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A PUBLICATION OF:
HAEE
HELLENIC ASSOCIATION *for* ENERGY ECONOMICS

ISSUE #09
SEPTEMBER
2026

Southeast Europe:
Building Europe's New Energy Corridor



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IN FOCUS

ISSUE #09 | SEPTEMBER 2026

Southeast Europe: Building Europe's New Energy Corridor

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ACRONYM	
FSRU	Floating Storage and Regasification Unit
LNG	Liquefied Natural Gas
TAP	Trans Adriatic Pipeline
IGB	Interconnector Greece-Bulgaria
TEN-E	Trans-European Networks for Energy
GHG	Greenhouse Gas

Foreword

Europe's energy system is undergoing an unprecedented transformation in both its speed and complexity. While the continent has faced energy crises before—from the oil shocks of the 1970s to disputes over Russian gas transit in the early 2000s—never have geopolitical upheaval, market restructuring, climate ambitions, and technological change converged so rapidly. The assumptions that underpinned European energy policy for decades are being fundamentally re-examined, giving rise to a new strategic landscape in which resilience has become just as important as efficiency, and flexibility has become just as valuable as affordability.

The catalyst for this transformation was undoubtedly Russia's invasion of Ukraine in February 2022. Beyond its devastating humanitarian consequences, the conflict exposed the vulnerabilities of a European energy system that had gradually become dependent on a limited number of supply routes and external partners. For years, energy security had been largely synonymous with diversification, market liberalization, and the completion of the internal energy market. Although these objectives delivered significant benefits, the crisis demonstrated that diversification alone could not fully shield Europe from geopolitical shocks when a substantial share of its energy imports remained concentrated in a single supplier.

The European response was immediate and unprecedented. Governments accelerated investments in liquefied natural gas (LNG) infrastructure, expanded cross-border interconnections, strengthened storage obligations, and intensified efforts to diversify suppliers. These measures proved remarkably effective in stabilizing markets and avoiding the widespread supply shortages that many had feared during the first winters following the invasion. More importantly, however, they initiated a structural reconfiguration of Europe's energy geography. New supply routes emerged, infrastructure priorities shifted, and regions that had previously occupied a secondary position within the European energy system suddenly acquired strategic significance.

Yet just as Europe began adapting to this new reality, another reminder of the fragility of global energy markets emerged. Rising tensions in the Middle East and the repeated disruption of maritime trade routes, particularly around the Strait of Hormuz, highlighted a different dimension of energy security. While Europe had successfully reduced its dependence on Russian pipeline gas, it had simultaneously become more exposed to globally traded LNG markets, where supply chains are influenced not only by commercial considerations but also by geopolitical instability thousands of kilometers away. The lesson was not that diversification had failed, but rather that energy security had entered a new era. One in which risks originate from multiple directions and resilience can no longer be measured solely by the number of suppliers.



These developments have fundamentally broadened the concept of energy security. Ensuring reliable energy supplies today requires much more than access to alternative fuels. It demands interconnected infrastructure capable of redirecting flows during disruptions, electricity systems that can accommodate growing shares of renewable generation, storage assets that provide operational flexibility, and markets that function efficiently under conditions of increasing uncertainty. In other words, the challenge facing Europe is no longer simply one of diversification, but of building an energy system that is adaptable, integrated, and capable of responding to an evolving geopolitical environment.

It is within this broader context that Southeast Europe has emerged as one of the most strategically important regions in Europe's evolving energy architecture.

For decades, the region was often viewed primarily as a transit area connecting producers and consumers, rather than as a strategic energy actor in its own right. Its fragmented markets, limited interconnections, and relatively modest role in European policymaking meant that discussions surrounding the continent's energy future were frequently centered elsewhere. Over the past few years, however, this perception has changed dramatically. The need for alternative supply routes, increased regional integration, and greater system flexibility has transformed Southeast Europe from a geographical periphery into a strategic crossroads linking the Eastern Mediterranean, the Black Sea, Central Europe, and the wider European Union.

