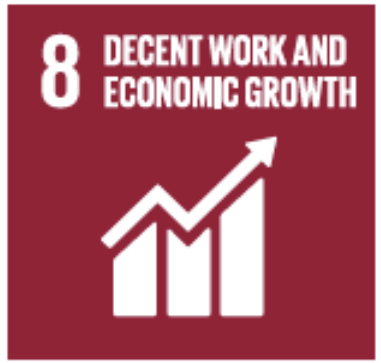
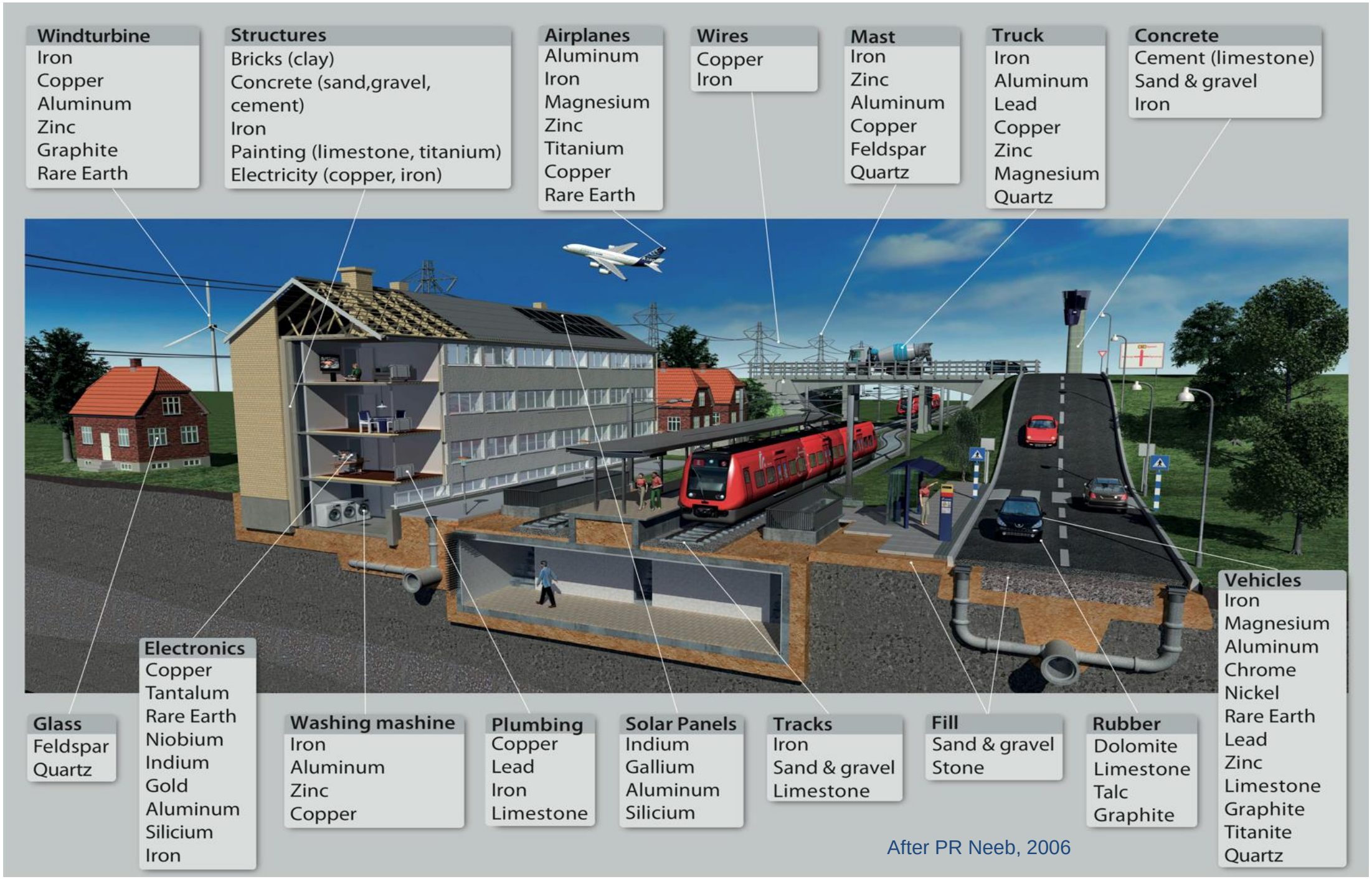
Why mining in our back yard may be important for making a better world

Karen Hanghøj, CEO, Managing Director,
EIT RawMaterials

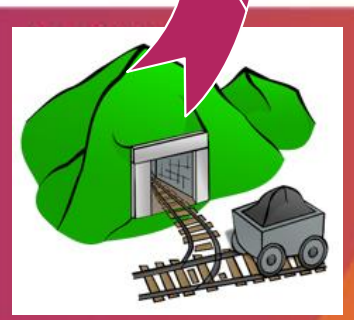
EIT Raw Materials is supported by EIT,
a body of the European Union

SUSTAINABLE DEVELOPMENT GOALS




Windturbine
Iron
Copper
Aluminum
Zinc
Graphite
Rare Earth
Structures
Bricks (clay)
Concrete (sand,gravel, cement)
Iron
Painting (limestone, titanium)
Electricity (copper, iron)
Airplanes
Aluminum
Iron
Magnesium
Zinc
Titanium
Copper
Rare Earth
Wires
Copper
Iron
Mast
Iron
Zinc
Aluminum
Copper
Feldspar
Quartz
Truck
Iron
Aluminum
Lead
Copper
Zinc
Magnesium
Quartz
Concrete
Cement (limestone)
Sand & gravel
Iron
Vehicles
Iron
Magnesium
Aluminum
Chrome
Nickel
Rare Earth
Lead
Zinc
Limestone
Graphite
Titanite
Quartz
Electronics
Copper
Tantalum
Rare Earth
Niobium
Indium
Gold
Aluminum
Silicium
Iron
Glass
Feldspar
Quartz
Washing mashine
Iron
Aluminum
Zinc
Copper
Plumbing
Copper
Lead
Iron
Limestone
Solar Panels
Indium
Gallium
Aluminum
Silicium
Tracks
Iron
Sand & gravel
Limestone
Fill
Sand & gravel
Stone
Rubber
Dolomite
Limestone
Talc
Graphite
After PR Neeb, 2006

