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Greece's Wholesale Electricity Market in Transition: The Export Paradox

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A Changing Position in Southeast Europe's Electricity Market

The Greek wholesale electricity market has undergone a profound transformation since the introduction of the Target Model and the acceleration of renewable energy deployment. Between 2021 and mid-2026, the market evolved from a system characterized by import dependence and exposure to external fuel-price shocks into a more integrated and increasingly export-oriented participant in Southeast Europe's electricity landscape.

Like most European markets, Greece experienced unprecedented volatility during the 2022 energy crisis, when disruptions in natural gas markets and heightened geopolitical uncertainty pushed wholesale electricity prices to record levels. As fuel markets gradually stabilized and renewable generation expanded, wholesale electricity prices declined significantly, establishing a new equilibrium well below the peaks observed during the crisis period.

An important feature of this transition has been Greece's changing position relative to neighboring electricity markets. Comparison of Day-Ahead Market (DAM) prices across Greece, Bulgaria, and Italy reveals a notable shift in regional competitiveness. While all three markets remain interconnected and influenced by common regional fundamentals, Greek wholesale electricity prices increasingly traded below those observed in Bulgaria and remained consistently lower than those in Italy throughout much of 2025 and 2026.

Lower wholesale prices have strengthened Greece's position within the regional electricity market, creating conditions that increasingly favor electricity exports during periods of surplus generation. Lower wholesale prices have strengthened Greece's position within the regional electricity market, creating conditions that increasingly favor electricity exports during periods of surplus generation.

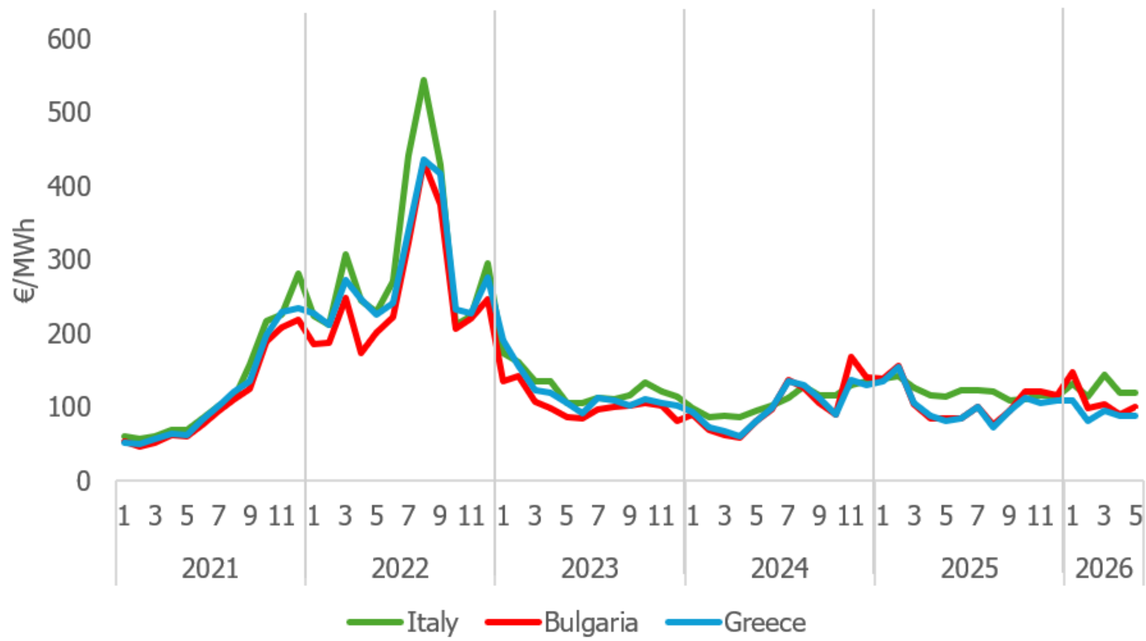


Figure 1 Monthly average DAM prices in Italy, Bulgaria, and Greece (€/MWh), Source: EMBER, ENTSOE

From Net Importer to Net Exporter

Until 2023, Greece remained a net importer of electricity, reflecting both domestic generation constraints and prevailing regional market conditions. This pattern reversed for the first time in 2024, when Greece recorded its first positive annual electricity trade balance, marking an important turning point in the country's regional energy position.

