6th "MED & ITALIAN ENERGY REPORT"

THE ENERGY TRANSITION IN THE MEDITERRANEAN BETWEEN SUSTAINABILITY AND SECURITY: A DYNAMIC THINK-TANKING APPROACH

EXECUTIVE SUMMARY FOR THE PRESS

Compared to the major global economies, the EU shows a greater energy dependence, with 58% of its consumption fulfilled by imports. The production capacity has been improving thanks to the growth of renewables whose share in the electricity generation mix has gone up from 15% in 2000 to 45%.

- **Europe has the highest energy dependence among great economies, with 58.3% of its energy needs dependent on imports.** In contrast, this figure drops to **20% for China**, while the **US is completely self-sufficient**.
- **A high reliance on external energy sources** makes countries more vulnerable to the **volatility of energy commodity prices** on international markets and the impacts of **geopolitical tensions**, reducing their **competitiveness** compared to more self-sufficient nations.
- Focusing specifically on **electricity generation**, the **European energy mix has undergone significant changes over the past two decades**. **Coal use has dropped drastically, from 32% in 2000 to around 12%** (latest available data), while the share of **natural gas has risen slightly, from 12% to 17%.** Today, **renewable energy sources dominate, increasing from 15% in 2000 to 45%.** The pace of renewable electricity expansion is expected to more than double by 2030.
- **Looking at major European countries**, **Spain** has the most balanced energy mix, with **renewables** making up 51% of total generation in 2023. **Germany** remains the country with the highest **coal** use (26% of the total), though this is declining significantly. In **France**, the energy mix is dominated by **nuclear power**, which accounts for 64% of the total.

Trump's energy policy is expected to have significant impacts. An increase in American LNG exports to Europe is anticipated, which will contribute to greater diversification of suppliers.

- **Trump's energy policy, with its return to fossil fuels**, if implemented, **will have significant impacts on the global energy landscape and the geopolitical balances tied to energy commodity trade.** The expansion of American hydrocarbon production is seen as a strategy to reduce energy costs and gain an edge, especially in competition with China.
- The new U.S. presidency's strategies are expected to **reshape supply chains and global trade dynamics, thereby also affecting the trade of energy products.**
- **Under Trump, the push to sell more U.S. oil and gas to Europe is expected to intensify.** In recent years, Europe has already **increased LNG imports from the United States**. While these accounted for 27% in 2021, the share rose to 41% the following year and reached **48%** of Europe's total LNG imports in **the early months of 2024.**

Italy has historically been the European country with the highest level of energy dependence. However, there are clear signs of gradual and steady reduction, with total reserves exceeding the European average. Notably, renewable energy is playing an increasingly significant role in the electricity generation mix.

- Within the European context, **Italy has the highest level of energy dependence, at 74.8%,** well above the European average.
- **However, this figure has decreased by nearly three percentage points compared to the pre-COVID level in 2019**, **when dependence stood at 77.5%.** France has the lowest energy dependence, at 44.8%, thanks to its reliance on nuclear power.
- **At the start of the withdrawal season (November 1, 2024), Italy achieved a natural gas storage fill level of 98.5%, exceeding the European average and ensuring a buffer against potential risks related to gas supplies for the 2024/25 winter season.**
- **Increasing renewable energy production is the key to reducing Italy's dependence on gas imports.** According to **the latest data** from Terna **for 2024**, electricity demand was met with 42.5% non-renewable energy sources, **41.2% renewable energy sources (the highest share ever recorded)**, and the remaining 16.3% from net imports. However, **the gap to reach the 2025 (48%) and 2030 (65%) interim targets** set by the PNIEC (National Integrated Energy and Climate Plan) demands significant effort.
- Among the various sources, **solar power has shown particularly positive results: up by 19.3% compared to 2023**. This record production **met 11.5% of Italy's electricity demand in 2024.**

- Overall, **the combined growth of solar and wind power reached +8.4% compared to 2023.** Together, these sources covered 18.6% of national electricity needs.

World energy trade has been affected by the geopolitical tensions that have unfolded in the last few years, in particular, the Russia-Ukraine conflict and the Middle East crisis. Hopes for and reports of truces on both fronts seem to pave the way for a more positive outlook.

