

MED & Italian Energy Report

Presentation of the 7th edition

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2025. Energy security in the Mediterranean transition: electrification, critical raw materials and technologies



- 2025 Security, nuclear and CRMs
- 2024 EneMed Platform
- 2023 Geopolitical and Energy
- 2022 Alternative fuels
- 2021 Hydrogen
- 2020 RES
- 2019 GAS

The cornerstone of this edition is the **concept of security of energy supply** applied to the countries of the **Mediterranean Basin**.

Agenda



Key figures of EU energy dependency and the energy mix

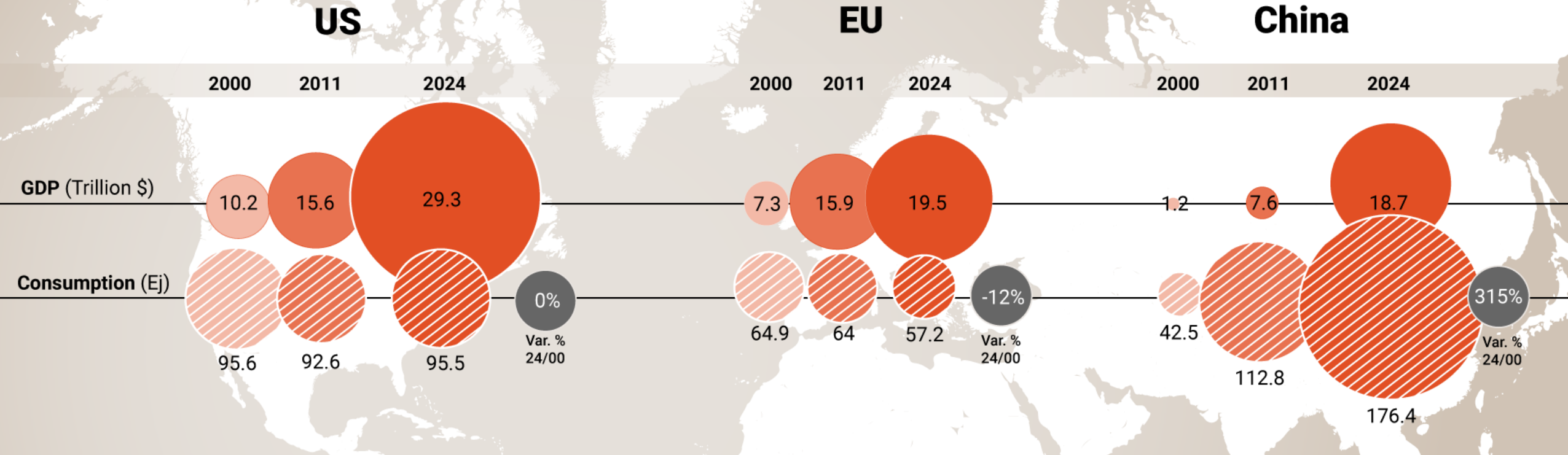


Critical Raw Materials
and the reshaping of global geopolitical strategies



Maritime trade routes as the backbone of energy value chains

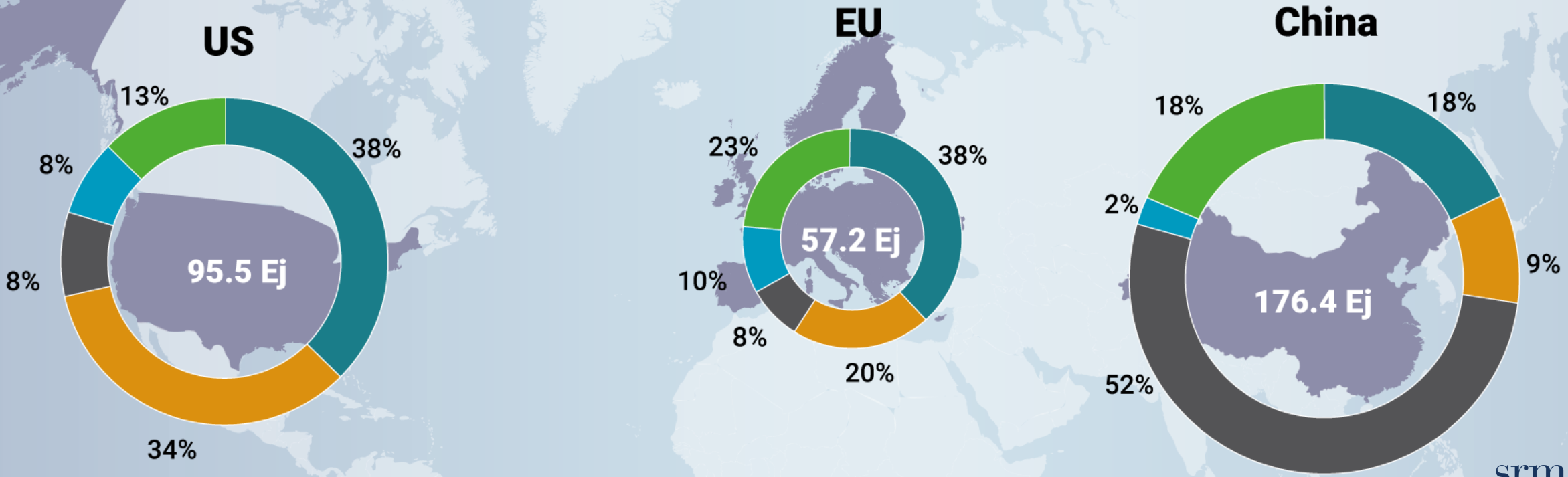
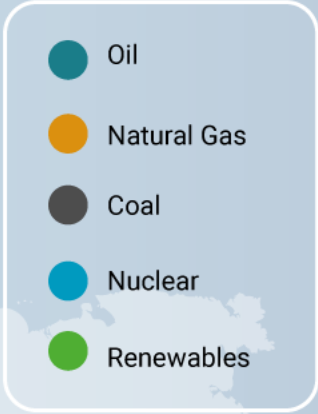
Europe has the best energy consumption-to-GDP ratio...



