ICAMCYL

Centro internacional de materiales avanzados y materias primas

International center for advanced materials and raw materials

Dr. Santiago Cuesta

Director General

FUNDACION ICAMCyL: Centro internacional en materiales avanzados y materias primas de Castilla y León

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ICAMCYL & IBERIAN SUSTAINABLE MINING CLUSTER

ICAMCyL (Internacional Center for Advanced Materials and Raw Materials of Castilla y León)

Non-profit research foundation created by the main industries of Castilla y León region (Spain) in the sectors of automotive, manufacturing , advanced materials , engineering, mining and processing of raw materials.

It constitutes a singular Competence Center with the objective of aligning and working towards regional Smart Specialisation Strategies (RIS3) and international policies

BUILDING A FUTURE IN RAW MATERIALS

XXI CENTURY SUSTAINABLE MINING

SCIENTIFIC INTERESTS

ADVANCED MINING TECHNOLOGIES

- Exploration
- Classification
- Processing

CIRCULAR ECONOMY

- Waste
- Recycling
- Valorisation

SUSTAINABILITY

- New production methods
- Eco-innovation
- Resource efficiency

NANOMATERIALS

- Carbon-based
- MOFs
- Composites
- Alloys

FABRICATION

- Additive manufacturing
- Pilot lines
- Industry

ENERGY & CLIMATE CHANGE

- Batteries / fuel-cells
- CO_2 capture
- Smart cities

EXPERTISE AND CAPACITIES

ENGINEERING & DESIGN
RAW MATERIALS RECOVERY
CRMs
MARKET
SUSTAINABLE PRODUCTION
ENVIRONMENTAL PROTECTION
DIGITAL MINE
RECYCLING
MODELLING & SIMULATION
FRAMEWORK POLICIES
WASTE VALORISATION
STAKEHOLDER ENGAGEMENT
VALUE-CHAIN DESIGN
INDUSTRY
CLUSTERING ACTIVITIES
END USERS INVOLVEMENT
RESOURCE MANAGEMENT
ECOSYSTEMS
LCA

EUROPEAN PROJECTS

MIREU
RawMaterials
tarantula
INNOCAT
NEXTOWER
Interreg Europe
cost
SMARTY Interreg Europe
CRM
MINEA
Join the SMART SPECIALISATION PLATFORM

ISMC (Iberian Sustainable Mining Cluster)

MISSION & VISION

The Iberian Sustainable Mining Cluster (ISMC) has been created to halt the current decline of the mining sector in Spain, with special attention to the region of Castilla y León and the mining areas of the Province of León, in Northwest Spain. This decline affects the whole value chain as well as social acceptance of mining operations.

ISMC currently includes around 50 companies, research and institutional entities joining efforts to consolidate the strengths of the mining sector and its associated services, promoting sustained economic growth for its members, with special attention to SMEs.

OBJECTIVES

- Boost the mining sector and related services
- Promote growth and competitiveness
- Foster cooperation across industries
- Attract business and commercial opportunities
- Promote technological innovation and sustainability

EXPERTISE OFFER

- ISMC covers the whole mining value chain
- Wide coverage of raw materials & CRMs
- Pilots and new lines of research
- Stakeholders participation
- Clustering and matchmaking activities

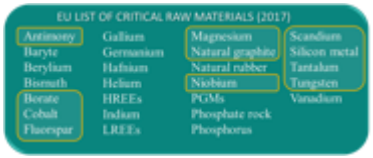
ECONOMY
ENVIRONMENT
SOCIETY

ISMC & THE MINING VALUE CHAIN

ISMC has members across the whole mining value chain, from mineral extraction, exploration and production to business development, recycling and other services.

RAW MATERIALS & THE CIRCULAR ECONOMY

ISMC members cover a wide range of raw materials, including some essential critical raw materials (CRMs) used in high added-value, innovative products.1



The development of a sustainable, low environmental impact mining will only occur through the improvement and integration of new methods, techniques and processes that allow the use and valorisation of raw materials and their by-products, always according to the principles of sustainability and circular economy.

Research & exploration → Deposit appraisal → Design of mining complex → Mining operations → Site restoration

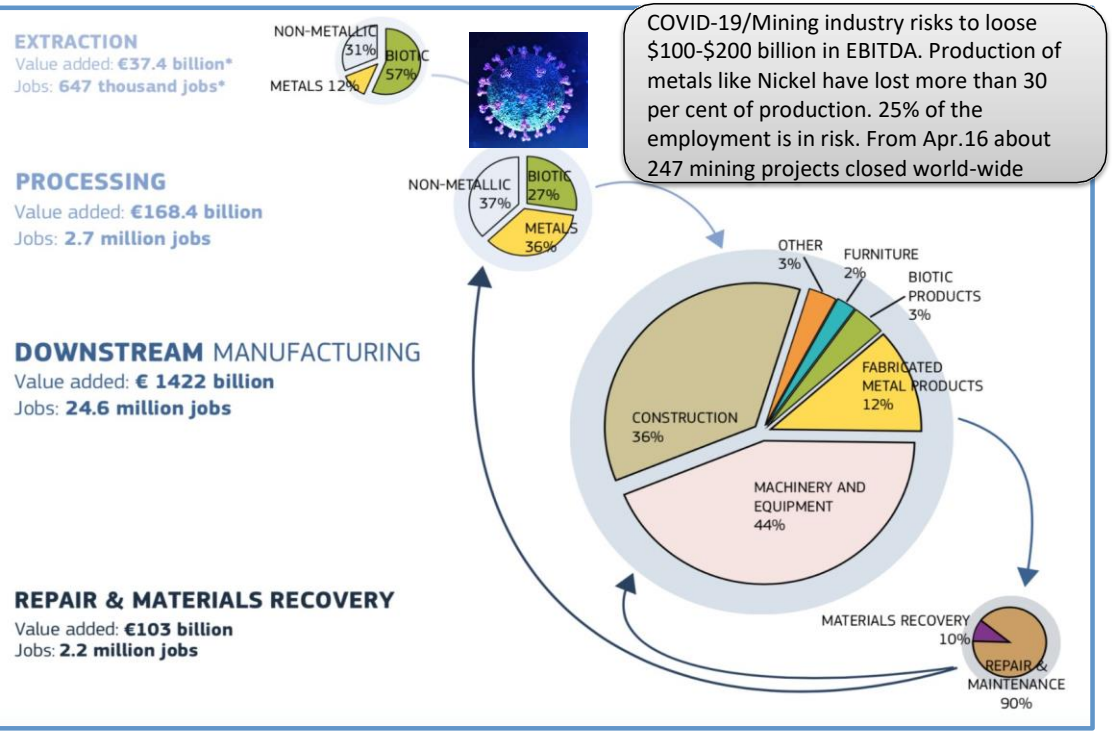
Raw Materials Value chain is crucial for present and future EU economy, employment and well-being

Raw materials extractive and processing industries provided more than EUR 206 billion of value added and **3.4 million jobs**

Downstream industries generated around EUR 1 422 billion and **25 million jobs.**

Repair and materials recovery provided EUR 103 billion and **2.2 million jobs.**

Sustainable raw materials production is the basis of the EU economic security and autonomous, all technology development and needed to achieve EU targets in Green Deal



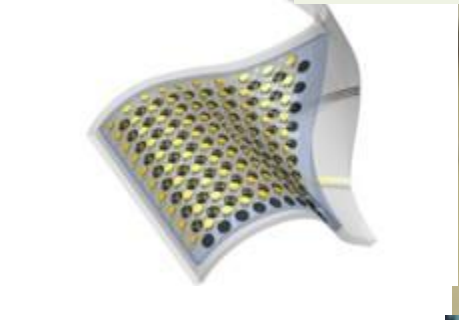
COVID-19/Mining industry risks to loose $100-$200 billion in EBITDA. Production of metals like Nickel have lost more than 30 per cent of production. 25% of the employment is in risk. From Apr.16 about 247 mining projects closed world-wide

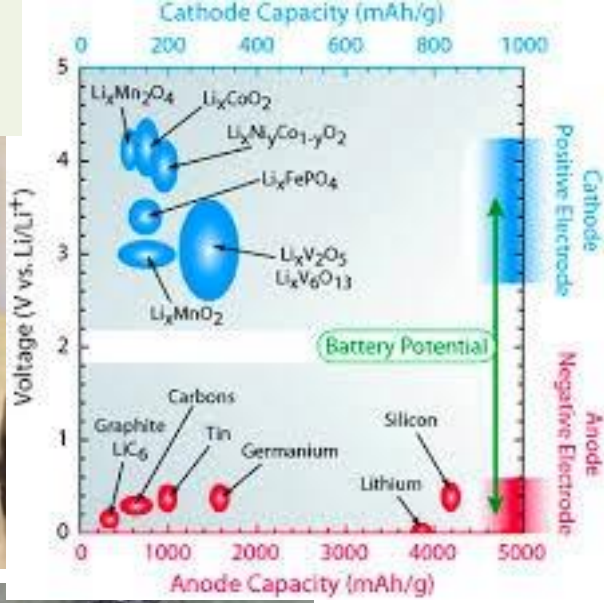
EU-28 as trade bloc is the 1st top 10 global **exporters of mining equipment, close to 20 billion USD**. Total R&D investment for the sector represents > EUR 2.7 billion EUR. EU generates an average of 1200 patent applications/year

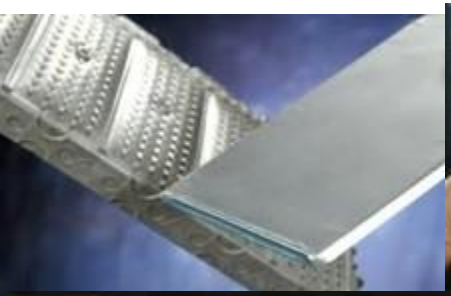
EU raw materials industries are **leaders in sustainability and corporate social responsibility.** About 24 % of the Global Reporting Initiative reports are from companies with headquarters in the EU.

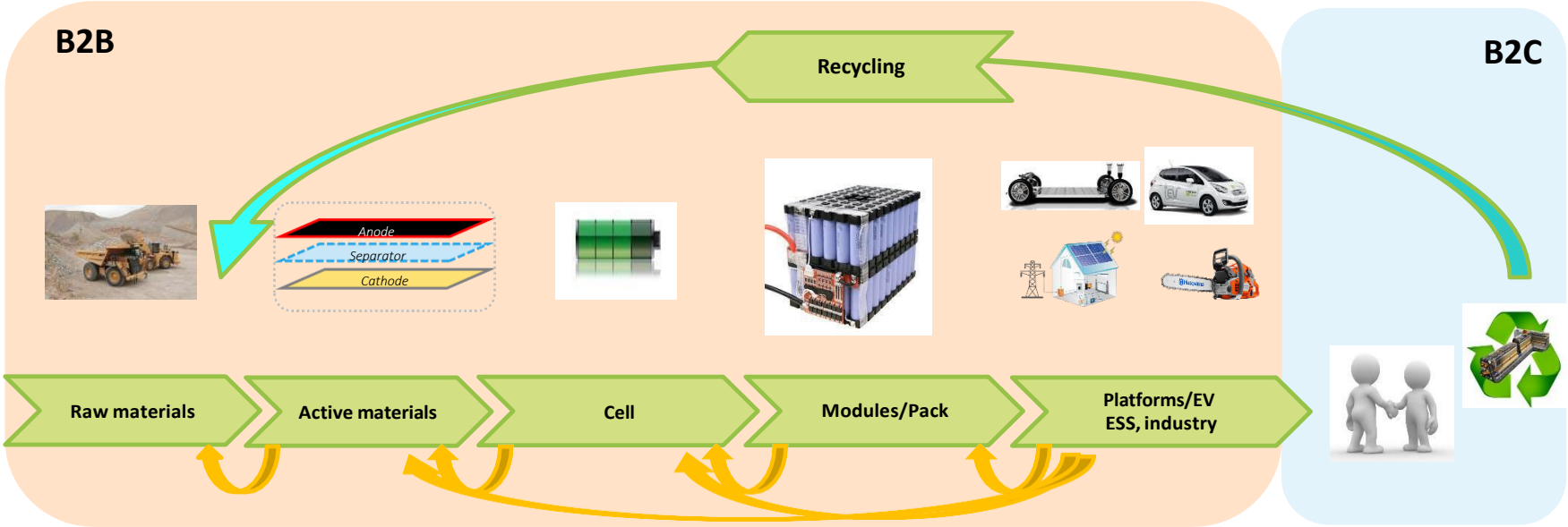
Only EU sustainable mobility and associated Li batteries value chain will need for 2025 > 400.000 t for cathode materials ; > 250.000 t for anode materials; > 235.000 t in electrolytes Including Ni, Co, Al, Mn, Graphite, and Li.