The shift was driven by a combination of expanding renewable generation, increased utilization of cross-border interconnections, and improved market integration. As domestic electricity production increasingly exceeded domestic demand during certain periods, Greece was able to export surplus electricity to neighboring markets.

The trend accelerated further in Q2 2025. In 2026 between January and May, electricity interconnection balance exceeded 4.42 TWh in net exports, generating a positive cross-border trade balance, with €390 million in export revenue. The increase was largely driven by periods of abundant renewable generation, particularly during hours when domestic demand was insufficient to absorb available supply, thus the revenue balance was lower than in previous cases.

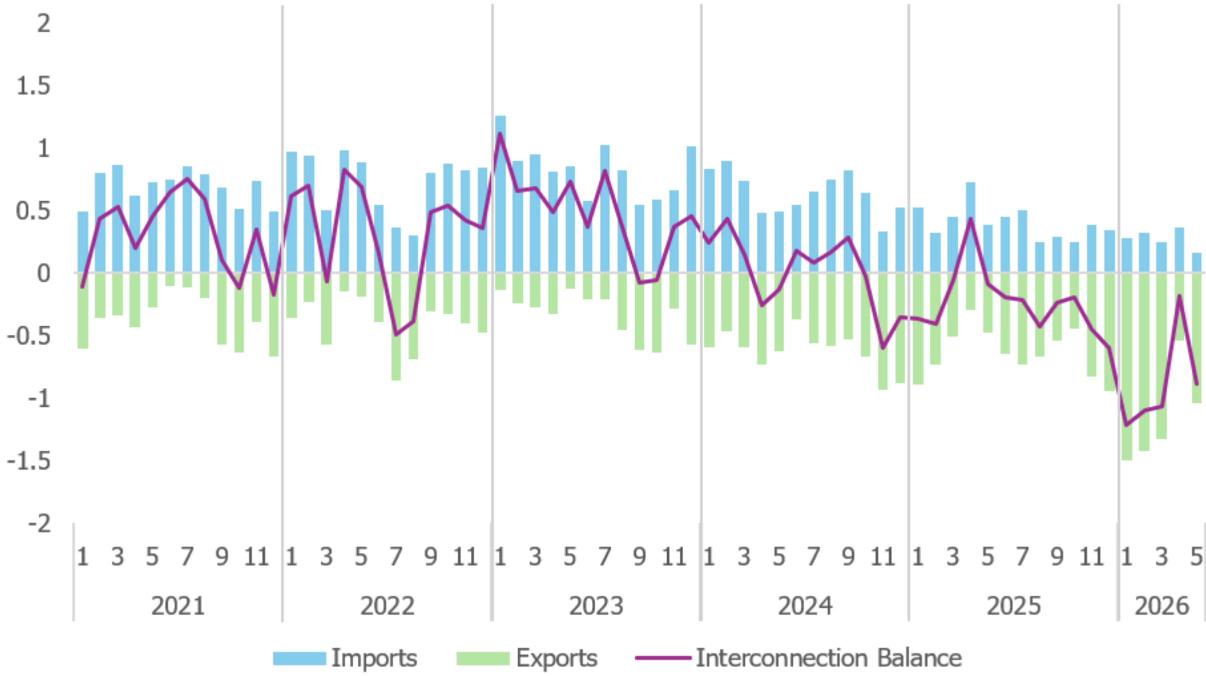


Figure 2 Monthly Imports and Exports in the Greek Wholesale Electricity Market (TWh), [2021 - May 2026], Source: EnExGroup, Center's Analysis

