



Transformation of car industry from the European perspective

EU response to challenges in batteries, chips and raw materials

Josef Schwarz

*Representation of the European Commission
in the Czech Republic*

9 June 2022

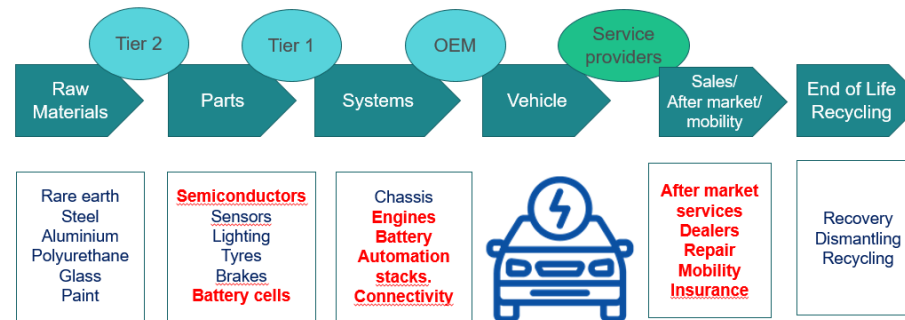
Transformation of the EU Automotive Industry

- 1) Introduction: Future of automotive sector
- 2) **Batteries**
- 3) **Semiconductors**
- 4) **Critical raw materials**
- 5) Next steps: EU legislative proposals

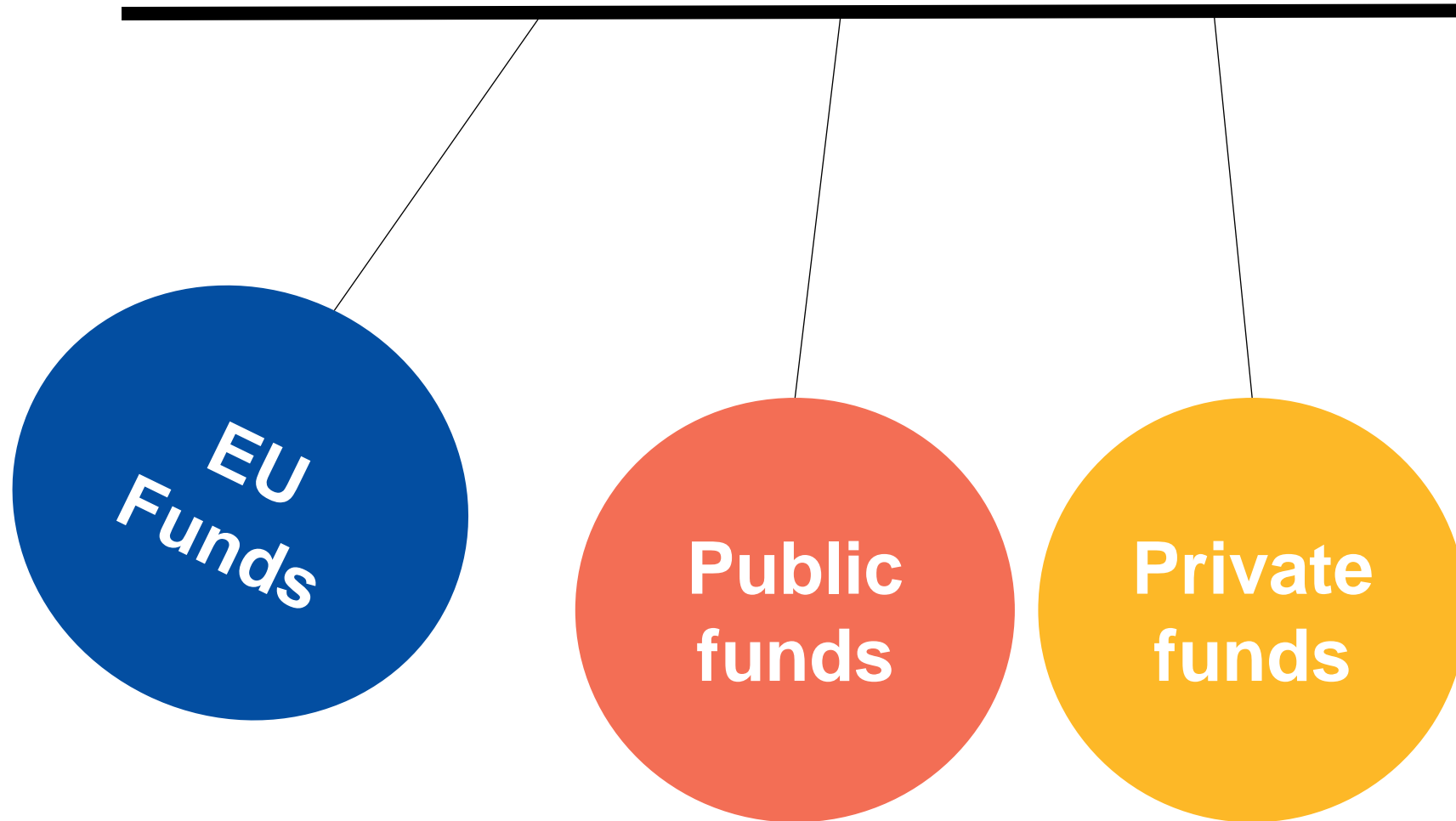
1. A sea change in the automotive ecosystem

	Autonomous driving	Connectivity	Mobility as a service	Clean technologies
Description	Automated and self-driving vehicles with built-in sensors and actuators that help them navigate on their own via AI-enabled driving algorithms	Connectivity functions that connect vehicles with each other and their surroundings, enabling e.g. IoT applications, traffic management and over-the-air updates	Broad palette of shared mobility modes (e.g., ride-hailing, car sharing, micro-mobility) and mobility aggregator platforms	EVs as well as the required components and infrastructure (e.g. batteries, public and private charging infrastructure), hydrogen technology, etc.
Global market	€46 billion (2019) ↓ €472 billion (2026) <i>In 2019, EU was 40% of the market</i>	€46 billion (2020) ↓ €141 billion (2025) <i>In 2019, EU was 30% of the market</i>	€28 billion (2019) ↓ €59 billion (2027) <i>In 2019, US was 1st, EU was 2nd</i>	€138 billion (2019) ↓ €715 billion (2027) <i>1st is China, 2nd Europe</i>

Affecting value distribution:



UNLOCKING INVESTMENT



Current challenges and developments

Challenges:

- Impact of Covid
- Semiconductor shortage
- Ukraine
- Jobs

Developments in 2021:

- Petrol car sales fell by a third (34%), diesel by a half (51%) **but!**
- Share of battery electric and plug-in hybrids almost doubled (from 11% to 18%) &
- Share of hybrids as well (from 12% to 20%)