SUSTAINABLE FUTURE IS HERE AND IT NEEDS RAW MATERIALS



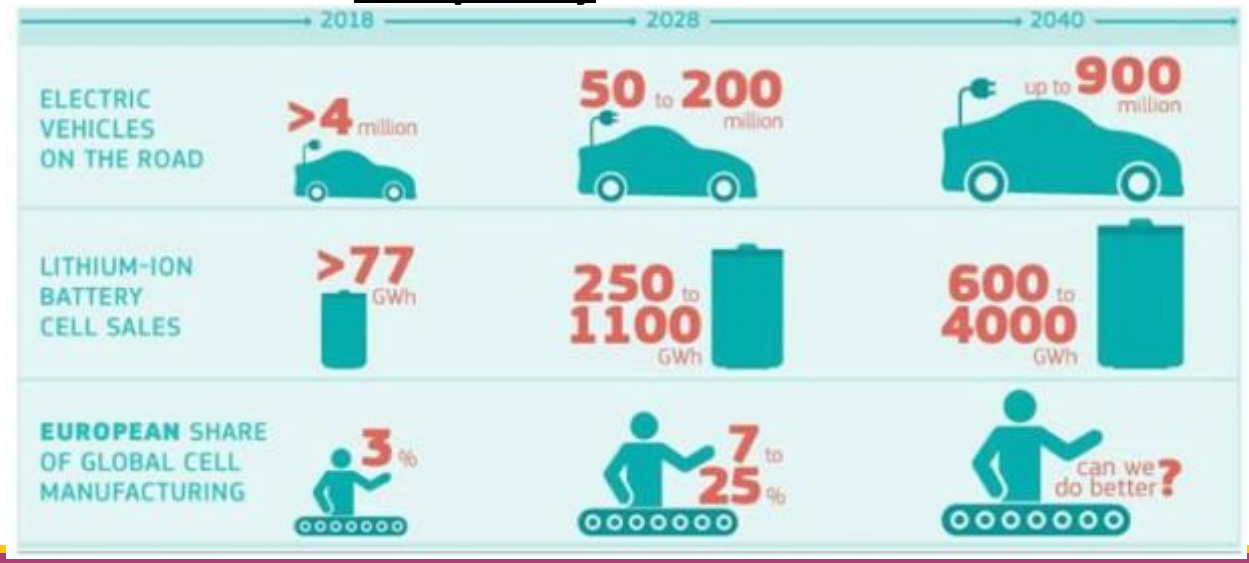


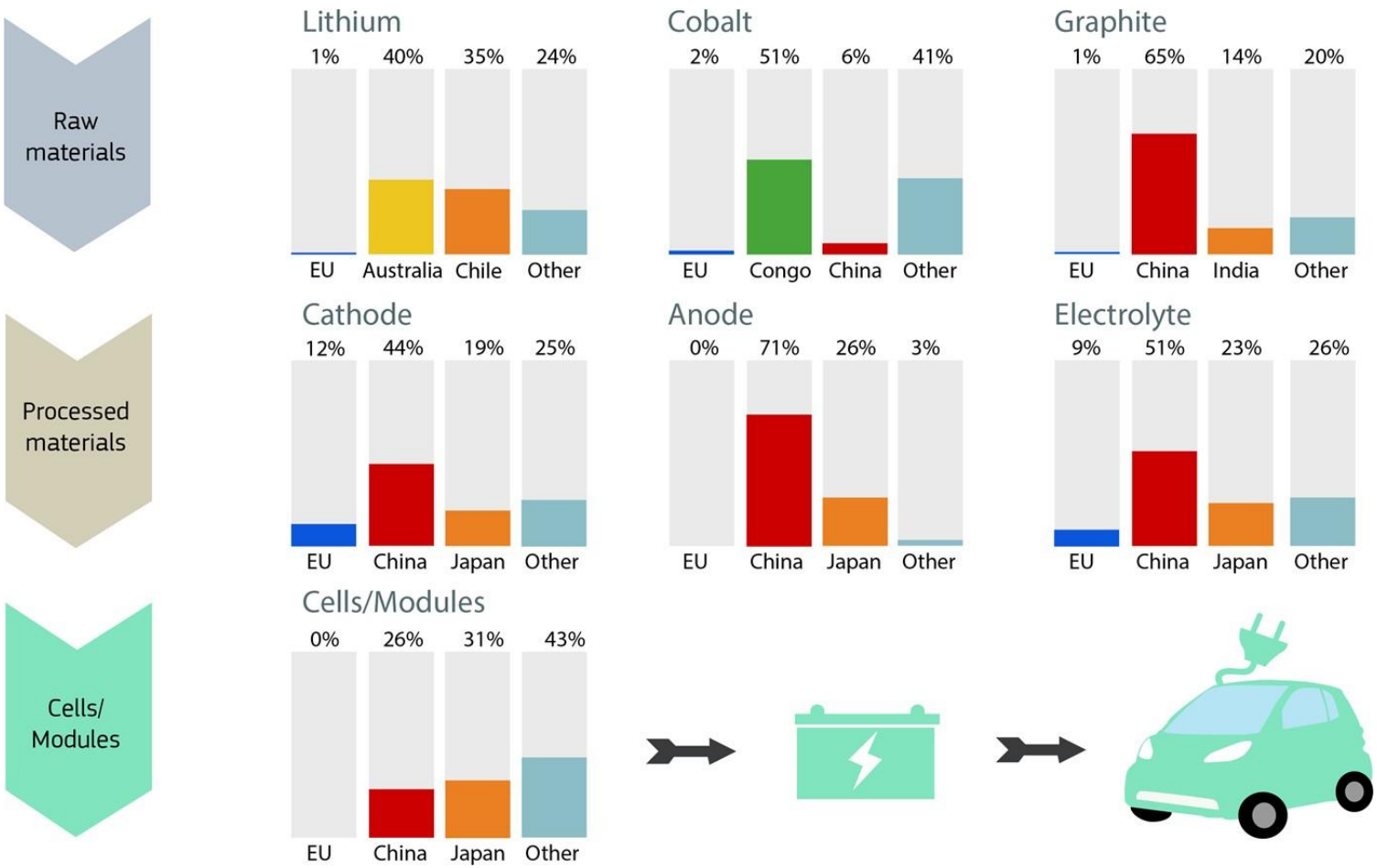




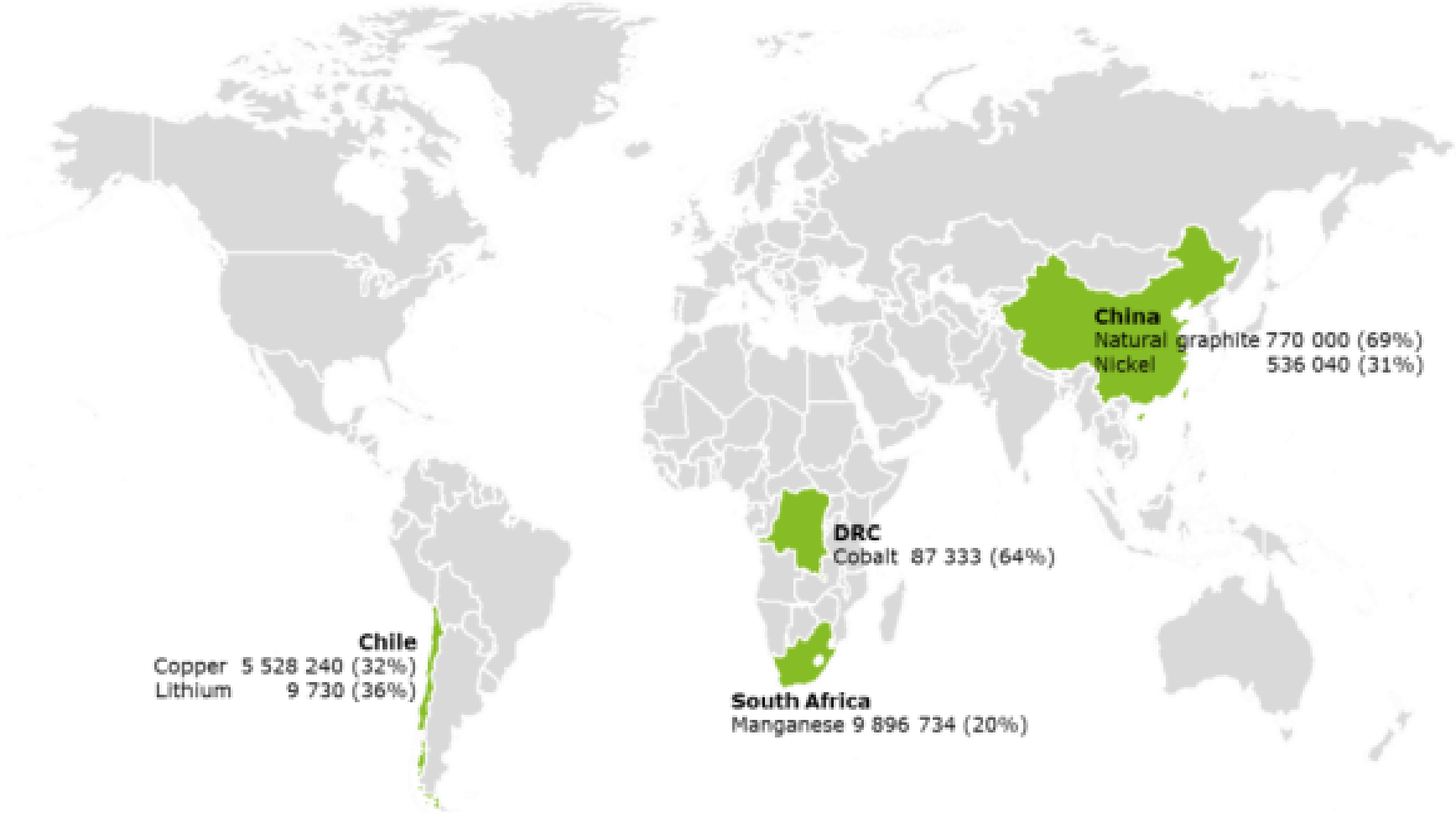
Europe can capture a new market worth 250B€/year in 2025 ….

