EUROPEAN RAW MATERIALS ALLIANCE | ERMA

RAW AND ADVANCED MATERIALS FOR ENERGY STORAGE AND CONVERSION

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eit RawMaterials
Connecting matters

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

ERMA IS SET UP TO WORK ALONG TWO DISTINCT WORKSTREAMS

ERMA action will be aimed at securing access to critical and strategic raw materials, advanced materials, and processing know-how for the EU Industrial Ecosystems

wide consultation

Value chain specific consultation process

- **Stakeholder alignment** through an open process
- **Identify raw material challenges** along industrial ecosystems and within wider society
- **Provide tailored solutions** to industry needs
- **Unlock regulatory bottlenecks**

case-specific actions

Investment channel for raw material projects

- **Select and prioritize** cases and projects to **secure raw materials supply to European industrial ecosystems**
- **Install investment platform** to bring investors and investees together
- Define **case-specific financing strategies** and **assess EU funding opportunities and financing sources**

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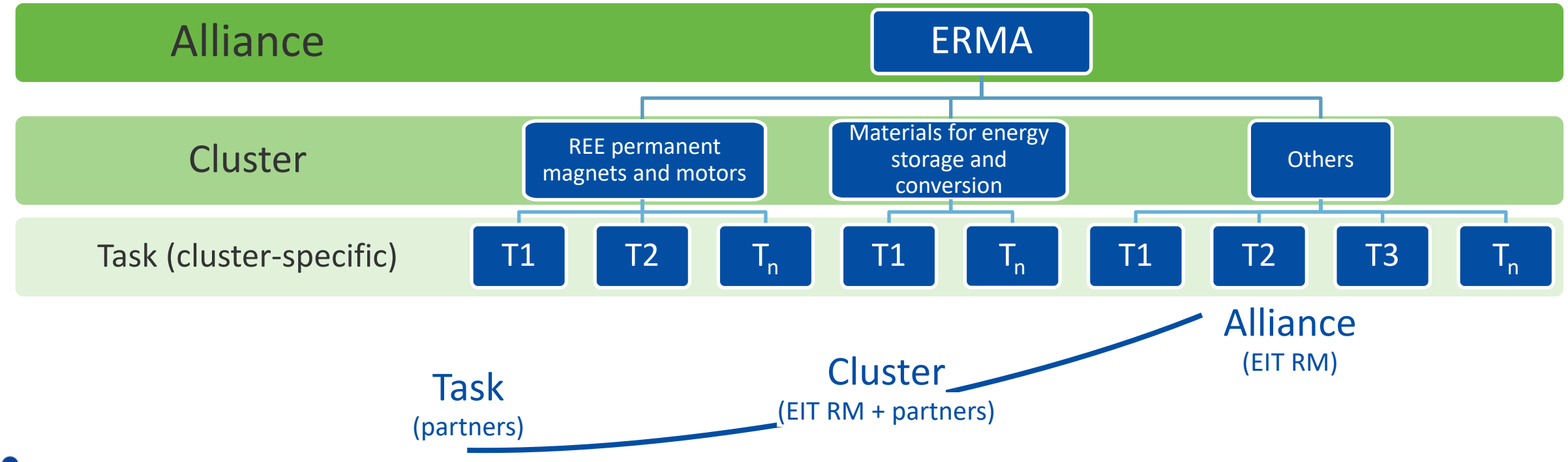
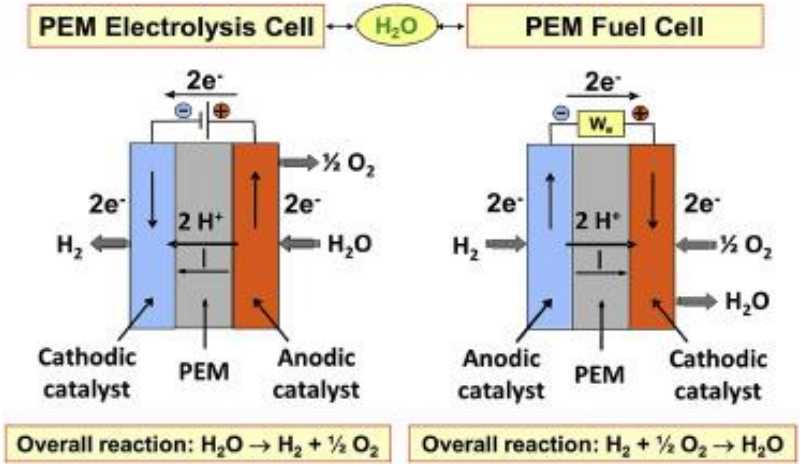


