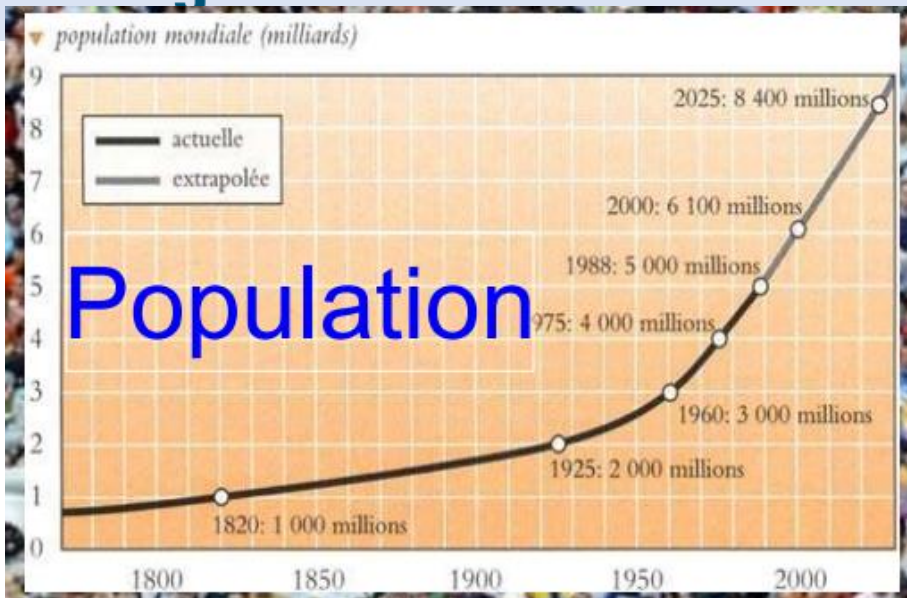
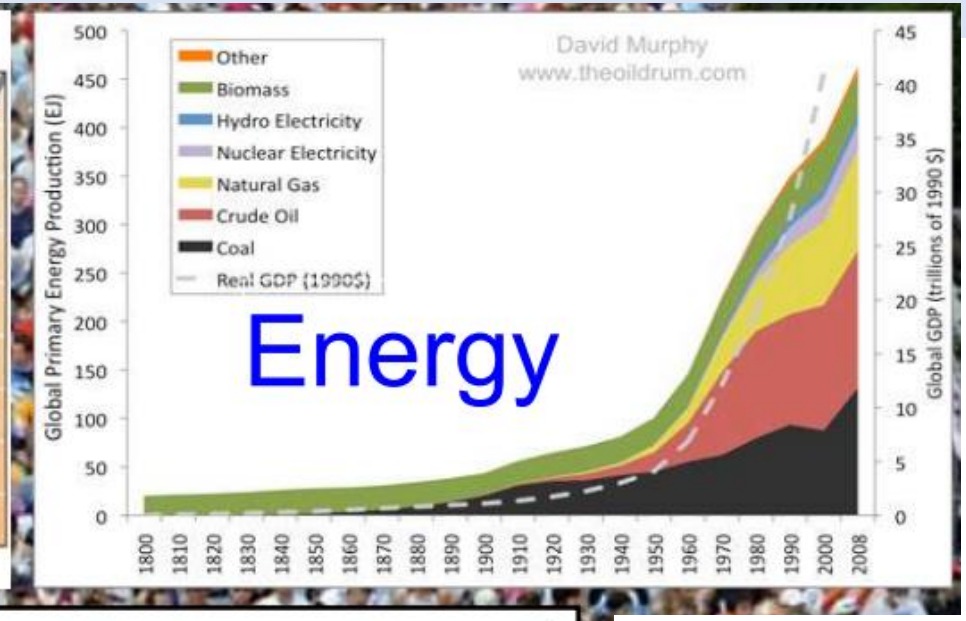
OFREMI
OBSERVATOIRE FRANÇAIS
DES RESSOURCES MINÉRALES
POUR LES FILIÈRES INDUSTRIELLES

