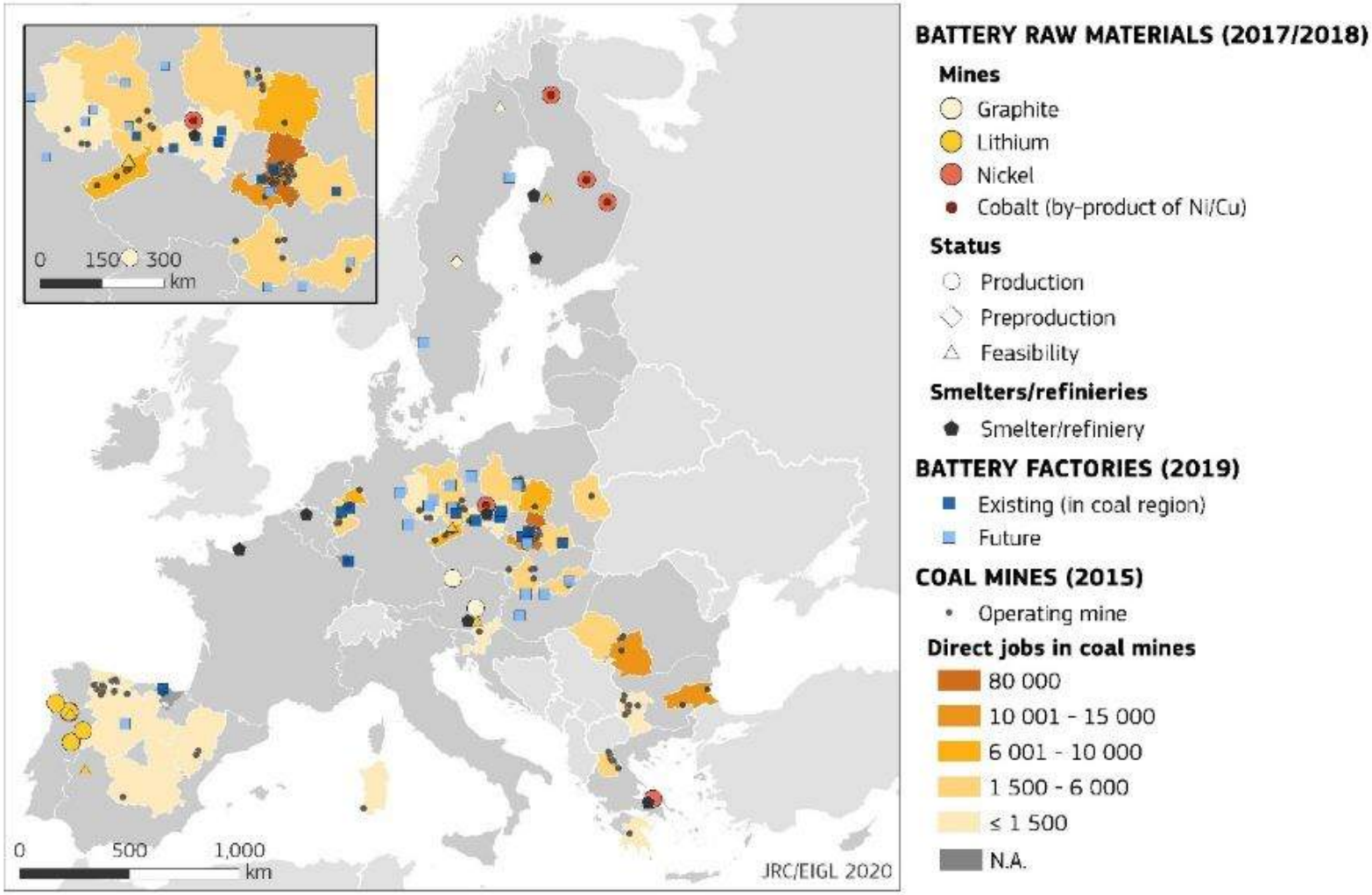
Industrial Strategy for the Three Seas Region



Building High-Value Industry from Regional Mineral Resources

The countries located between the Baltic, Adriatic and Black Seas possess a diverse base of mineral resources. Historically these resources were extracted and exported as raw materials. However, the greatest economic value does not come from mining itself, but from transforming minerals into high-technology products.

The strategic objective of the Three Seas region should therefore be:

Mine locally → refine locally → manufacture high-value technology products within the region.

This approach would create an integrated industrial ecosystem capable of supporting advanced sectors such as battery manufacturing, aerospace materials, electronics, and energy technologies.

The following table presents a conceptual framework linking **mineral deposits, industrial locations, and high-value manufacturing sectors**.