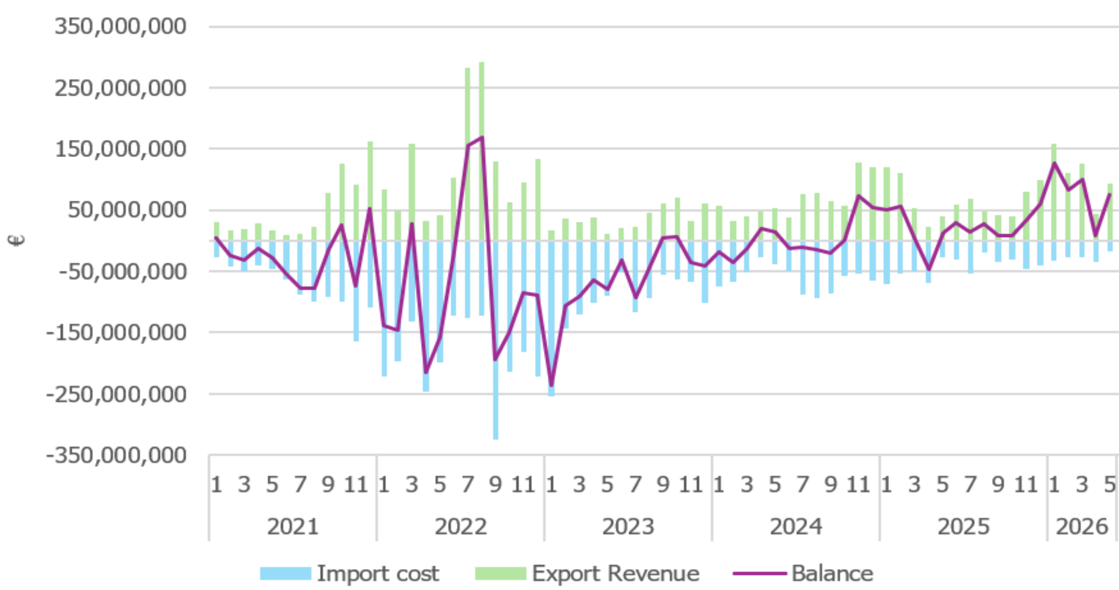


Figure 3 Revenues, Costs, and Balance for Exports, Imports, and Interconnection Balance (€), [2021-May 2026], Source: EnExGroup, Center's Analysis

The ability to export surplus electricity to neighboring markets, including Italy, Bulgaria, North Macedonia, and Albania, highlights the increasing strategic value of Greece's interconnection infrastructure. It also reinforces the country's growing role as a regional energy hub within Southeast Europe.

While Greece recorded a strong net export position during the first five months of 2026, the average weighted value of exported electricity reached €91.80/MWh, compared with €101.69/MWh for imported electricity. This indicates that Greece is increasingly exporting surplus electricity during lower-priced hours, while continuing to import electricity during periods of higher system demand and higher market prices (thus driving the import prices). The result is a positive volume balance, but a less favorable price differential in cross-border electricity trade.

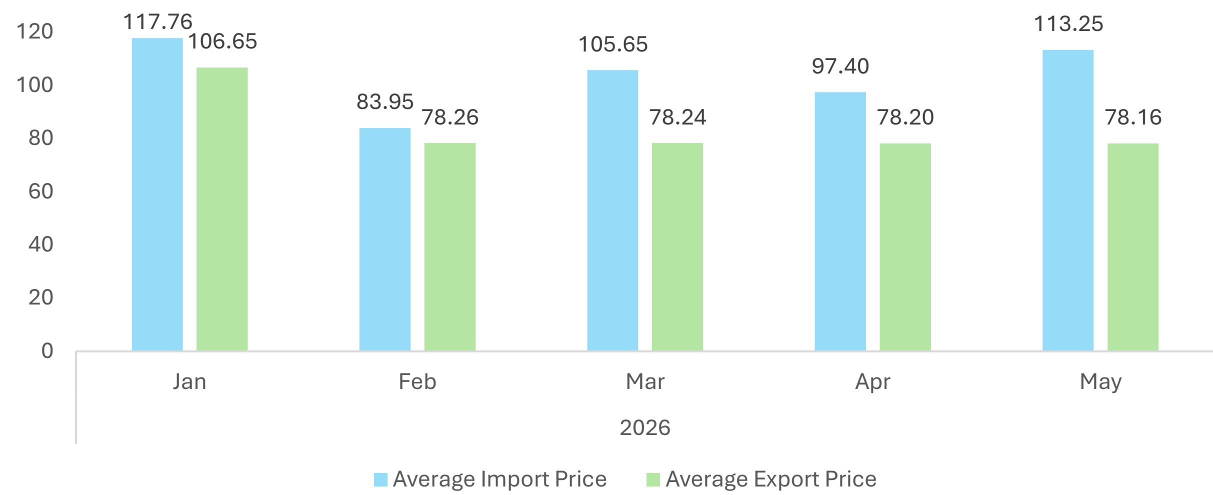


Figure 4 Monthly Average Weighted Import and Export Prices (€/MWh), [Jan-May 2026], Source: EnExGroup, Center's Analysis

During the month of April, the Greek electricity System was faced with a plethora of zero and negative prices, as well as curtailments during the same hours as to keep the system in balance. Specifically, 241 distinct Market Time Units (MTUs)* were prices at zero, and distinct 399 MTUs had negative prices. During the negative and zero MTUs, export quantities reached absolute peak, placing the balance at negative (*Figure 5,6)*.