…. if we act quickly with a value chain view

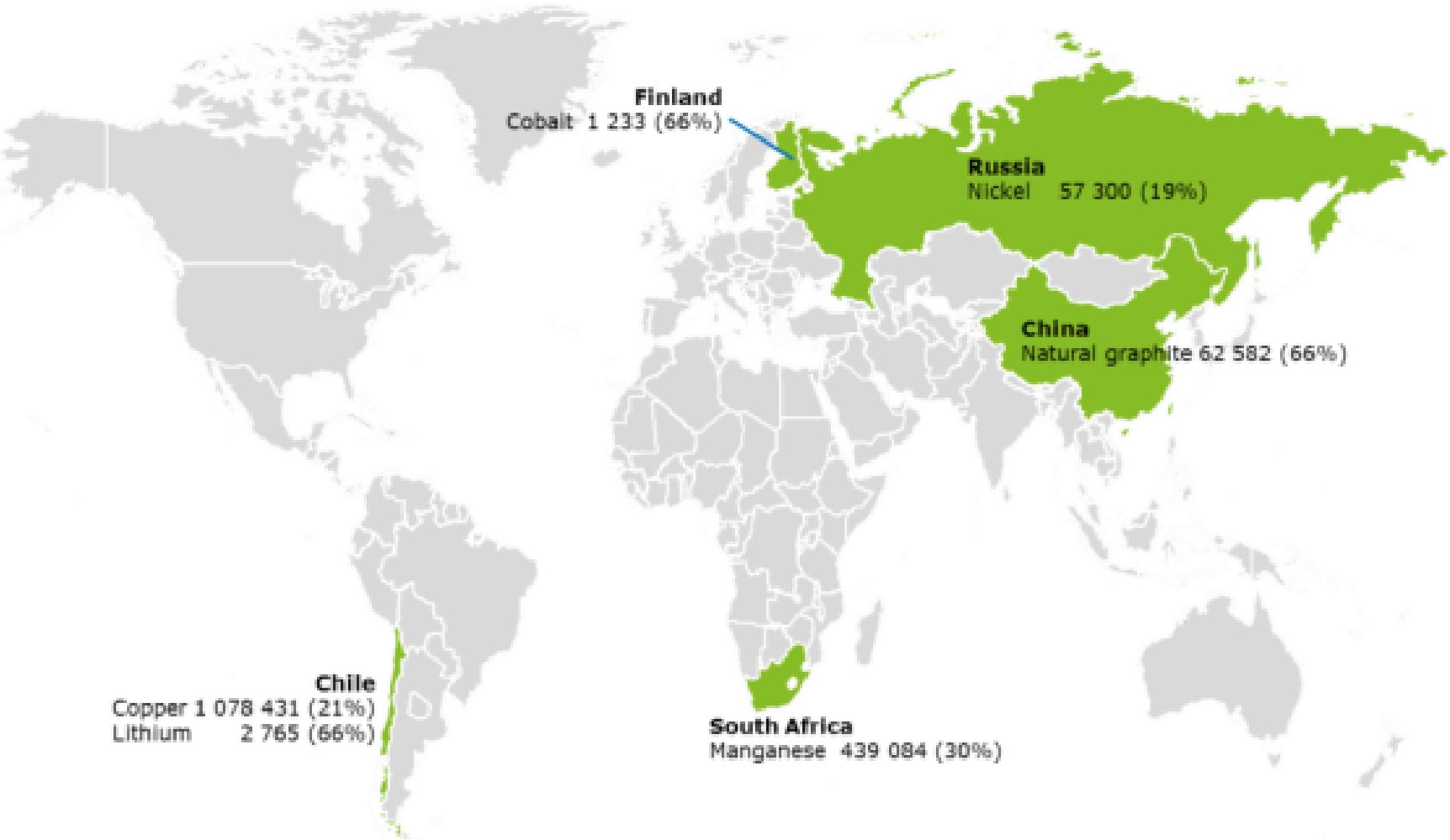




Source: Stathis Peteves etal., JRC, Materials' supply chain bottlenecks in the course of the EU energy transition, WRF 2017



Countries accounting for largest share of global production of battery materials (tonnes, percent of global supply)



Countries accounting for largest share of EU supply of battery materials (tonnes, percent of EU supply)

Raw material	Main producers (2014-2015)	Main sources of imports into the EU (mainly 2012)	Substitutability index	End-of-life recycling input rate
Critical raw materials used in Li-ion batteries				
Cobalt	Democratic Republic of Congo: 51 % China: 6 % Russia: 5 % Canada: 5 % Australia: 5 %	Russia: 96 % (cobalt ores and concentrates) USA: 3 % (cobalt ores and concentrates)	0.71	16 %
Natural graphite	China: 66 % India: 14 % Brazil: 7 %	China: 57 % Brazil: 15 % Norway: 9 %	0.72	0 %
Silicon metal	China: 68 % Russia: 8 % USA: 5 % Norway: 4 %	Norway: 38 % Brazil: 24 % China: 8 % Russia: 7 %	0.81	0 %
Non-critical raw material used in Li-ion batteries				
Lithium	Australia: 41 % Chile: 36 % Argentina: 12 % China: 7 %		n.a.	n.a.

EUROPEAN COMMISSION

Brussels, 22.11.2018
SWD(2018) 245/2 final

This document corrects document SWD(2018) 245 final of 17.05.2018

Corrected are relevant policies (p. 37) and permitting requirements and authorities (p.43).

The text shall read as follows:

COMMISSION STAFF WORKING DOCUMENT

Report on Raw Materials for Battery Applications

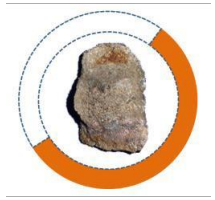
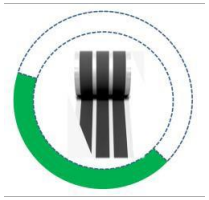
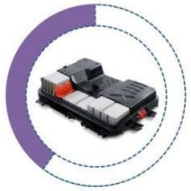
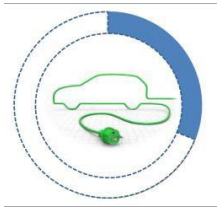
Environment/Social: Extraction has social and environmental consequences, making these materials not so green!

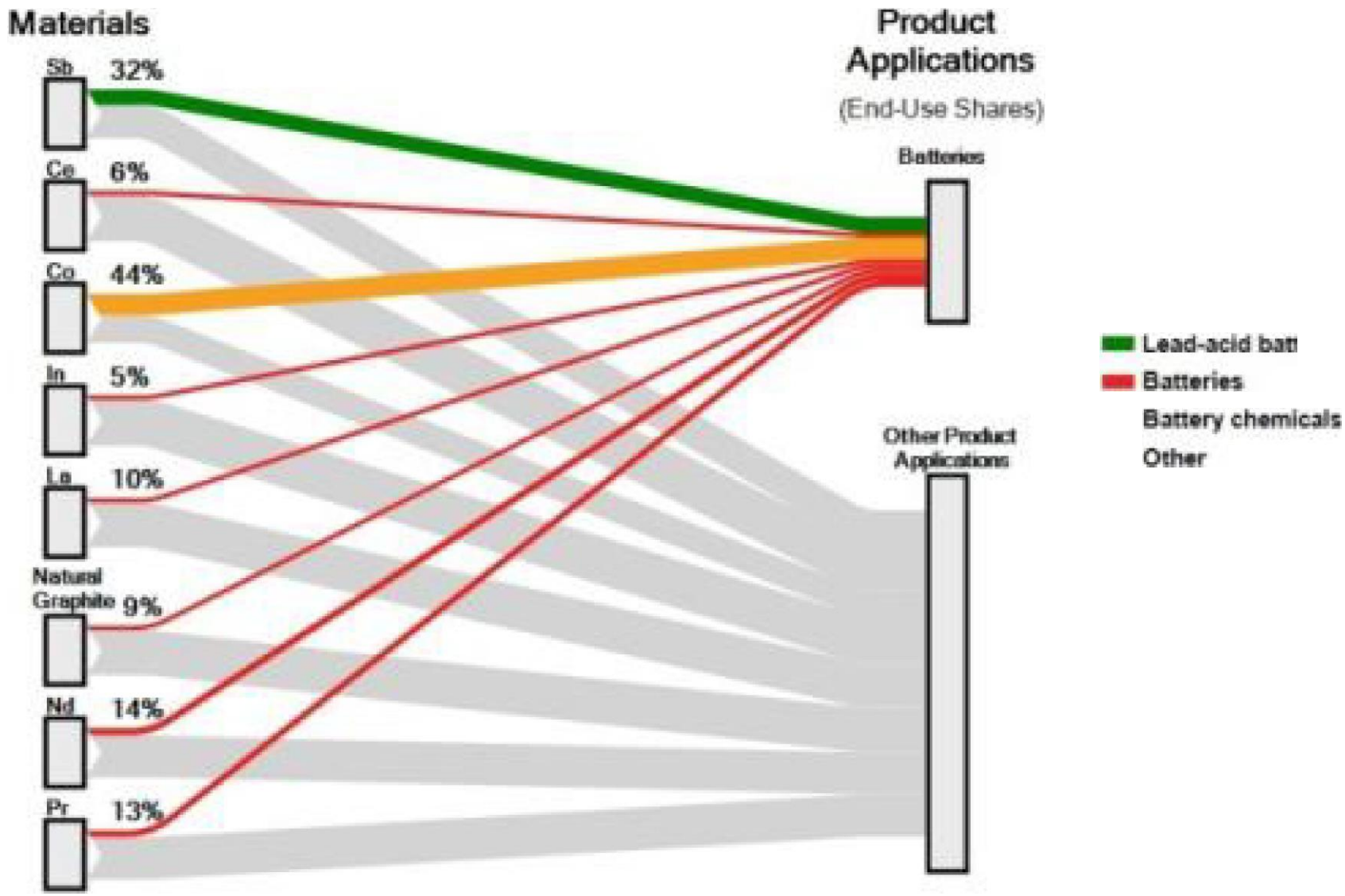
Cobalt mining in the DRC

Graphite mining in China

Lithium extraction in Chile

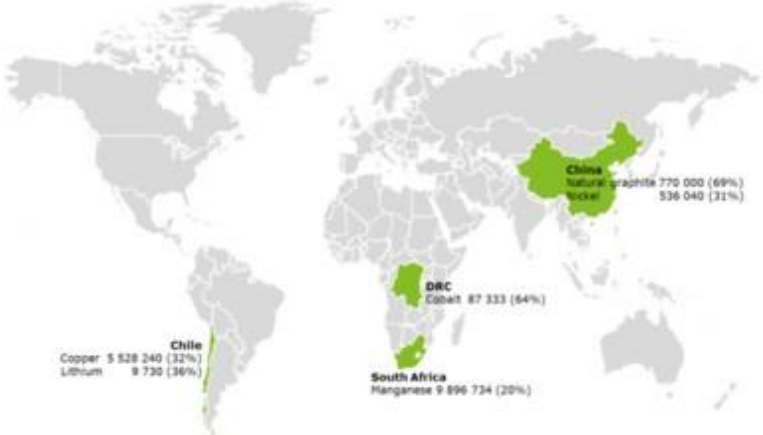
REE mining in China

	Raw and processed materials	Cell component manufacturing	Cell manufacturing	Battery pack manufacturing	Electric vehicle manufacturing	Recycling
Most Relevant Statistics	 51 %	 43 %	88 %	 40 %	 31 %	50 %
Most Relevant Statistics	Democratic Republic of Congo's share of global cobalt production [4] - a critical material for Li-ion technology	Cathode revenue as share of cell components market [5]	Asian share of Li-ion cell manufacturing market [6]	Share of pack assembly cost over the total battery pack cost [7]	Automotive share of Li-ion cell market in volume (MWh) [8]	Recycling efficiency for Li-ion batteries set in the Battery Directive [9]
Revenues	EU Mining and quarrying industry revenues: B$ 19 [1] EU Chemical industry Revenues: B$ 28 [1]	Global Li-ion cell components Industry revenues: B$ 7 [5]	Global Li-ion cell manufacturing revenues: B$ 16.7 [5]	Global automotive battery pack manufacturing revenues: B$ 22 [5]	EU Automotive industry Revenues: B$ 900 [10]. 20% of worldwide [11]	EU Waste collection & Recycling Industry Revenues: B$ 150 [10]. 75% of worldwide [12]

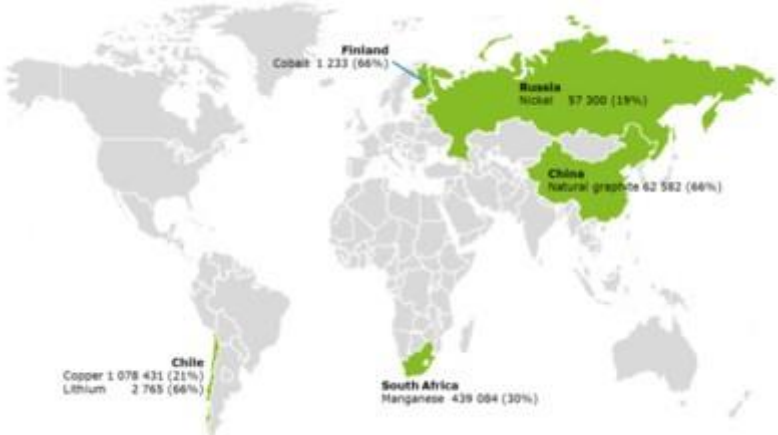

Materials
Sb
32%
Ce
6%
Co
44%
In
5%
La
10%
Natural Graphite
9%
Nd
14%
Pr
13%
Product Applications
(End-Use Shares)
Batteries
Other Product Applications
Lead-acid batt
Batteries
Battery chemicals
Other

Raw Materials and Batteries

- **Surge in demand** for electrical batteries in the early 2020's
- **Materials** represent the largest share of **total cell costs** (at least 50%)
- At approx. **USD 100/kWh** batteries will reach a tipping point at which EVs cheaper than ICE cars
- Only 8 producing countries, 3 account for 85% of production (Chile, Australia, China)
- **80% Li production worldwide:** ALBEMARLE, FMC, SQM, TLC
- Main sources:
  - Hard rock – pegmatites (spoudemene deposits)
  - Brines (evaporation / geothermal energy)
- Total **Li demand** (214kT LCE – 2017 to 669kT LCE – 2025)
- **Key action of the Action Plan**: "…map the current and future primary raw materials availability for batteries; **assess the potential for EU sourcing** battery raw materials and secondary raw materials; put forward **recommendations** aimed at optiming the sourcing of batteries raw materials within the EU…."