The raw materials value chain

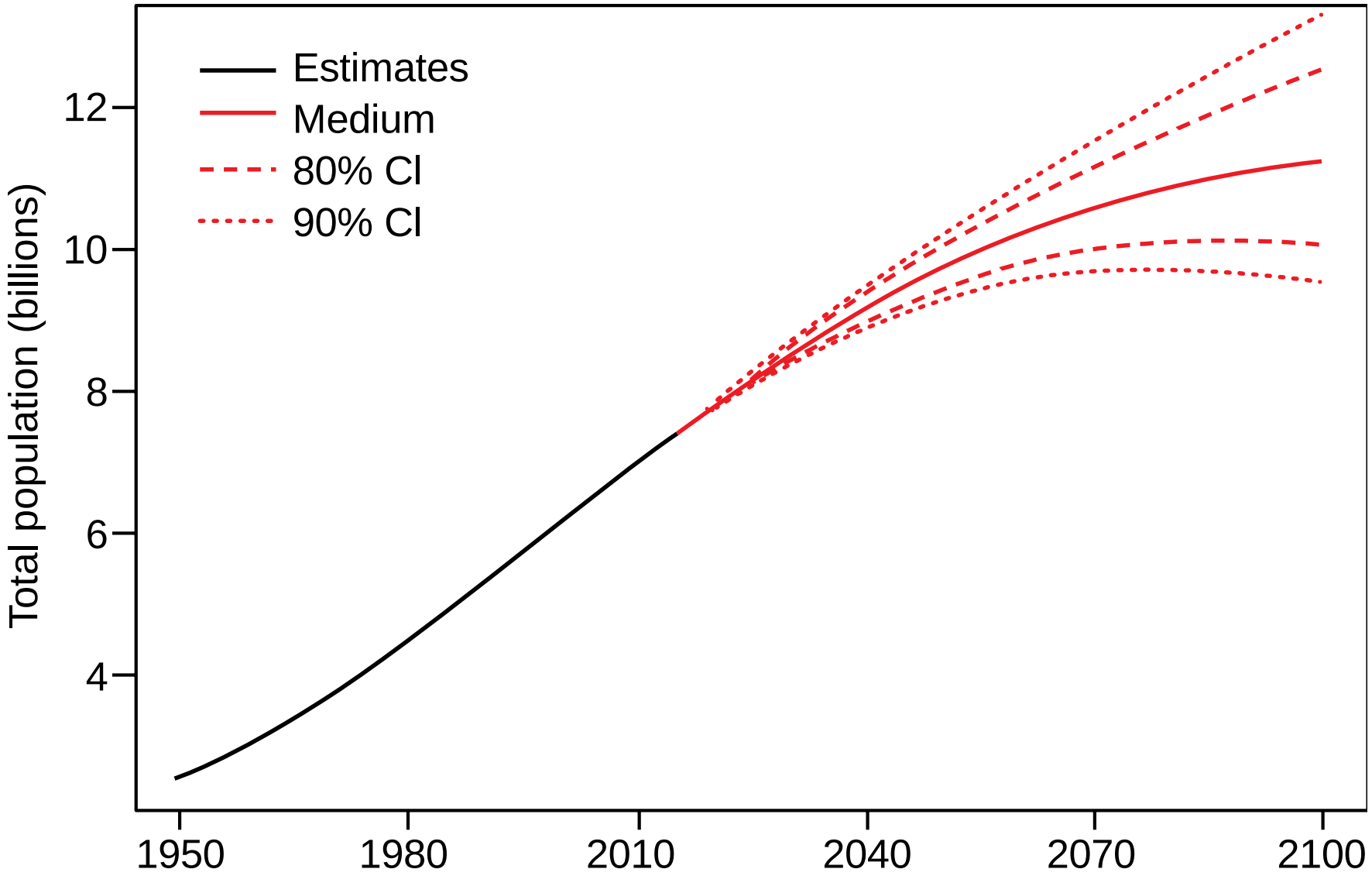


… and circular economy

eit RawMaterials
Connecting matters

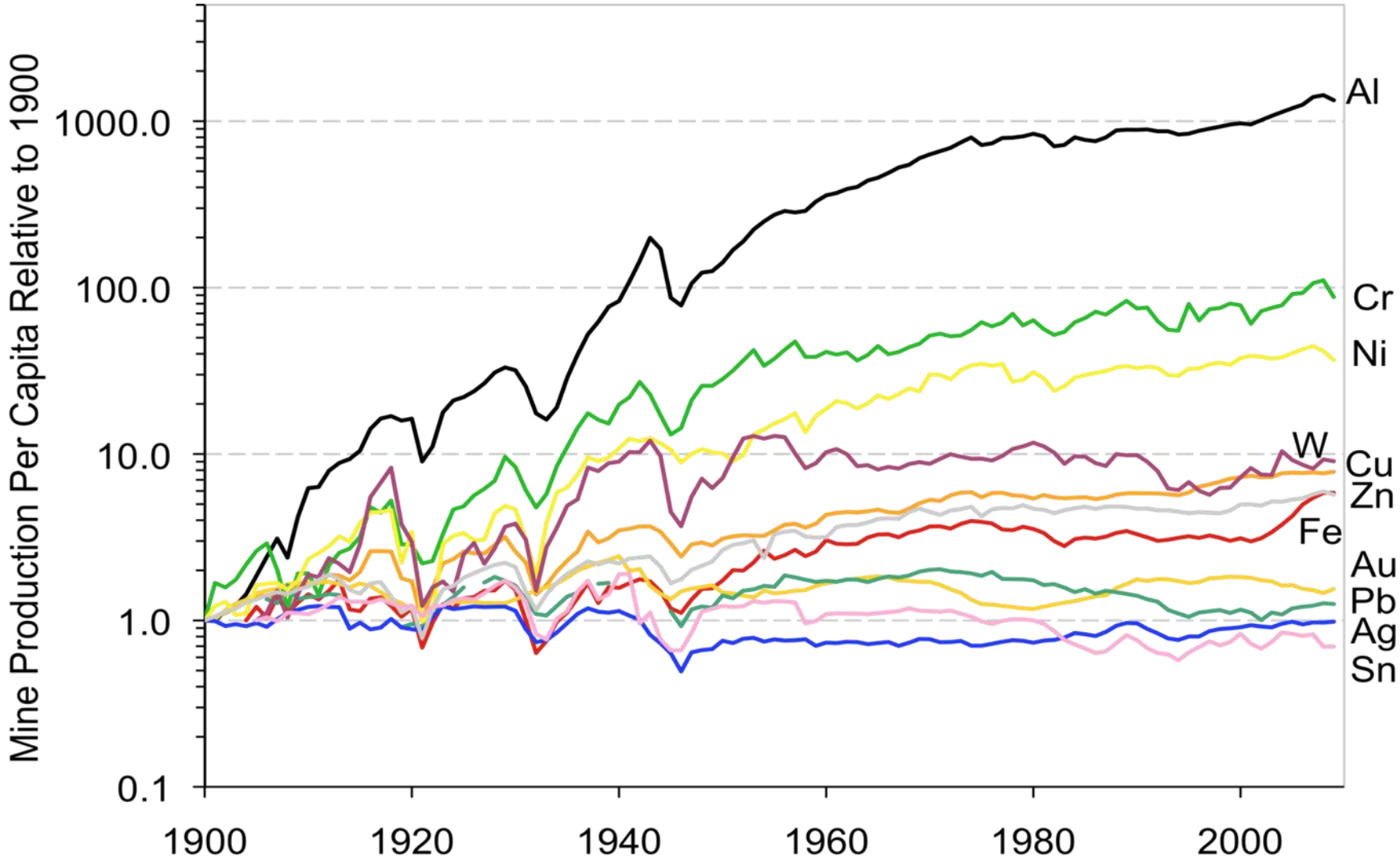
Modified from: http://www.europarl.europa.eu/resources/library/images/20150703PHT73954/20150703PHT73954_original.jpg

World population



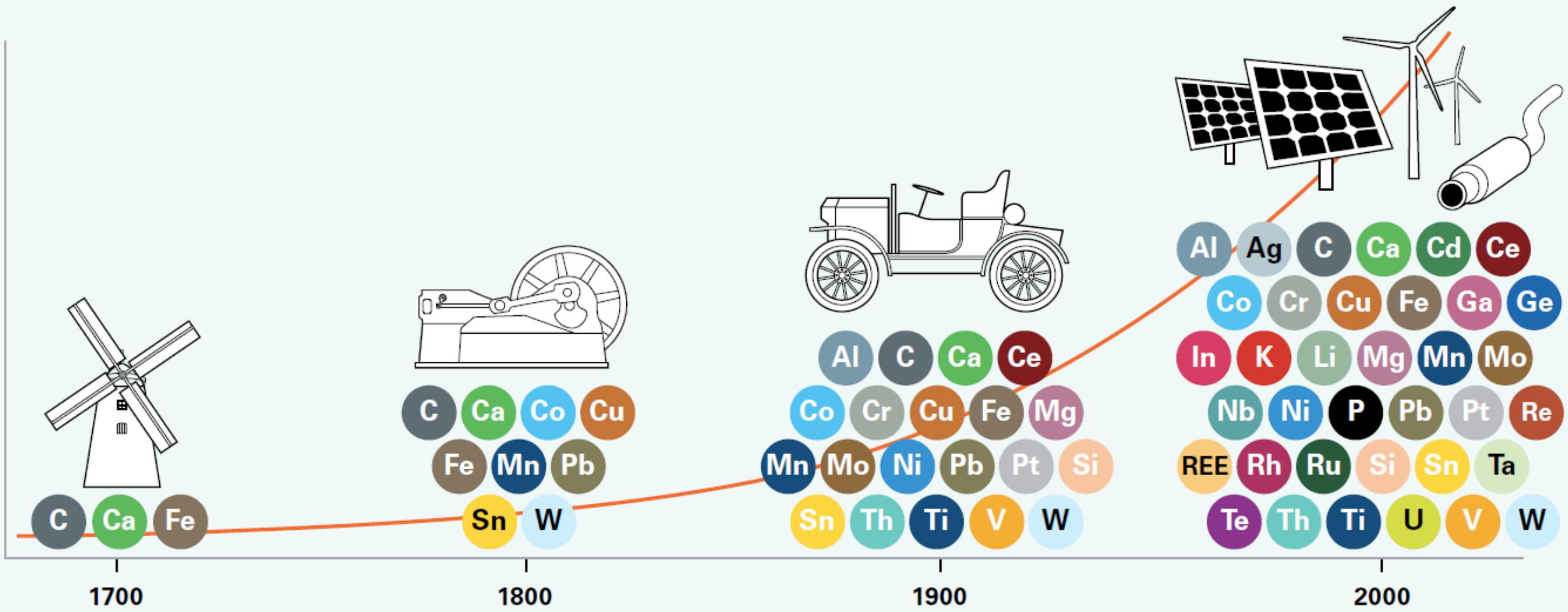
Source: United Nations, Department of Economic and Social Affairs. Population Division (2015). World Population Prospects: The 2015 Revision, New York, United Stated.