Despite the growing contribution of renewable energy, the Greek electricity system continues to rely on imports and NG for covering the electricity demand during evening and nighttime hours when PV production declines. This creates a growing contrast between low-priced surplus electricity available during midday and higher-priced

* In wholesale electricity exchange, a MTU is a specific delivery period for which electricity trading and settlement prices are calculated.

electricity required during peak demand periods, further widening intraday price differentials.

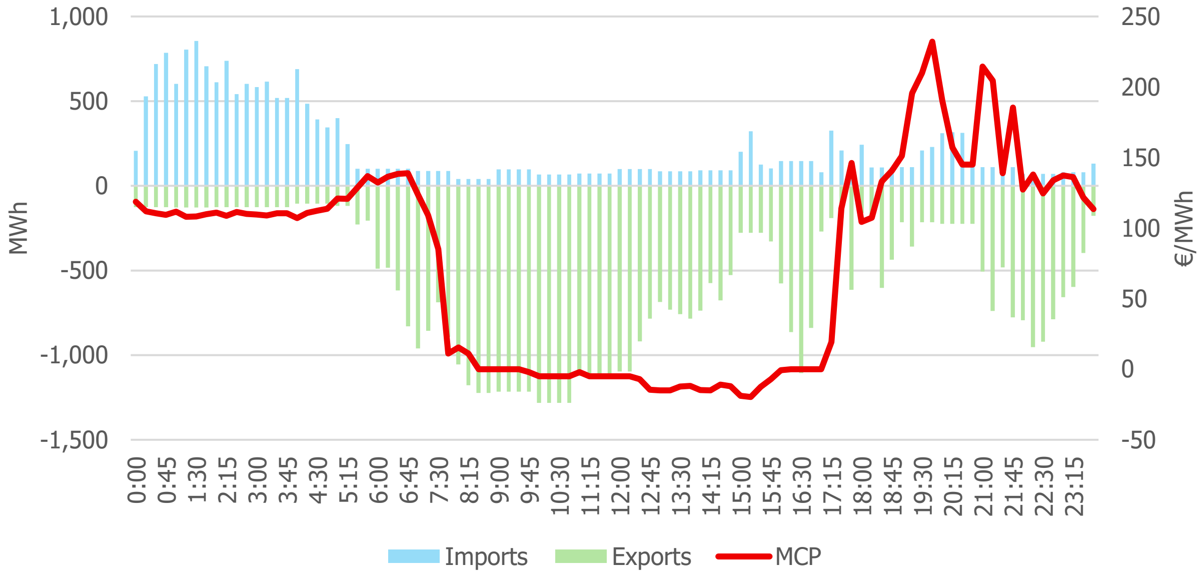


Figure 5 Imports, Exports (MWh) and DAM prices (€/MWh),[April 24, 2026], Source: EnExGroup, Center's Analysis