HYDROGEN TARGETS IN EUROPE

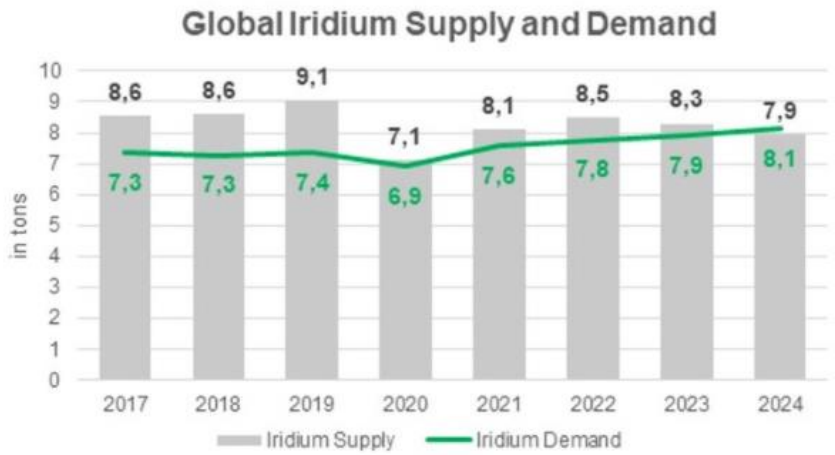
The path towards a European hydrogen eco-system step by step :

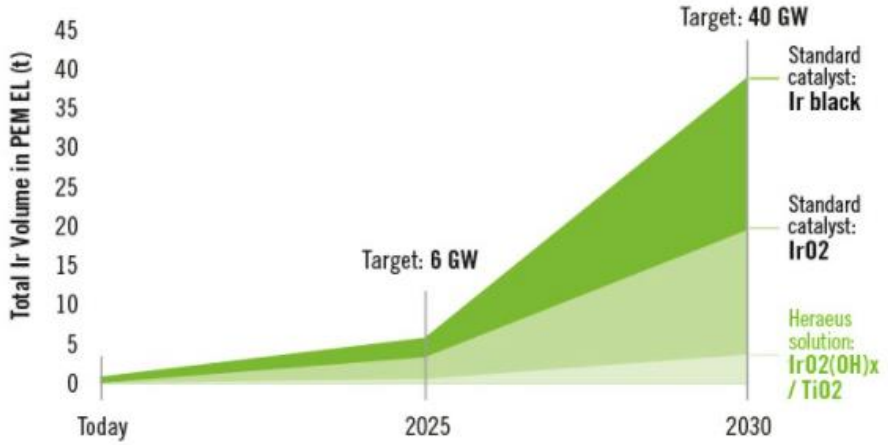
Today - 2024	2025 - 2030	2030 -
From now to 2024, we will support the **installation of at least 6GW of renewable hydrogen electrolysers in the EU**, and the production of **up to 1 million tonnes** of renewable hydrogen.	From 2025 to 2030, hydrogen needs to **become an intrinsic part of our integrated energy system**, with at least 40GW of renewable hydrogen electrolysers and the production of **up to 10 million tonnes** of renewable hydrogen in the EU.	From 2030 onwards, **renewable hydrogen will be deployed at a large scale** across all hard-to-decarbonise sectors.



GLOBAL IRIDIUM SUPPLY AND DEMAND

- The global iridium supply is about eight tons per year.
- A PEM electrolyser uses about one to two grams of iridium per kW electrolysis capacity.
- With a target of 40 GW electrolysis capacity for renewable hydrogen by 2030, 20 to 40 tons of iridium would be needed (at 20 GW of PEM electrolysis).