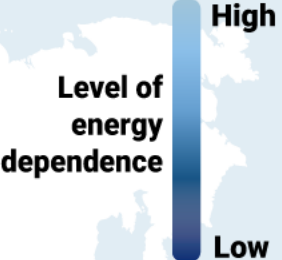
Europe has the best energy consumption-to-GDP ratio, consuming far less energy than **China** and also a little less – in proportion to GDP – than the **US**. Europe still is on the road of sustainability also in terms of energy saving and efficiency.

Global energy demand continues to grow: electricity leading the way

- **Global energy demand increased 2% in 2024** with non-OECD countries dominating both the share of absolute demand and annual growth rates.
- **Fossil fuels** continue to underpin the energy system accounting for **87% of the energy mix**.
- **China is the biggest consumer: alone** accounted for **27% of total global energy demand**.
- **Global growth in electricity demand continues to outpace growth in total energy demand.** A growth driven by increasing electricity consumption.

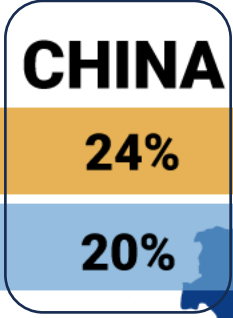
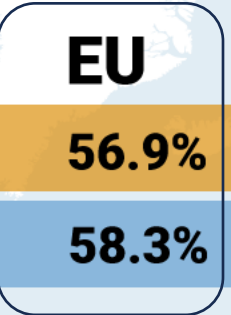
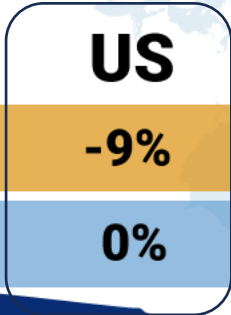


Energy dependency and critical minerals: new threats to energy security and geopolitical competition



latest

previous



	Spain	France	Italy	Germany
latest	68.9%	40.1%	73.9%	66.8%
previous	68.4%	44.9%	74.8%	66.4%

US

- self sufficient for fossil fuels, remain a net crude oil importer.
- improve natural gas export (LNG), especially to Europe.
- need the critical raw materials for renewables, where China is leading.

EU

- largely dependent on fossil imports and critical raw materials.
- needs to strength renewables production as a way to reduce dependency.
- launch the Critical Raw Materials Act to secure supply through domestic production, recycling, diversification, and strategic partnerships.

China

- is the country with the best position because of:
- a lower level of energy dependency.
 - a full control over the most important critical raw materials.

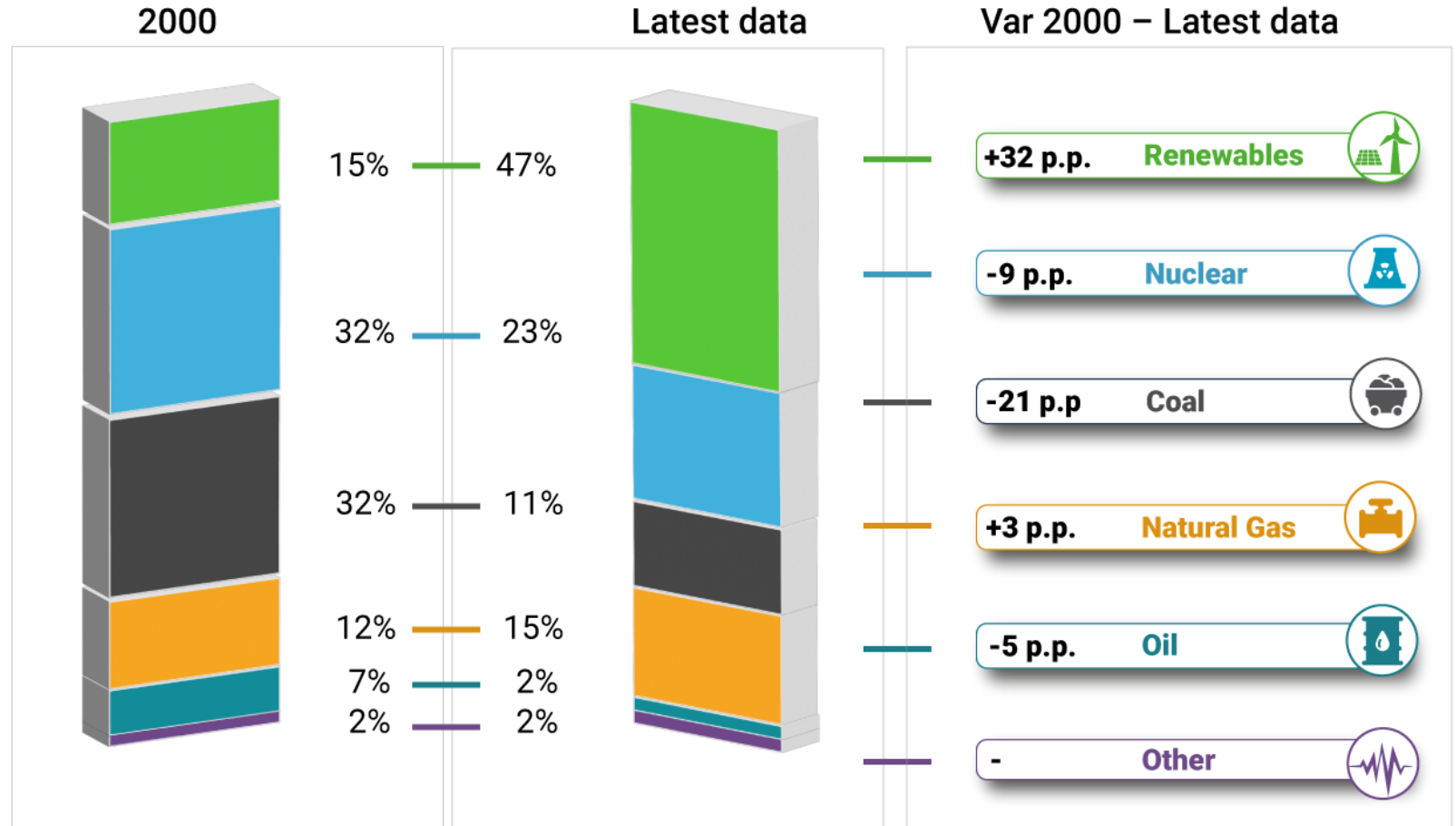
Source: SRM on EUROSTAT and World Bank Data, 2025