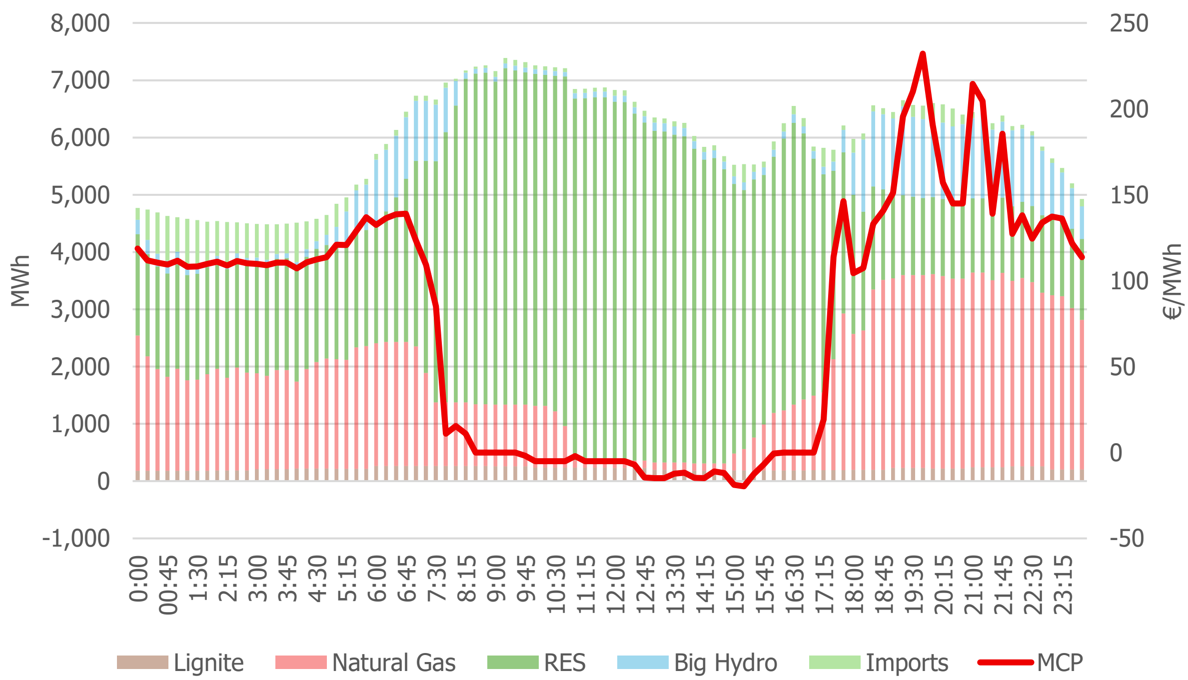


Figure 6 Traded volumes in DAM, System Load, and DAM MCP, [April 24,2026], Source: EnExGroup, Center's Analysis

Table 1 Electricity Demand, Weighted Average DAM, and YoY change, [2021-May 2026], Source: EnExGroup, Center's Analysis

Year	System Load (TWh)	YoY Change in System Load (%)	Weighted Average DAM MCP (€/MWh)	YoY Change in Weighted Average DAM MCP
2021	52.46		124.93	
2022	51.89	-1.09%	286.12	129.03%
2023	48.63	-6.27%	121.05	-57.69%
2024	54.04	11.11%	105.29	-13.02%
2025	54.26	0.4%	104.44	-0.80%

Renewable Expansion as the Principal Driver of Market Transformation

The most significant structural factor behind these developments has been the rapid expansion of renewable energy generation.

Renewable production within the Day-Ahead Market increased substantially between 2021 and 2026, transforming the composition of the Greek generation mix. Non-dispatchable RES technologies have become increasingly influential in determining market outcomes, particularly during daylight hours when solar PV availability is highest.

The expansion of renewable generation has fundamentally altered market outcomes, increasing the availability of low-cost electricity and strengthening Greece's role in regional electricity trade.

However, the increasing concentration of renewable production during specific hours of the day has also begun to reshape market dynamics in ways that were not previously observed. As renewable penetration rises, the market is increasingly characterized by periods of abundant supply followed by periods requiring greater system flexibility.

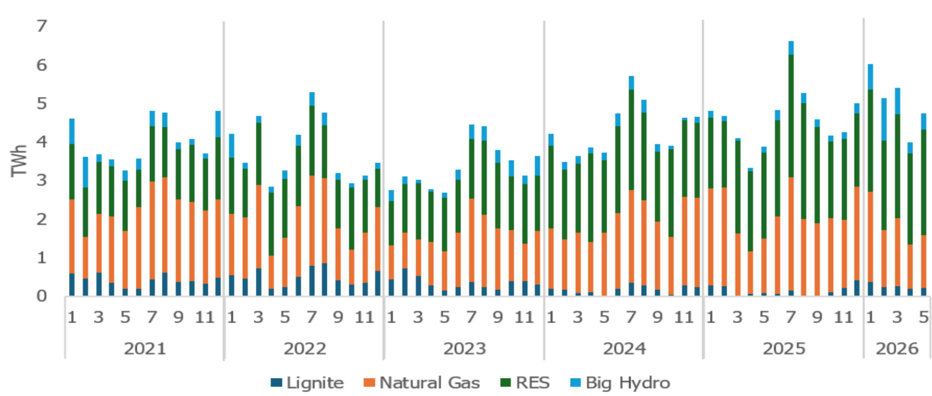


Figure 7 Traded Volumes in DAM by Technology, excluding Crete (TWh), [2021 - May 2026], Source: EnExGroup, Center's Analysis

Price Compression and Weighted Remuneration of Technologies

With increasing renewable penetration, a growing divergence is observed between wholesale electricity prices and the weighted prices captured by renewable energy.