Strategic Industrial Development Based on Regional Mineral Resources

Mineral	Mining location (city / region)	Processing & industrial cities	High-value industry	Estimated resource lifetime	Potential annual industrial value
Lithium	Cínovec (Czech Republic) near Teplice	Ústí nad Labem, Wrocław	Battery cell manufacturing	25–30 years	€20–40 billion
Copper & Silver	Legnica–Głogów mining district (Poland)	Wrocław, Katowice	Electric motors, power cables, transformers	40–60 years	€30–50 billion
Gold	Roșia Montană (Romania)	Cluj-Napoca, Brno	Microelectronics, precision connectors	20–30 years	€5–10 billion
Antimony	Pezinok (Slovakia)	Bratislava, Brno	Advanced alloys, defense materials	30–40 years	€3–6 billion
Tungsten	Krupka / Ore Mountains (Czech Republic)	Plzeň, Chemnitz	Aerospace tools, turbine components	30–50 years	€5–8 billion
Bauxite	Ajka (Hungary)	Győr, Vienna	Lightweight aerospace and EV alloys	~40 years	€10–20 billion
Iron Ore	Eisenerz (Austria)	Linz, Ostrava	High-performance steel manufacturing	~50 years	€20–30 billion
Natural Gas	Black Sea offshore near Constanța (Romania)	Constanța, Gdańsk	Hydrogen production, chemical industry	20–25 years	€20–40 billion
Zinc	Olkusz (Poland)	Katowice, Ostrava	Battery materials, industrial coatings	25–35 years	€5–10 billion
Kaolin	Karlovy Vary region (Czech Republic)	Karlovy Vary, Plzeň	Advanced ceramics and semiconductor substrates	100+ years	€2–5 billion

Potential Economic Impact

If the Three Seas region develops a **complete industrial value chain** — from extraction to advanced manufacturing — the potential economic output could reach:

€120–220 billion per year in high-value industrial production.

This is roughly equivalent to the annual GDP of a medium-sized European economy.

Proposed Industrial Clusters

To optimize logistics and regional specialization, the industrial ecosystem could develop around several strategic clusters.

Central Technology Corridor

Prague – Brno – Vienna

Focus areas:

- semiconductor technologies
- research and development
- aerospace engineering

Heavy Industry and Battery Corridor

Katowice – Ostrava – Wrocław

Focus areas:

- battery manufacturing
- metallurgy
- electrotechnical industry

Advanced Materials Corridor

Linz – Graz

Focus areas:

- advanced steel production
- aerospace materials
- industrial machinery
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Innovation and Electronics Hub

Cluj-Napoca – Bratislava

Focus areas:

- electronics manufacturing
- digital industry
- advanced materials engineering

Energy and Chemical Industry Hub

Constanța – Black Sea region

Focus areas:

- hydrogen production
- synthetic fuels
- petrochemicals

Strategic Principle

The key economic principle behind this concept is simple:

Raw materials have low value.

Technological products created from those materials generate exponential value.

For example:

- Raw lithium ore: low market value
- Processed lithium chemicals: several times higher value
- Battery cells: dramatically higher value
- Electric vehicles powered by those batteries: the highest value in the chain

Therefore, the strategic goal for the region should be to **export technology products, not raw minerals**.

Vision

By coordinating mineral resources, industrial capacity, and infrastructure, the Three Seas region can develop a **new European industrial core** based on:

- energy security
- advanced manufacturing
- technological innovation
- regional economic cooperation

This transformation would turn the region from a supplier of raw materials into a **major producer of strategic technologies for the 21st century**.

Three Seas Region – Mining & Industrial Hubs

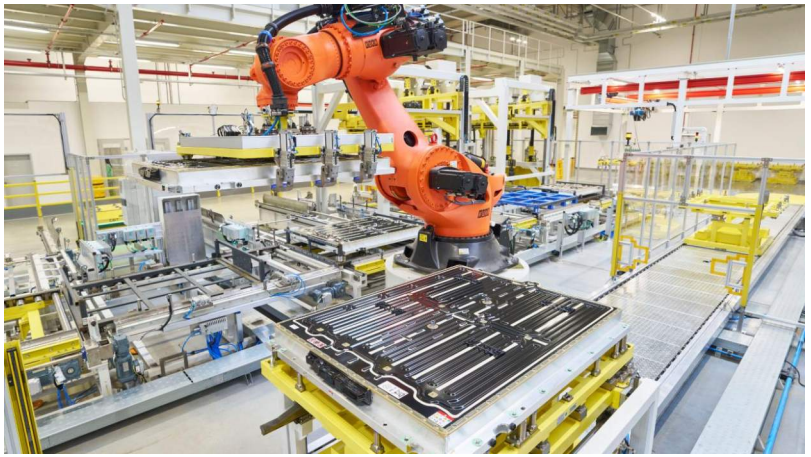
Czech Republic (Česko)

