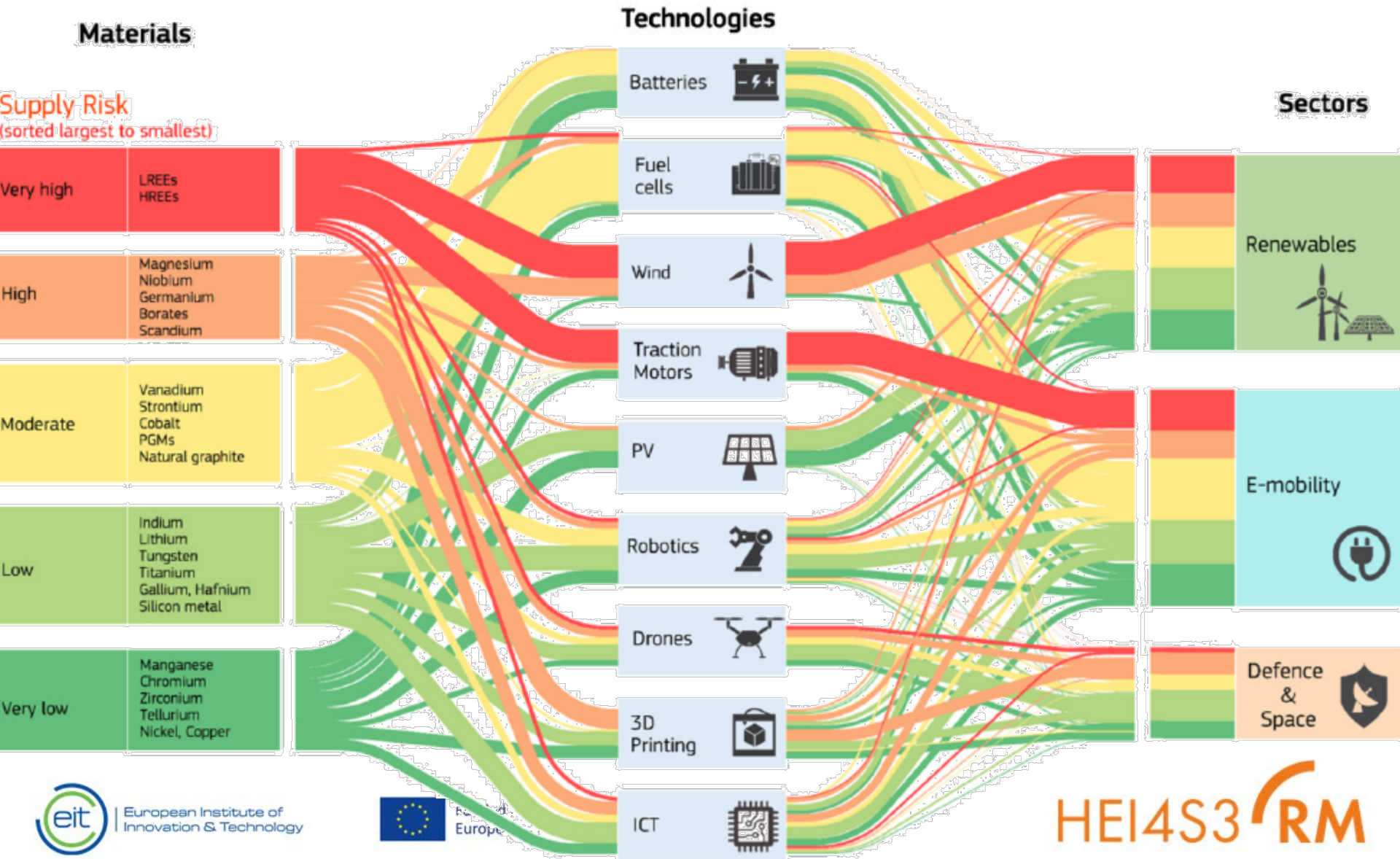
<https://rmis.jrc.ec.europa.eu/?page=crm-list-2020-e294f6>

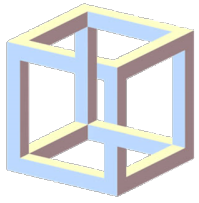


Key sectors and technologies dependency on CRM

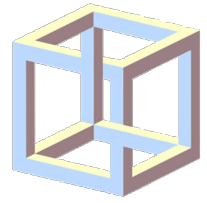
Action Plan on Critical Raw Materials - factsheet