FRENCH MINERAL INTELLIGENCE CENTRE
A PUBLIC/PRIVATE PARTNERSHIP

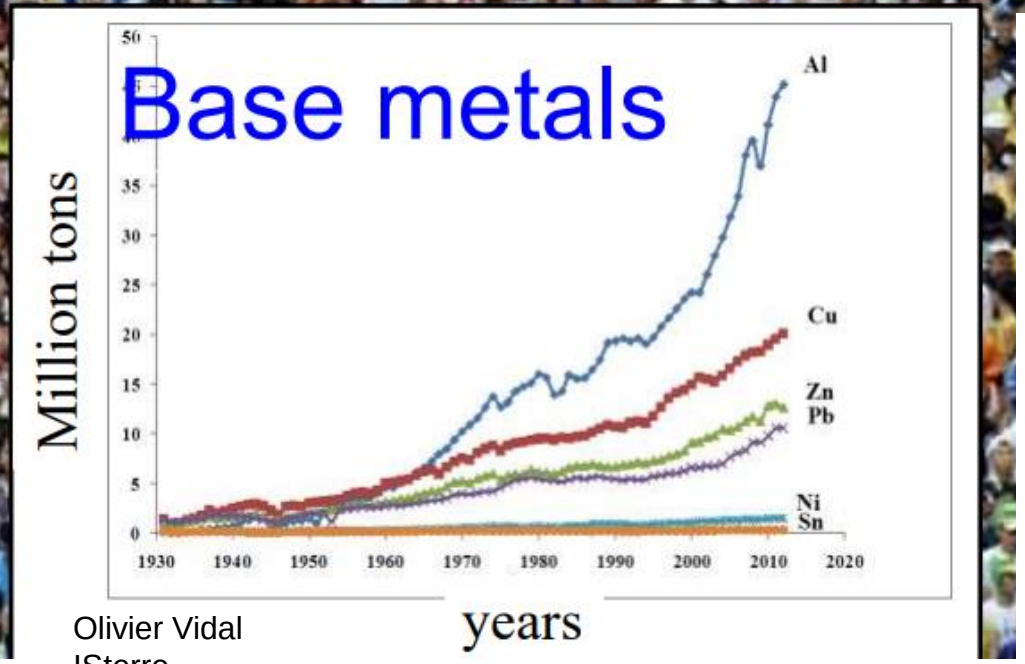
Stéphane Bourg, Director

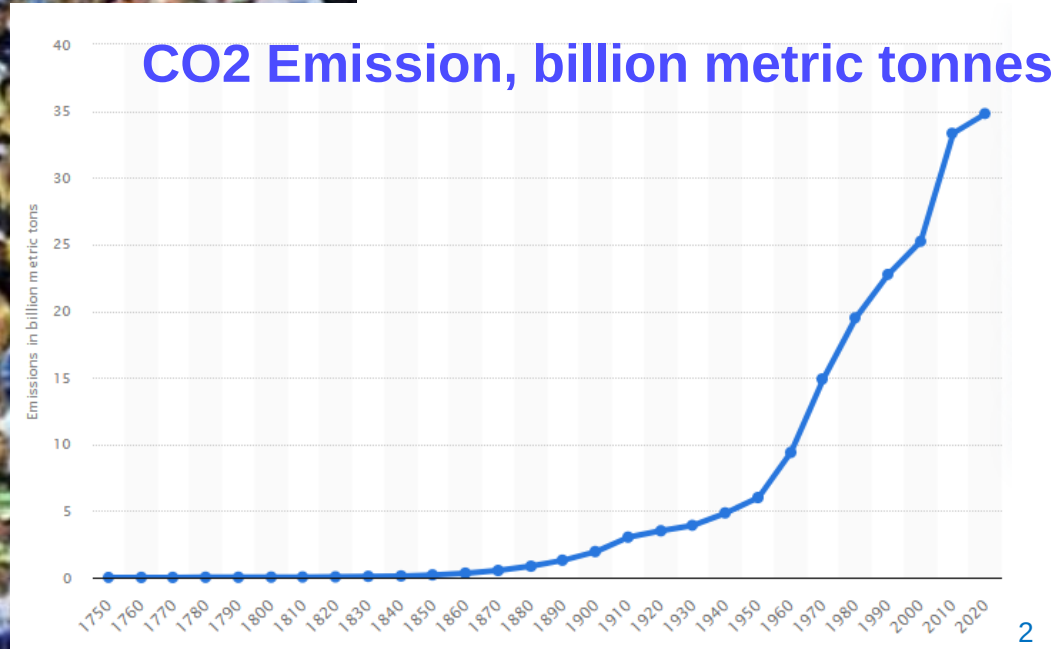
The global context of CRM





When everything is connected…