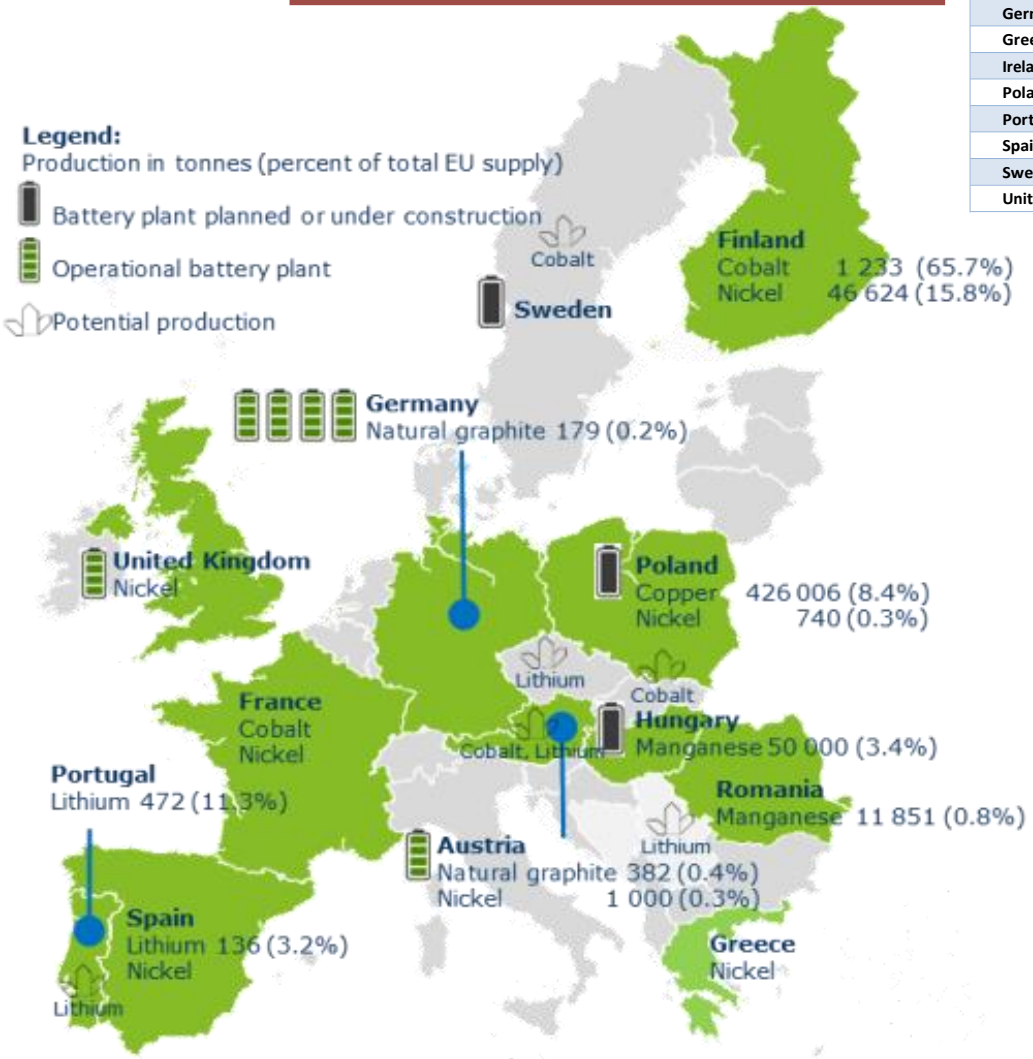
Global production battery raw materials



Sourcing to EU

Raw Materials are essential for the battery value chain and the clean transition and sustainable mobility agenda

European Union 28	Cobalt (t)	Lithium (t)	Nickel (t)	Graphite (t)
Austria			✔	✔
Czech Republic		✔		✔
Finland	✔	✔	✔	
France	✔		✔	
Germany			✔	✔
Greece			✔	
Ireland				
Poland			✔	
Portugal		✔		
Spain		✔	✔	
Sweden			✔	
United Kingdom			✔	

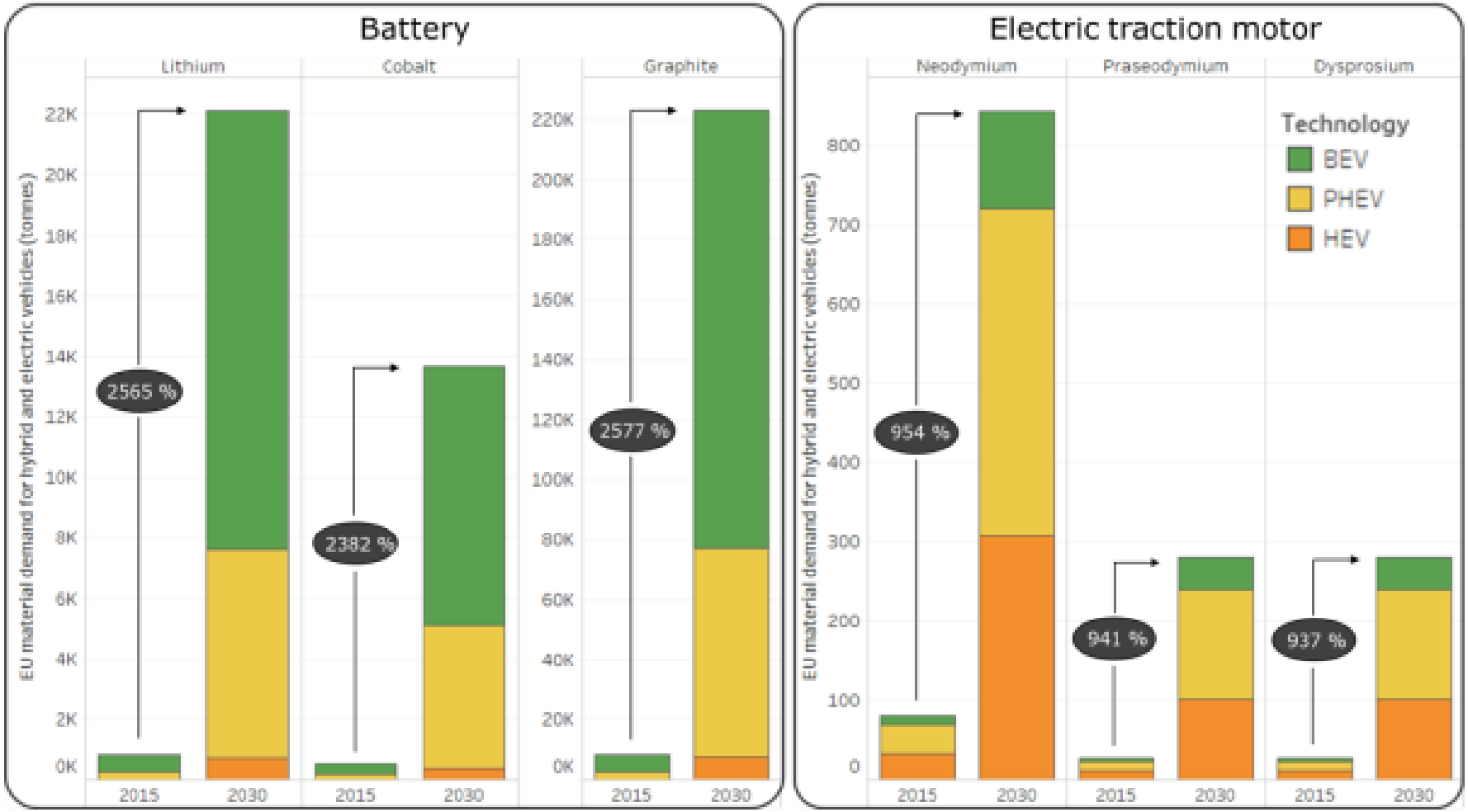


European Commission

JRC SCIENCE FOR POLICY REPORT

Lithium ion battery value chain and related opportunities for Europe

Natalia Lebedeva
Franco Di Persio
Lois Boon-Brett

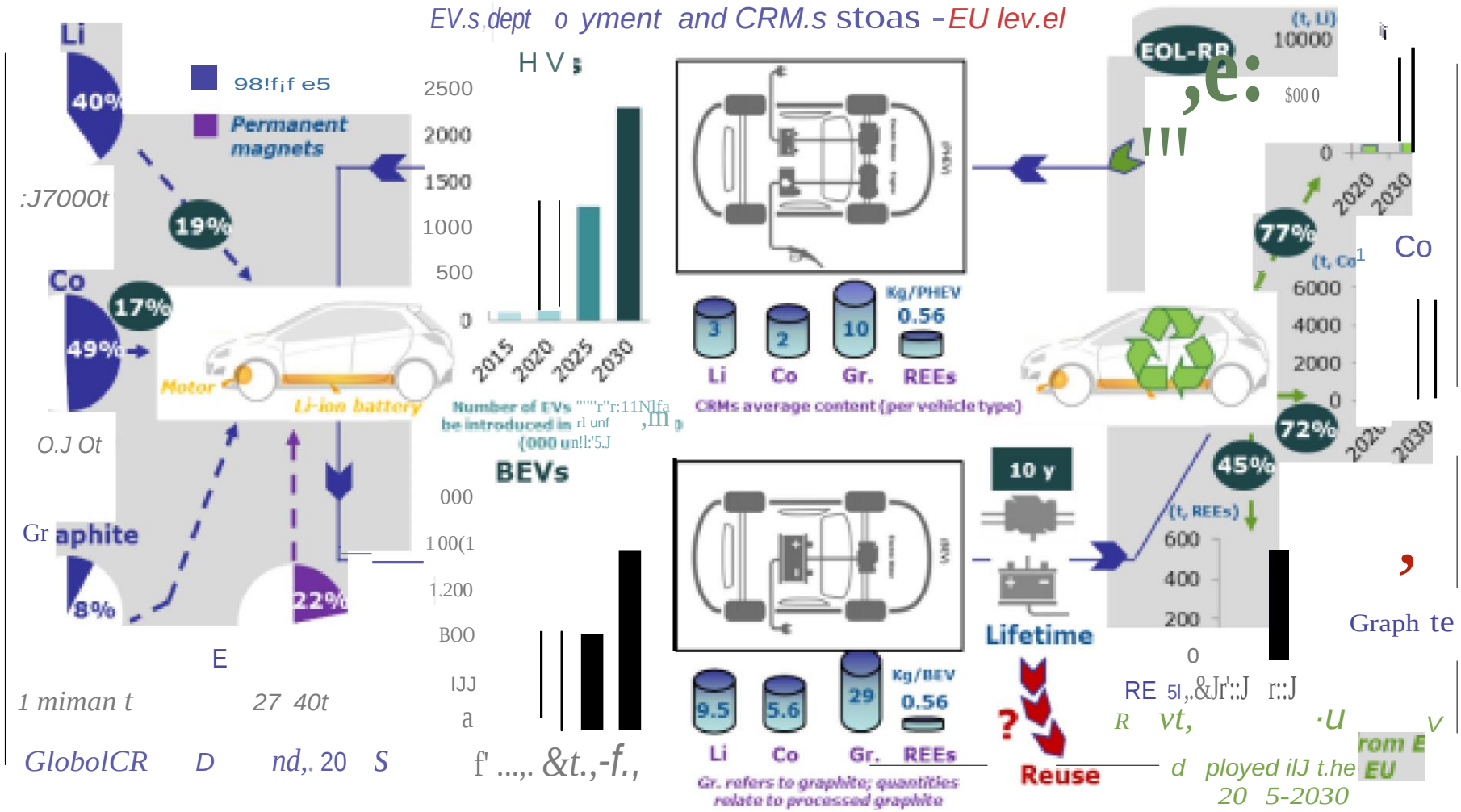


Demand forecast in the EU for selected Raw Materials (including some CRMs) for the hybrid and electric vehicles segments (BEV: battery electric vehicle; PHEV: plug-in hybrid electric vehicle; HEV: hybrid electric vehicles).