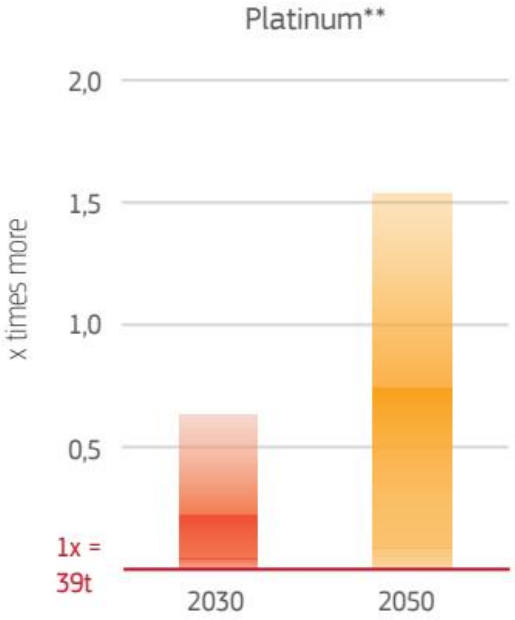




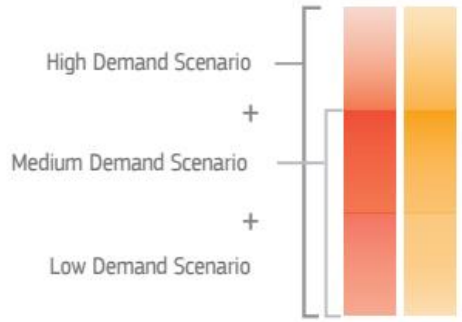
Source:Heraeus

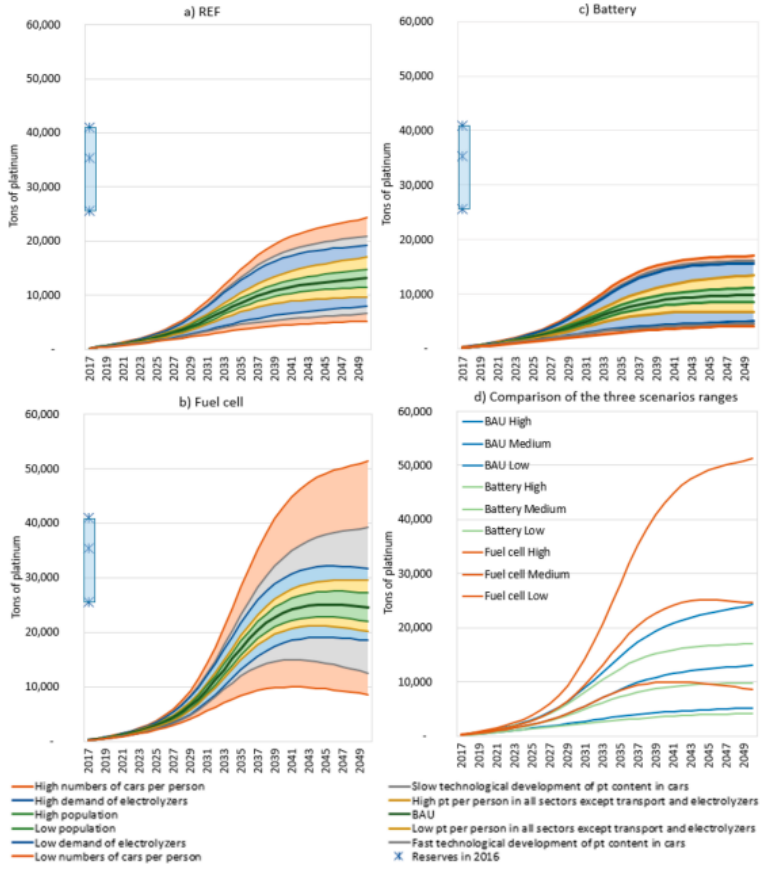
PLATINUM DEMAND IN HYDROGEN CONVERSION

Additional material consumption for fuel cells in **e-mobility and renewables** only in 2030/2050
compared to current EU consumption* of the material in **all applications**