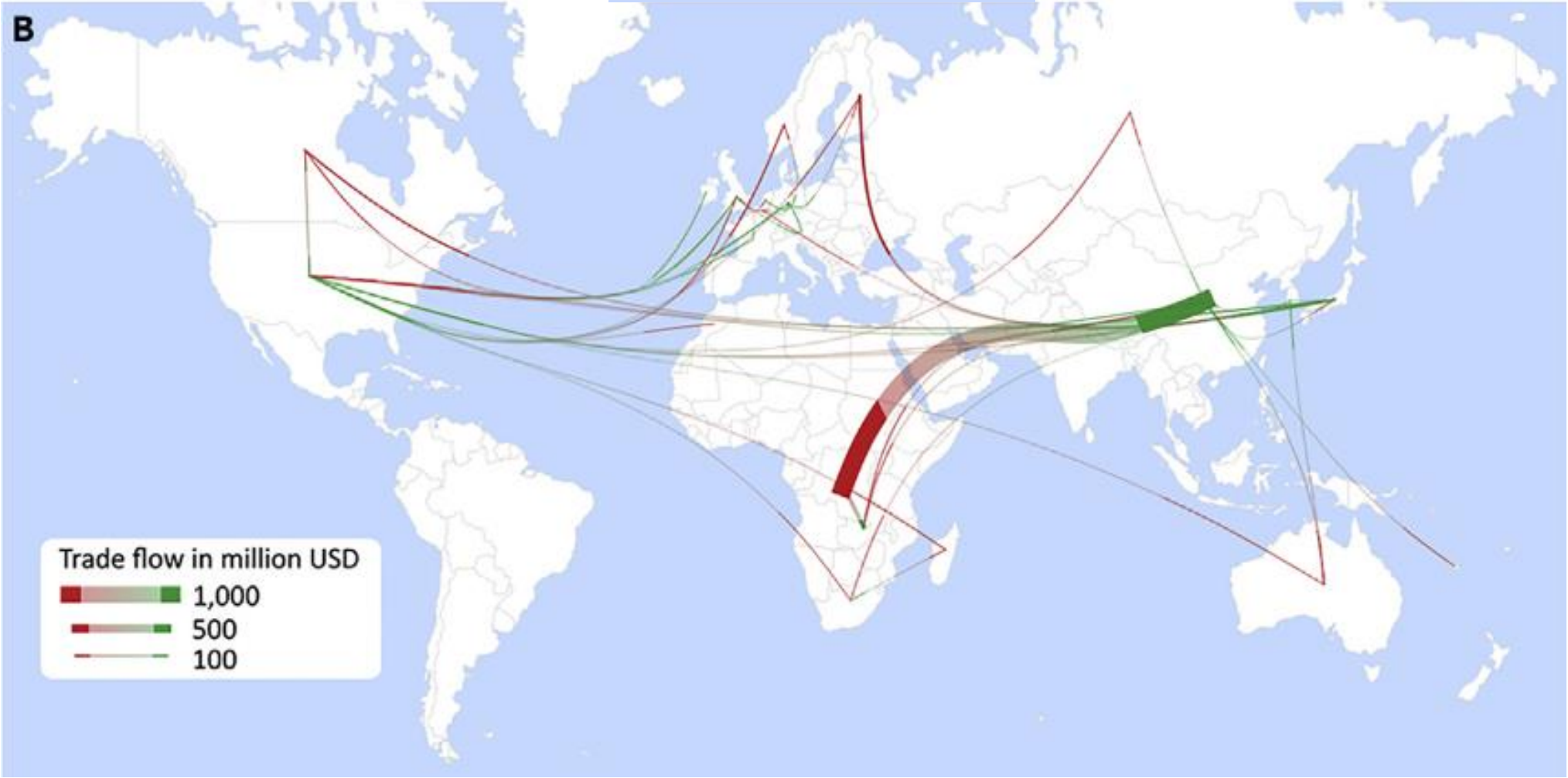




Olivier Vidal
ISterre

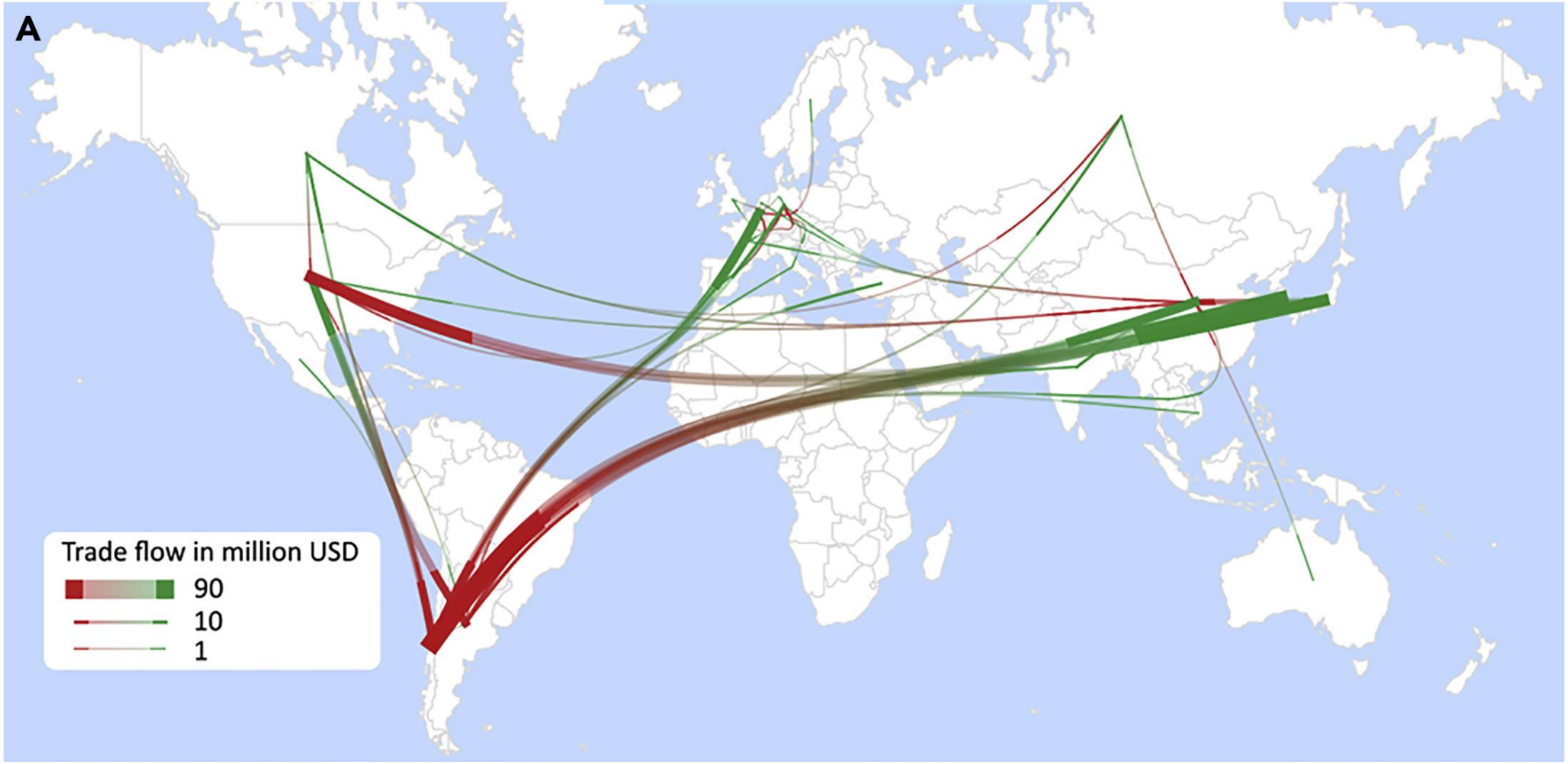
With complex value chains

Cobalt value chain

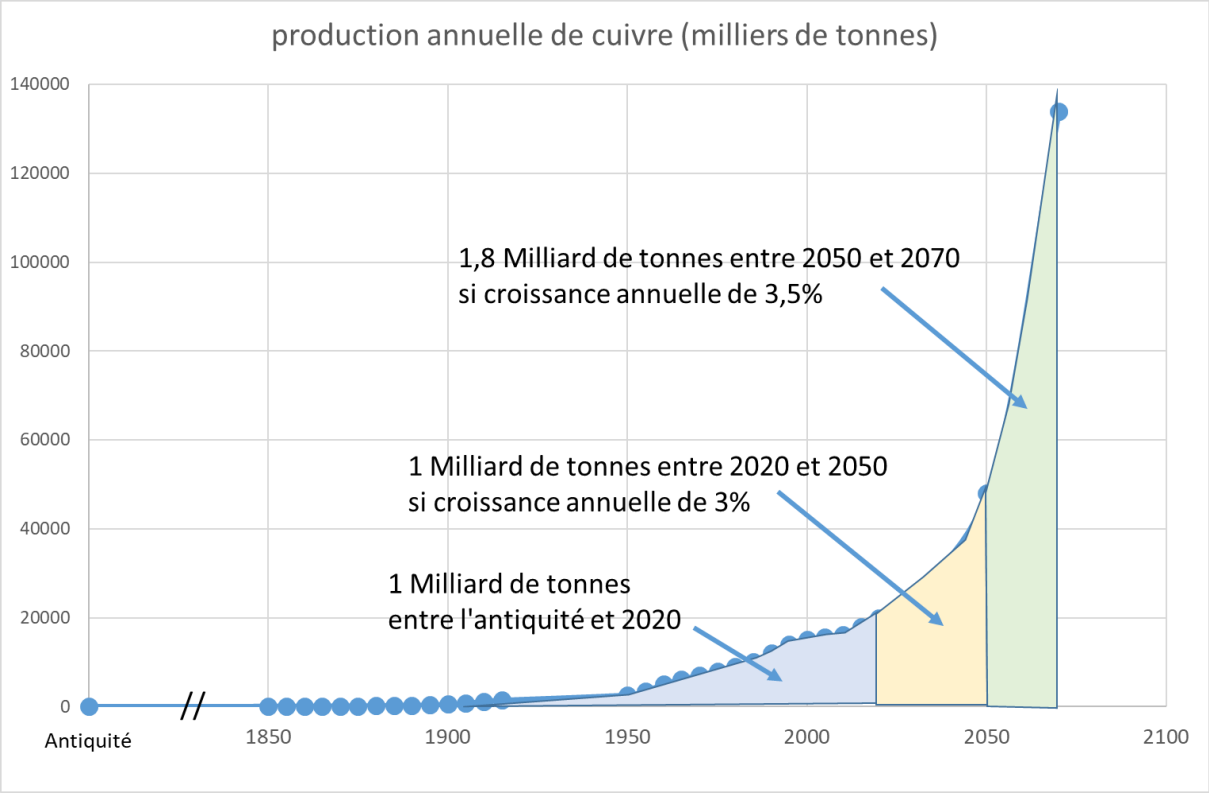


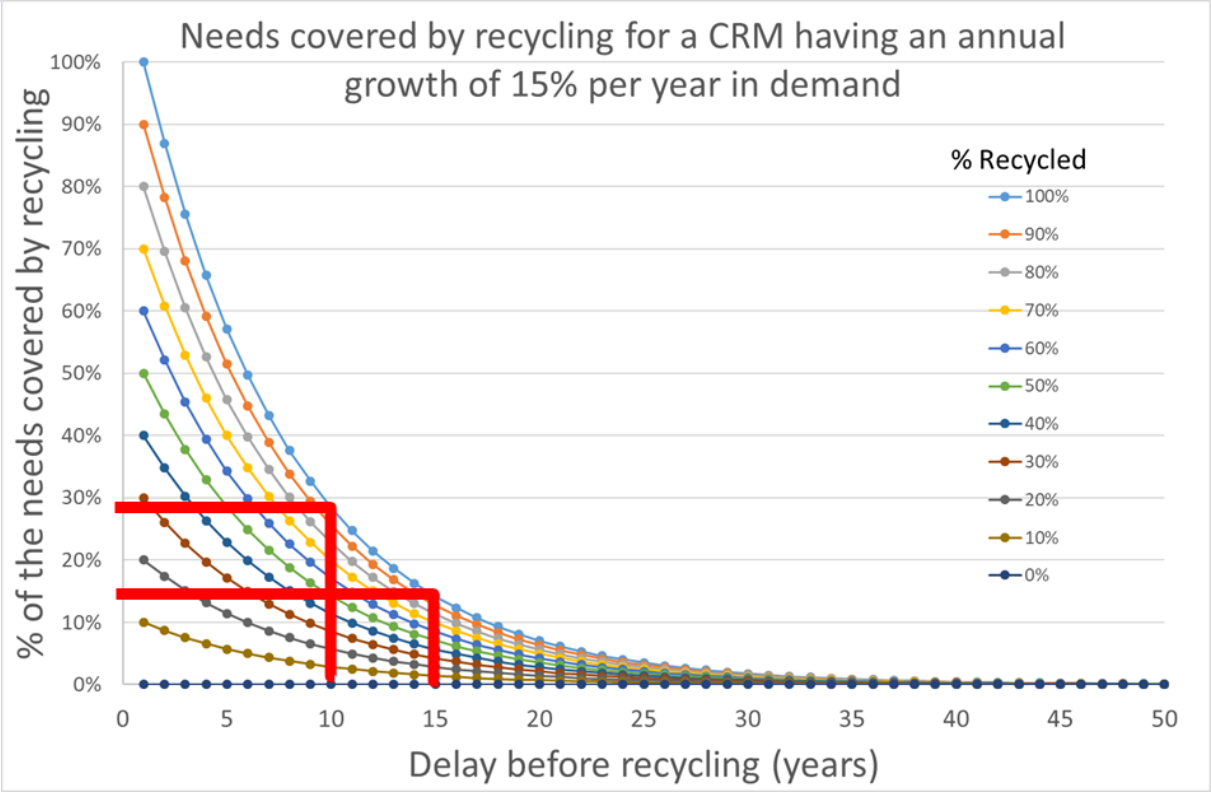