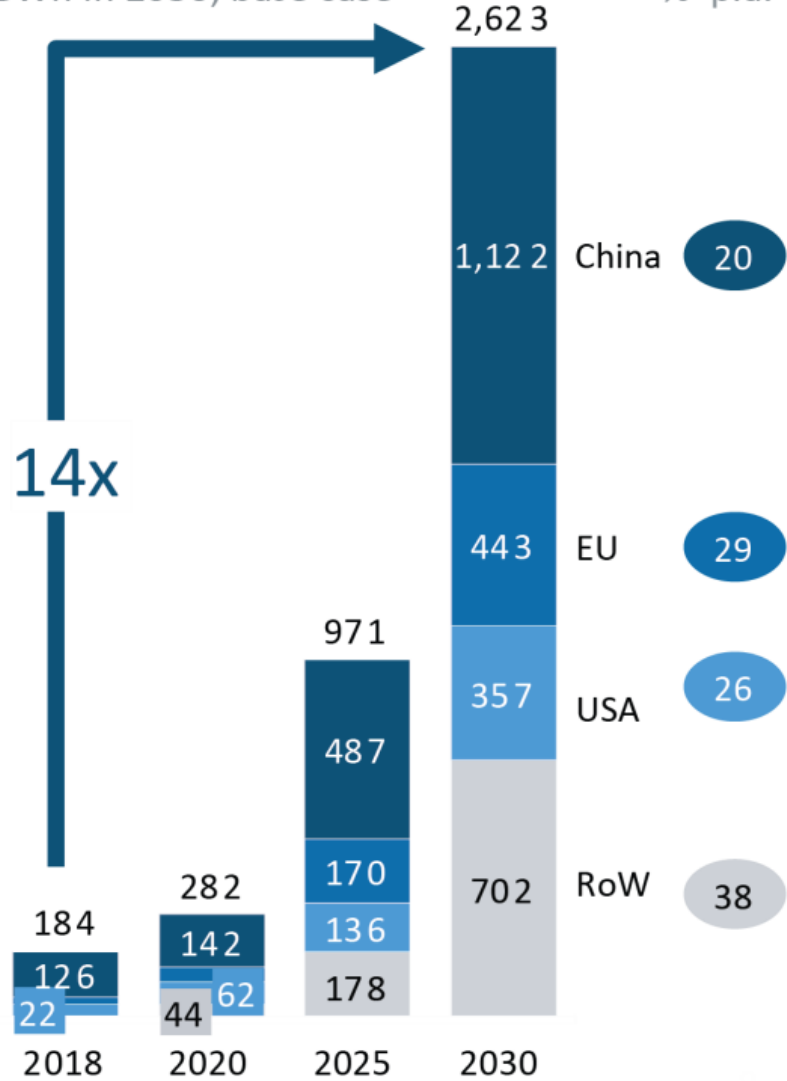
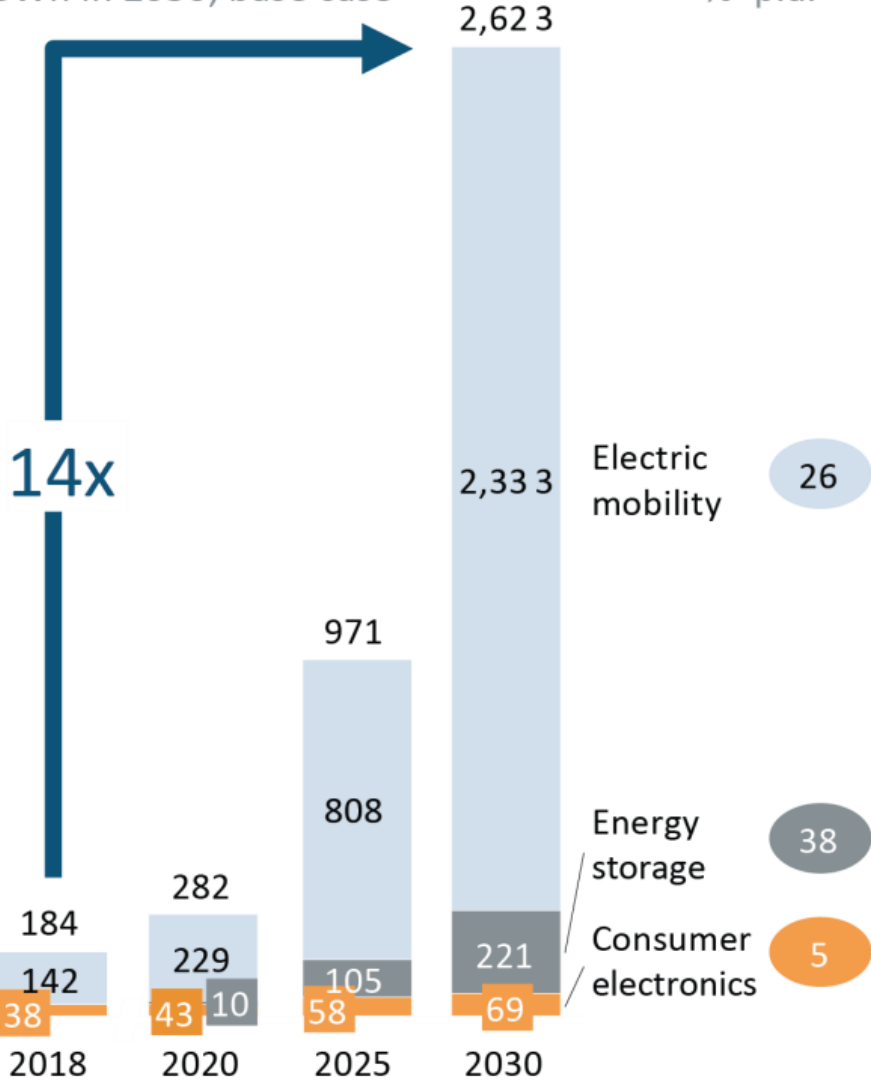
2. Massive need for batteries...

Global battery demand by application
GWh in 2030, base case

CAGR,
% p.a.