- **The red Sea crisis has severely affected energy flows. LNG directed to the northern coasts of the Mediterranean basin**, passing through the Suez Canal, was **disrupted in February 2024**. At the same time, **the average duration of voyages for the supply of these commodities increased significantly** (the **average travel time for LNG carriers from Qatar rose from 18.5 days in 2023 to 39.7 days in April 2024**) due to the need to reroute via the Cape of Good Hope, entering the Mediterranean basin through the Strait of Gibraltar, with higher delivery costs.
- Indeed, **the share of crude oil imported via the Red Sea dropped** from over 16% of the Mediterranean region's total crude oil imports in October 2023 to about 4% in February 2024 and has since remained consistently below 5%.
- **Tensions in the Middle East are also impacting the planned expansion of the Leviathan natural gas field**, located in the critical area of the conflict. In October 2024, the Israeli company NewMed Energy, which holds over 45% of the field's shares, announced a **six-month delay in expansion operations due to uncertainties stemming from the conflict between Israel and Hamas**.
- **The truce signed between Israel and Hamas offers hope for a gradual resumption of trade through the Red Sea.**

The Euro-Mediterranean region is at the heart of global energy scenarios, as it plays a crucial role in ensuring gas supply security and, looking ahead, in the success of the transition toward decarbonization. This is particularly true with the growing importance of LNG (Liquefied Natural Gas).

- **The northern Mediterranean countries** are the **largest energy consumers**, while the southern Mediterranean countries (North Africa) have significant fossil fuel resources: Algeria, Egypt, and Libya together hold 86.7% of the region's natural gas reserves and 94.5% of its crude oil reserves.
- **The Russia-Ukraine war has strengthened intra-Mediterranean trade in fossil fuels**, with **Algeria gradually replacing Russian gas flows** and becoming **Italy's primary gas supplier in a short time.**

- G**as imports from Algeria via the Transmed pipeline increased from 29.5%** of the total in 2021 **to 38%** in 2023. Meanwhile, **Russian supply fell from 39.4%** in 2021 **to just 4.2%** in 2023.
- **The termination of the Russian gas transit agreement via Ukraine** (which accounted for about 5% of European supplies) **on January 1, 2025, will have no significant impact on Italy.** However, it will further push Europe toward diversifying its supply sources.
- In 2024, for the third consecutive year, **the European Union secured ample gas reserves**, reaching its 2022 storage target as early as August. By October 2024, **average storage levels in Europe stood at approximately 95%.**
- **The importance of liquefied natural gas (LNG) is growing as it enhances supply security** by enabling greater diversification, flexibility, and the rapid addition of new regasification capacity through floating storage and regasification units (FSRUs).
- In addition to U.S. LNG, **Algerian LNG has also played an increasing role over the past three years**, rising from 10.9% of total LNG imports in the Mediterranean region in 2022 to 17.2% in 2024.
- Many Mediterranean countries have expanded or plan to expand their regasification capacity. **Italy has increased the utilization of its three existing LNG terminals** (Adriatic LNG near Rovigo; Snam LNG terminal in Panigaglia near La Spezia; OLT Offshore LNG Toscana near Livorno) **and has made a new terminal, the Golar Tundra in Piombino, operational.** Additionally, a new FSRU, the BW Singapore, is scheduled to become operational near Ravenna in 2025. This leaves Italy far better prepared compared to February 2022.

The Euro-Mediterranean region is central to Europe and Italy's energy competitiveness challenges. Producing renewable energy in North Africa and importing it to Europe serves as a 'green bridge' to achieve sustainability goals and structurally reduce energy dependence. The role of the Mattei Plan is pivotal in this context.

- The southern shore of the Mediterranean shows promising potential for solar and wind energy, which are currently underutilized. **The Report shows that, considering photovoltaic electricity generation, less than 1% of the surface area of the countries on the southern shore would be sufficient to generate enough electricity not only to meet their future demand but also to produce a surplus that could be exported to the other two shores.**
- **Most of the installed renewable energy capacity is currently concentrated on the northern coast**: out of a total of **112.5 GW of photovoltaic capacity** installed in 2023, **81.9%** is **located on the northern coast**, while only 2.8% is on the southern coast. **For wind energy**, out of a total of 92.6 GW, **82.5% is located on the northern coast**, with only 4.3% on the southern coast.