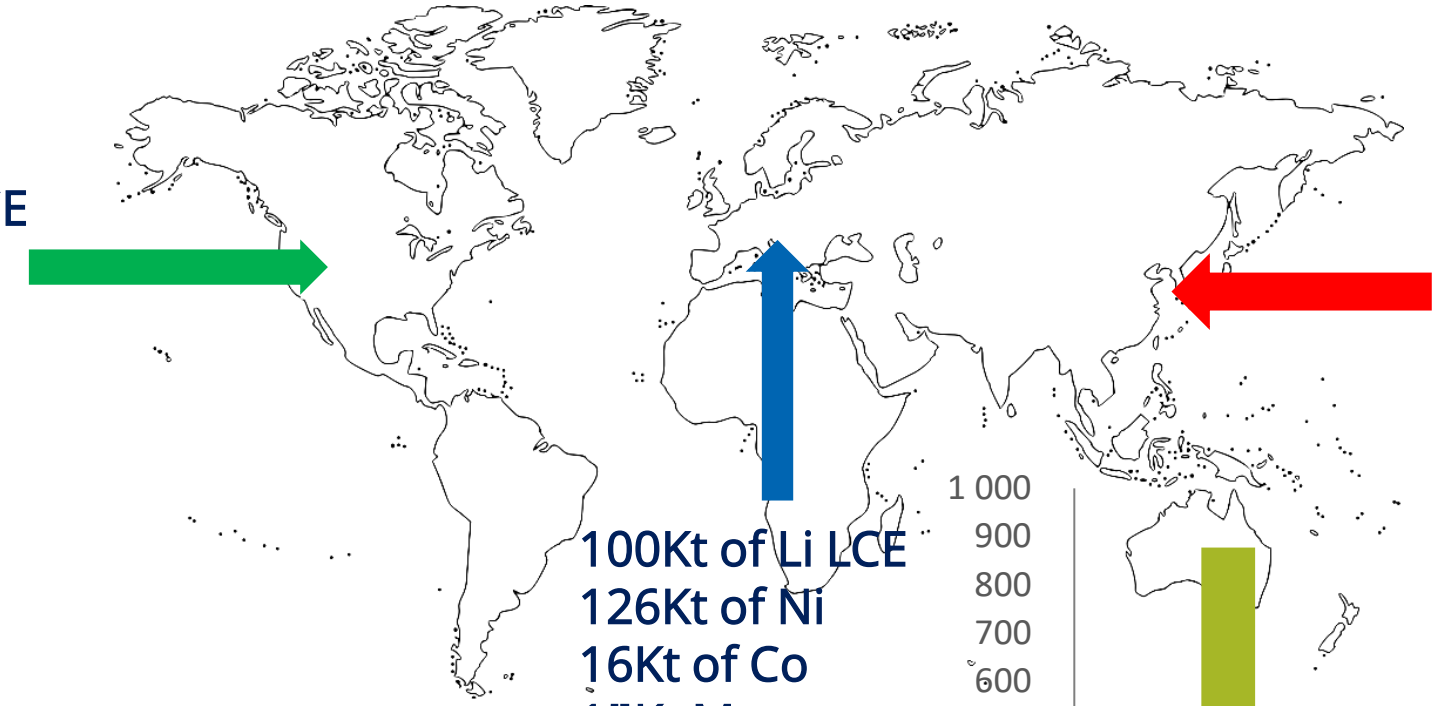


* See the methodological notes in Annex 1 and all data in Annex 2
** of refined supply (Stage II) instead of ore supply (Stage I)





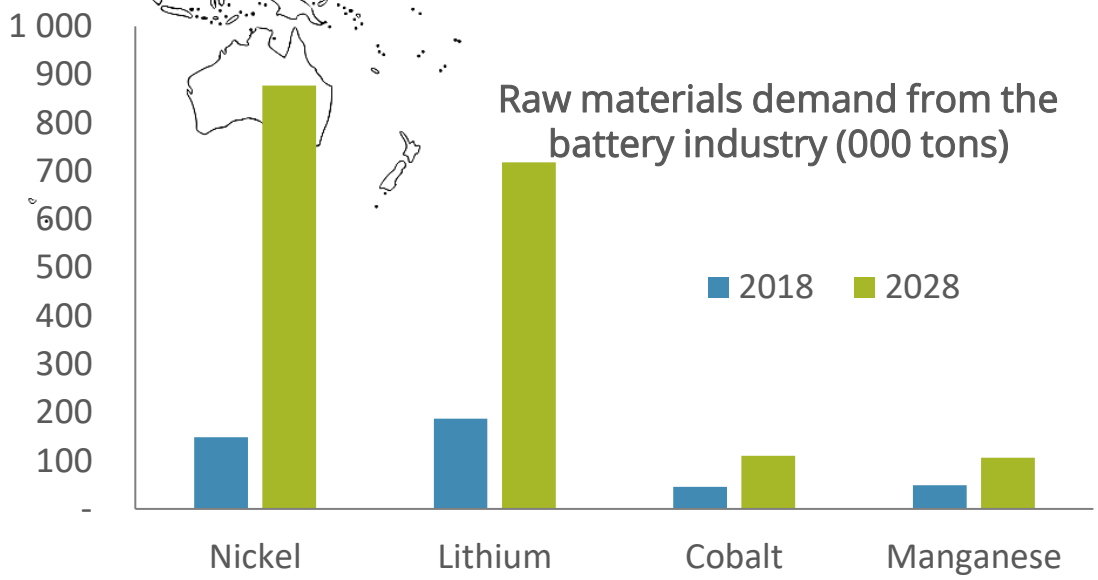
THE BATTERY CHAIN: DO WE GET ALL THE RAW MATERIALS NEEDED?