Global battery demand by region
GWh in 2030, base case

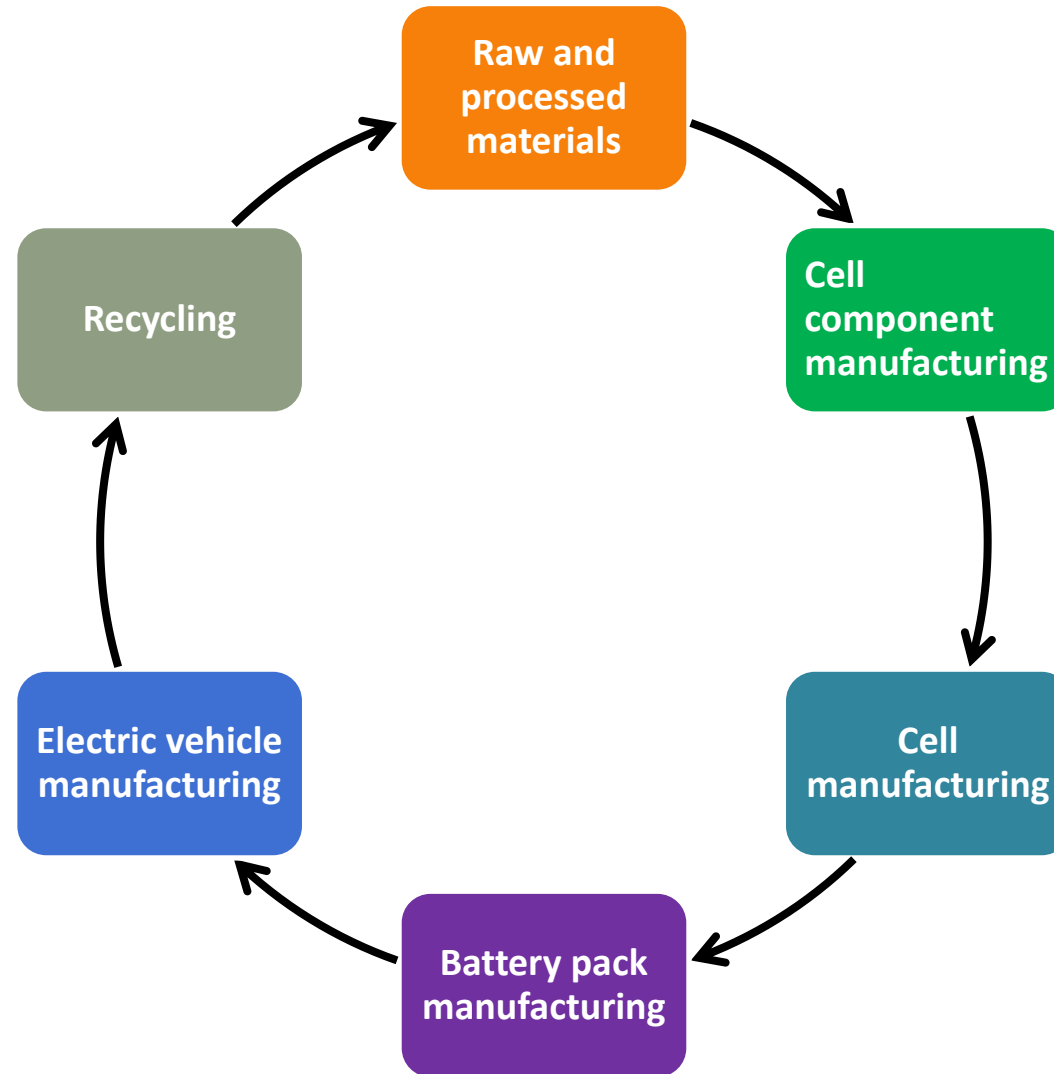
CAGR,
% p.a.



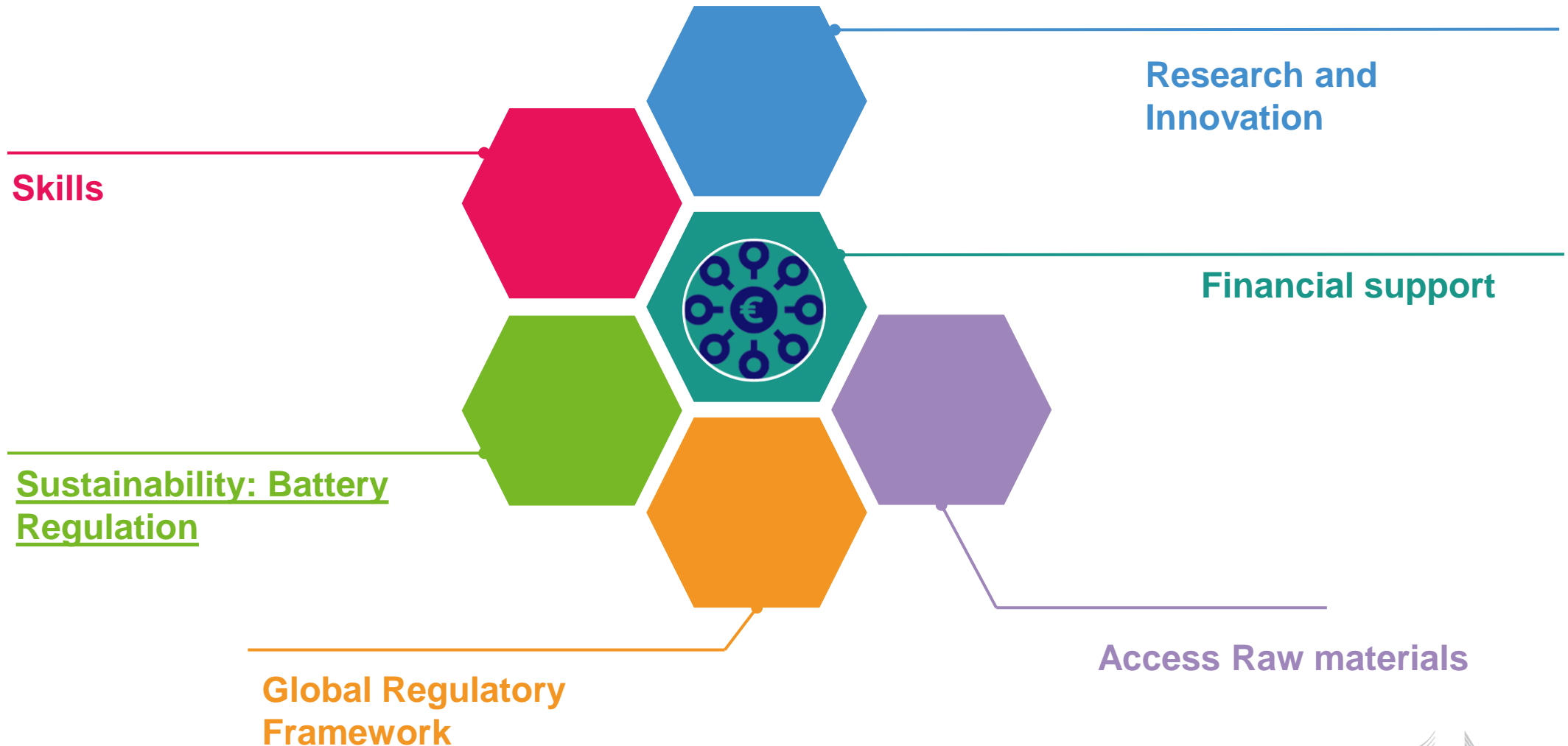
Source: Batteries Europe Strategic Research Agenda

European Battery Alliance

covers all segments of the value chain



Batteries: Instruments/Actions



European Battery Academy



Battery Skills – EU-supported Initiatives



Batteries: research and innovation

Horizon 2020

WP 2019-2020 -
Several battery calls
were organised within
Horizon 2020.