Focus EU: electricity production mix. The expansion pace of renewables continues to be remarkable

- The electricity generation mix in the EU has changed over more than two decades: the use of oil and coal has declined, while natural gas has increased being the buffer to support energy transition.
- Generation from low and zero-carbon sources was 47% of total electricity generated in 2024.

The era of **coal-fired electricity** is ending. **Renewables will become World's Top Power Source by 2026.**

Electricity generation by fuel (TWh)

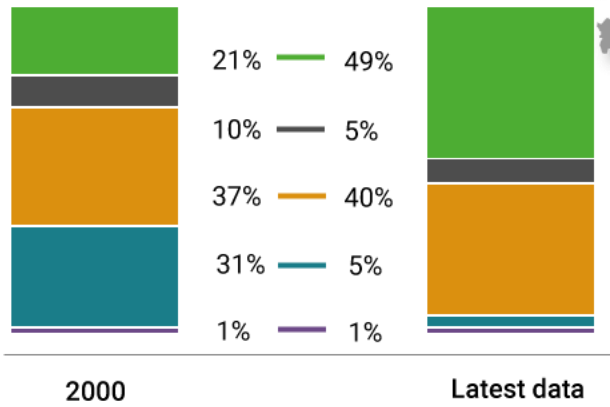


Source: SRM on Energy Institute, 2025

Italy vs main partners: electricity generation mix

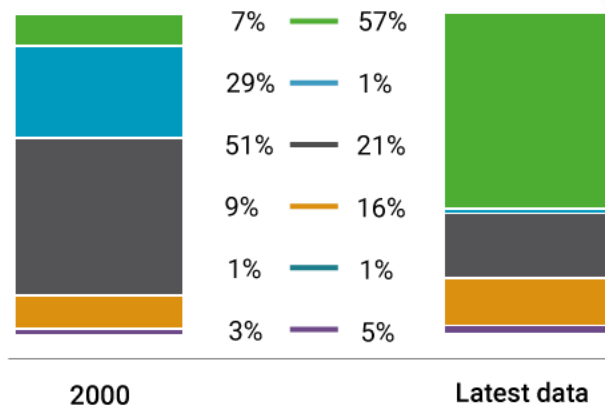
Source: SRM on Energy Institute, 2025

Italy



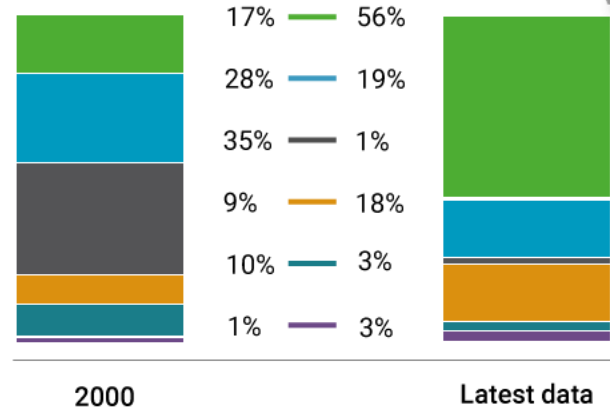
Italy: significant use of gas and renewables. Nuclear not used.

Germany



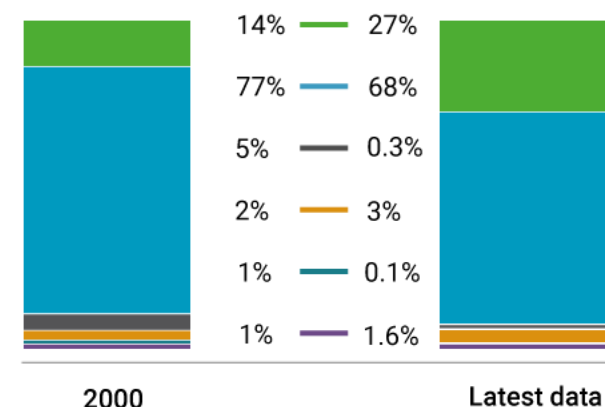
Germany: still significant use of coal and highest renewables.