<https://ec.europa.eu/docsroom/documents/42852>





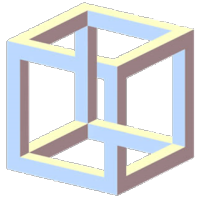
Socio-environmental paradox of Raw Materials (RM) production



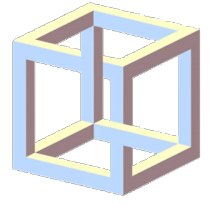
Paradox 1.0 (NIMBY)

Society demands consumer goods which need mineral RM for their production; **but people do not want to accept environmental consequences of that production...**





Socio-environmental paradox of Raw Materials (RM) production



Paradox 2.0 (NIMBYITBY)

“Developed countries” endow themselves with the toughest legislation (labor, environment) making almost impossible any RM local projects; **thus promoting the mineral production somewhere, somehow...**



SDGs major issue areas for Mining

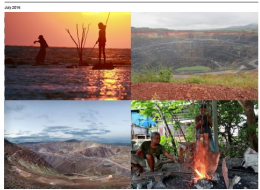


Solving the paradox with CS and SDGs

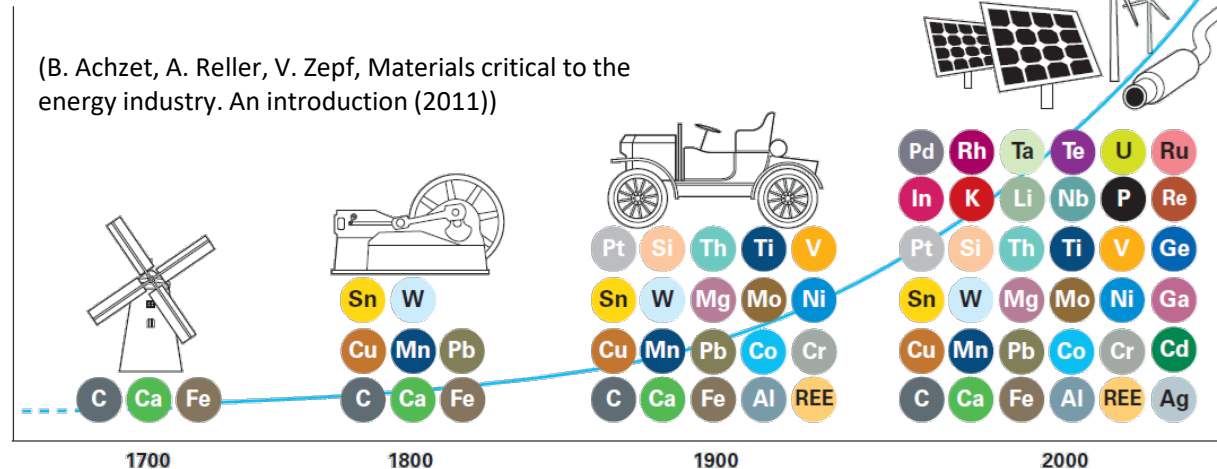
(Common Sense)
Dependence of technological development on Mineral RM



Mapping Mining to the Sustainable Development Goals: An Atlas



(B. Achzet, A. Reller, V. Zepf, Materials critical to the energy industry. An introduction (2011))



Who does mine if we don't mine

Expectation



Reality



<https://www.westafricanpilotnews.com/2020/10/31/why-cobalt-mining-in-the-drc-needs-urgent-attention/>

Who does mine if we don't mine



<https://law-in-action.com/2019/07/17/free-all-countries-gold-mining-and-the-polluted-rivers-of-central-african-republic/>