w aten Is ..... Manufacture — Coll@cf□n (EOL) — Recyding

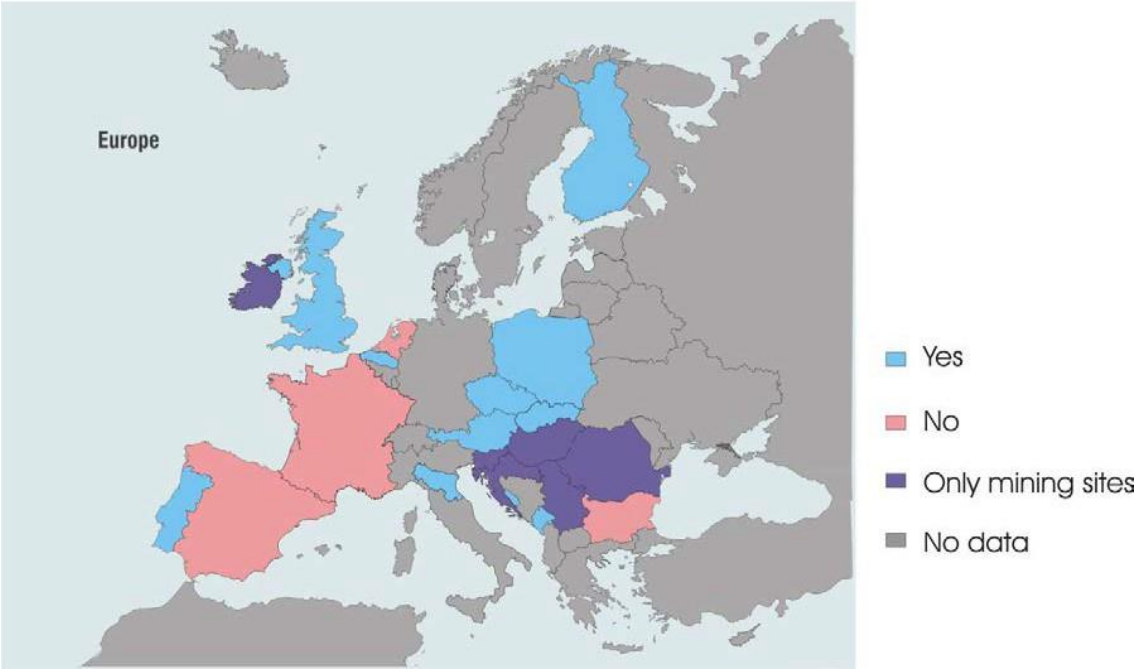
Produ cf on

EV.s,dept o yment and CRM.s stoas –EU lev.el



Access to mineral deposits and permitting is very dependent on the land use planning. Most of the EU Member States have a specific land use planning policy. However, consideration of minerals in the land use planning, type and details of data are heterogeneous. Austria, Czech Republic, Poland, Slovakia, Slovenia and Sweden protect certain minerals by legislation. Only Flanders (BE) and the Netherlands consider 3D spatial planning.

Land use planning policies covering mineral deposits in Europe (Minatura2020)



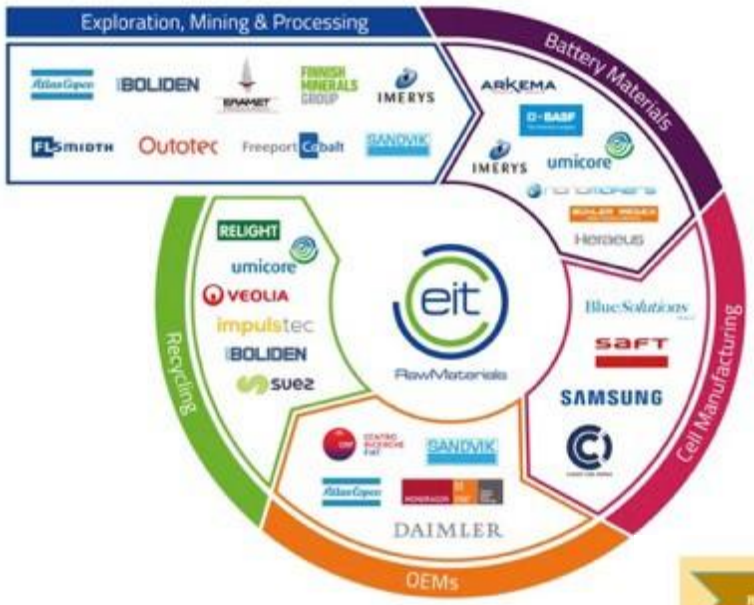
The European Battery Alliance

officially launched in Brussels, October 11th 2017

Matthias Machnig, German State Secretary, Federal Ministry for Economic Affairs and Energy, Brune Poirson, French Minister of State, attached to the Ministre d'Etat, Minister for the Ecological and Inclusive Transition, Jadwiga Emilewicz, Polish Deputy Minister of Economic Development, and Maroš Šefčovič, European Commission Vice-President in charge of the Energy Union.

"The lack of a domestic, European cell manufacturing base jeopardises the position of EU industrial customers because of the security of the supply chain, increased costs due to transportation, time delays, weaker quality control or limitations on the design", the Commission Vice-President said.
"So, we need to act fast – and collectively – to overcome this competitive disadvantage and capitalise on our leadership in many sectors of the battery value chain, from materials to system integration and recycling."

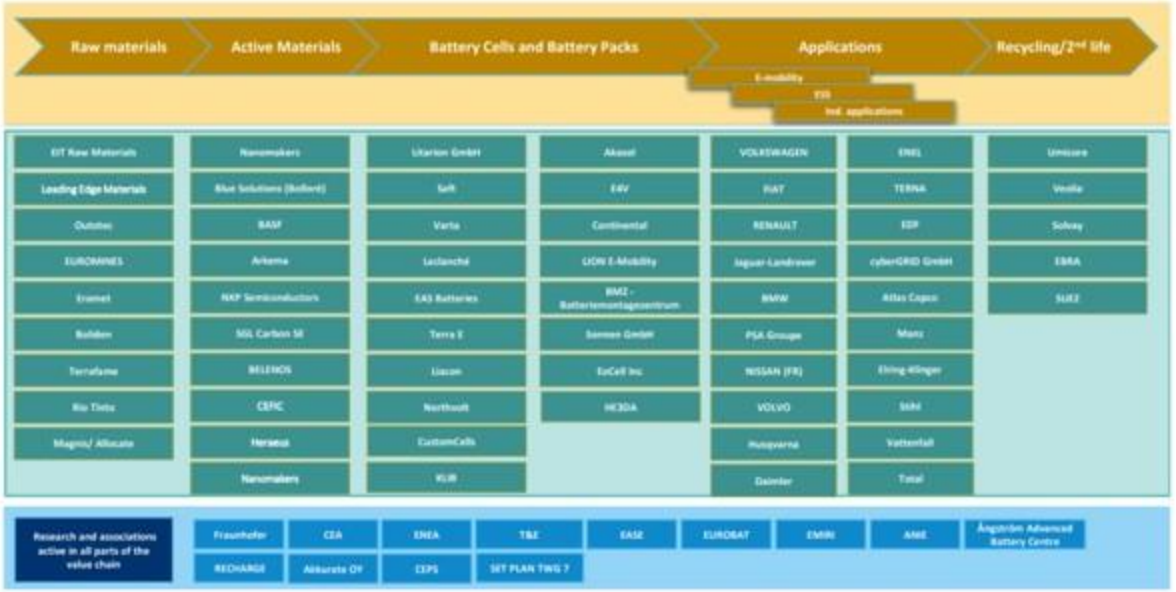
Contribution of EIT Raw Materials to the EBA



EIT RawMaterials is one of the key actors in the European Battery Alliance (EBA).

key players from industry, research, and academia who drive the transition

EIT RMs contribution to the EBA



EIT RawMaterials industry partners role in the Battery Value Chain Implementing EBA actions

IBERIAN SUSTAINABLE MINING CLUSTER

Understand intertaces to prolon9 battery Iife

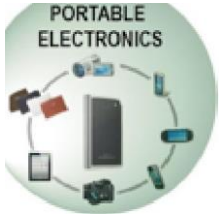
Recyclability of new batteries

Smart battery functionalities to increase safety and mitigate ageing phenomena

Upscalability and manufacturability of new concepts

SMAIU ,CITT'

Accelerate the discovery of mater•als to enhance battery performances



Innovalion

Ra.w maten.als

Educatio:n

Cost regulations

Society

t

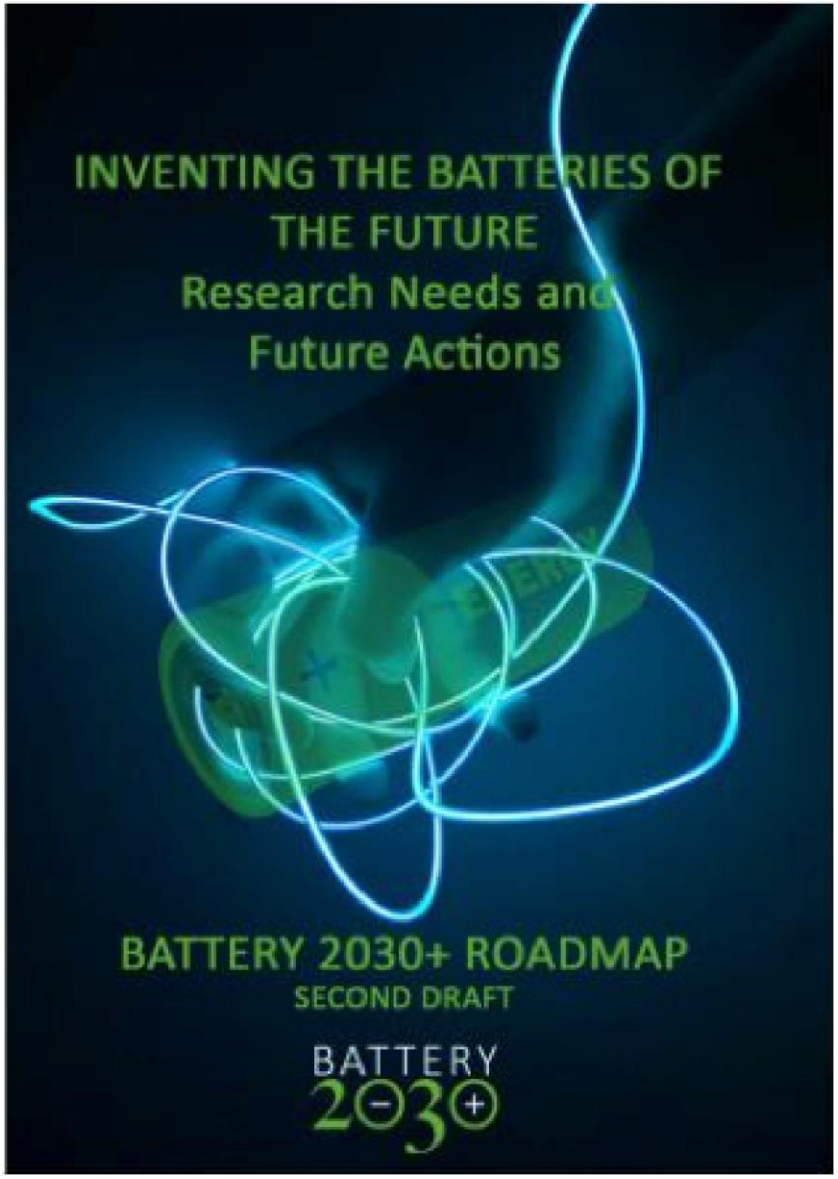
Acceptanoe

GRID ANO FA:EQUENCY REGULATION

System imegration

cnvironmen t

IC MCYL


INVENTING THE BATTERIES OF THE FUTURE
Research Needs and Future Actions
BATTERY 2030+ ROADMAP
SECOND DRAFT
BATTERY 2030+