80Kt of Li LCE
105Kt of Ni
10Kt of Co
9Kt Mn

100Kt of Li LCE
126Kt of Ni
16Kt of Co
15Kt Mn

540Kt of Li LCE
640Kt of Ni
83Kt of Co
80Kt Mn

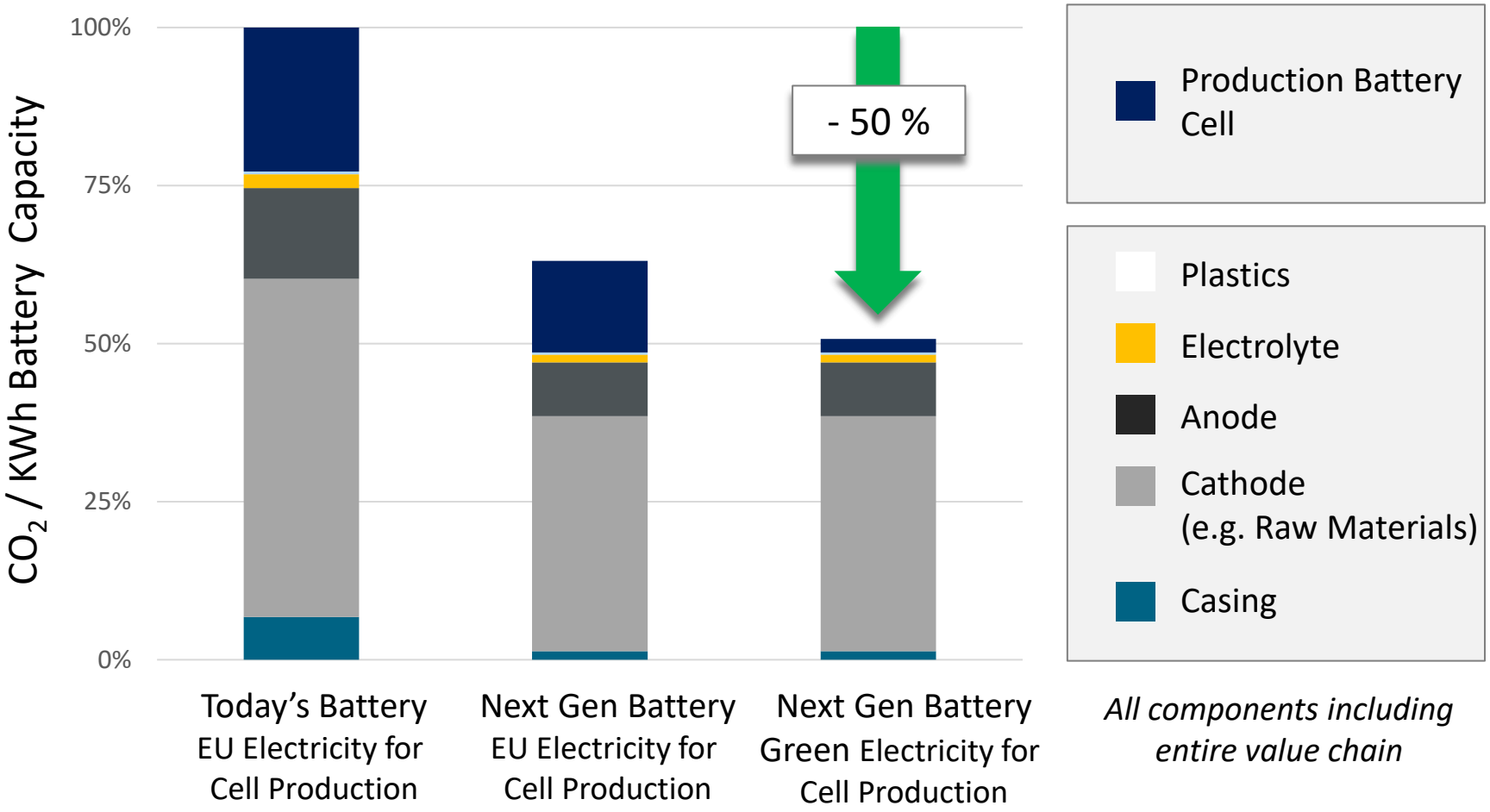


Demand growth in batteries by 2028

- Nickel = 6x more
- Lithium = 4x more
- Cobalt = 2.4x more
- Manganese = 2.2x more

Source: Roskill

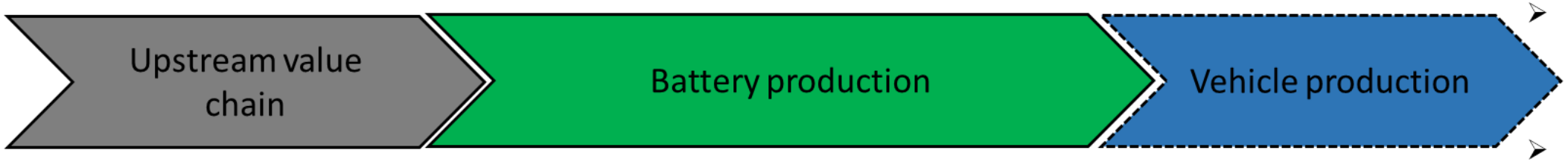
SUPPLY: POTENTIAL TO REDUCE EMISSIONS



The CO_2 footprint of a battery is largely influenced by the footprint of its materials, particularly of the anode and cathode