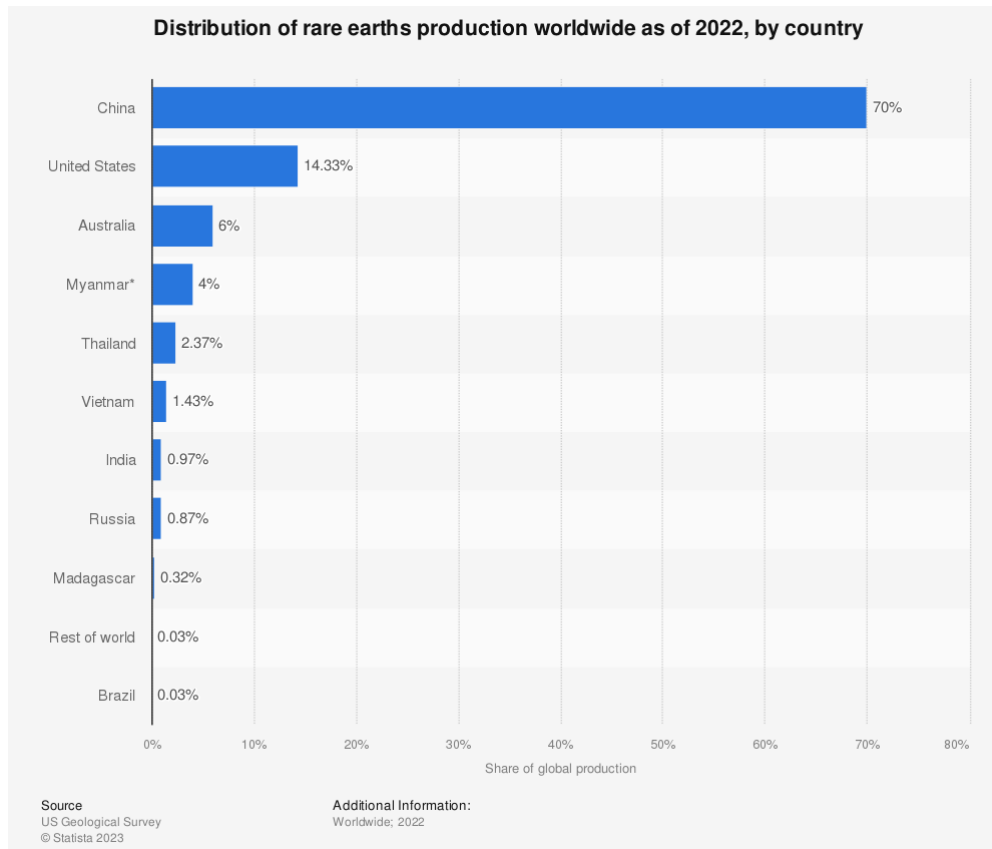
<https://time.com/4203034/central-african-republic-william-daniels/>

Who does mine if we don't mine



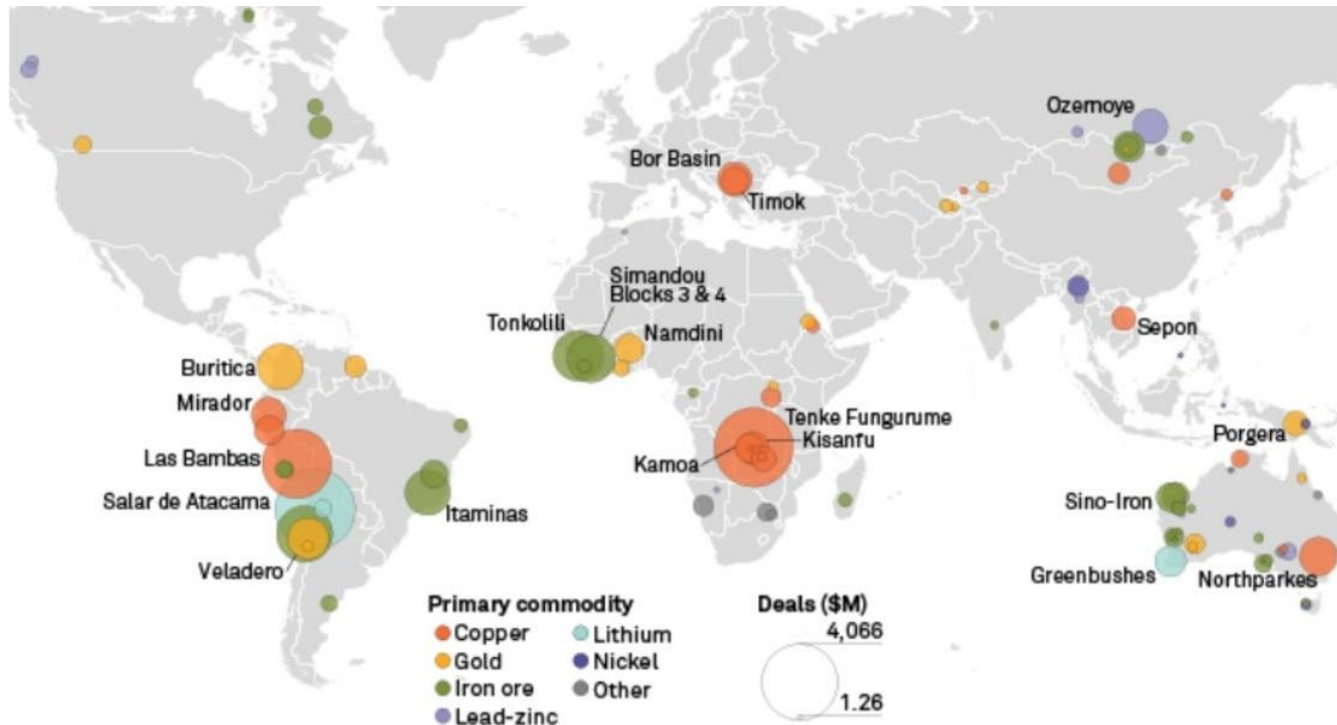
<https://www.theguardian.com/global-development/2021/may/27/brazil-aerial-photos-reveal-devastation-by-goldminers-on-indigenous-land>