BATTERY 2030+ TRANSFORMATIONAL CHEMISTRY-NEUTRAiIR ESEARCH:

- Acoe er at ed batt ery material discovery & interiace engin e ed ng
- Smart senslng & self-hea ing functionaUties
- CeU design & manufacturability (cro ss-cutt ng)
- Recydabillty (cross-cutt ng)

Game changes instead of incremental

FUTURE BATTERY CHEMISTRIES

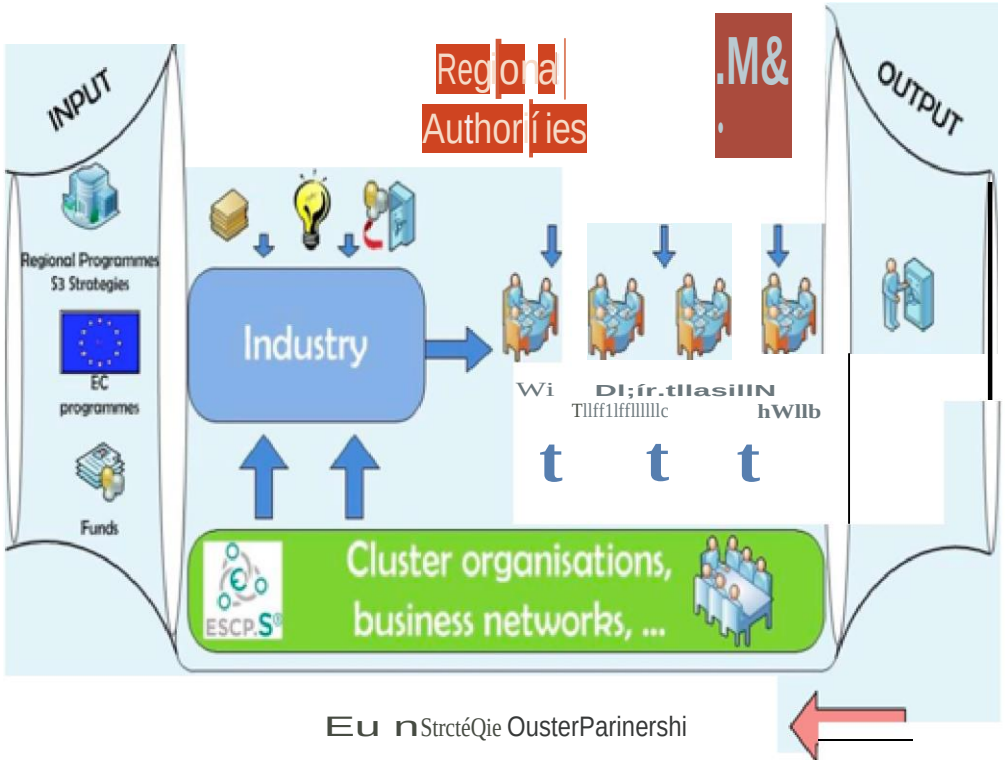
POST-L T UM BATTERY CHEMISTRIES
Sod um- o , multivalent met a!-i on, met a!-air , redox flow, etc.

LITHIUM BATTERY CHEM ISTRIES (SET Plan)
GeneraHon 5 0it h um-a r, Ut hium-su fur}
GeneraHon 4 (ai -sO id-st at e it hium- on or Ut h um-m eta }
Generation 3 (advanced lit hium-ion)

Strategic cross-regional co laboration

Industrial Modernisation Platform

PROCESS



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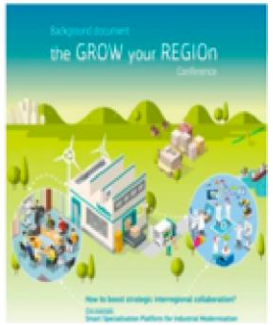
backjjround docurneo.t

GROW
REG O:



Regional strength
(5edoral and cross-sec.toraf duster mapping)

European Cluster Observatory

Regional prioritíes
(research and ínnovatíon polícy príorítíes)

Join the SMART SPECIAL TIO PLATFORM

Regional partners
(duster organísatíons, European Partnershíps)

European Cluster Collaboration Platform

DIH
Digitol lnnovotion Hub

C límate-KIC

Clusters as accelerators for innovation & industrial chan e

INNOSUP-1 HORIZON 2020

Interreg

E CP S

ESCP@i Partnership

Inter-regional & international cluster cooperation

Capacity-building

Cluster Excellence Programme

COSME
Programme for the Competitiveness of Enterprises and SMEs
2014-2020

COSME
Programme for the Competitiveness of Enterprises and SMEs
2014-2020

INTRODUCTION: S3P

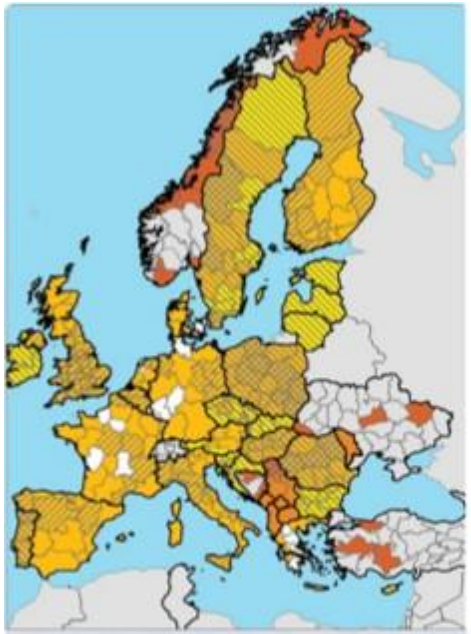
Why? The S3 Platform assists EU countries and regions to develop, implement and review their **Research and Innovation Strategies for Smart Specialisation (RIS3)**. Provide **information, methodologies, expertise and advice** to national and regional policy makers, as well as promote mutual learning, trans-national co-operation and contribute to academic debates around the concept of Smart Specialisation.

How? Thematic S3 Platform provide **a multi-level support mechanism, combining efforts at regional, national and European level.** **Interregional collaboration** by opening-up regional smart specialisation strategies.

Thematic S3 Platforms on
Energy
Agri-Food
Industrial Modernisation

http://s3platform.jrc.ec.europa.eu/

Join the SMART SPECIALISATION PLATFORM



- EU Countries registered in S3P: 18
- EU Regions registered in S3P: 178
- Non-EU Countries registered in S3P: 6
- Non-EU Regions registered in S3P: 16
- S3P Peer-reviewed Countries: 16
- S3P Peer-reviewed Regions: 72

S3P-Industrial modernisation

Industrial modernisation requires important investment efforts:
Regional Smart Specialisation Strategies (RIS3)

The **Smart Specialisation Platform for Industrial Modernisation** (S3P-Industry) aims to support EU regions committed to generate a pipeline of industrial investment projects following a bottom-up approach - implemented through:

INTERREGIONAL COOPERATION

CLUSTER PARTICIPATION

INDUSTRY INVOLVEMENT

RESEARCH INSTITUTIONS, ACADEMIA AND CIVIL SOCIETY

Such interregional cooperation with allow **scaling up** towards larger impact and more effective collaboration along **industrial value chains**.

70 regions involved in 12 thematic areas under the Smart Specialisation Platform for Industrial Modernisation

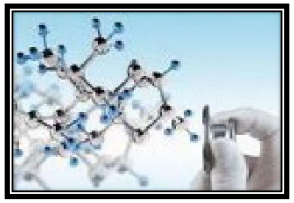
S3P-Industrial Modernisation: Thematic areas

Advanced manufacturing for energy applications

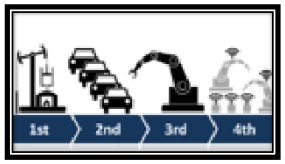
3D Printing

Innovative use of non-food biomass

Efficient & Sustainable Manufacturing



Nano-Enabled Products



SMES to the Industry 4.0

Textile Innovation

Medical Technology

Sports Innovation

Photonics

Digitalisation and Safety for Tourism

European Cyber Valleys

Social Economy

Artificial Intelligence & Human Machine Interface

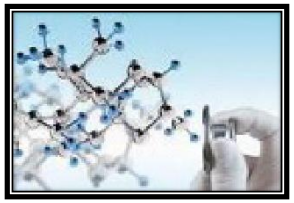
Personalised medicine

Chemicals

Safe and sustainable mobility

70 regions involved in 12 thematic areas under the Smart Specialisation Platform for Industrial Modernisation

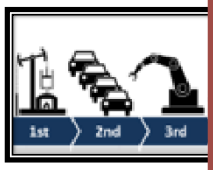
S3P-Industrial Modernisation: Thematic areas



Advanced manufac for en applica

Nano-Enabled Products

- ADVANCED MATERIALS FOR BATTERIES
- MINING AND ASSOCIATED VALUE CHAINS



SMES to t Industry 4

Digitalisation and Safety for Tourism

European Cyber Valleys

Social Economy

Artificial Intelligence & Human Machine Interface

Personalised medicine

Chemicals

Safe and sustainable mobility

Participation in other S3P-Industry Platforms

SMART SPECIALISATION PLATFORM

Joint Research Centre

European Commission

"Advanced Materials for Batteries"

http://s3platform.jrc.ec.europa.eu/batteries

KEMIJSKI INŠTITUT

Junta de Castilla y León

Part of the Strategic Action Plan on Batteries

26 regions involved

ICAMCYL Pilot 2 leader: "Sustainable Raw Materials Extraction & Processing"

6 pilots

Outcome: PP investment projects industry-driven

"Mining Industry"

http://s3platform.jrc.ec.europa.eu/mining-industry

Approved Feb 2019 - KOM March 2019

Matching & Scoping note next

Key themes:

- Critical raw material production
- Empowerment of SMEs in Global Value Chains
- New technologies and sustainable mining
- Social acceptance of mining through stakeholder involvement
- Education and training in mining and related industries

Join the SMART SPECIALISATION PLATFORM

Advanced materials for batteries for electromobility and stationary energy storage

COORDINATOR

KEMIJSKI INŠTITUT

CO-LEADING REGIONS

La Région Auvergne-Rhône-Alpes

GRUPO spri TALDEA

RÉGION Nouvelle-Aquitaine

METROPOOL REGIO EINDHOVEN

Junta de Castilla y León

Agencia Andaluza de la Energía
CONSEJERÍA DE ECONOMÍA, INNOVACIÓN Y CIENCIA

EMIRI

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ICAMCYL

La Région Auvergne-Rhône-Alpes

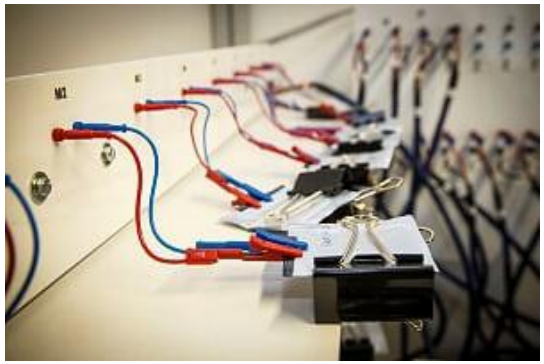
GRUPO spri TALDEA

RÉGION Nouvelle-Aquitaine

METROPOOL REGIO EINDHOVEN

EMIRI

S3P-Industrial modernisation for batteries



Advanced materials for batteries

ELECTRO MOBILITY

STATIONARY ENERGY STORAGE

Aim of this S3P-Industrial Modernisation is to **bridge the large gap** between research and industrial applications.