This edition of InFocus explores this transformation of Southeast Europe. It argues that the region's growing importance is not simply the consequence of recent geopolitical events, but the result of a deeper structural shift in Europe's energy geography. The chapters that follow examine how changing energy flows are reshaping the continent, why the concept of energy security must evolve beyond diversification, how the Vertical Corridor is redefining regional integration, and why electricity, renewable energy, and system flexibility will become just as important as pipelines in determining Europe's energy future. Finally, the publication considers the opportunities and challenges that lie ahead, asking whether Southeast Europe can evolve from an emerging transit corridor into one of Europe's principal energy hubs.



Part I: *SE Europe on the rise*



A new energy geography for Europe

Throughout history, the location of resources, the development of transport infrastructure, and shifting geopolitical alliances have continuously reshaped the way energy is produced, traded, and consumed. Coal fueled the industrialization of Western Europe because it was abundant close to centres of economic activity. The discovery of oil shifted global strategic attention towards the Middle East, while the expansion of natural gas pipelines during the second half of the twentieth century created an intricate network connecting producing regions with the continent's rapidly growing industrial economies. In every case, energy infrastructure has reflected the political and economic priorities of its time, often outliving the circumstances that originally justified its construction.

The European energy system that emerged after the end of the Cold War was no exception. It was built upon a relatively straightforward premise: secure, affordable, and abundant pipeline gas from Russia would complement domestic production, facilitate the gradual phase-out of coal, and support Europe's industrial competitiveness while the continent advanced towards a lower-carbon economy. Supported by long-term contracts and an extensive network of transmission infrastructure, this model proved remarkably successful for almost three decades. Investment decisions, industrial development, and even the design of Europe's internal gas market were shaped around an energy architecture that appeared both economically efficient and politically sustainable.

Yet the apparent stability of this system concealed an increasingly significant strategic vulnerability. As domestic production declined, particularly following the gradual depletion of mature fields in the North Sea and the closure of major assets such as the Groningen gas field in the Netherlands, Europe's dependence on imported energy steadily increased. Although policymakers repeatedly highlighted the importance of diversification, the combination of competitive Russian gas prices, well-established infrastructure, and decades of reliable deliveries reduced the urgency of pursuing alternative supply routes. As a result, much of the continent's infrastructure remained oriented along an east-west axis, reinforcing a model that concentrated both physical flows and geopolitical risk. Although dependency levels vary considerably across Member States, the overall European trend has been one of increasing reliance on imported energy, with countries such as Greece remaining above the EU average (Figure 1).

The Russian invasion of Ukraine in February 2022 fundamentally altered this equilibrium. The subsequent reduction of Russian gas exports to Europe was not simply another supply disruption. It represented the collapse of an energy model that had defined European policy for decades. Governments were forced to act with unprecedented speed, securing alternative supplies, accelerating LNG infrastructure, increasing storage obligations, and strengthening cross-border cooperation. What initially appeared to be an emergency response soon evolved into a structural transformation of Europe's energy landscape, fundamentally changing the direction of energy flows across the continent.