- **Electricity** is expected to play a **central role in the energy transition**, supported by other commodities such as green hydrogen and alternative fuels.
- **The recent strategic pact between Italy, Albania, and the United Arab Emirates, signed on January 15 by Italian PM Giorgia Meloni, is key to a new energy diplomacy.** Focusing on interconnections, it represents a concrete and sustainable approach to tackling the energy transition. **This energy alliance strengthens dialogue between the Mediterranean's shores and is an additional step in the strategy to position Italy as an energy hub for flows between Europe and Africa.**

Ports and shipping are strategic for the maritime routes of energy commodities, with a key role played by chokepoints, strategic nodes along "energy corridors". New "green" port models are advancing.

- The main maritime trade routes remain vital for the well-being of global oil and gas markets, but they depend not only on the Suez Canal but also on the security of operations through the Strait of Hormuz and the Strait of Malacca.
- **The Strait of Hormuz** at the entrance to the Arabian Gulf and **the Strait of Malacca**, between the Malay Peninsula and Sumatra, are the most significant chokepoints in terms of global energy traffic.
- During the first 11 months of 2024, **34%** of crude oil trade**, 14.3%** of refined products, **25.6%** of gas, and 18% of LNG pass through **Hormuz**. In contrast, the Strait of **Malacca** handles about **33.5%** of crude oil trade, along with approximately **13%** of refined products, **15.1%** of gaseous hydrocarbons, and g of LNG.
- Another crucial node in the supply chains is the **Suez Canal**. Its location makes it a **key regional hub for the transport of oil and other hydrocarbons**; **5%** of total oil trade (crude + refined), **2.2%** of gaseous hydrocarbons, and **1.2%** of LNG pass through Suez.
- **Indeed, due to tensions in the area, maritime flows through the Bab el-Mandeb Strait and into the Red Sea have decreased dramatically over the last year. LNG carrier** transits through the Egyptian chokepoint have **fallen by 90%** (in terms of gross tonnage) compared to average levels in 2023, while **oil tanker transits have dropped by 40-50%.**
- **Energy flows passing through the main chokepoints predominantly move from west to east. About 80% of crude oil imported into East Asian countries passes through the Strait of Malacca, and more than half passes through the Strait of Hormuz.** Saudi Arabia, the United Arab Emirates, Iraq, Russia, Qatar, and the United States are among the main exporters of energy commodities, while China, South Korea, Japan, India, and other Asian countries are the leading importers.

In the energy landscape, port and logistics infrastructures are taking on an increasingly strategic role. New port management models are emerging, transforming ports into energy hubs, known as green ports.

- **Over time, Mediterranean ports have taken on the role of crucial nodes in the energy supply chain**, enabling the import and export of oil, natural gas, and LNG.
- **Ports are increasingly turning into energy and digital hubs, alongside their usual function for logistics**. Since they are terminals for fossil fuels, and located close to high-energy intensive industries, they can actively contribute to global decarbonisation efforts.
- Alongside their role as a hubs for fossil commodities, **ports are set to become significant areas for the development of the green transition and for the establishment of an energy bridge between Europe and North Africa.** At the same time, ports are increasingly often becoming the location of great renewable energy projects such as solar PV and wind, including offshore.
- Authoritative estimates from the ESPO (European Sea Port Organization) have shown that sustainability will be the strategic driver of European port investments over the next 10 years. **A survey conducted on 173 port authorities across 85 countries revealed that over 90% of ports have investment plans for infrastructure and sustainability.** Additionally, about one-third of the ports analyzed will allocate space for renewable energy production, while 13% will expand existing energy production facilities.

Alternative fuels for ships will be the first great future challenge of the energy transition for green ports.