S3P-Industrial modernisation for batteries:

Mission

- **Contribute to Industrial Modernisation of Regions** in the field of advanced materials for clean energy
- **Accelerate the transition of innovative advanced materials from the lab to the market**
- **Develop at regional level the ecosystem** supporting innovation in the field of advanced materials for electromobility and stationary energy storage
- **Reinforce innovation interactions** within this ecosystem
- **Support the manufacturing processes at scale** and creation of full competitive value chains

Objectives

- **Facilitate R&D&i efforts to reduce intrinsic cost of advanced materials**
- **Accelerate transition to a resilient Energy Union**
- **Contribute to reindustrialisation in EU in the field**
- **Business impact: job creation + R&D reinvestement**

PARTNERSHIP

Leading regions:

1 Andalusia (ES)
2 Castilla y León region (ES)
3 West Slovenia (SI)

Participating regions:

4 Aragon (ES)
5 Austria (AT)
6 Auvergne Rhone Alpes (FR)
7 Baden-Württemberg (DE)
8 Basque Country (ES)
9 Bavaria (DE)
10 Brussels - Capital Region (BE)
11 Central Ostrobothnia (FI)
12 Emilia Romagna (IT)
13 East Slovenia (SI)
14 Flanders (BE)
15 Kainuu (FI)
16 Lapland (FI)
17 Lombardy (IT)
18 Metropol Region Eindhoven (NL)
19 Navarra (ES)
20 Northern Ostrobothnia (FI)
21 Nouvelle Aquitaine (FR)
22 Pohjois-Savo (Nothern Savonia) (FI)
23 Regione Piemonte (IT)
24 State Hessen (DE)
25 Valencia (ES)
26 Vestlandet (NO)
27 Viken (NO)

S3P-Industrial modernisation for batteries

Advanced Materials = KET + priority for EU industrial policy

650billion € + 2.5million direct Jobs (300million Tones)

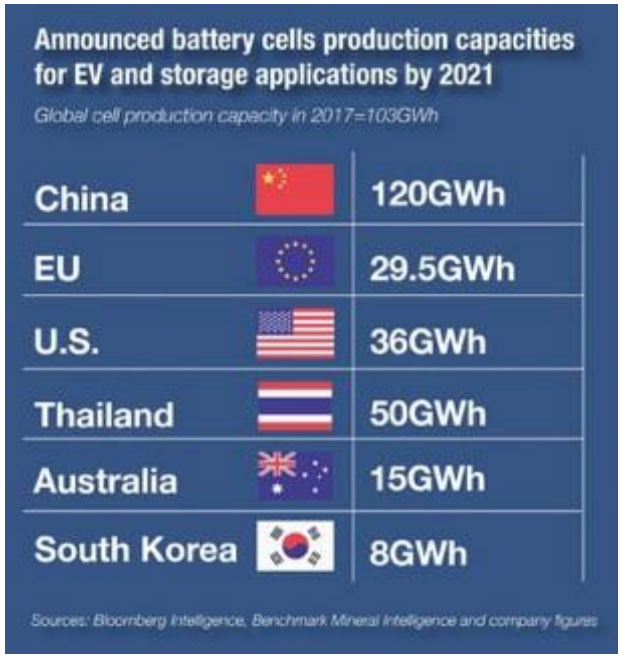
Prioritised to achieve mid-term goals under Strategic Action Plan on Batteries

Access to Raw Materials + Battery Manufacturing

Battery cell manufacturing facility: Co, Ni, Mn, Li

Other raw materials (electrification): Graphite, Si, Al, Cu

European Battery Alliance (EBA) initiative to provide 10-20 Gigafactories and capture batteries market (250billion€ annually)



Announced battery cells production capacities for EV and storage applications by 2021

Global cell production capacity in 2017=103GWh

China	120GWh
EU	29.5GWh
U.S.	36GWh
Thailand	50GWh
Australia	15GWh
South Korea	8GWh

Sources: Bloomberg Intelligence, Benchmark Mineral Intelligence and company figures

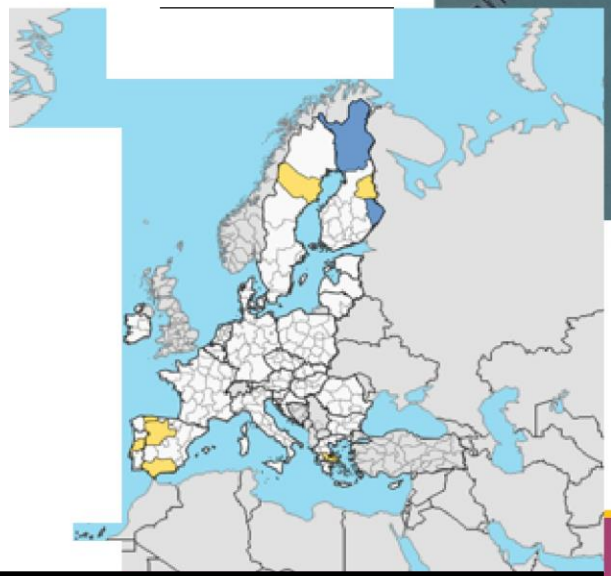
S3P-Industrial Modernisation Platform AMBP

Interregional partnership for Smart Specialisation (S3P-Industry) on "Advanced materials for Batteries for Electromobility and Stationary Energy Storage"

- **PILOT 1**: Solid state lithium-ion batteries (Generation 4) (Lead Region: Bavaria)
- **PILOT 2: Sustainable Raw Materials Extraction & Processing (Lead Region: Castilla y Leon)**
- **PILOT 3**: Recycling of existing Lithium Ion Batteries (Lead Region: Bavaria)
- **PILOT 4**: Liquid based-batteries (stationary) (Lead Regions: Basque/Valencia)
- **PILOT 5**: Network of research & testing centers (Lead Region: West Slovenia)
- **PILOT 6**: Improved lithium-ion batteries (Generation 3b) (Lead Region: Auvergne Rhone Alpes)

Preliminary thematic areas for S3P Mining industry

- Critical raw material production
- **Empowerment of SMEs in Global Value Chains**
- New technologies and sustainable mining
- Social acceptance of mining through stakeholder involvement
- Education and training in mining and related industries



Kristiina Jokelainen ·
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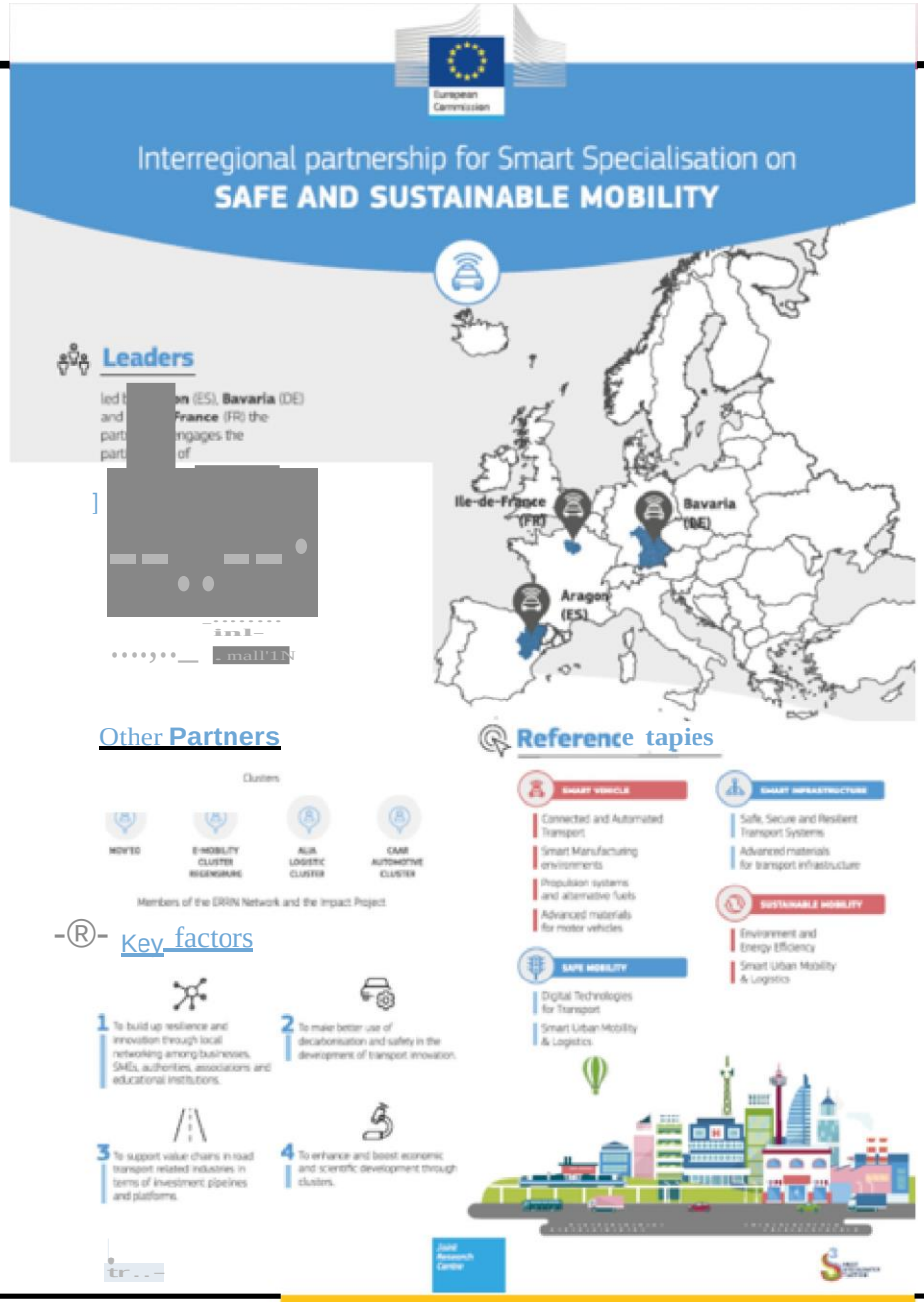
BUSINESS JOENSUU

JOE


European Commission
Interregional partnership for Smart Specialisation on
SAFE AND SUSTAINABLE MOBILITY
Leaders
Bavaria (DE)
France (FR)
Ile-de-France (FR)
Bavaria (DE)
Aragon (ES)
Other Partners
Clusters
MOVEO
E-MOBILITY CLUSTER RIGENGRUNE
AUA LOGISTIC CLUSTER
CAAR AUTOMOTIVE CLUSTER
Members of the ERRIN Network and the Impact Project
Reference tapies
SMART VEHICLE
Connected and Automated Transport
Smart Manufacturing environments
Propulsion systems and alternative fuels
Advanced materials for motor vehicles
SMART INFRASTRUCTURE
Safe, Secure and Resilient Transport Systems
Advanced materials for transport infrastructure
SUSTAINABLE MOBILITY
Environment and Energy Efficiency
Smart Urban Mobility & Logistics
SAFE MOBILITY
Digital Technologies for Transport
Smart Urban Mobility & Logistics
Key factors
1 To build up resilience and innovation through local networking among businesses, SMEs, authorities, associations and educational institutions.
2 To make better use of decarbonisation and safety in the development of transport innovation.
3 To support value chains in road transport related industries in terms of investment pipelines and platforms.
4 To enhance and boost economic and scientific development through clusters.
Joint Research Centre