39 projects selected

€266 million

Horizon Europe: 2021 - 2027

Batteries Partnership: €925 million

WP 2022-23 (calls opened in April 2021, deadline for submission on 6 September 2022). Topics:

- Sustainable processing and refining of raw materials;
- High-performance and safe batteries for e-mobility;
- Smart functionalities in battery cells;
- Integrated and sustainable manufacturing & advanced production;
- Battery recycling technologies and logistics.

Automotive: Context

Green Deal (December 2019) –
Climate Neutrality by 2050

Industrial Policy (March 2020 & May 2021) – EBA the basis for Industrial Alliances policy

Climate Law (September 2020) -
revised EU emission reduction target
of at least 55% by 2030

Mobility Strategy (December 2020)
– various policies to support zero-
emission mobility

Major shift to electric vehicles:

VW – build 6 giga-factories

Volvo – 50% of HDVs to be electric
by 2030

Renault – Zoe No 1 EV in the EU and
as profitable as its ICE equivalent
Clio.

BMW – ending ICE production in
Germany

> 1 million EVs sold in EU in 2020

EU policy framework



- European Green Deal (12/19)
- New Industrial Strategy for the EU (03/20)
- New Circular Economy Action Plan (03/20)
- The recovery plan for the EU (05/20)
- Critical Raw Materials Action Plan (09/20)
- Sustainable batteries regulation (12/20)
- Conflict minerals regulation (in force since 01/21)
- Updated 2020 new industrial strategy (05/21)
- EU strategy for critical raw materials (11/21)
- European Chips Act (2/22)
- CZ PRES (7-12/22)

Raw
Materials

Global semiconductor shortage: More challenging times ahead for Europe's major carmakers



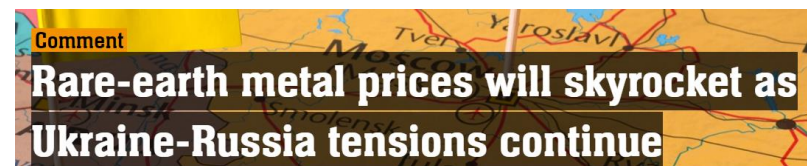
EU leaders signal alarm over Chinese magnesium crunch

Germany's Merkel and Czech PM Babiš fear Europe's car industry will be hit hard.



Most Read Articles

1. Polish protests erupt against abortion law after woman's death
NOVEMBER 7, 2021 | 11:52 AM
2. EU tells UK: It's your turn to compromise on Northern Ireland
NOVEMBER 5, 2021 | 4:20 PM
3. Merkel vows not to become political "troubleshooter" in retirement
NOVEMBER 7, 2021 | 7:50 PM
4. UK health minister: Get booster shot, avoid Christmas restrictions
NOVEMBER 7, 2021 | 1:22 PM
5. At COP26, Rwandan minister hits back

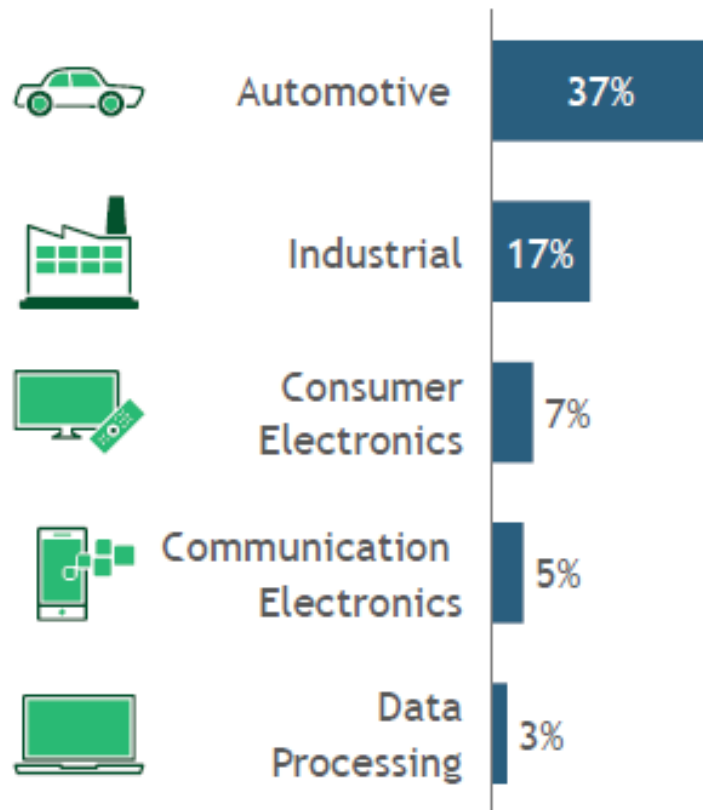


By Abizer Shaikhmahmud, Future Market Insights
Published Wednesday, March 2, 2022

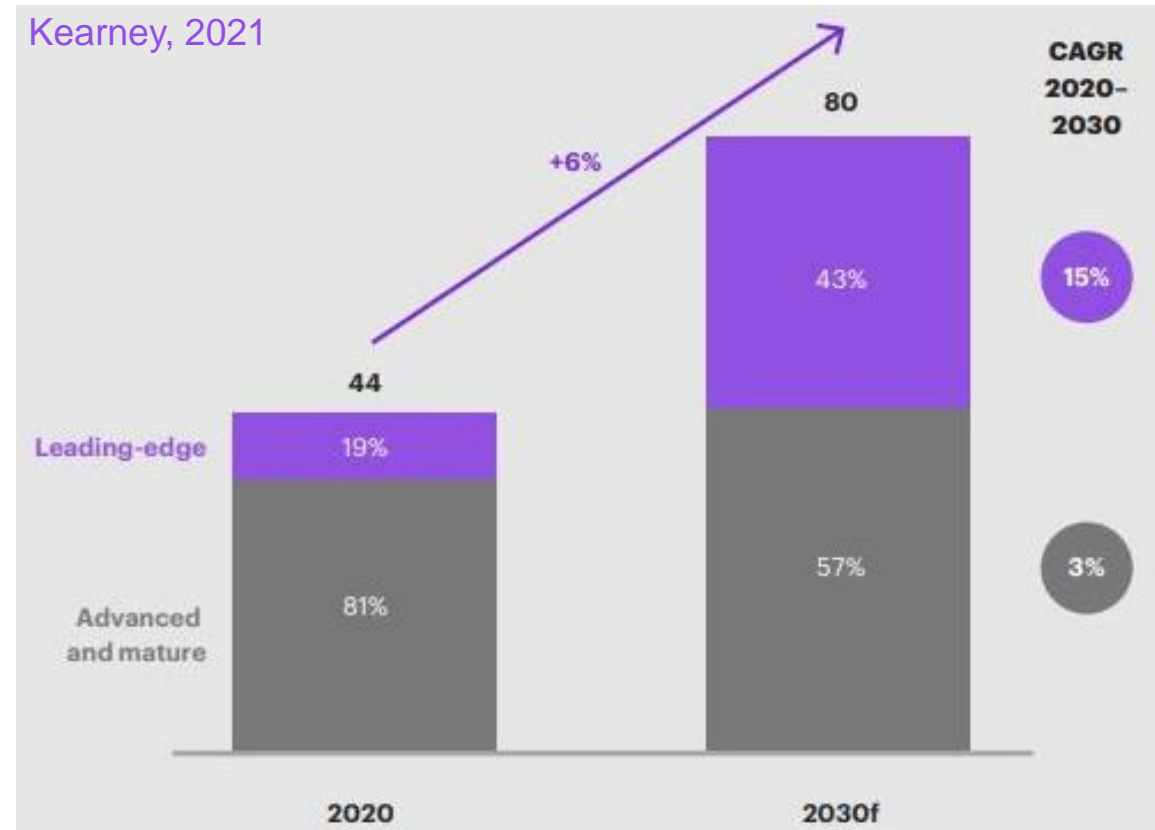
The Ukraine-Russia conflict may escalate rare-earth metal prices across key application industries.