Who does mine if we don't mine



<https://www.statista.com/statistics/270277/mining-of-rare-earths-by-country/>

Who does mine if we don't mine

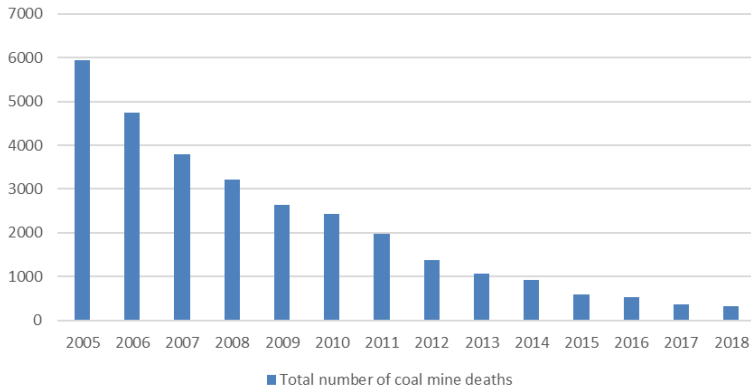


China's overseas mining M&A deals from 1988-2020. Map: Elizabeth Thomas; S&P Global Market Intelligence

<https://www.mining-journal.com/exploration/news/1407092/china%E2%80%99s-miners-seeking-low-cost-regions-s-p>

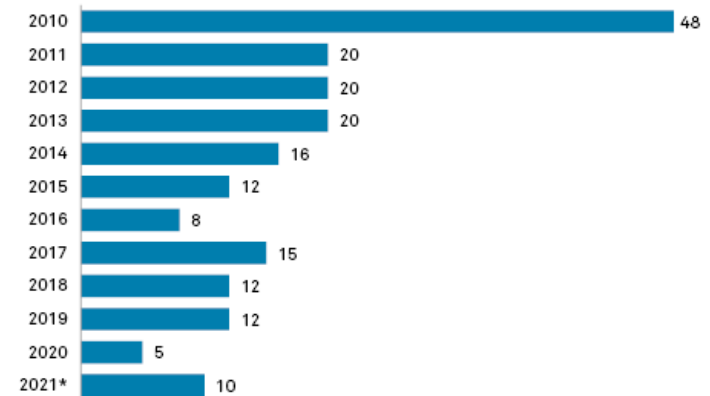
How do they mine if we don't mine

Total number of coal mine deaths in China 2005-2018



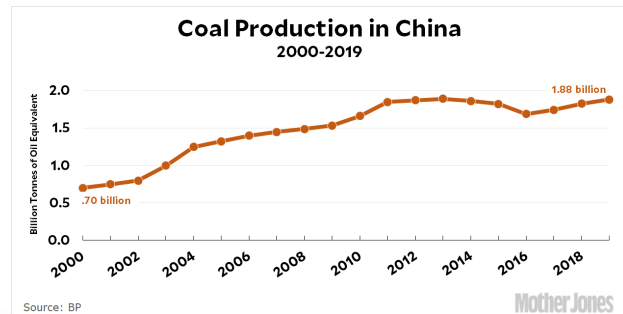
<https://clb.org.hk/content/deaths-coal-mine-accidents-china-fall-new-low-333-2018>