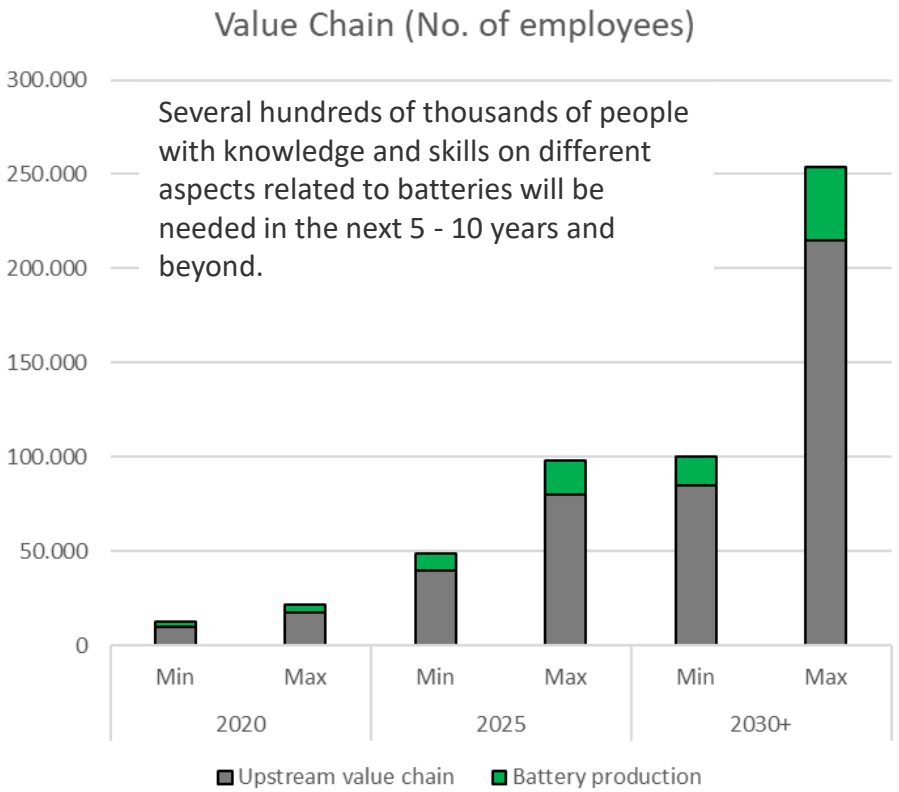
Source: Jens Warsen, ACEA

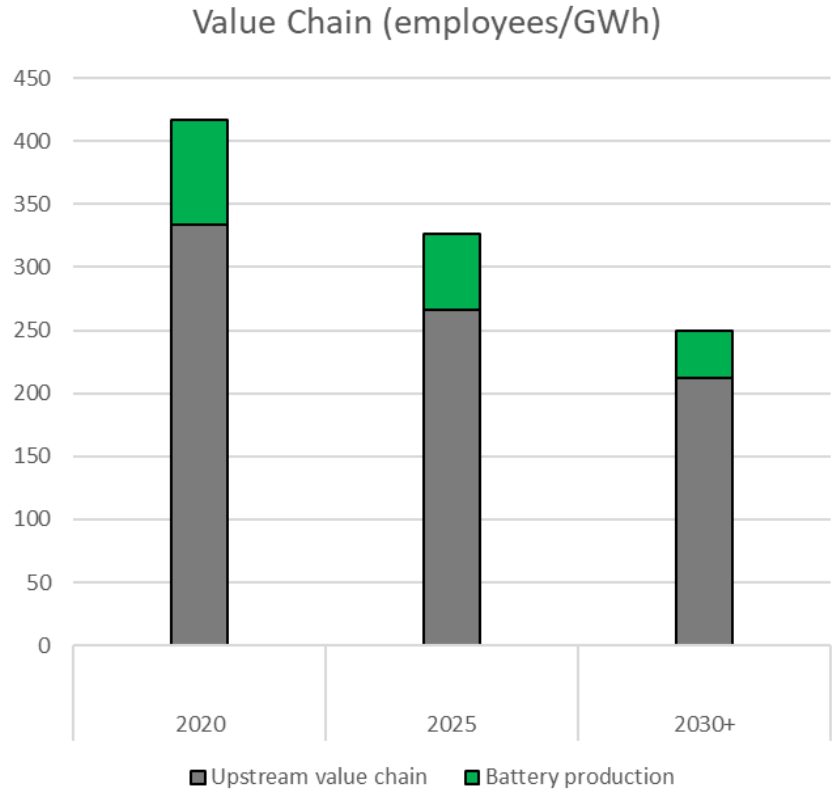
Employment effects and educational needs due to battery production

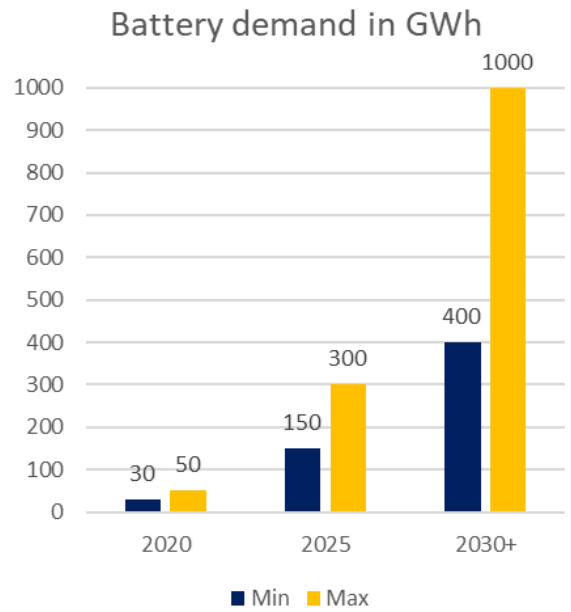


- Huge impact on upstream value chain 4- 6 times higher than battery production itself.
- High uncertainties in current studies for employment effects in vehicle production.

Several hundreds of thousands of people with knowledge and skills on different aspects related to batteries will be needed in the next 5 - 10 years and beyond.