3. European chip market by end use

Europe share by end-application, 2019



European consumption of leading-edge chips is poised to skyrocket in the next decade



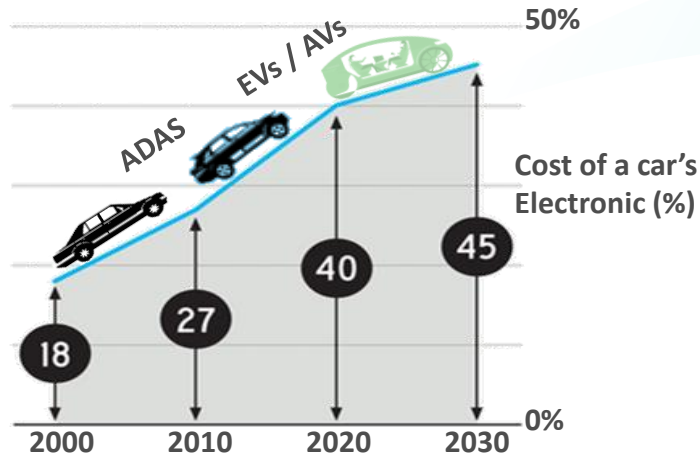
Semiconductors in automotive

Challenges

Possible Solution(s)

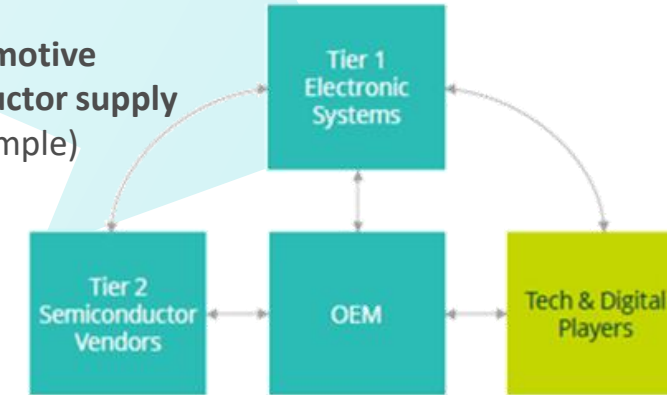
Automotive: manufacturers must rethink their supply chain

Automotive : Semiconductors become strategic



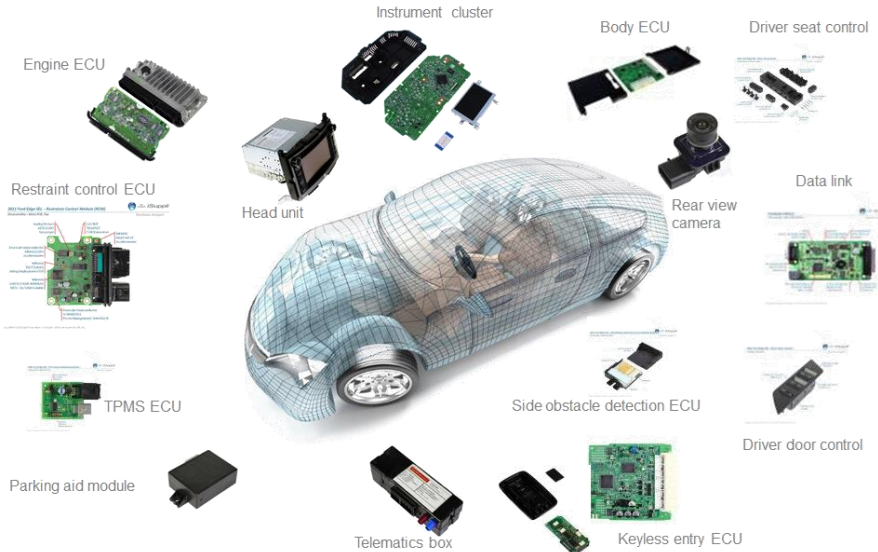
Classic automotive semiconductor supply chain
Usually a Lean supply Chain

New automotive semiconductor supply chain (example)



Semiconductors:

1. World-wide value chain
2. Strong dependency on few actors
3. Market disruption: COVID and international tension



Semiconductors: EU to increase its resilience for the technologies of the future: Chips Act, IPCEI, Horizon Europe, FDI screening