Spain

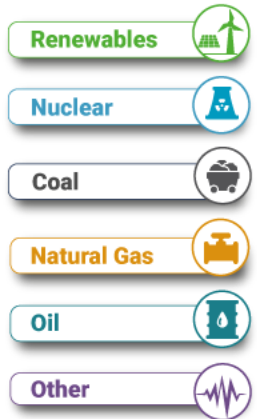


Spain: the most balanced fossil mix and a high percentage of renewables.

France



France: significant use of nuclear; low contribution of gas and growing renewables even if less developed than other countries.



Disruptive events in energy geopolitics: energy and raw material exports are increasingly being used as instruments of foreign policy

In recent years the global geopolitical landscape has been marked by **more fragility and rising tensions**



Iran holds **9.1% of the world's oil reserves** and controls **5.2% of the production market share**. The Country is a leader in gas fields with **17.1% of the world's reserves**, but is only third in terms of production. (**6.4% of the world's gas extraction**). Iran has a geographical significance, as it overlooks the Strait of Hormuz.

Venezuela holds **17.5% of the world's proven oil reserves** (ahead of Saudi Arabia, which has 17.2%), but does not appear among the top 10 producers in the world in terms of total production in 2024.

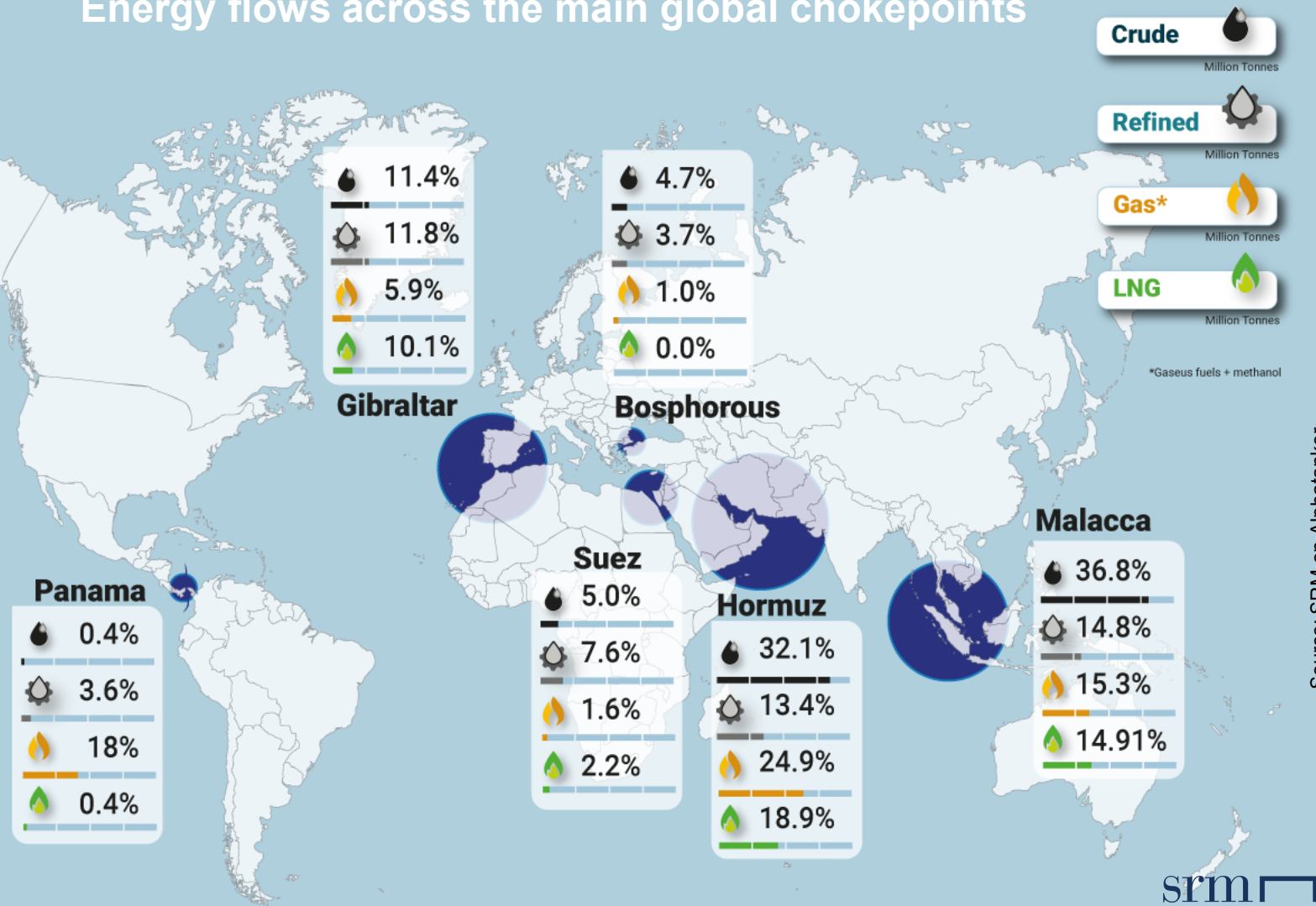
Maritime dimension is the most relevant for energy trade

Source: SRM

Global chokepoints are relevant for maritime throughput of oil&gas

Energy flows across the main global chokepoints

- **Hormuz and Malacca** - account **50%** of the global maritime traffic of oil and gas.
- About **29%** of oil trade (crude+refined) passes through the **Strait of Malacca**, and **25%** passes through the **Strait of Hormuz**.
- Strategically linking Europe and Asia, **the Suez Canal is crucial**. Crude, oil and gas transits through Suez is rising from 5.3% of oil products and 1.2% of LNG maritime flows of the last year to **7.6% of oil products trade** and **2.2% of LNG** currently.
- The importance of transit through **Gibraltar** is growing. LNG traffic transiting this Strait rose from 6.4% to 10% of the total.