US coal mining fatalities since 2010



<https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/as-us-coal-demand-surged-worker-fatalities-doubled-yoy-in-2021-68234862>

Coal Production in China
2000-2019

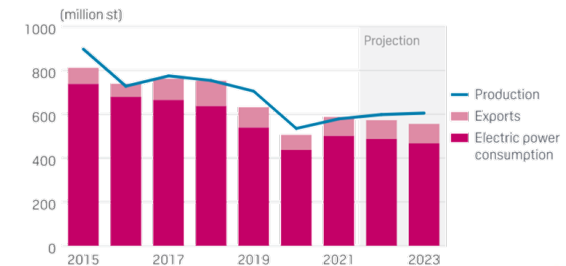


Source: BP

Mother Jones

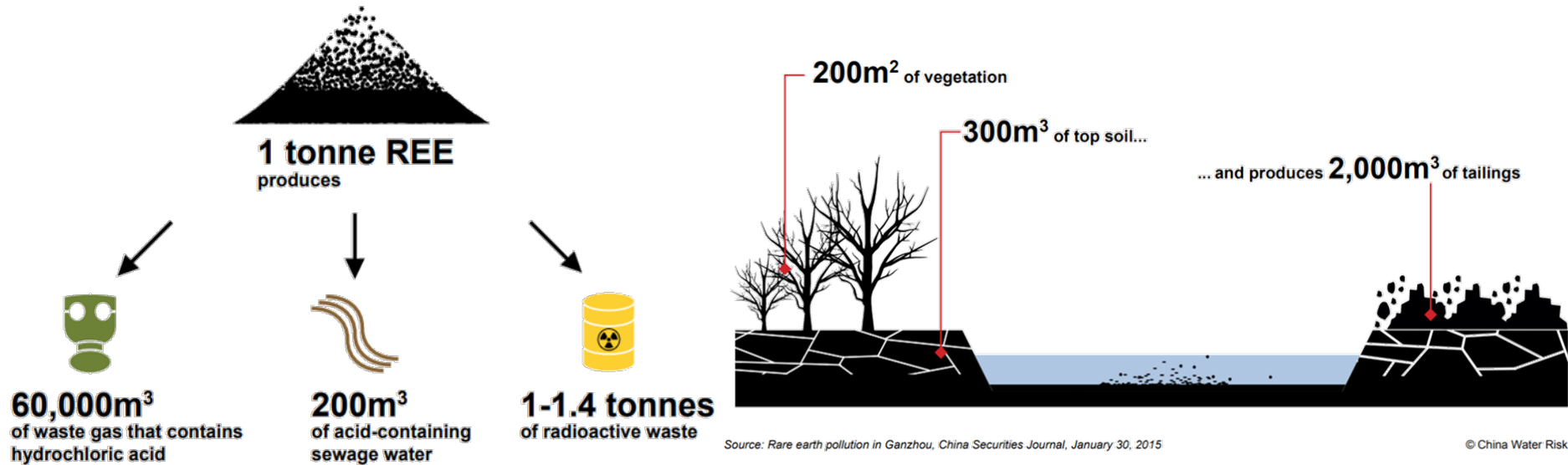
3 x production
vs
30 x fatalities

US COAL SUPPLY AND DEMAND



Source: EIA Short Term Energy Outlook

How do they mine if we don't mine



Source: L. Hayes-Labruto et al. (2014)

© China Water Risk

Source: Rare earth pollution in Ganzhou, China Securities Journal, January 30, 2015

© China Water Risk

<https://www.chinawaterrisk.org/wp-content/uploads/2016/07/CWR-Rare-Earths-Shades-Of-Grey-2016-ENG.pdf>

Don't you mind who and how do mine?

Responsible production needs
responsible consumption...

Who and how does mine if we don't mine



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Thank you for your attention!