European Chips Act

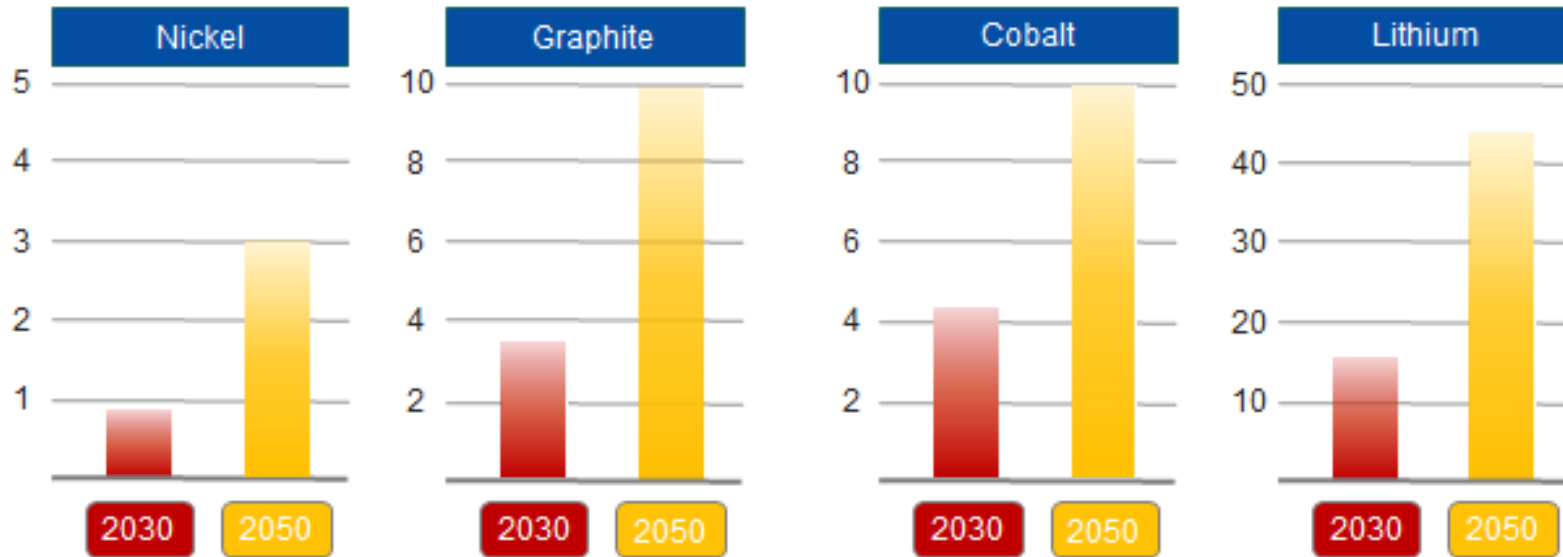
- **Investments in new technologies** (€43 billion of public & private investment)
- Access across Europe to **design tools and pilot lines for the prototyping, testing and experimentation of cutting-edge chips**
- **Certification procedures for energy-efficient and trusted chips**
- An **investor-friendly framework** for establishing manufacturing facilities in EU
- **Support for innovative start-ups, scale-ups and SMEs**
- **Fostering skills, talent and innovation in microelectronics**
- Tools for **anticipating and responding to semiconductors shortages**
- Building **semiconductor international partnerships** with third countries

Chips: EU's actions

- **Important Projects of Common European Interest (IPCEI)** since 2018
- **Screening of Foreign Direct Investment**
- **EU Alliance on processors and semi-conductor technologies** launched in July 2021
- **Key Digital Technologies Joint Undertaking** launched in November 2021
- **European Processor Initiative**
- **Strategic Trade Action Plan for Semi-Conductors (STAPS)**
- **Technology and Trade Council with the U.S. (WG 3)**
- **EU oriented study will look at chips demand towards 2026**

4. Critical raw materials

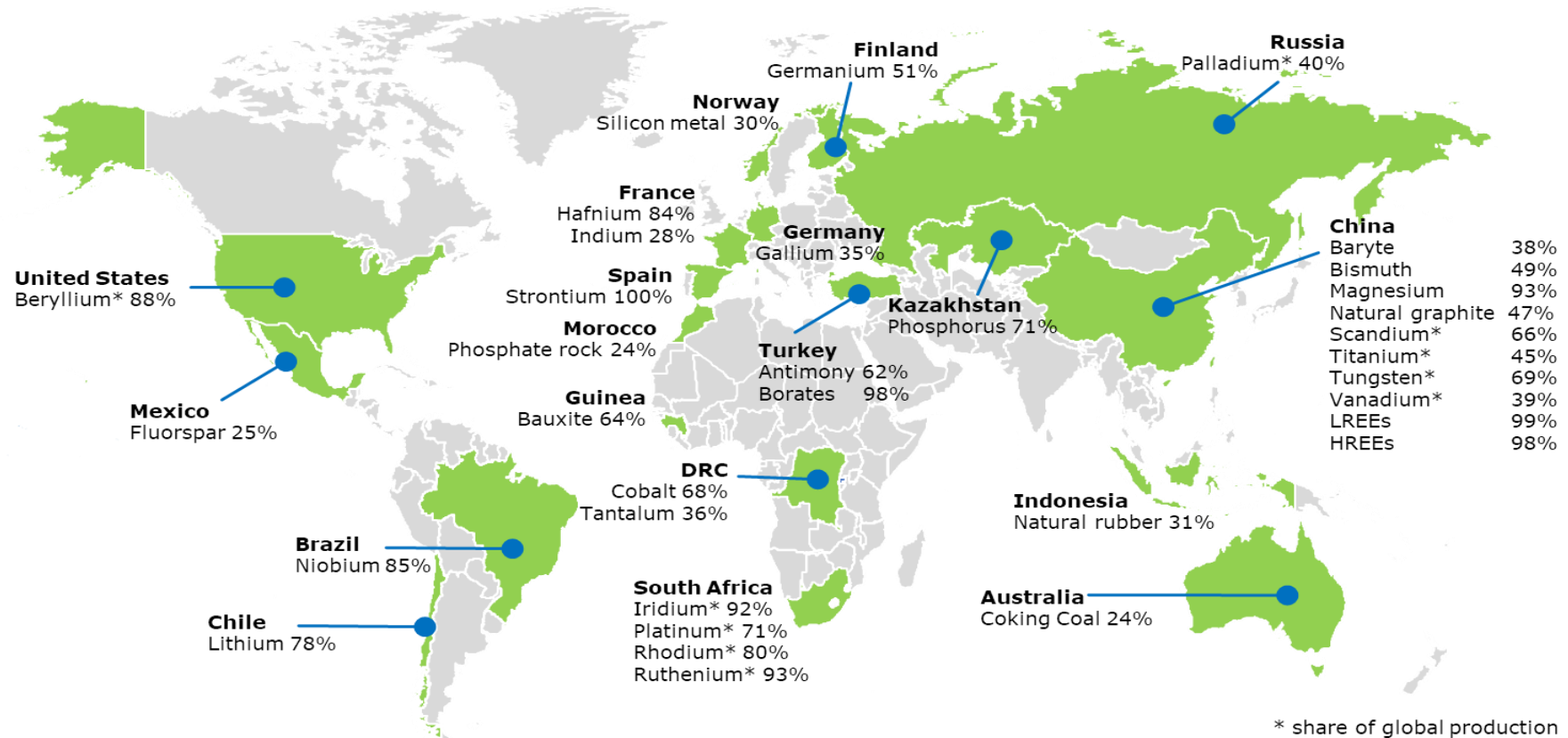
The demand for battery raw materials will increase



Source:
Critical Raw Materials for Strategic Technologies and Sectors in the EU; A Foresight Study.
Joint Research Centre, European Commission, 2020



Main Critical Raw Materials suppliers of the EU



Source: "European Commission, Study on the EU's list of Critical Raw Materials – Final Report (2020)"

Political climate ripe for action on CRM strategic autonomy and resilience

President Von Der Leyen (23/02/2021)

'Green and digital technologies currently depend on a number of scarce raw materials. [...] 98% of the rare earth elements we need come from China. This is not sustainable'.