With complex value chains

Lithium value chain



When recyling is not the answer… (alone)

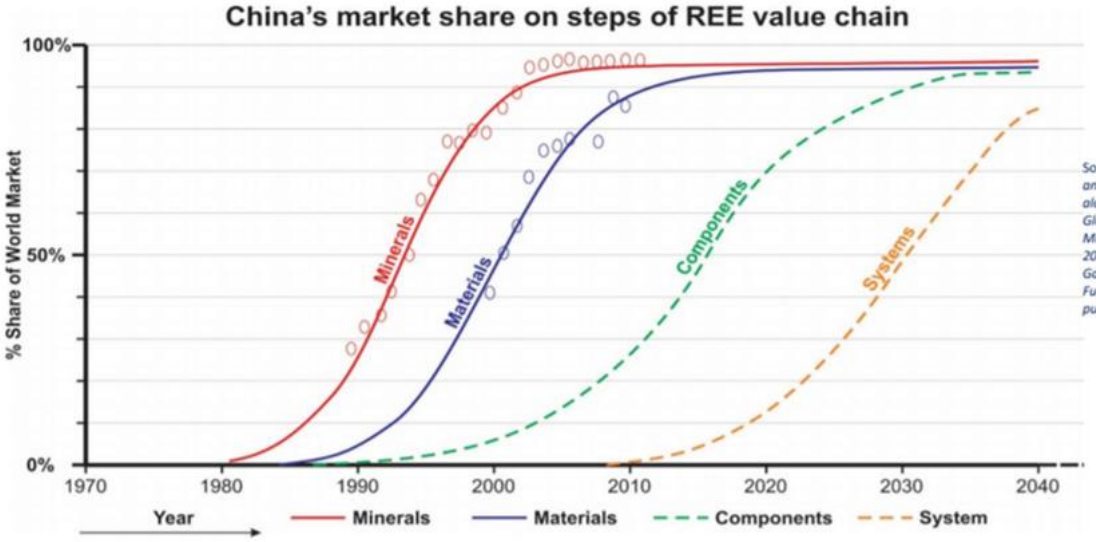




Recycling all the copper produced between antiquity and 2050 would barely meet the needs of the period 2050-2070!
And still it would have to have the right specifications depending on the applications…

In a market growing by 15%, the recycling of end-of-life products manufactured 15 years earlier only meets the theoretical maximum of 12.5% of needs...