Global per Capita metals use 1900-2008



Graedel, Pers. Comm. (2015)

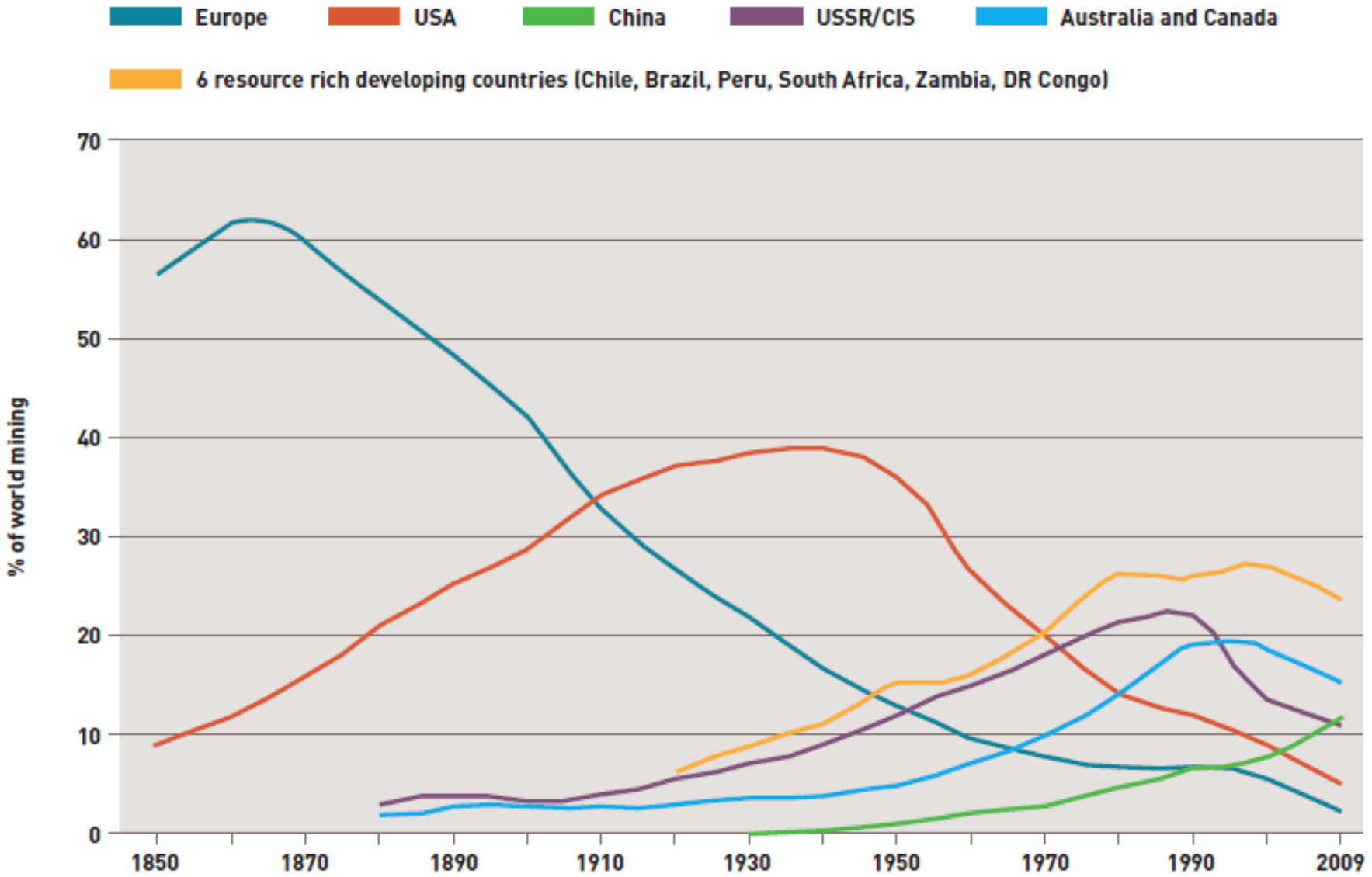
Consumption of mineral raw materials



eit RawMaterials
Connecting matters

Source: Achzet et al (2009)

Mining regions 1850 - now



Source: Raw Materials Group, Stockholm, Sweden.

Trends and Predictions in Raw Materials

World Economic Forum (2015) Mining and Metals in a Sustainable World 2050:

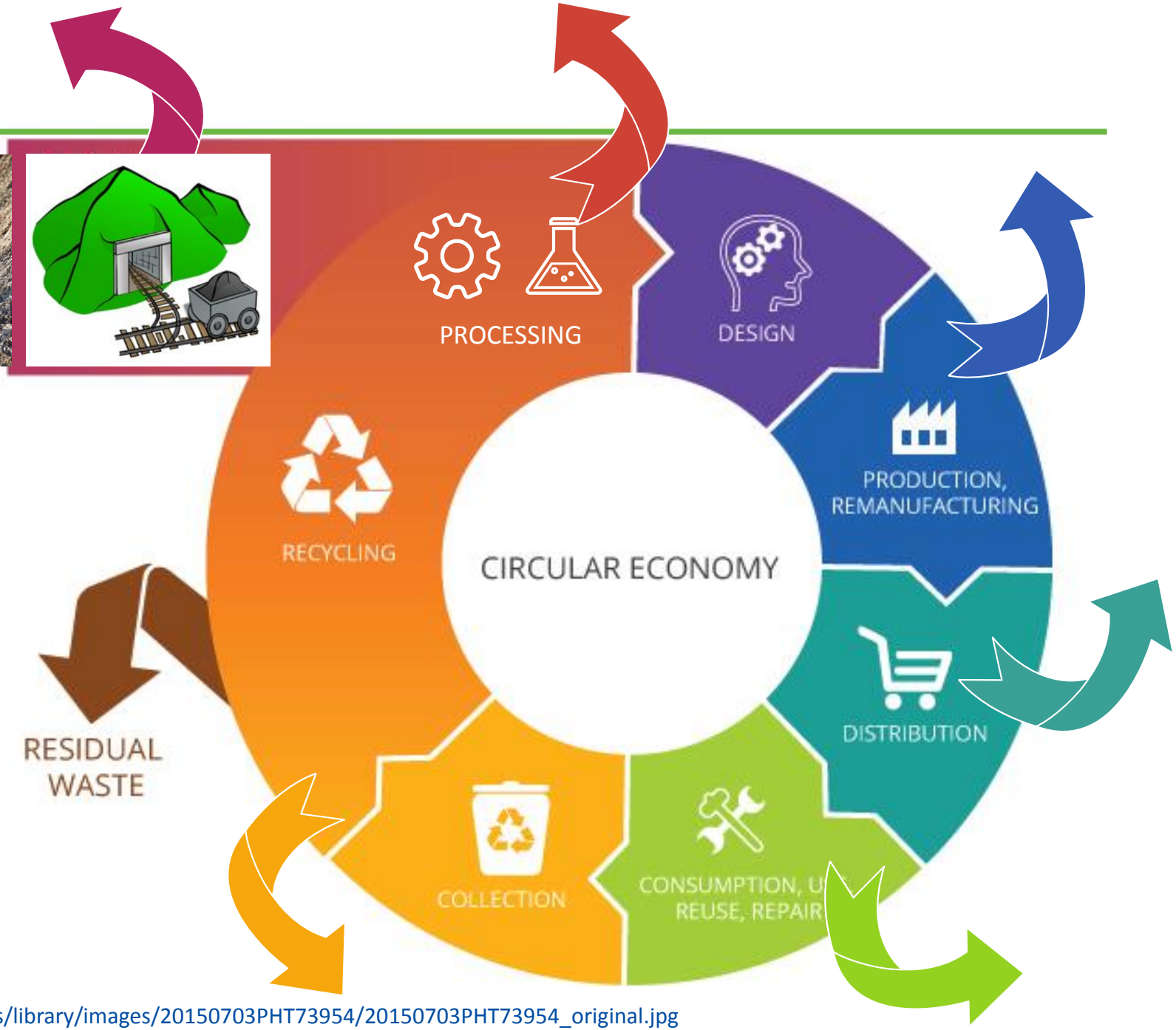
- A strong move towards recycling and circularity
- Mining will not disappear
- The need for raw materials will not disappear
- Technology will matter more than ever
- Understanding value chains will be important