- We must **invest** in **circular technologies** that re-use resources instead of constantly extracting them.
- We must **diversify** our supply chains.'

European Parliament report of 24 November 2021 on European strategy for critical raw materials (MEP Bentele)

- Call for EU strategy to boost Europe's strategic autonomy and resilience
- Strong support for action, but call for more urgency
- Call for diversification, more recycling and domestic sourcing
- Bringing in investment throughout the CRM value chain
- Focus on strategic steps
 - stockpiling of critical raw materials
 - future FTAs and PAs should include CRM provisions

Action Plan on Critical Raw Materials

10 actions to ensure Europe's access to raw materials

1. European Raw Materials Alliance
2. Develop sustainable financing criteria for mining
3. Research and innovation on waste processing, advanced materials and substitution
4. Map the potential supply of secondary CRM from EU stocks and wastes
5. Identify priority mining and processing projects for critical raw materials in the EU
6. Develop expertise and skills
7. Deploy Earth observation programmes for exploration, operation and post-closure environmental management
8. Develop research and innovation projects on exploitation and processing of CRMs
9. Develop strategic international partnerships to secure CRMs supply
10. Promote responsible mining practices for CRMs

The European Raw Materials Alliance

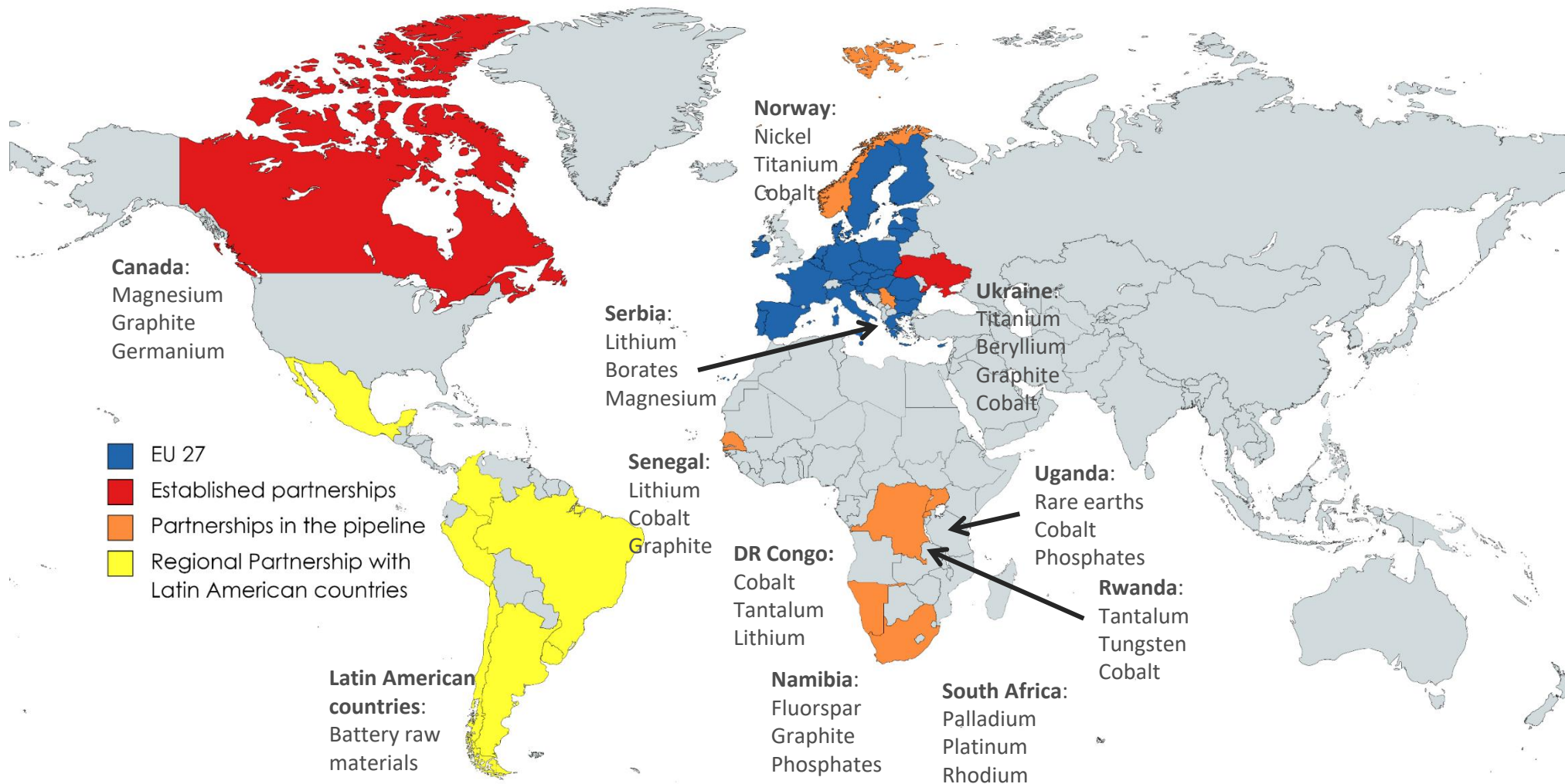
- Launched on 29 September 2020 by Commissioner Breton and VP Šefčovič
- **Vision:** To secure access to critical and strategic raw materials, advanced materials, and processing know-how for the EU Industrial Ecosystems
- Operationally managed by EIT RawMaterials, a Knowledge and Innovation Community of the European Institute for Innovation and Technology
- **Network:** Over 1500 Individuals from around 600 organizations and 50 different countries – includes JP, US, CA and AU members

Two Main Workstreams

- Stakeholder **consultation processes** – value chain specific, to identify regulatory bottlenecks (> 600 partners) – **REE permanent magnets and motors 1st priority**
- Raw Materials **Investment Platform** (> 125 investment projects identified to date)



Stakeholders can join the Alliance by signing its declaration under <https://erma.eu>



Strategic partnerships for supply security

5. Next steps: EU legislative proposals

- **Alternative Fuels Infrastructure Regulation (AFIR) & Intelligent transport systems** – general agreement by the Council on 2 June 2022, first vote in the European Parliament possibly in October, trialogues could start in November
- **Batteries Regulation** – on the agenda of the ENVI Council (end of June 2022)
- **CZ PRES** (July – December 2022)
- **Emissions standards (Euro 7)** – Commission proposal in July 2022 (tbc)
- **End of Live Vehicle Directive** – Commission revision proposal in Q4 2022

Thank you



© European Union 2022

Unless otherwise noted the reuse of this presentation is authorised under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license. For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.