Even more if the recovered materials do not supply our economy

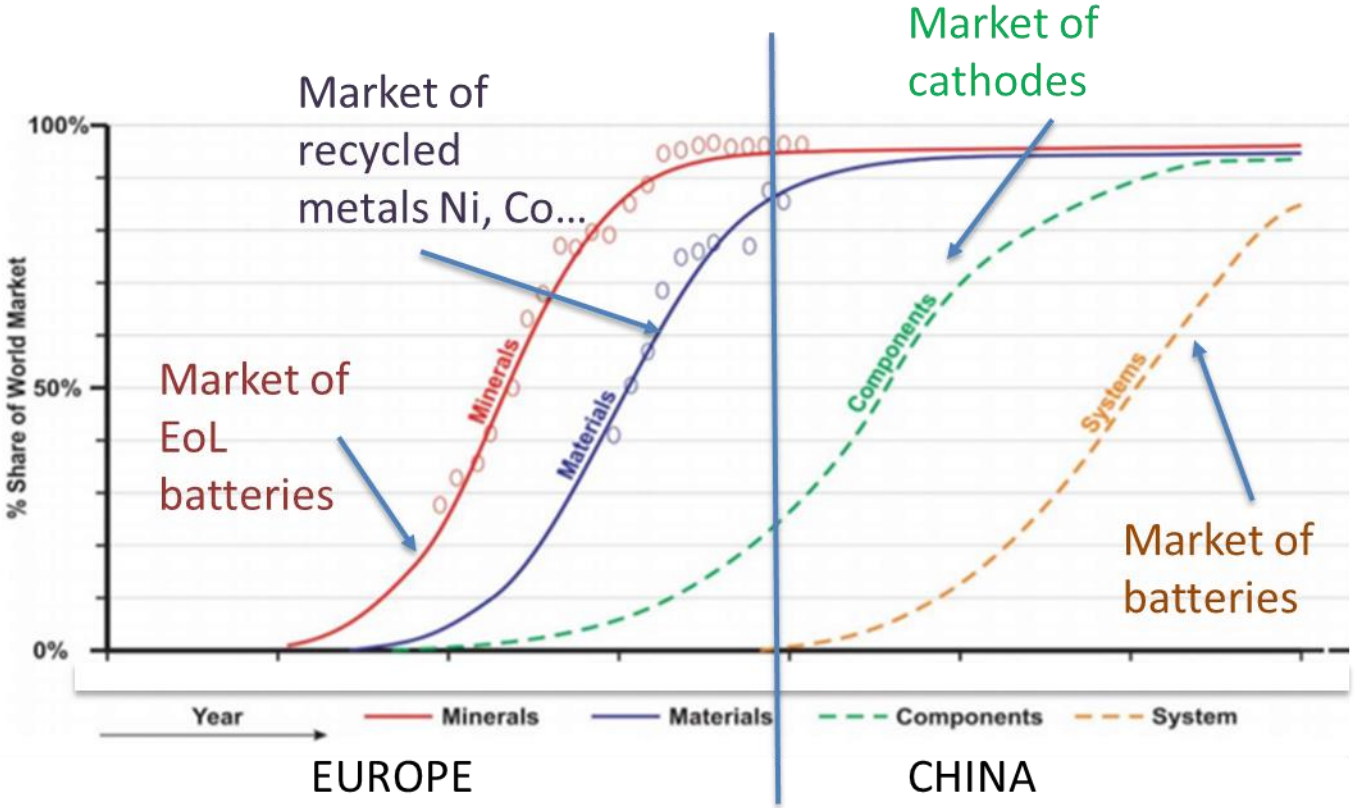


Source: Karl Gerald van den Boorgart, Polina Klossek and Andreas Klossek, "How Forward Integration along the Rare Earth Value chain Threatens the Global Economy", paper presented at 2014 Critical Minerals Conference, Denver, Colorado, August 3-5 2014. Referenced in "The Elements of Power, Gadgets, Guns and The Struggle for a Sustainable Future in the Rare Metal Age, David S Abraham, published by Yale University Press, October 2015

The value increases from US$4B Minerals; US$40B Materials; US$400B Components; to US$4T Syste

The real value is in the function

Not (always) in the raw materials



Is there sustainable business model ?

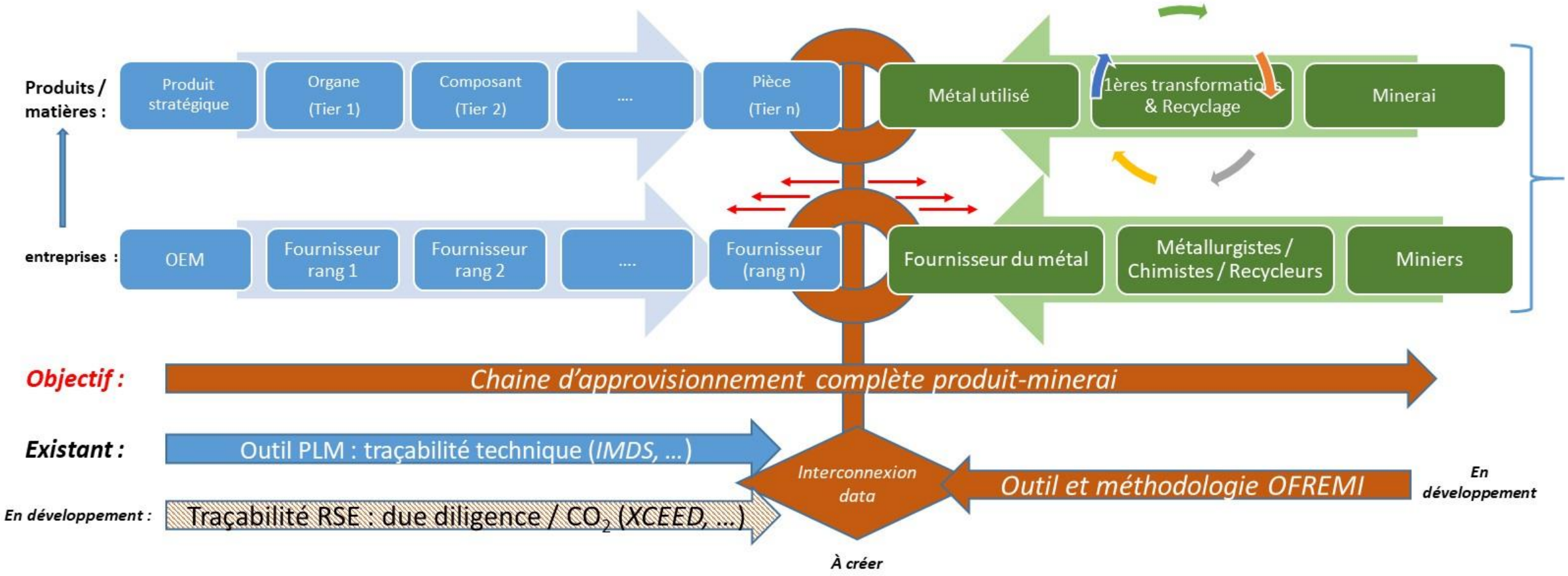
It is necessary to ensure the concordance of times and flows and the right level of transformation