eit RawMaterials
Connecting matters

Circular economy

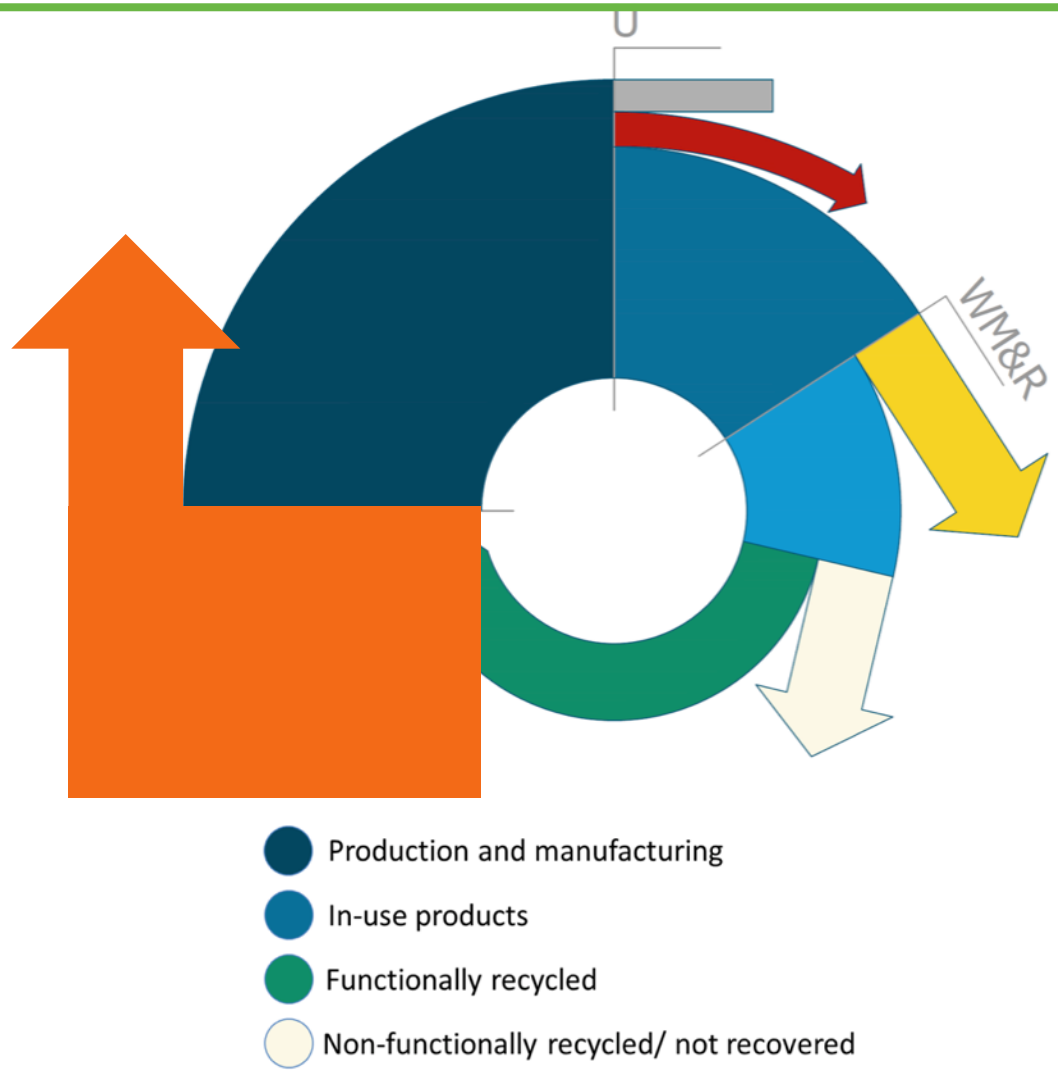
… and

The value chain



Modified from: http://www.europarl.europa.eu/resources/library/images/20150703PHT73954/20150703PHT73954_original.jpg

Recycling opportunities



(From Graedel Pers. Comm. and Ciacci et al. *Environ Sci. Technol.* 2015.)