As larger volumes of solar generation enter the market simultaneously, wholesale prices are increasingly pushed downward during the very hours when renewable assets produce the greatest amount of electricity. Consequently, while renewable generation contributes to lower overall system costs, renewable producers increasingly receive lower captured prices compared with historical levels.

The decline in remuneration prices, after the recovery of the 2022 Russian invasion to Ukraine, does not diminish the contribution of renewable energy to the electricity system. Rather, it reflects the challenges associated with integrating large volumes of variable generation into an increasingly mature and competitive electricity market.

Natural gas fired plants continuously serve as the marginal price-setting technology during periods of tight system conditions, until sufficient energy storage systems are introduced in the System.

As renewable penetration continues to increase and zero-marginal-cost generation displaces conventional production, gas-fired plants will be confronted with declining operating hours precisely when sustained utilization is required to recover their investment costs. This emerging tension highlights one of the central challenges of the energy transition: balancing the economic viability of dispatchable generation with the growing dominance of low-cost renewable energy.

Price Volatility and the Duck Curve in the Greek Wholesale Electricity Market

The growing penetration of solar generation is no longer influencing only annual market averages. It is increasingly reshaping hourly market outcomes, giving rise to pronounced intraday price differentials.

As PV capacity has expanded, electricity prices during midday hours have experienced increasing downward pressure. During these periods, abundant solar generation substantially reduces the need for higher-cost generation resources, lowering market clearing prices. As solar output declines later in the day and evening demand increases, flexible generation resources are required to meet system needs. The resulting increase in marginal generation costs contributes to higher prices during evening hours.

The resulting market profile increasingly resembles the well-known "duck curve" phenomenon observed in electricity systems with high levels of solar penetration. In Greece, this trend is becoming progressively more visible in Day-Ahead Market outcomes, creating a widening spread between low-priced midday electricity and higher-priced evening electricity.

These developments are reshaping investment incentives, licensing processes, and increasing the importance of technologies capable of shifting energy across different hours of the day.

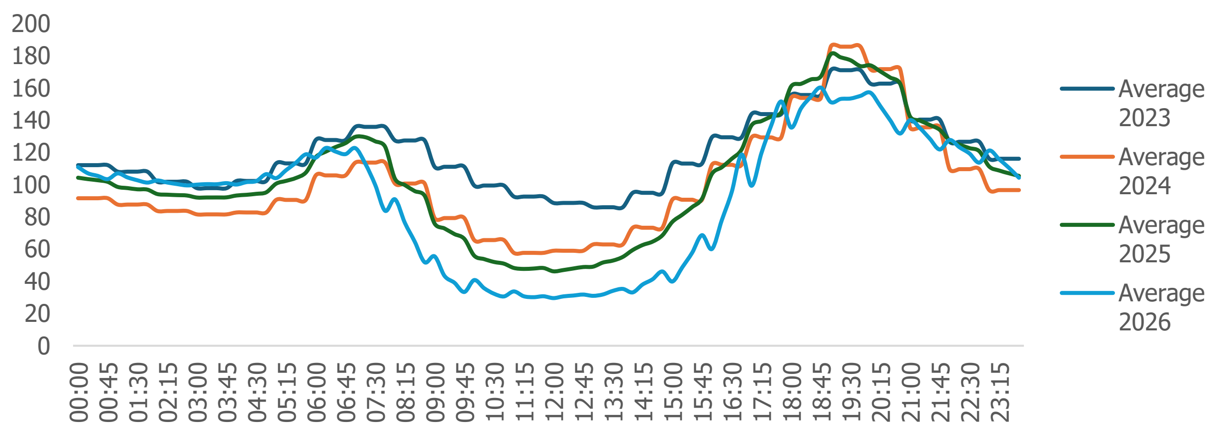


Figure 8 Quarter-hourly Average Annual DAM prices Duck Curve (€/MWh), [2023-May 2026], Source: EnExGroup, Center's Analysis

Flexibility Resources and the Continuing Role of Dispatchable Generation

Despite the rapid expansion of renewable generation, flexible and dispatchable resources continue to play a critical role in maintaining system reliability.

Natural gas remains the primary balancing fuel within the Greek electricity system and continues to set marginal prices during many periods of elevated demand. Hydroelectric resources provide additional flexibility by shifting production toward periods of higher system value and supporting system balancing requirements.

Despite the rapid growth of renewables, system reliability continues to depend on adequate flexibility resources, including natural gas, hydroelectric generation, storage, and interconnections.