- **Mining / Resources:**
    - Lithium → Cínovec (near Teplice / Dubí)
    - Tungsten → Krupka / Ore Mountains
    - Kaolin → Karlovy Vary region
- **Industrial / High-tech Cities:**
    - Brno (battery tech, electronics)
    - Plzeň (precision tools, ceramics)
    - Ústí nad Labem (battery chemical processing)
    - Ostrava (steel, metallurgy)



Poland (Polsko)

- **Mining / Resources:**
    - Copper & Silver → Legnica–Głogów
    - Zinc → Olkusz
    - Coal → Upper Silesia
- **Industrial / High-tech Cities:**
    - Katowice (metal industry, batteries)
    - Wrocław (copper processing, electronics)



Slovakia (Slovensko)

- **Mining / Resources:**
    - Antimony → Pezinok
    - Gold → Kremnica
- **Industrial / High-tech Cities:**
    - Bratislava (advanced alloys, electronics)
    - Košice (metallurgy, industrial production)

Austria (Rakousko)

- **Mining / Resources:**
    - Iron Ore → Eisenerz
- **Industrial / High-tech Cities:**
    - Vienna (light alloys, R&D, aerospace)
    - Linz (steel, heavy industry)
    - Graz (aerospace materials)

Hungary (Maďarsko)

- **Mining / Resources:**
    - Bauxite → Ajka / Bakony Mountains
- **Industrial / High-tech Cities:**
    - Győr (aluminum processing, automotive)
    - Budapest (R&D, tech hub)



Romania (Rumunsko)

- **Mining / Resources:**
    - Gold → Roșia Montană
    - Gas → Black Sea offshore, near Constanța
- **Industrial / High-tech Cities:**
    - Cluj-Napoca (microelectronics)
    - Constanța (chemical industry, hydrogen)

Circular Battery Industry – Strategic Resource for the Three Seas Region

The Three Seas region can complement its natural mineral resources with **recycled critical metals from used batteries**, creating a sustainable and high-value supply chain.

Key Metals Recoverable from Battery Recycling

Metal	Main Sources	Potential Industrial Use	Notes
Lithium	Li-ion batteries from EVs, electronics	Battery production	Reduces need for raw lithium mining
Cobalt	Li-ion batteries	Battery cathodes, specialty alloys	Limited but high-value metal
Nickel	Li-ion batteries	Batteries, stainless steel	Increasingly critical for high-energy batteries
Copper	Battery wiring, electronic components	Electrical conductors	Widely reusable
Manganese	Battery cathodes	Battery materials	Often overlooked, high demand

Process Overview

1. **Collection & Sorting**
    - EV batteries, smartphones, laptops, UPS units
    - Separate by chemistry: Li-ion, NiMH, Pb-acid
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2. **Mechanical Processing**
    - Crushing, sieving, separation of metals and plastics
3. **Chemical Refining**
    - Hydrometallurgy / pyrometallurgy
    - Produces high-purity lithium, cobalt, nickel, copper
4. **Reintegration into Industry**
    - New batteries
    - Advanced alloys and high-tech components

Strategic Advantages

- **Energy efficiency:** Recycling lithium consumes up to **50% less energy** than mining.
- **Resource independence:** Less reliance on imports from outside Europe.
- **Environmental benefits:** Reduced mining footprint, decreased industrial waste.
- **High-value industrial chain:** Raw materials → refined metals → batteries → EVs / energy storage.
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Estimated Regional Potential

- Europe produces ~**1.2 million tons of Li-ion batteries** per year (EV + electronics).
- If the Three Seas region captures **10–15% for recycling**, potential recoverable metals per year:
  - Lithium: 2,000–3,000 tons → enough for ~200,000–300,000 EV batteries
  - Cobalt: 1,000–1,500 tons
  - Nickel: 5,000–7,000 tons
- **Economic value:** Approx. **€3–5 billion/year**, just from recycling metals for industrial reuse.

Strategic Concept

- **Battery recycling hubs** in **Brno, Wrocław, Katowice, Bratislava**.
- Integrate with **lithium mining in Cínovec** → hybrid supply chain (natural + recycled lithium).
- Forms a **circular, high-tech, low-carbon industrial ecosystem**.
- Politically attractive: independence, jobs, green economy, innovation.
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Key Takeaway:

The Three Seas region can **create Europe's first circular battery hub**, combining **local mineral extraction with high-tech recycling**, reducing imports, generating high-value products, and positioning the region as a leader in **sustainable energy technologies**.