In-use dissipated

- Se, Mn in fertilizers
- Al, Cu, Mg in pyrotechnics

Currently unrecyclable

- REEs in polishing powders
- Al in steelmaking

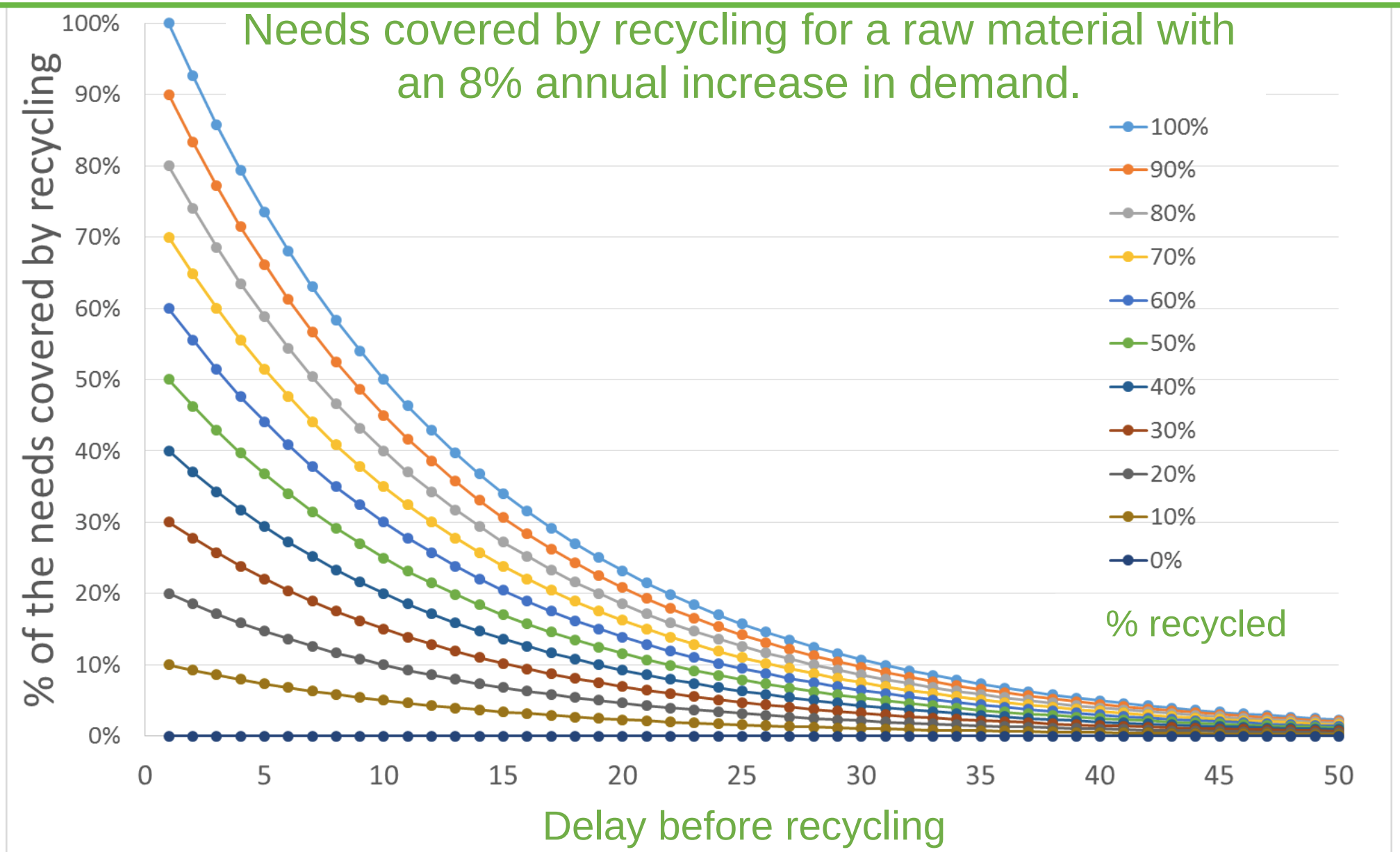
Potentially recyclable

- Alloying elements recoverable/recyclable

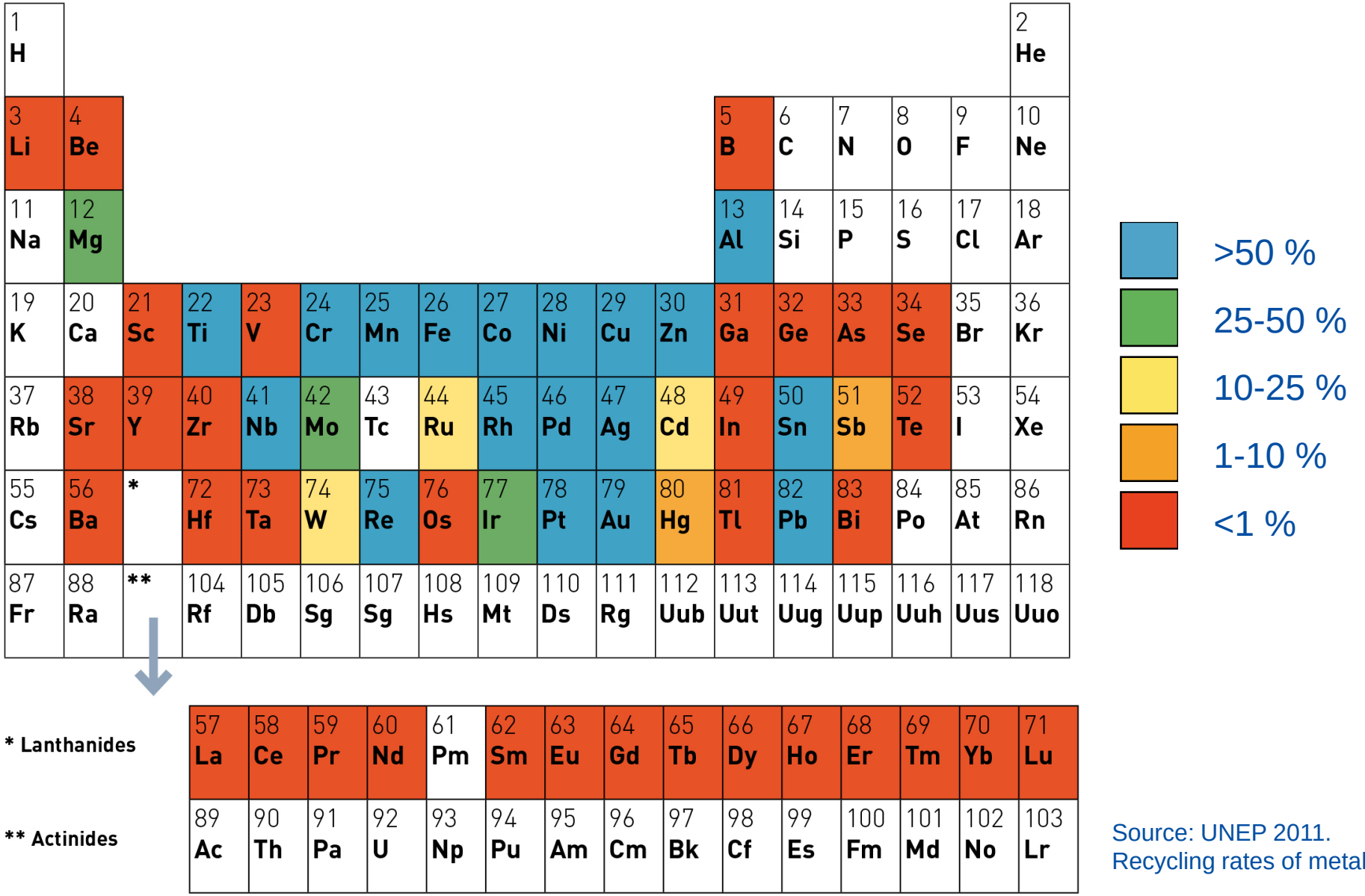
Unspecified

- Miscellaneous uses

Recycling opportunities



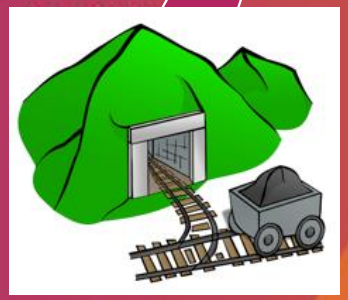
Recycling Opportunities



Source: UNEP 2011.
Recycling rates of metals

eit RawMaterials
Connecting matters

Circular economy



…or

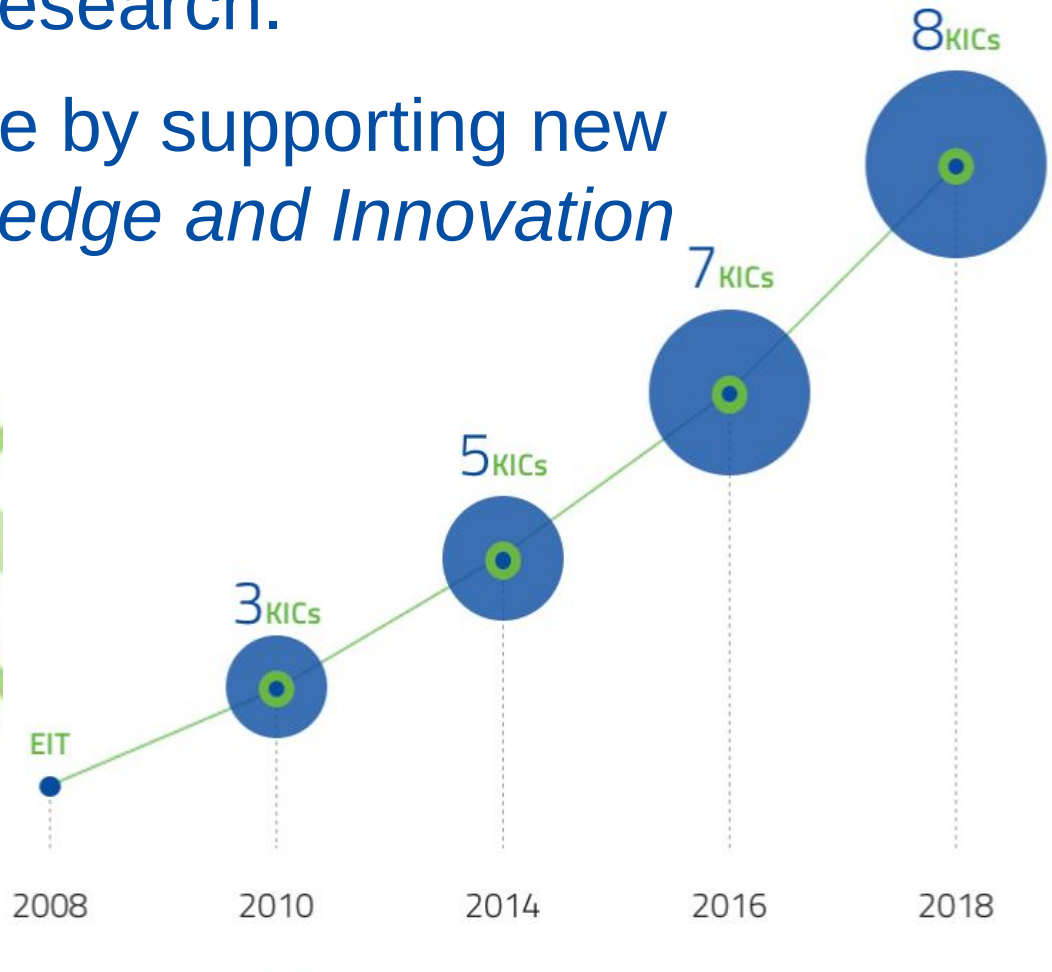
Making a better world…

Modified from: http://www.europarl.europa.eu/resources/library/images/20150703PHT73954/20150703PHT73954_original.jpg

European Institute of Innovation and Technology - EIT

EIT brings together the three sides of the “knowledge triangle”: business, education and research.