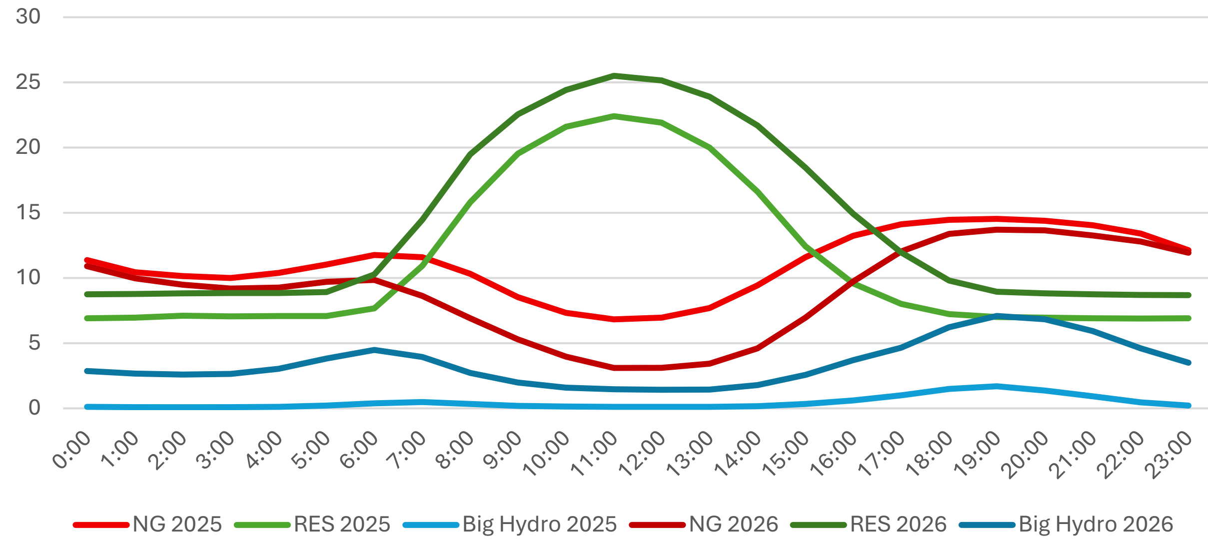
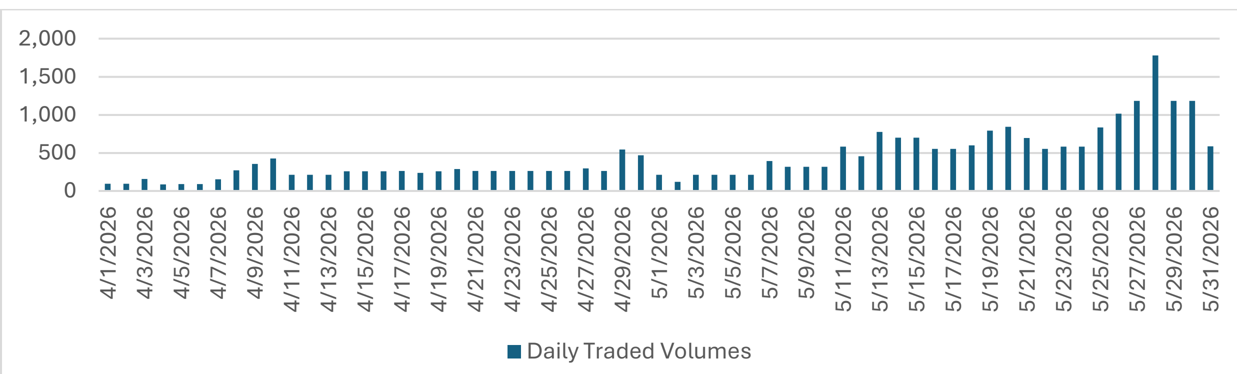


Figure 9 Average Hourly DAM Dispatch of Natural Gas, Big Hydro, and Renewables (GWh), [2025-May 2026], Source: EnExGroup, Center's Analysis

Storage and the Next Phase of Market Development

The widening gap between low-priced midday electricity and high-priced electricity during evening peak demand hours is strengthening the economic rationale for energy storage technologies. Utility-scale battery storage was introduced in the wholesale market on April 1st 2026, marking an important milestone for providing flexibility. Since the BESS have traded[†] more than 26 GWh, giving potential to leverage intraday price spreads by charging during periods of peak solar PV production and discharging during higher demand hours, where prices are higher.