The strategy will depend on the materials
Pt, Rh <> Nd, Ce, Y …

400000-700000€/kg
27 tonnes/year

25-40€/kg
30000 tonnes/year

In such complex value chains…



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OFREMI at a glance

French public policy support
Industry strategic Intelligence support

Public-Private partnership
A dedicated team

Facing sovereignty
and responsibility
Challenges

A dedicated information and
analyses system
for an up to date knowledge

The context

Increased frequency and intensity of HAZARDS + **Increase in VULNERABILITY factors** = **Increase in major RISKS**

#1 Repeated major unanticipated crises

#2 Effects of competition between value chains

#3 Complexity of value and supply chains

#4 Explosion of metal needs and dependence on Europe

#5 Need for coordination between French actors

! *Risk for French and European industrial sovereignty*

! *Risk of supply disruption and loss of strategic autonomy*

! *Ethical and reputational issues if non-virtuous value chains*

OFREMI's Offer

CURRENT SITUATION	OFREMI'S SOLUTION	
	Tools	Profits
# Complexity of value and supply chains	• Mapping of reserves, resources • Mapping of transformation capacity • Mapping of raw materials flows • Market monitoring, price dynamics	Monitoring and multi-criteria analysis of value chains characterizing the international offer
# Explosion of metal needs and dependence on Europe # Competition between value chains	• Materials/technologies intensity database • Materials flows/uses database • Potential evolution of demand	Analysis of the uses and material needs of current and emerging technologies
# Repeated major unanticipated crises	• Criticality analyzes • Resilience tests • Identification of crises • Preventive actions • Risk quantification and monitoring (KPI)	Analyzes of the vulnerability of value chains and resilience of downstream strategic industrial sectors
# Need for coordination between French actors	• A place for consultation and action between industry and public authorities	A public-private partnership and a unifying dynamic across the entire value chain

OFREMI's Assets

- ✓ A complete vision of value chains "from mine to object" and including recycling loops
- ✓ Permanent studies and the possibility of carrying out custom studies
- ✓ Integration of economic, environmental and geopolitical dimensions
- ✓ Vulnerability analysis and search for supply alternatives
- ✓ Integration of secondary resources
- ✓ Permanent monitoring of all strategic mineral resources for French industrial sectors through specific on demand dashboards (~40)

OFREMI's Services

Monitoring

OFFER

- Mapping of world production
- Market analyses
- Raw materials price monitoring
- Geographic sector surveys