EIT strengthens innovation in Europe by supporting new talent and new ideas through *Knowledge and Innovation Communities* (KICs).



EIT RawMaterials

Vision:

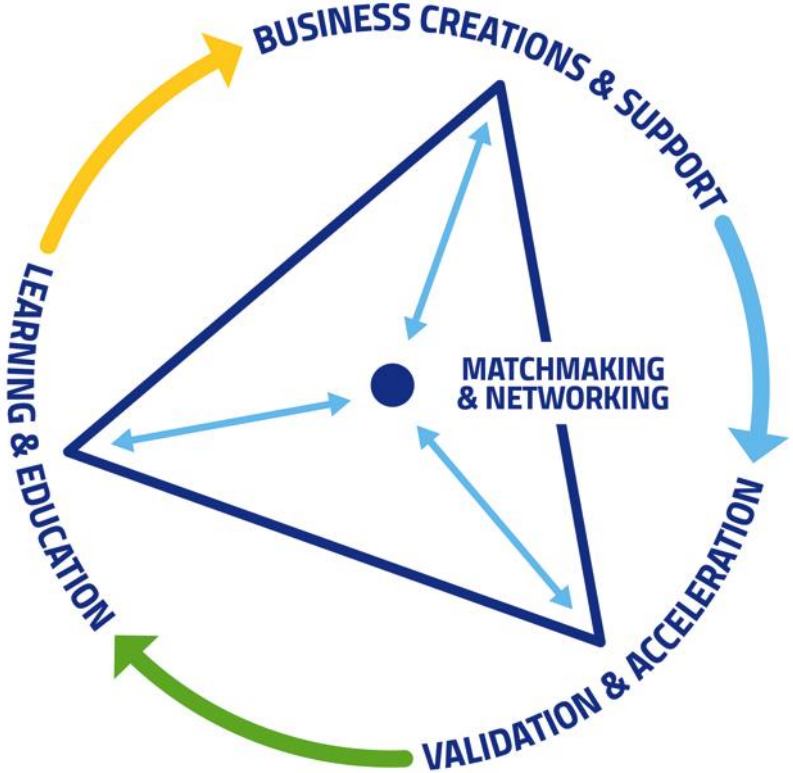
To develop raw materials into a major strength for Europe

Mission:

To boost competitiveness, growth and attractivenes the European raw materials sector via radical innovation and entrepreneurship.

Objectives:

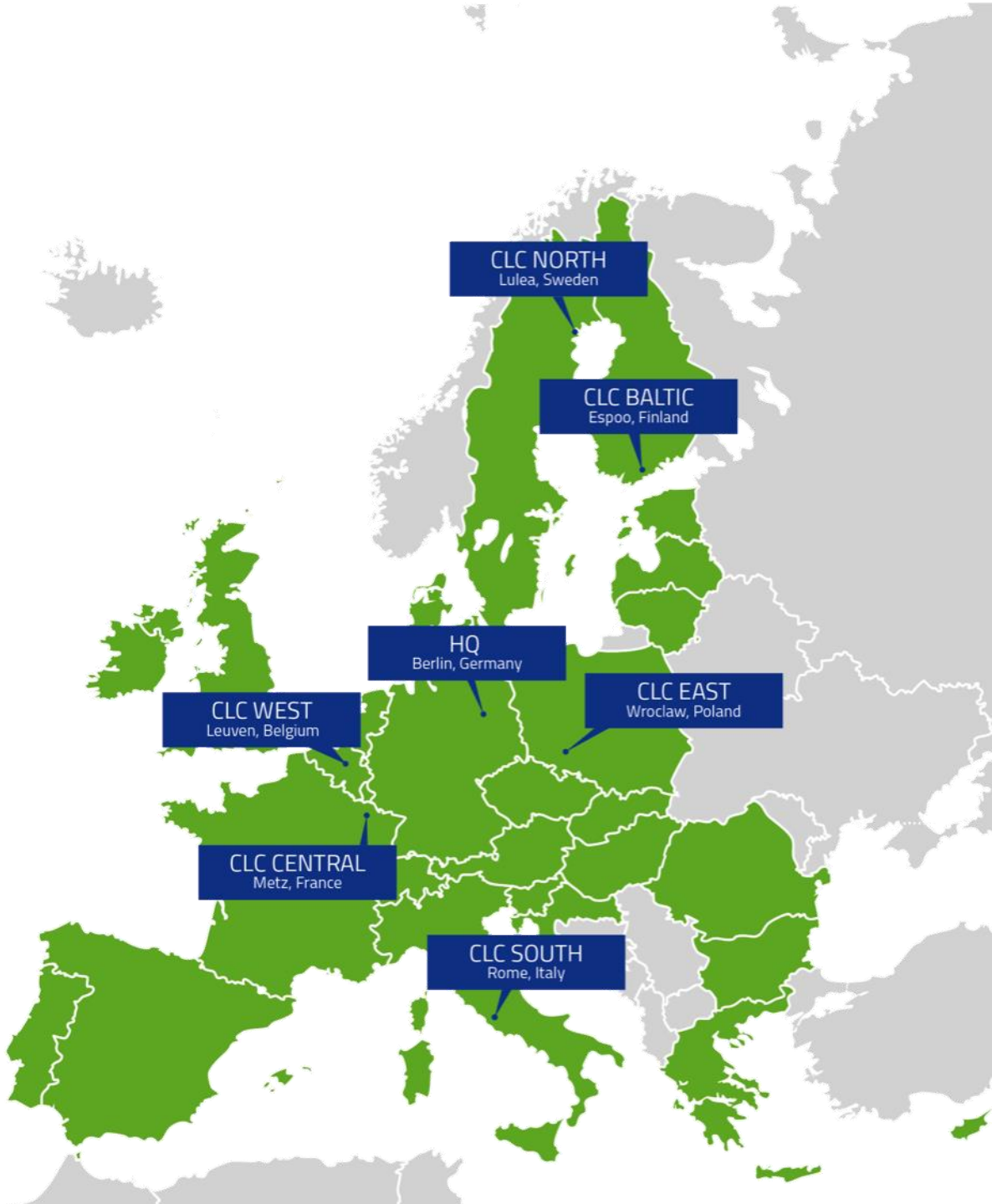
- Securing raw materials supply
- Designing solutions
- Closing material loops