- The development of new energy infrastructure, such as **LNG terminals and bunkering facilities for alternative fuels**, can enhance energy security and reduce dependence on fossil fuels. By shifting to greener energy sources in port operations, ports can set a precedent for sustainable practices, improving energy efficiency and reducing emissions.
- **A key challenge for ports will be alternative fuels**; the ability to accommodate ships powered by fuels such as Methanol, LNG, Ammonia, and others could be a major competitive factor. Currently, **7.6% of the global fleet at sea** (up from 5.3% in 2023 and 2.5% in 2017) **and 52.6% of the order book in terms of gross tonnage** (up from 45.5% in 2023 and 10.8% in early 2017) **are capable of using alternative fuels or propulsion systems**. By the end of 2026, it is expected that 9% of the global fleet's total capacity will be powered by alternative energy sources.
- **Various opportunities are tied to the development of green hydrogen in the countries on the Southern Shore.** Coastal nations have significant potential not only due to the

availability of water and energy but also because of existing port infrastructure, which could produce and store green hydrogen for export to Europe.

- **Development opportunities are linked to the creation of the SoutH2 Corridor, a planned network of pipelines between Europe and Africa dedicated entirely to transporting hydrogen.** The project, overseen by Snam, recently saw the signing of a declaration of intent among the involved countries (Austria, Germany, Algeria, and Tunisia, with Switzerland as an observer), establishing the rules to follow in the coming years. This marks a crucial step in moving from the planning phase to the implementation stage of the project.
- **The development of the corridor is part of the European Hydrogen Backbone and will be key to creating a connected and diversified hydrogen backbone in Southern and Central Europe.** The corridor could account for over 40% of the total import target set by the REPowerEU plan. The SoutH2 Corridor will be one of the flagship projects in Snam's new Strategic Plan for 2025-2029.

Italy is at the forefront in the development of a new port model as energy hub, with Trieste focusing on Crude, Naples on Gas and Porto Levante and Piombino on LNG.

- **Several Italian ports rank among the top 10 energy ports in the Mediterranean region, playing a significant role, particularly in the trade of oil and its derivatives. For crude oil**: **Trieste** (38 million tonnes handled), **Augusta and Sarroch** (12 million tonnes handled each); **for refined petroleum products: Augusta** (9.5 million tonnes) **and Sarroch** (7.8 million tonnes); **for gas: Naples** (1 million tonnes); **for LNG: Porto Levante-Rovigo** (6.4 million tonnes) **and Piombino** (2.4 million tonnes).
- **The energy sector accounts for 35% of the total cargo handled by Italian ports**. These ports are currently undergoing – and will increasingly be at the forefront of – a transformation towards energy. The new challenge for these ports is to become hubs for the energy transition, with a commitment to making their activities more sustainable.
- **The top 5 Italian energy ports account for 69% of the traffic, namely: Trieste, Cagliari, Augusta, Milazzo, and Genoa.** Trieste stands out as the most important energy port and gateway for Italy. **Three of these ports are located in Southern Italy.**
- **Southern Italy, handling approximately 50% of the country's total port traffic, plays a key role in the transition to a "green" energy future**, contributing to the creation of synergies between the Mediterranean's two shores and leveraging North Africa's vast renewable energy resources.

- **Thanks to the proximity to potential renewable production areas in North Africa, investments in sustainable infrastructure and logistics help make our ports key players, strengthening Italy's geostrategic position in the Mediterranean.**

SRM (Study Center linked to Intesa Sanpaolo Group) and ESL@energycenter of the Politecnico di Torino have launched a new interactive platform for analyzing energy scenarios in the Euro-Mediterranean region: the ENEMED Plat.

- The Euro-Mediterranean region, with Italy at its heart, is facing a crucial challenge to ensure both the transition to decarbonization and the security of its energy context, amid widespread geopolitical instability such as the Russia-Ukraine war, the Red Sea crisis, and conflicts in the Middle East
- To analyze and understand the impacts of these phenomena, SRM and ESL@energycenter of the Politecnico di Torino are implementing an **interactive platform called ENEMED Platform.** Through an automatically updated data lake sourced from various providers, a library of mathematical analysis models, and an innovative web-based interface, the platform allows users to conduct research and analysis, providing up-to-date information on energy flows in the Euro-Mediterranean region, including the ability to customize data visualizations.
- **A first demonstration of ENEMED – Plat will be previewed at the European Parliament on January 28 during the presentation conference of the 6th Annual Report 'Med & Italian Energy Report,'** which was also developed using the platform.

For further information

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