[†] *In trading both buy and sell orders are considered*

Figure 10 BESS Storage traded volumes (MWh), [Jan– May 2026], Source: EnExGroup, Center's Analysis

April 24, 2026 provides a clear illustration of the value of battery storage (*Figure 11)*. Batteries charged during midday hours, when renewable generation was abundant and DAM prices were at their lowest, and discharged during the evening peak when demand increased and prices recovered. The event demonstrates how storage can capture intraday price spreads while supporting system flexibility and reducing renewable curtailments.

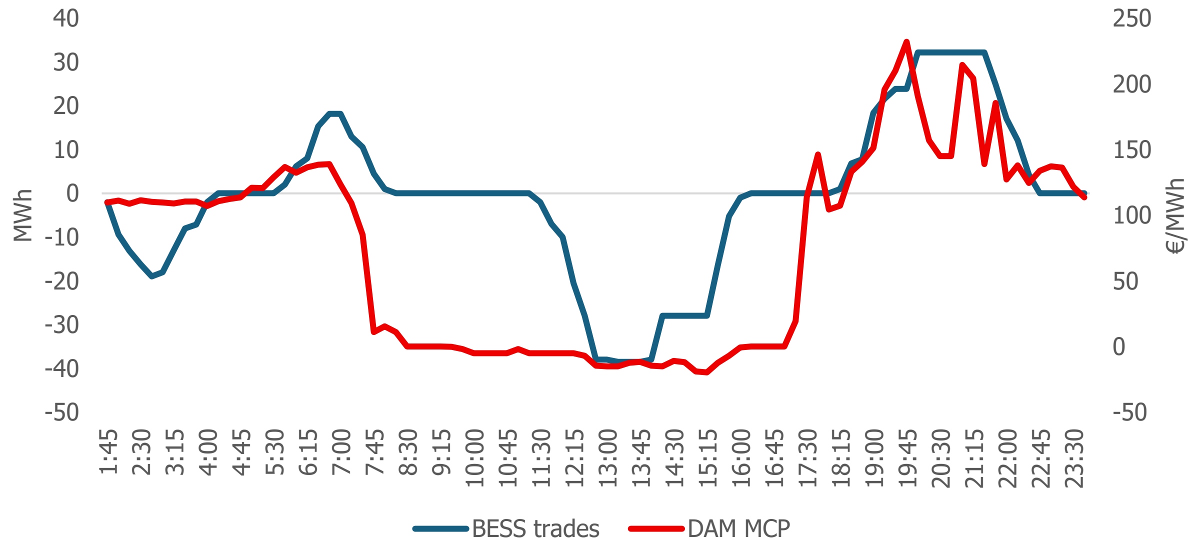


Figure 11 BESS trades and DAM MCP (€/MWh), [April 24, 2026], Source: EnExGroup, Center's Analysis

As renewable penetration continues to increase, storage technologies are expected to play an increasingly important role in reducing curtailments, enhancing system flexibility, and improving overall market efficiency.

Conclusions

The Greek wholesale electricity market has undergone a significant structural transformation over the past five years. Supported by rapid renewable energy deployment and deeper market integration, Greece has evolved from a predominantly importing market into a major regional exporter of electricity.

This transition has strengthened Greece's competitiveness within Southeast Europe and contributed to lower wholesale electricity prices relative to neighboring markets. However, the nature of cross-border trade is also changing. Increasingly, Greece exports large volumes of electricity during periods of renewable surplus and low market prices, while imports continue to occur during higher-priced periods when domestic renewable production is limited. As a result, export volumes have risen substantially, but export prices remain below import prices.

These developments highlight both the success and the challenges of the energy transition. Higher renewable penetration has reduced dependence on imported fossil fuels, strengthened long-term energy security, and improved the country's ability to meet domestic demand through indigenous energy resources. At the same time, it has intensified price volatility, increased renewable curtailments, compressed captured revenues for generators, and exposed the growing mismatch between periods of renewable abundance and periods of peak electricity demand.

The next phase of market development will therefore depend on the deployment of flexibility resources. Storage, demand-side participation, dispatchable generation, and stronger interconnections will be essential to shift low-cost renewable electricity to periods of higher system value, while maintaining system adequacy and reliability.

Greece's challenge is to maximize the value from renewable generation by reducing curtailments, increasing system flexibility, and narrowing the gap between low-priced exports and higher-priced imports.