REMIX – MIREU – S3P Mining industry as key future EU Actions in raw materials

Smart and Green Mining Regions of EU

REMIX
Interreg Europe

01/2017 – 06/2021

www.interregeurope.eu/remix/

Connect EU regions through their raw materials and minerals production, metallurgy and common S3 objectives

9 Partners | 1 Advisory Partner | 9 Countries | 8 Policy Instruments

Mining and Metallurgy Regions of EU

MIREU
MINING AND METALLURGY REGIONS OF EU

12/2017 – 11/2020

www.mireu.eu

Establish a network of mining and metallurgy regions across Europe

30 Partners | 17 Regions | 15 Countries

Join the SMART SPECIALISATION PLATFORM

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European Commission

"Advanced Materials for Batteries"

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KEMIJSKI INŠTITUT

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"Mining Industry"

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BUSINESS JOENSUU | JOE

REGIONAL COUNCIL OF LAPLAND

Towards a common strategy for securing reliable access to and supply of (critical) raw materials in the European Union area

MINE.THE.GAP Ecosystem: – a solid network to support SMEs in the EU raw materials industry

Smart and Green Mining Regions of EU

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Interreg Europe

01/2017 – 06/2021

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S3 Platform Mining Industry and Global value chains

http://s3platform.jrc.ec.europa.eu/mining-industry

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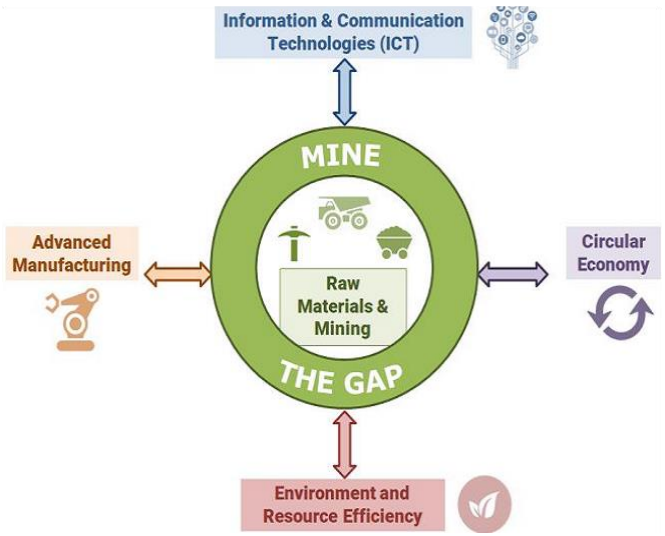
INNOSUP-01-2019

Horizon 2020
European Union Funding for Research & Innovation

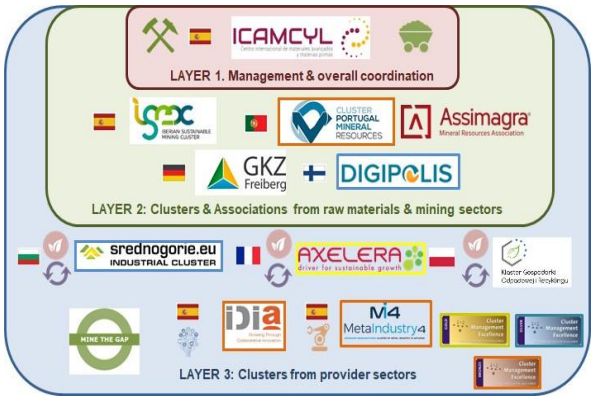


EU Council of Mining regions

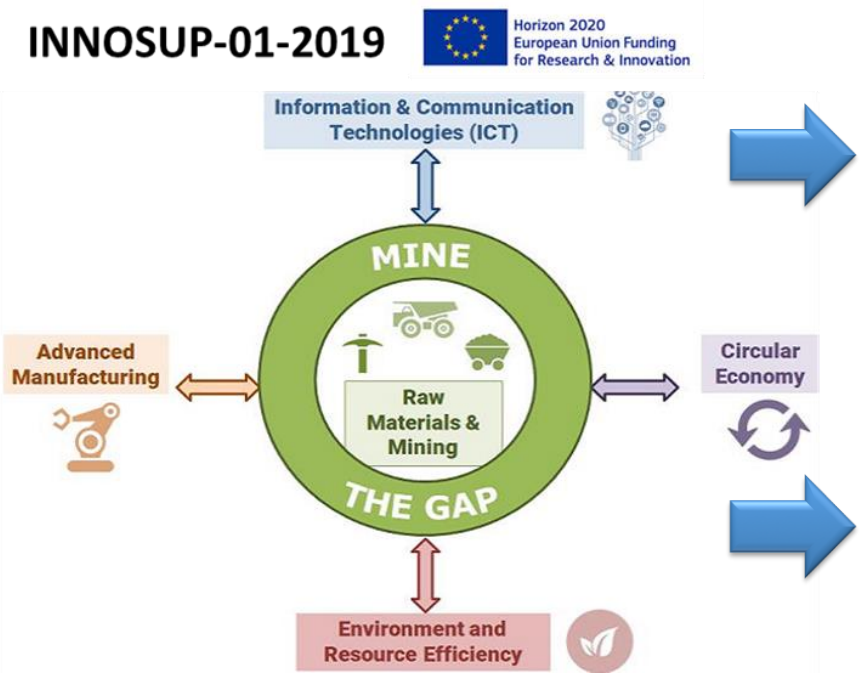
SMARTY
Interreg Europe

Interreg Europe

14 Partners | 10 regions | 7Countries | 8 Policy Instruments



MINE.THE.GAP Ecosystem CLEAR PRIORITIES AND FOCUS IN SMEs: Funding & Business



1. **Upgrading SME competitiveness in mining to industrial services**
   - role of clusters, digitalisation, access to finance, piloting, and technologies
2. **Sustainability of mining**
   - circular economy, industrial symbiosis, recovery-reuse, reduce pollutants, and social licensing
3. **Inter - Regional Business Hubs**
   - Potential for public funding/financing of SMEs
4. **Social and industrial related value chains**
   - highly synergetic raw materials value chains
5. **Value chain elements**
   - digitalisation of the industry (related to the development of the testing centre or the automation of mining

By means of the MINE.THE.GAP ECOSYSTEM
Help and support > 500 SMEs - Secure > 100.000 jobs - Support > 25 EU regions

MINE.THE.GAP Open Calls (Incomming 2020 - 2021)

MINE-PoC

MINE-PoC: Design and implementation of a prototype/proof-of-concept to demonstrate the viability of the proposed solution.

TRL: 6-7

Project lifetime: 9 months

MINE-Demo

MINE-Demo: Developing and testing of a fully functional demo/pilot in a production environment with all the major features of the product/ service/solution.

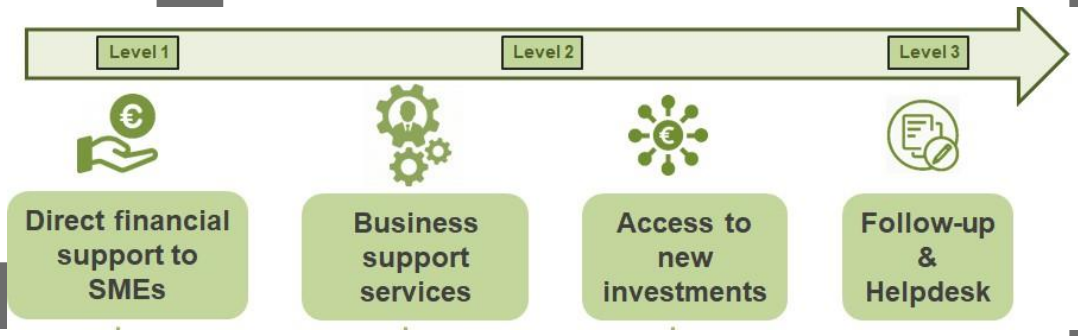
TRL: 7-8

Project lifetime: 12 months

Total no. SMEs in the 'adopters' sectors: 29

Total no. SMEs in the 'provider' sectors: 58

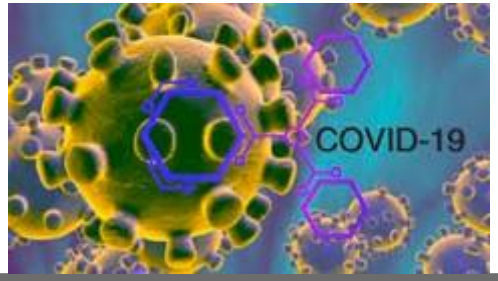
Maximum no. expected SMEs benefited: 87



OPEN CALLS

URGENT COVID-19 CALL?:

Making the raw materials industry resilient to pandemia



Case study 1: Linking ICT and mining – A reinforced value chain

A junior mining company in Spain incorporates cutting-edge remote sensing and satellite technology from a German SME, replacing traditional, ground-based exploration methods on the field in a new Tungsten mine•

The problem

The mine is in an area *of* dlfficult acc:ess, where ground-based exploration is challenging. This exploratlon phase is taklng longer than expected, hinde rtna access to flnance and Jeo pardlsing the whole project.

The technolo1Y

Satellite imqery and remate sensori1111 prevlously used In agrlculture can hiahlight ore bodies, the ir minerallsation or alte ration, variabillty throuah the mine site and associated stn.ictural features.

The project

A Spanish mining company and a German ICT company receive fundina throuah MINE.THE.GAP, resulting in **a** cross-regional, cross-sectoral project for adaptlng satellite technolOIIY to the mining lndustryneeds.

E IMPACT

The mining company

- Accelerate explo ratlon phase
- lmprove access to flnance
- Reduce operatlonal costs
- Can use the technolgy in subsequent phases

The ICT company

- Accessa new market
- Galn newknowledge
- Offer a new service
- Strenghten intemational presence

EBIG PICTURE

SHORTER, REINFORCED VAWE CHAIN

ECONOMY THRIVES AT LOCAL MINE SITE

INTERREGIONAL UNICS STRENGTHEN

SOCIAL ACCEPTANCE IMPROVES

Case study 2: Linking advanced minerals processing and circular economy – A new value chain

A WEEE management company in Poland incorporates advanced, tailored-made hydrometallurgical processes from a Finnish company for recovery and reuse of high added value rare earth elements (REE) and other critical raw materials (CRM).

01

The missed opportunity

Metal scrap is recovered from electronic waste and sold to metallurgical companies as a mixed alloy for lower value applications. However, it contains significant amounts of highly valuable elements (REE & other CRM).

02

The advanced technology

Recently developed hydrometallurgical technologies allow tailored-made solutions for the recovery of REE and other CRM in a cost-effective, environmentally-friendly and sustainable process.

03

MINE.THE.GAP

The project

MINE.THE.GAP Open Calls provide a hub where a Finnish company specialised in advanced processing technologies joins a Polish WEEE company for the recovery of products of higher added value.

THE IMPACT

The recycling company

- Add new value to its products
- Contribute to the circular economy
- Extend its customer base
- Improve its knowledge on materials recovery

The AM company

- Access a new market
- Gain new knowledge
- Offer a new service
- Strenghten international presence

THE BIG PICTURE

- A NEW VALUE CHAIN IS CREATED
- THE CIRCULAR ECONOMY IS REINFORCED
- INTERREGIONAL LINKS STRENGTHEN
- DEPENDENCE ON IMPORTS LESSENS

ICAMCYL
Centro internacional de materiales avanzados y materias primas
International center for advanced materials and raw materials

ismc
IBERIAN SUSTAINABLE MINING CLUSTER

Thank you for your attention

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