Source: SRM on Alphatanker

Critical minerals has become a focal point of new strategic geopolitics

The concept of **energy security** in the **Mediterranean** countries is linked to the **guarantee of a continuous and sufficiently large supply of *natural resources***:

energy resources

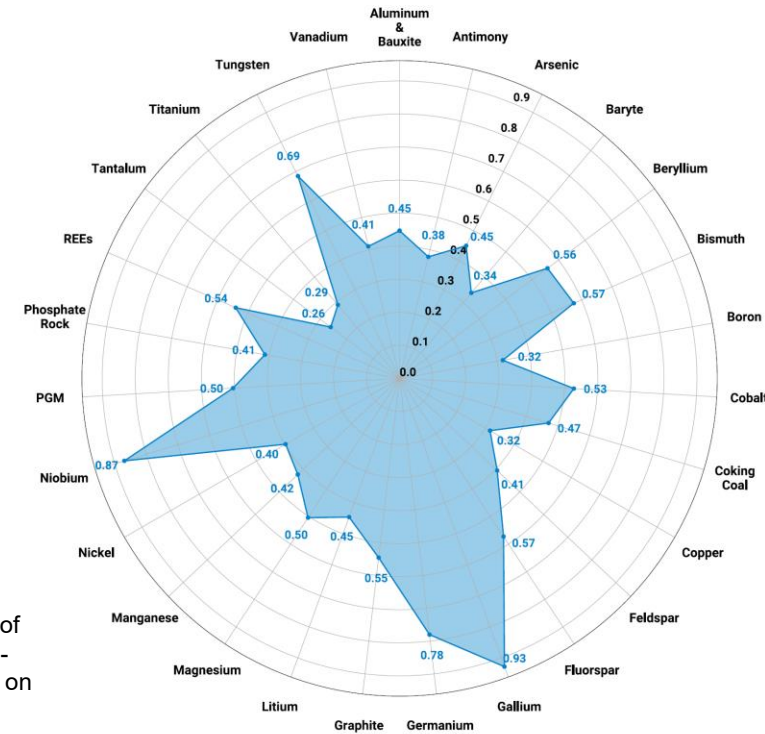
including **fossil fuels** (crude oil, natural gas, coal) and **renewable resources**

- The **increase in RES production increase of the demand for Critical Raw Materials. Lithium, cobalt, nickel, Rare Earth Elements** are crucial to manufacture **solar PV cells and wind turbines, electric vehicles, battery energy storage systems**, and several other clean energy technologies.
- They are **geographically concentrated** creating new further **bottlenecks along global supply chains** and giving birth to **new strategic dependencies** and **high risk of supply disruptions**.

non-energy resources

meaning **all the raw materials** required to manufacture the technological devices employed along energy commodity chains

Concentration index of the production of CRMs



(higher values imply the production is more concentrated, thus less secure)

Source: Elaboration of EST@energycenter - Politecnico di Torino on World Mining Data

Depending on single-country suppliers (China is the leading refiner for nearly all of the 20 energy-related strategic minerals, with an average market share of around 70%) increases vulnerability, making diversification of supply and strategic autonomy urgent priorities.

Seaborne trade serves as the backbone of critical raw materials value chains

- Critical minerals such as iron ore, copper and zinc are transported primarily **via bulk carriers** (the trade of these raw materials falls specifically within **the *minor bulk category***).
- **Critical minerals shipments experienced strong long-term growth between 2000 and 2025.**

Maritime trade in:

28
Ni
nickel
58.6934



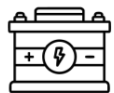
from **5.7 million tonnes in 2000**
to **58.5 million tonnes at the end of 2025**