eit RawMaterials
Connecting matters

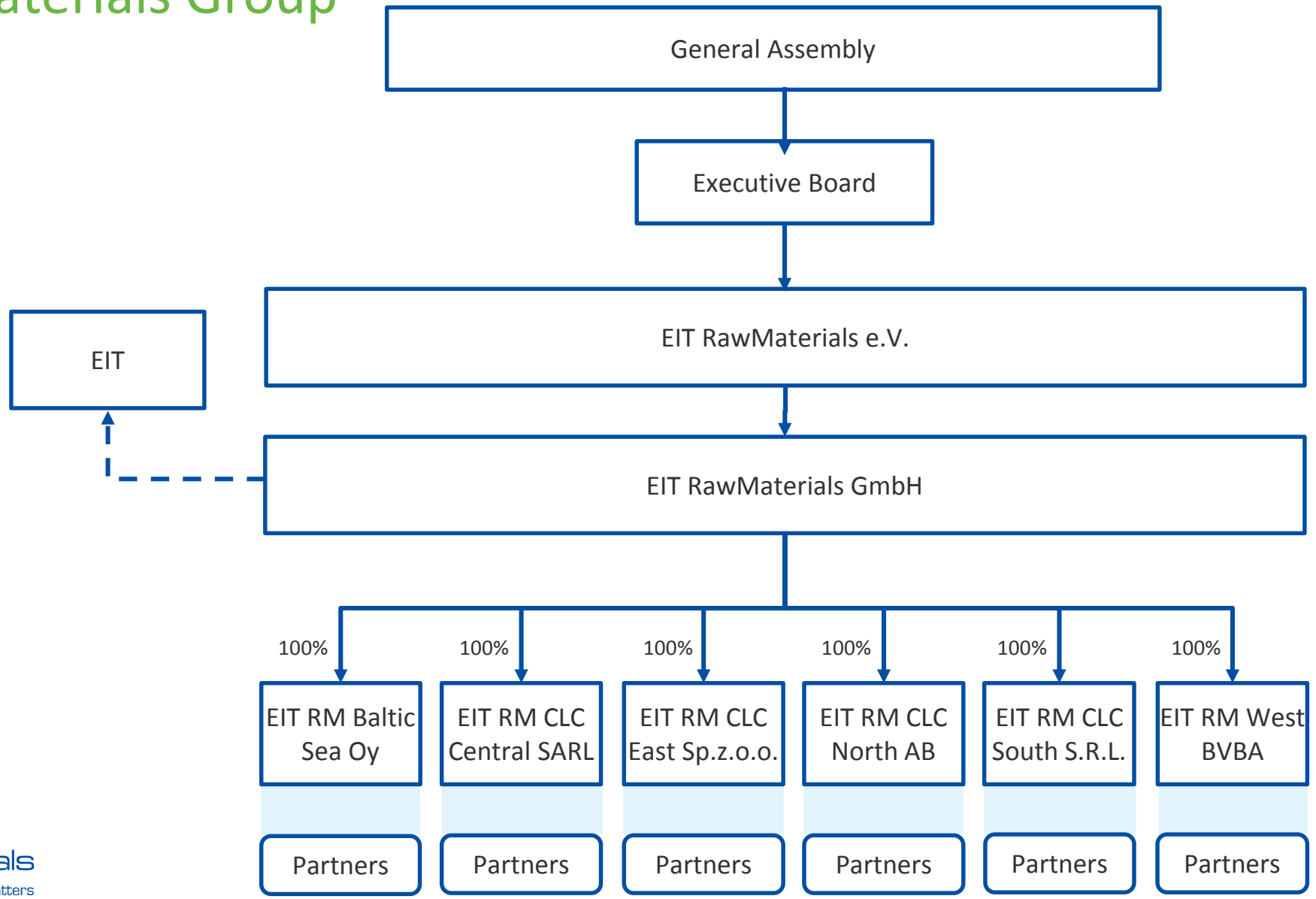
A pan-European partner network

- 120 partners
- 22 countries
- Coverage of full value chain
- Worlds largest community in the raw materials sector
- Six Co-Location-Centers across Europe
- Headquarter in Berlin, Germany



eit RawMaterials
Connecting matters

EIT RawMaterials Group



eit RawMaterials
Connecting matters

EIT RawMaterials Partners

Industry

EIT RawMaterials Partners

Research and Technology Organisations

eit RawMaterials
Connecting matters

EIT RawMaterials Partners

Universities

eit RawMaterials
Connecting matters

EIT RawMaterials Themes

- Exploration and raw materials resource assessment
- Mining in challenging environments
- Increased resource efficiency in mineral and metallurgical processes
- Recycling and materials chain optimisation for End-of-Life products
- Substitution of critical and toxic materials in products and substitutions for optimised performance
- Design of products and services for the circular economy

eit RawMaterials
Connecting matters

EIT RawMaterials KAVA Activities

- Validation & Acceleration
- Learning & Education
- Business Creation & Support
- Matchmaking & Networking

eit RawMaterials
Connecting matters

Matchmaking & Networking

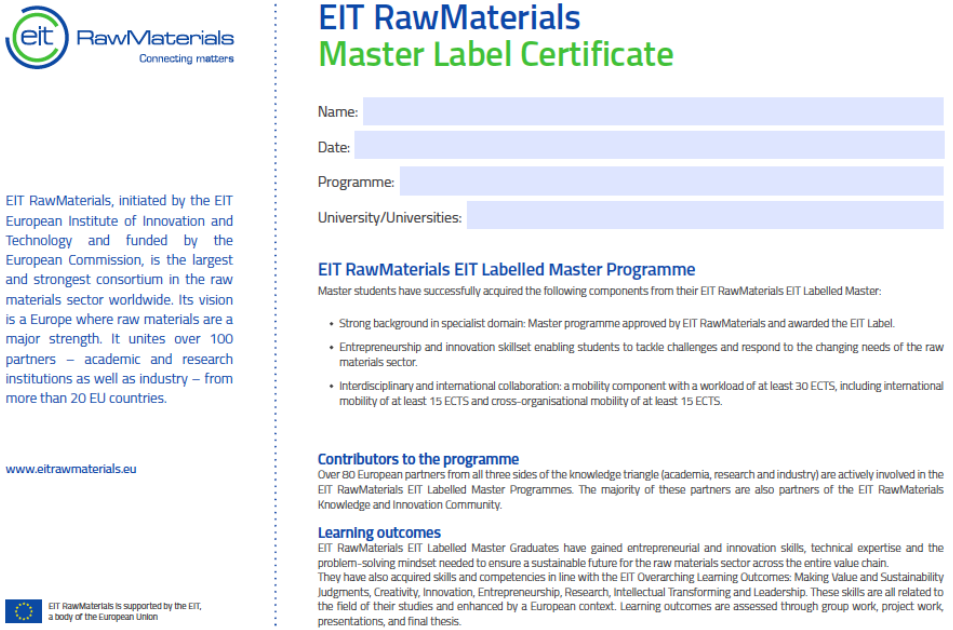
- **InfoCenter:** Intranet/network/providing research and expertise
- **Matches:** Combining existing technology and new business models, joint ventures, access for students to find a job and a job to find a student, EU wide internships, SME needs for skills & expertise
- **IDEA Camp:** Event for idea exchange
- **Intrapreneurship Facilitator**: Events for generation & acceleration of intrapreneurship
- **Events:** Workshops, brokerage, thematic conferences, …

eit RawMaterials INFOCENTER

eit RawMaterials Connecting matters

Learning & Outreach

- **PhD and Master education**: Modules for Programmes focus on raw materials themes and industry needs
- **Professional education:** Industry needs focused education for qualified professionals
- **Wider society learning:** Aims to raise awareness
- **Raw Materials Academy**



RawMaterials
Connecting matters

EIT RawMaterials, initiated by the EIT European Institute of Innovation and Technology and funded by the European Commission, is the largest and strongest consortium in the raw materials sector worldwide. Its vision is a Europe where raw materials are a major strength. It unites over 100 partners – academic and research institutions as well as industry – from more than 20 EU countries.

www.eitrawmaterials.eu

EIT RawMaterials is supported by the EIT, a body of the European Union

EIT RawMaterials
Master Label Certificate

Name:

Date:

Programme:

University/Universities:

EIT RawMaterials EIT Labelled Master Programme

Master students have successfully acquired the following components from their EIT RawMaterials EIT Labelled Master:

- Strong background in specialist domain: Master programme approved by EIT RawMaterials and awarded the EIT Label.
- Entrepreneurship and innovation skillset enabling students to tackle challenges and respond to the changing needs of the raw materials sector.
- Interdisciplinary and international collaboration: a mobility component with a workload of at least 30 ECTS, including international mobility of at least 15 ECTS and cross-organisational mobility of at least 15 ECTS.

Contributors to the programme

Over 80 European partners from all three sides of the knowledge triangle (academia, research and industry) are actively involved in the EIT RawMaterials EIT Labelled Master Programmes. The majority of these partners are also partners of the EIT RawMaterials Knowledge and Innovation Community.

Learning outcomes

EIT RawMaterials EIT Labelled Master Graduates have gained entrepreneurial and innovation skills, technical expertise and the problem-solving mindset needed to ensure a sustainable future for the raw materials sector across the entire value chain.
They have also acquired skills and competencies in line with the EIT Overarching Learning Outcomes: Making Value and Sustainability Judgments, Creativity, Innovation, Entrepreneurship, Research, Intellectual Transforming and Leadership. These skills are all related to the field of their studies and enhanced by a European context. Learning outcomes are assessed through group work, project work, presentations, and final thesis.

WHY?