Sustainable and Smart Mobility Strategy

Strategy (December 2020) for a clean, digital and modern economy for the EU transport sector.

82 initiatives in 10 key areas for action (“flagships”) including:

- **By 2030**

- **30 million zero-emission cars** will be in operation on European roads by 2030 and **80 000 zero-emission lorries** in operation.
- **100 European cities** will be climate neutral by 2030
- **automated mobility** will be deployed at large scale
- 3 million **public recharging points** and 1 000 **hydrogen** stations

- **By 2050**

- nearly all cars, vans, buses as well as new heavy-duty vehicles will be **zero-emission**
- the multimodal **Trans-European Transport Network (TEN-T)** equipped for sustainable and smart transport with high speed connectivity will be operational.



Business case for the automotive industry in the green and digital transition

Inputs/supply chain resilience

- **Battery Alliance**
- **Raw Material Alliance**
- **EU Chips Act**
- **Clean Hydrogen Alliance** – need clean hydrogen supply for heavy-duty vehicles
- **RePowerEU** – intensifying work on supply of critical raw materials

Technology & skills

- **Automotive Skills Alliance** under the Pact for Skills
- Alliance for Batteries Technology, Training and Skills (ALBATTTS)
- R&I partnerships under **Horizon Europe**: ‘Batteries’, ‘Clean Hydrogen’, ‘Towards Zero-Emission Road Transport (2Zero)’
- EU automotive industry accounting for **1/3 of EU business R&D** – focus on electromobility and connected vehicles
- Standard Essential Patents

Regulatory framework

- **Fit for 55 / CO2 standards, including AFIR** – clear market signal for zero-emission cars
- **Euro 7** – improving air quality without burden to industry
- **Access to in-vehicle data** – allow flourishing market for data-driven services
- **Automated driving** – first rules to allow fully automated cars from July 22

Markets

- Huge **EU trade surplus** for cars (€76 bn), but need to keep the lead with Chinese competition on EV and automation
- **FTAs** with car annex to avoid technical barriers to trade
- **Harmonisation of technical rules** in World Forum/UNECE

Skills

Automotive

- Ecosystem is facing unprecedented transformation:
 - Long-term shift to:
 - Zero-emission mobility
 - Digital mobility
 - New mobility concepts
 - Short-term - COVID impact
- Transition will lead to job losses but new jobs created
 - E.g. software/electrical engineers, AI specialists etc.
- Massive & sustained up- & re-skilling exercise needed

Batteries

- Major growth in EU battery eco-system – nearly 70 major projects (around 20 giga-factories planned)
- 3-4 m jobs (direct & indirect) expected to be created by 2025 – 800.000 will need to be reskilled by 2025
- Shortage of battery-specific skills (e.g. chemistry engineers) & industrialisation/mass production
- Anecdotal evidence that skill shortage already a significant problem



Batteries Sector
Ongoing (2019-2023)

Objectives

- Bring together key stakeholders – 20 partners (industry, education providers & regions) from 10 countries
- Identify skill needs
- Identify mutually recognised; job roles, skills & competencies
- Develop: common learning modules & training courses



Automotive Sector
Ongoing (2018-2021)



- Develop: common learning modules & training courses
- Identify mutually recognised; job roles, skills & competencies



FOR GREEN AND DIGITAL TRANSITION



The ambition:

1. Empowering 5% workforce/year => 700,000 up/re-skilling
2. €7bn private + public investment
3. Streamlining blueprint strategic outcomes to Europe-wide Automotive Skills Alliance Framework

Turning ambition into a reality:

Establishment of a **skills partnership for the automotive ecosystem**, based on the stakeholder's joint call

Updated intelligence about the automotive ecosystem and its development, as well as guidance to education and training bodies leading to continuous skills needs updates.

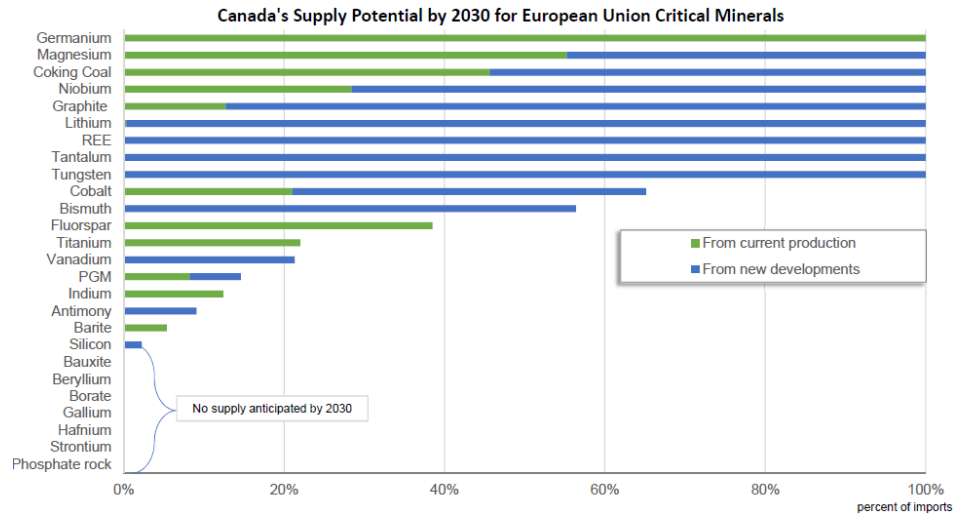
MASSIVE WORKFORCE UPSKILLING AND RESKILLING ACROSS THE AUTOMOTIVE ECOSYSTEM

EU-wide framework for skills and job roles building on DRIVES outcomes, as well as shared experience and best practices.

Platform for **exchange of best practices and one-stop-shop guidance** for the financial instruments available on European and national level for financing skills agenda

Strategic international partnerships

Concluded EU-Canada:

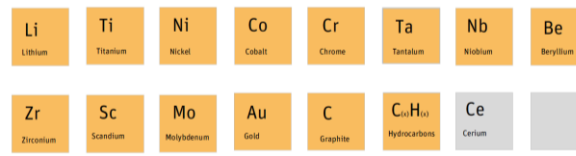


Strategic partnership endorsed at the EU-Canada summit on 14 June 2021.
Framework and action plan for 2021/22.

CRM dialogue EU-US-JP-AU-CA, Trade and Technology Council

EU-Ukraine:

Strategic and Critical Raw Materials



Strategic partnership signed on 13 July 2021 during the High Level Conference in Kyiv. Partnership Roadmap 2021-22.

Negotiations

EU Africa partnerships - CRM flagship initiative

- Serbia
- EU-Latin

America partnership project

- Norway cooperation