Bauxite

13
Al
Aluminium
26.9815385

from **30.6 million tonnes in 2000**
to **236.4 million tonnes in 2025**

25
Mn
Manganese
54.94



special steels

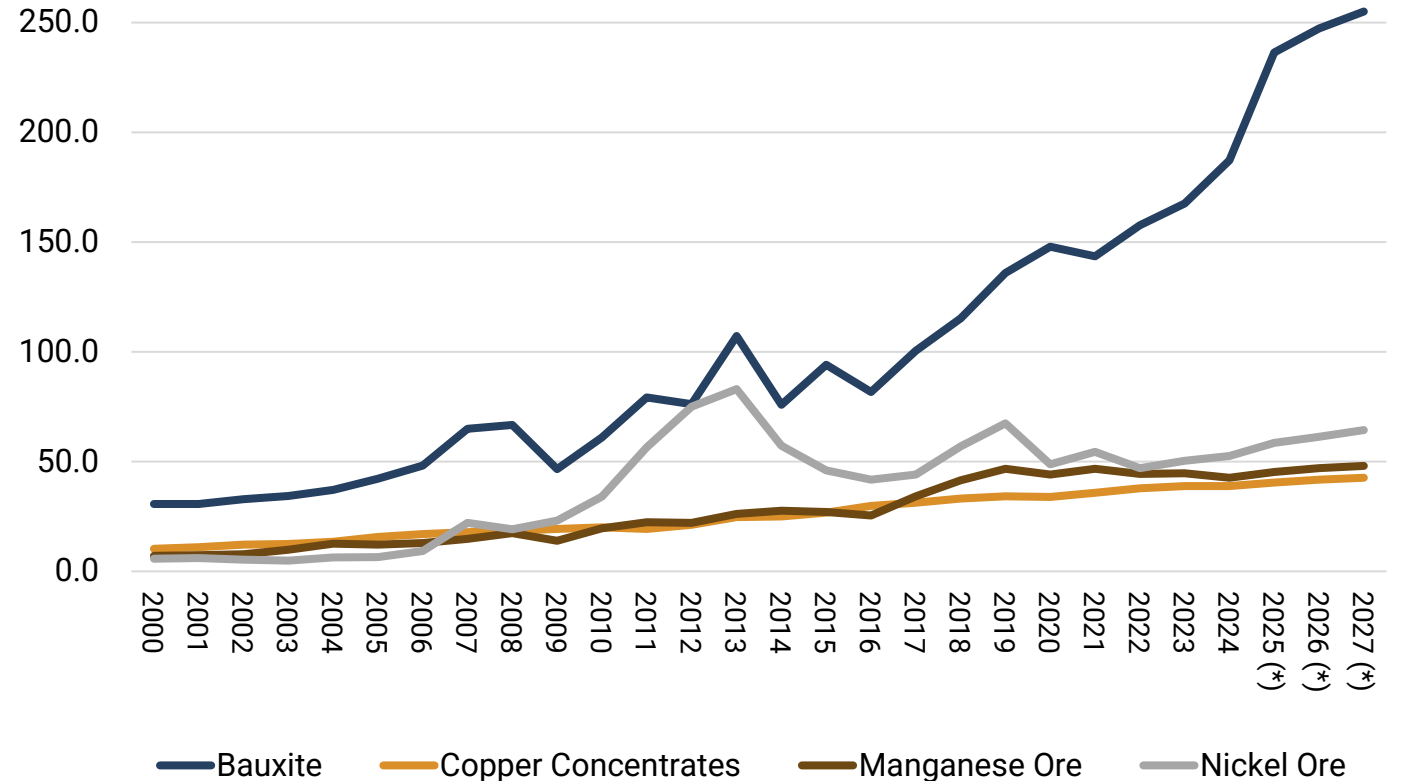
from **7.1 million tonnes in 2000**
to **45.2 million tonnes in 2025**

29
Cu
Copper
63.546

all electricity-related technologies

from **10.2 million tonnes in 2000**
to **40.4 million tonnes in 2025**

World seaborne trade of selected critical minerals (Million Tonnes)



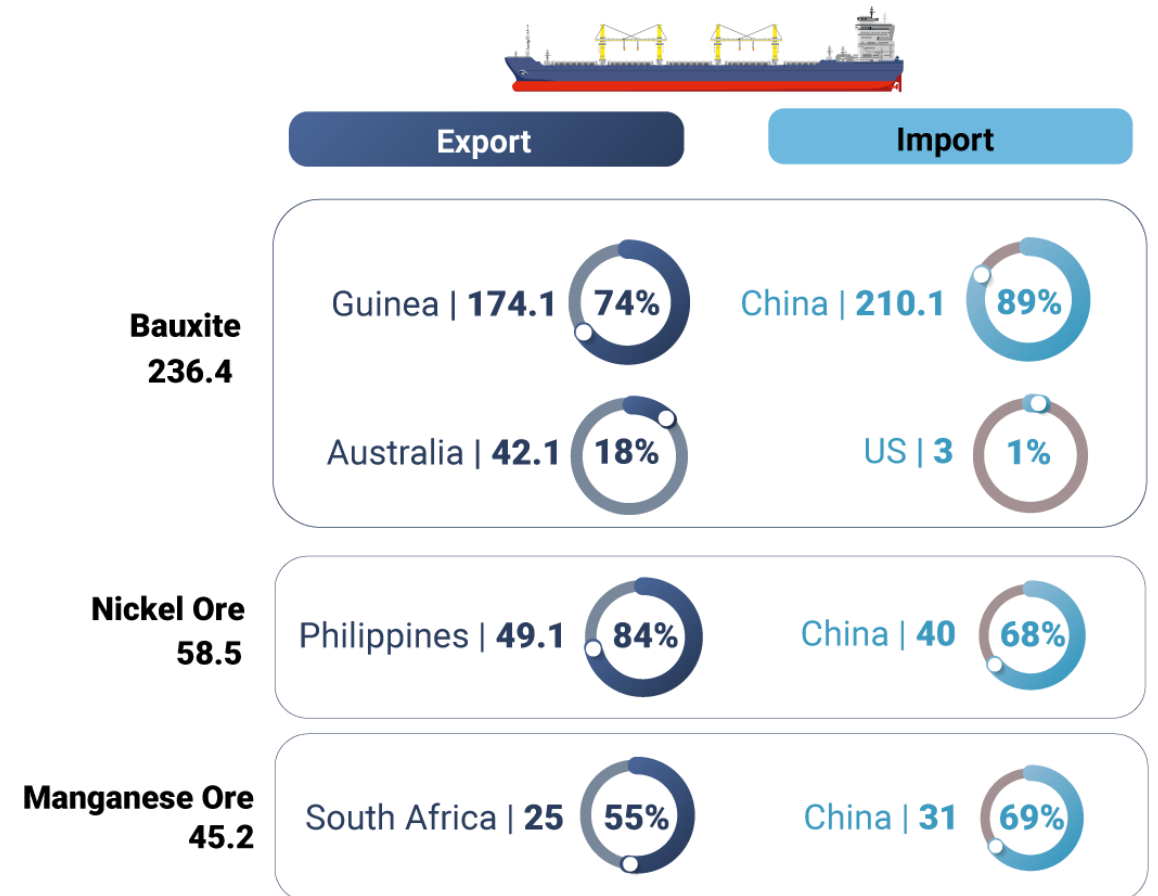
(*) Forecasts (for 2025 the data is updated to November 2025).