DEMAND

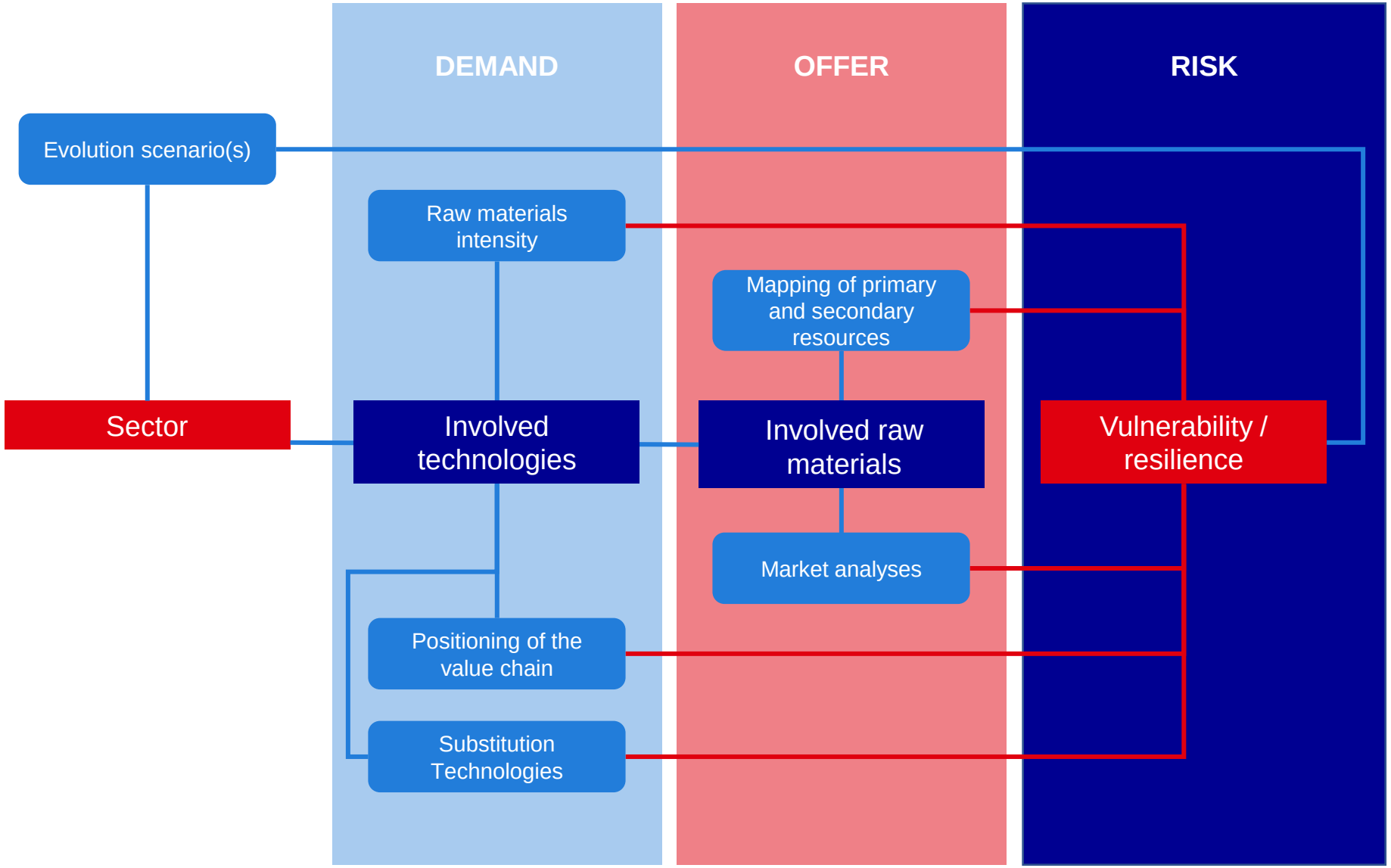
- Technologies raw materials intensity survey
- Evolution of the demand in raw materials
- Evolution of uses/end-uses of strategic raw materials

RISK ANALYSES

- Criticality factsheets
- Anticipation of geopolitical crises
- Regulation monitoring, Responsible supply
- Stress tests

OFREMI's Services

Industry Sector Analyses



OFREMI and CRM Act

The CRM Act will provide for the development of monitoring capacities and risk assessment ahead of crisis. A governance system with a dedicated Critical Raw Materials Board, **a network of Member States agencies** and internal capacity in the Commission will support the EU CRM value chain. The companies will directly benefit from the **regular publication of up-to-date information on supply risks** under the form of a monitoring dashboard that will enable them to tailor their mitigation strategies. The **monitoring and risk assessment actions, such as EU stress tests**, will create demand from governments and companies to purchase secure CRMs.

Policy option 1 provides for a mechanism to set targets for strategic raw materials. It comprises a **governance structure under a dedicated EU CRM board supported by a network of national agencies and operational capacity within the Commission**. This entity would develop monitoring capacity, enable the coordination of EU strategic stocks and ensure that companies are better prepared ahead of possible supply disruptions. It contains elements to support the value chain, notably by more coordination during the exploration phase greater support for national CRM projects and better access to finance. In terms of circularity, it provides for a recommendation targeting small consumer electronics and the announcement of future actions. It provides for greater EU action in international standards-setting, as well as minimum requirements for certification schemes on CRM sustainability and information requirements on the environmental footprint of CRMs placed on the EU market.

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/1724 and (EU) 2019/1020

(Text with EEA relevance)

{SEC(2023) 360 final} - {SWD(2023) 160 final} - {SWD(2023) 161 final} - {SWD(2023) 162 final}

To conclude

A dedicated team for an always up-to-date knowledge

- Public-private pooled funding model
- Collective definition of strategic priorities
- Multi-partner expertise (BRGM, CEA, IFPEN, Ademe, IFRI, CNAM)
- 20-25 dedicated staff

A response to issues of sovereignty and responsibility

- Fragility of value chains when facing major crises
- Explosion of demand for mineral resources and metals
- Need to identify alternatives within the chains
- Responsible and sustainable supplies imposed by the climate, health and geopolitical crises

OFREMI

Services

- Analysis of metal supply and changes in demand
- Monitoring of supply chains from the mine to the object
- Risk Quantification
- National alert system
- Tailored services to meet specific challenges

Reliable and up-to-date data

- Knowledge of value chains
- Material flow
- Stimulate reflection on
  - strategic stocks
  - Industrial projects (mines, processing industries, etc.)
  - Mining Resource Diplomacy
  - Alternative supply channels