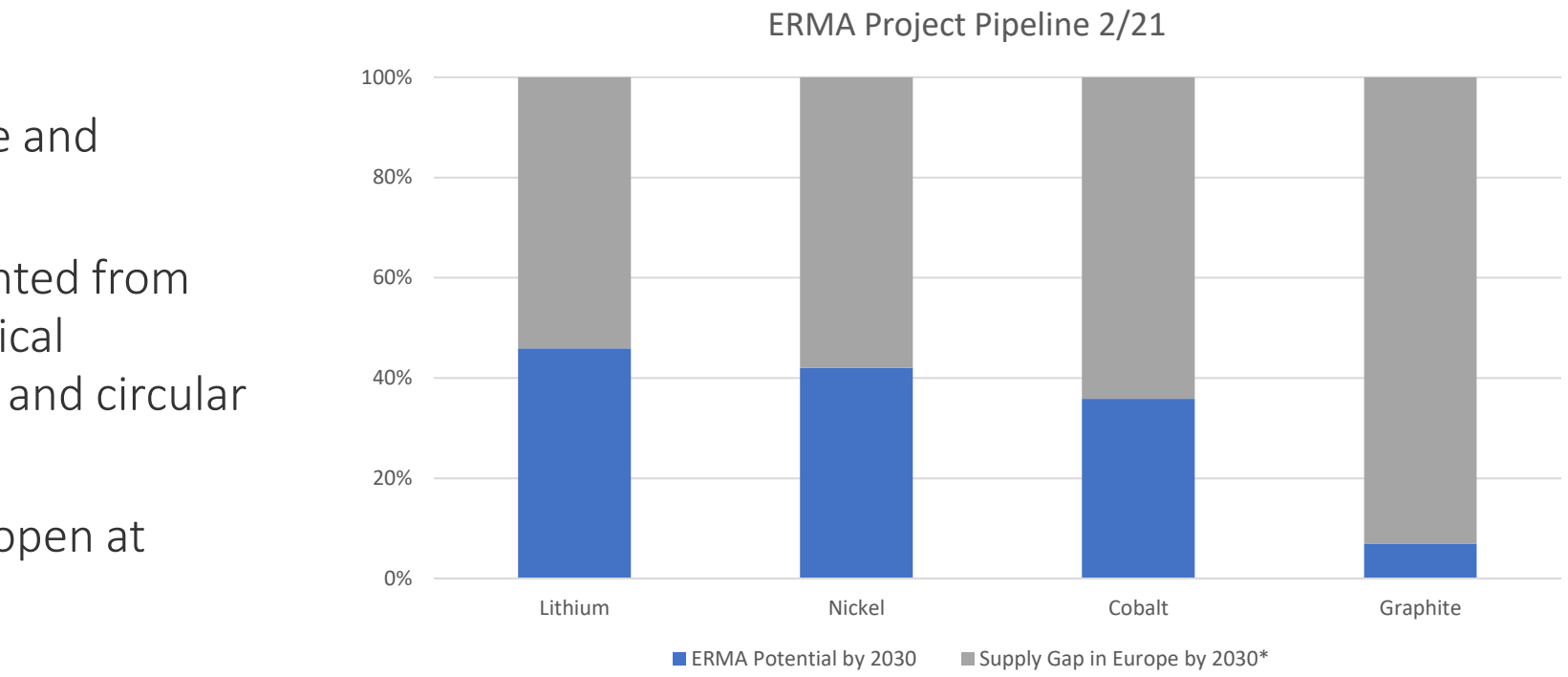




Source: ETIP Batteries Europe

INVESTMENT ACTIVITY IN ENERGY STORAGE AND CONVERSION

- > 30 proposals submitted
- Different value chains – storage and conversion – covered
- Cross-value chain well represented from exploration to metal and chemical processing, as well as recycling and circular economy
- Case submission continuously open at www.erma.eu



*Based on JRC demand estimates

GOALS FOR ERMA CLUSTER 2

main goal

To develop actions to tackle regulatory, technological, social and environmental issues around the extraction, processing and recycling of raw and advanced materials.

focus on materials for

- Battery solutions
- Hydrogen and alternative energy storage, spatial and geological energy storage alternatives
- Fuel cells and hydrogen production
- Solar conversion

NEXT STEPS

- Task forces created for
  - Fuel cells
  - Battery raw materials
  - Alternative energy storage
  - Solar conversion
- Each task force covers a number of topic areas, e.g
  1) Regulation
  2) Finance
  3) Innovation & technology
  4) Competitiveness
  5) Social licence to operate
  6) Skills / education
- To join the ERMA, the Cluster, and a task force: visit www.erma.eu

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