Source: SRM on Clarksons, 2025

Global trade in critical minerals revealed deep bilateral dependencies: trade routes are highly concentrated and strategic

Strategic routes for key minerals. Main export and import Countries

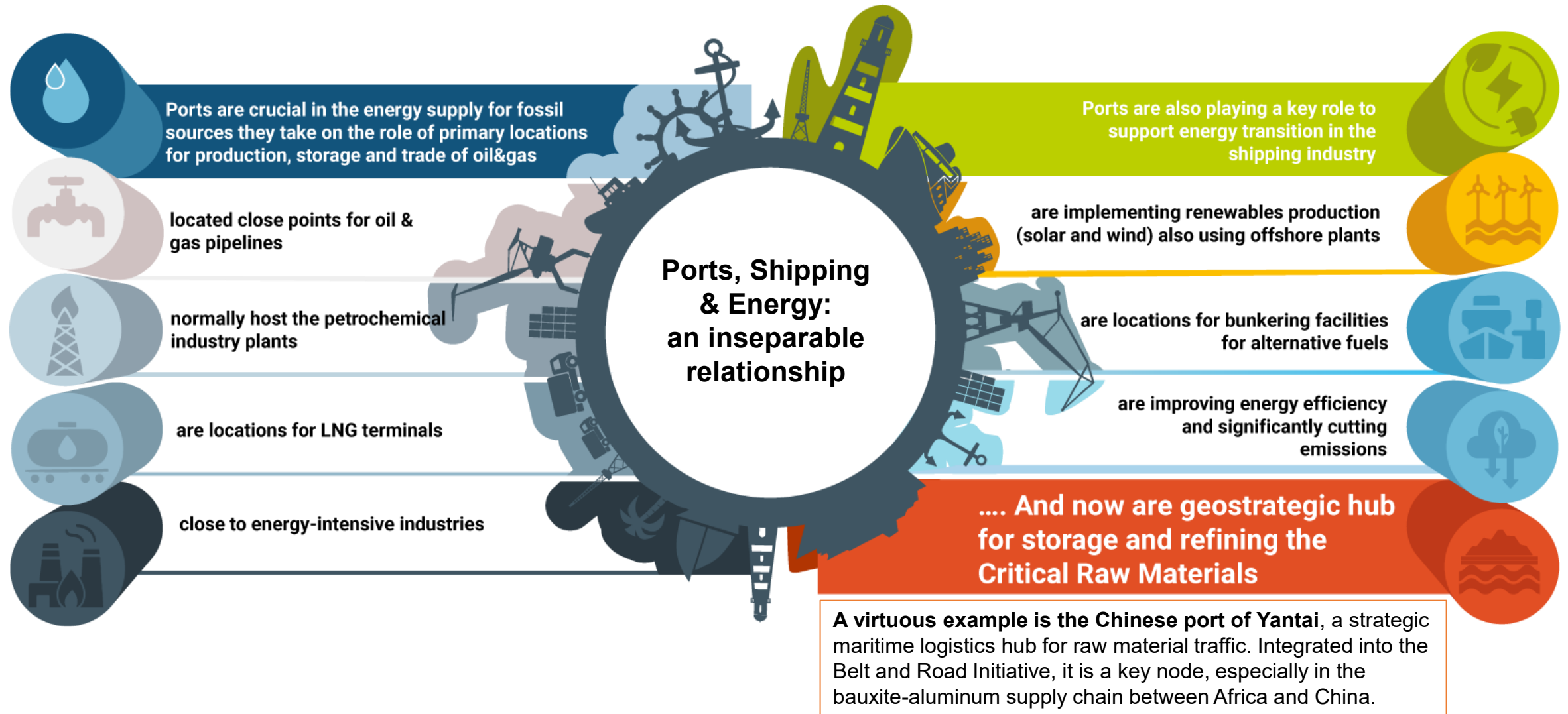
- Over 90% of sea traded **bauxite** is exported by just two countries: **Guinea (74%)** and **Australia (18%)**.
- 89% of the total is shipped to China (over 210 million tonnes)**. Chinese bauxite imports have increased at a rapid pace, tripling in volume between 2017 and today (+206% compared to approximately 69 million tonnes in 2017).
- China imports almost 70% of Nickel Ore and Manganese Ore.**
- 84% of seaborne Nickel Ore is exported from the Philippines.**
- 55% of seaborne Manganese Ore is exported from South Africa.**