Develop raw materials into a major strength for Europe

Boost competitiveness, growth and attractiveness of the European raw materials sector

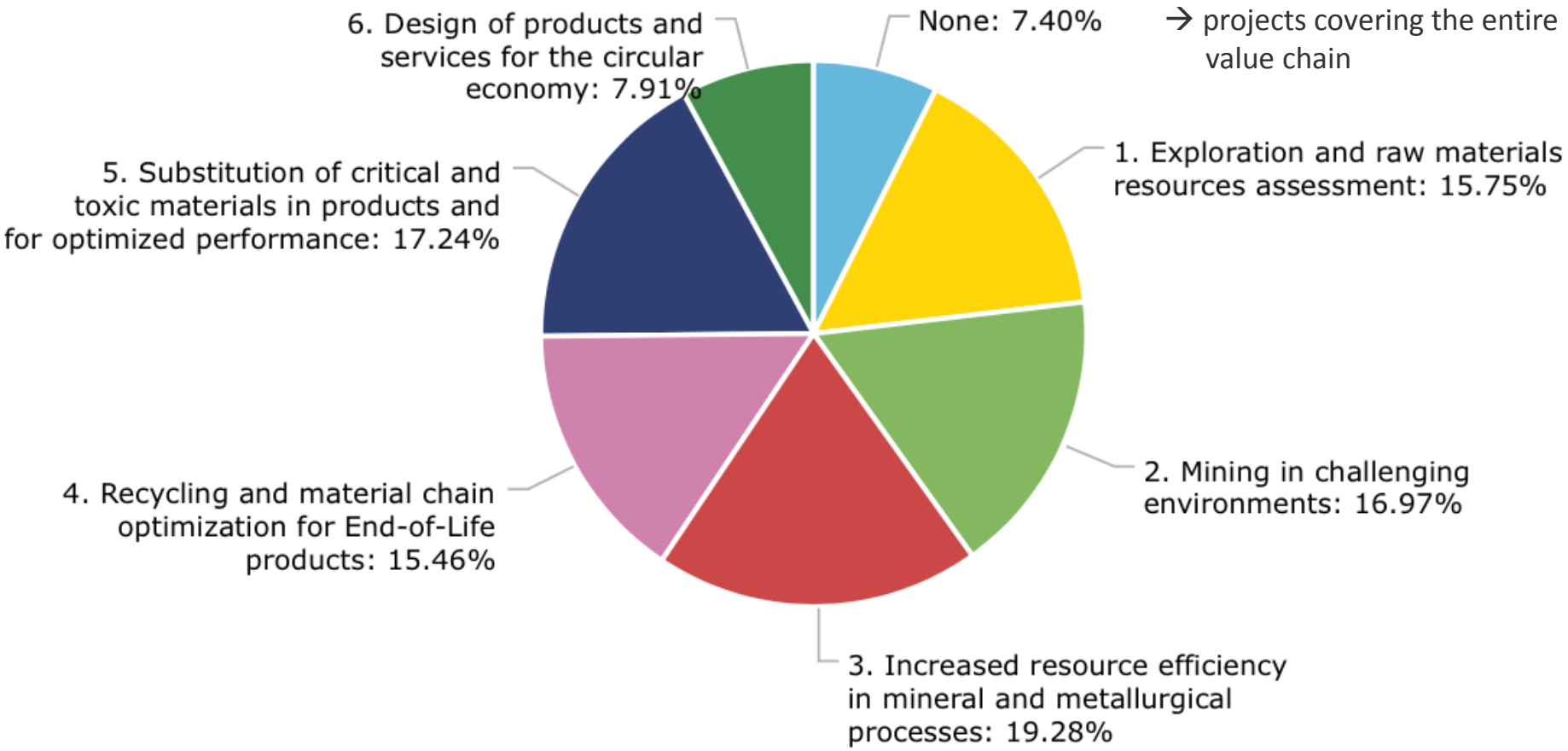
Bridge the valley of death
Enable market introduction of products and processes
Educate entrepreneurs

Create activities in Matchmaking & Networking, Education, Validation & Acceleration, Business Creation & Support

Launch calls, select activities, fund activities, support activities, support partners

HOW?

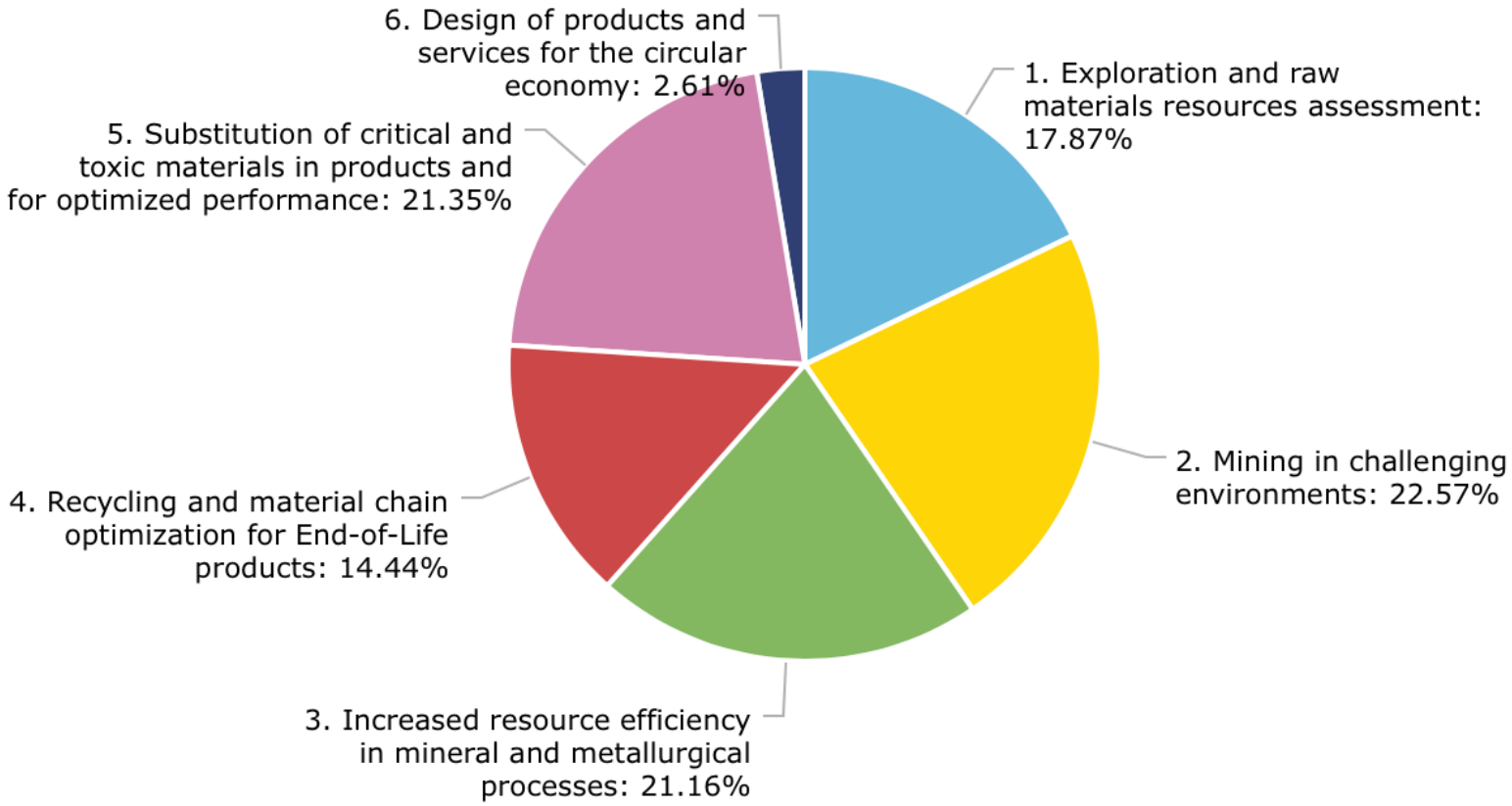
EIT Raw Materials project portfolio budget by *Main Theme* 2018



205 projects 62 MEUR

eit RawMaterials
Connecting matters

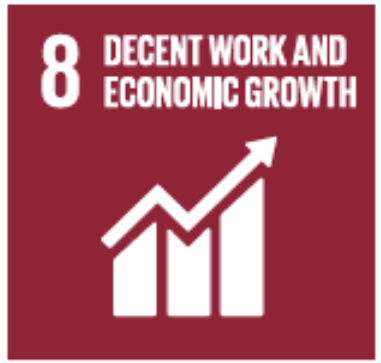
EIT RawMaterials Up-Scaling budget by *Main Theme* (39.2 M EUR) 2018



65 projects, 39,2 MEUR

eit RawMaterials
Connecting matters

SUSTAINABLE DEVELOPMENT GOALS



eit RawMaterials
Connecting matters

Thank you for your attention

EIT Raw Materials is supported by EIT,
a body of the European Union