Total seaborne trade. Data in Million Tonnes

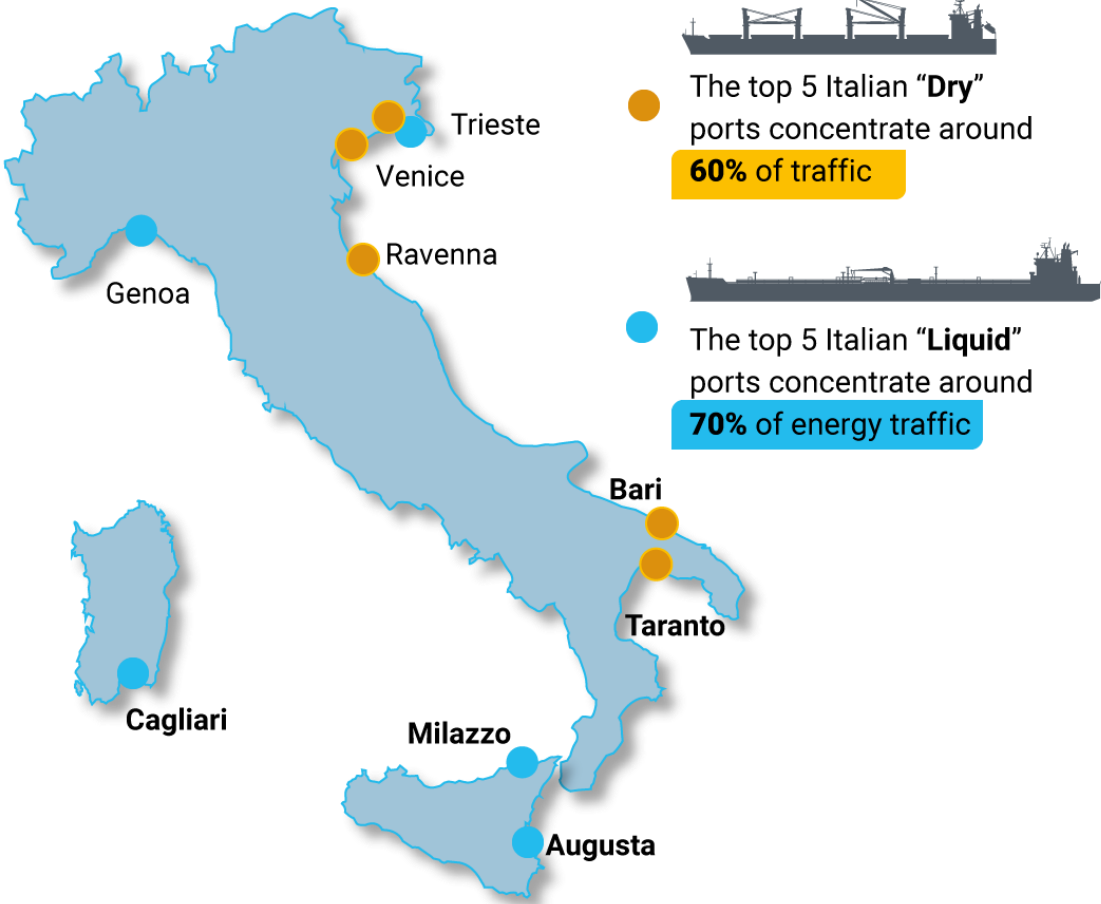
Source: SRM on Clarksons, 2025

Ports and logistics can play their part in integrating the energy supply chains even for the critical raw materials



Italian ports play an important role, not only for oil products or petrochemicals but also for the dry-bulk trade

- **Dry bulk (raw materials) traffic is strategic for Italy**; total Italian dry bulk traffic, which also includes metal components, reached nearly **50 million tonnes in 2024** and **30 million in the first half of 2025**.
- **The top 5 Italian “Dry” ports concentrate around 60% of traffic** and are: Ravenna, Venice, Taranto, Monfalcone and Bari. Two are Southern ports.
- Italian shipping also plays an important role in the transport of oil and gas: total liquid bulk traffic reached almost **170 million tonnes in 2024** and **exceeded 80 million tonnes in the first half of 2025**. **34% of ports throughput is liquid bulk**.
- **The top 5 Italian “Liquid” ports concentrate around 70% of energy traffic** and are Trieste, Cagliari, Augusta, Milazzo and Genoa. Three are Southern ports.
- Italy also has the **2nd largest European fleet of tankers** and the **4th largest European fleet of bulk carriers**, which represent a strategic strength for our country.



Source: SRM on Assoport

The proximity to potential renewable production areas in North Africa and the **investments in sustainable infrastructure and logistics offer to our ports a crucial opportunity to enhance cooperation with North Africa, strengthening Italy's position in the Mediterranean in accordance with Piano Mattei.**

Strategies and policy for the energy security are a boost for cooperation in the Med Area to spread renewables for a more sustainable energy system

Although the Southern Shore could harness the highest solar and wind intensities in the Mediterranean Basin, it only accounts for 1.2% of the Mediterranean electricity generation capacity from PV and wind (9 GW out of 770 GW). It is urgent for EU to develop a long-term strategic energy partnership with MENA Countries for RES and CRM.

Countries are prioritising energy security and affordability. Diversification is the cornerstone of energy security, yet Critical Raw Materials are moving in the opposite direction. It is important to also consider the role of ports as hubs for storage and refining of CRM. It is strategic for EU to invest in this type of port infrastructure for securizing routes of CRM.

Creation of a Trade of renewables energy across the Mediterranean through electricity highways; existing gas pipelines for green hydrogen and synthetic gas; maritime routes to ship biofuels and liquid synthetic fuels to EU ports. More integration in the Euro-Mediterranean energy network is a way to secure energy supply and to reinforce EU energy market.

The ***New Pact for the Mediterranean***, issued by the European Commission in October 2025, is part of the broader framework of *Projects of Common Interest* (PCIs) of the Commission, which include several **new strategic interconnections** such as the power lines **ELMED** between Italy and Tunisia (600 MW, 850 M€), **GREGY** between Egypt and Greece (3,000 MW, 3.6 G€), and the **Great Sea Interconnector** between Greece, Cyprus and Israel, for the mutual exchange of electricity from renewable sources.

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