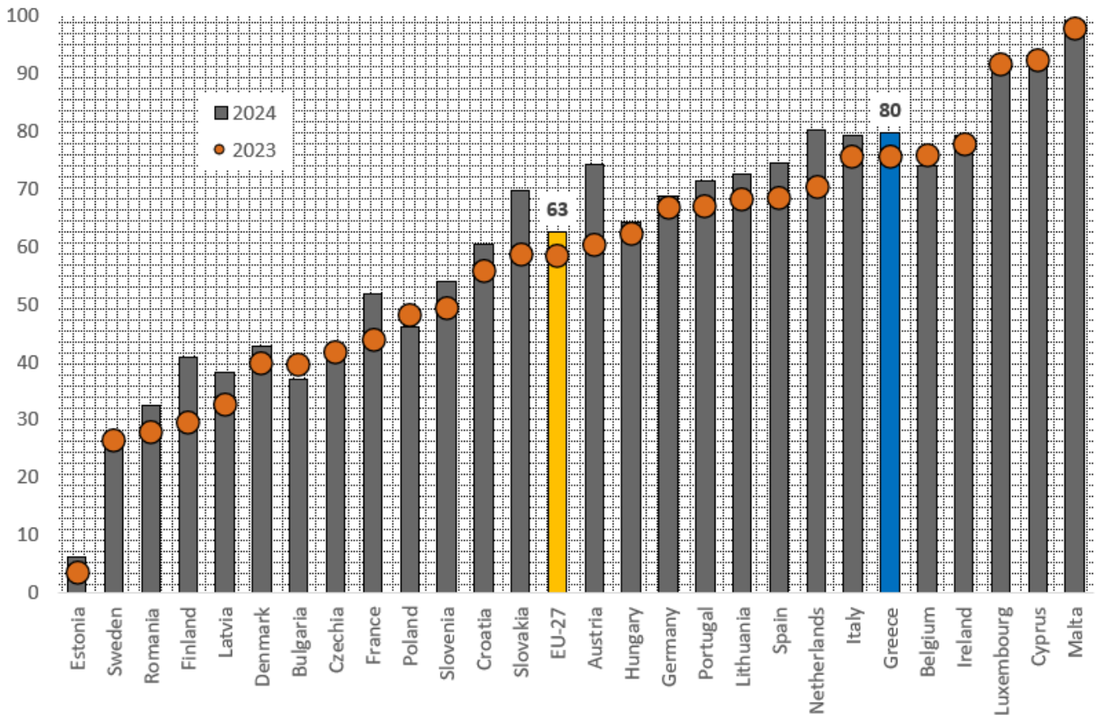


Figure 1. Energy Imports Dependency Rate in Europe (%), [2024]. Source: Eurostat.

One of the most remarkable consequences of this transformation has been the emergence of a new energy geography. Infrastructure that had once occupied a secondary role within the European system suddenly became strategically indispensable. LNG import terminals that had previously operated below capacity became critical gateways for replacing Russian supplies. Interconnectors, often viewed as projects primarily supporting market integration, proved essential for maintaining security of supply. Regions that had historically been considered peripheral found themselves positioned at the centre of Europe's diversification strategy.

Among them, Southeast Europe has experienced perhaps the most significant strategic re-evaluation. For decades, the region's importance within the European energy system was often viewed through the narrow prism of transit. Its geographical position between producing regions and European consumers was recognized, yet insufficient investment, fragmented markets, and limited interconnectivity prevented Southeast Europe from fully capitalizing on this advantage. National energy systems developed largely in isolation, while major infrastructure corridors frequently bypassed the region in favour of more established routes serving Western and Central Europe. Consequently, Southeast Europe remained more of an endpoint than a driver of European energy policy.

Recent developments have dramatically altered this perception. Rather than representing the southeastern edge of the European market, the region is increasingly being recognized as the point where several of Europe's most important energy corridors converge. LNG imported through the Mediterranean, natural gas transported via the Southern Gas Corridor, future production from the Black Sea, and potential supplies from the Eastern Mediterranean all intersect within Southeast Europe before continuing towards Central and Eastern European markets. Geography, which had long been an underutilized advantage, has become one of the region's greatest strategic assets.

Greece illustrates this evolution particularly well. Traditionally characterised as a net energy importer located at the southeastern edge of the European Union, the country is increasingly assuming a different role within the continent's energy architecture. Investments in LNG infrastructure, transmission networks, and cross-border interconnections have transformed Greece into one of the principal entry points for natural gas entering Southeast Europe. The expansion of the Revithoussa LNG terminal, the commissioning of the Alexandroupolis Floating Storage and Regasification Unit (FSRU), and the strengthening of regional pipeline connections have significantly enhanced the country's ability not only to satisfy domestic demand but also to contribute to the security of neighbouring markets.

Bulgaria has also strengthened its position as a critical transit country linking Southern and Central Europe, while Romania is expected to play an increasingly important role through both infrastructure development and the exploitation of offshore natural gas resources in the Black Sea. Together, these countries are contributing to the emergence of a regional energy system that is more interconnected, more flexible, and considerably more resilient than the fragmented landscape that existed only a few years ago.

At the same time, the changing nature of global energy markets has reinforced the importance of this transformation. Europe's increased reliance on LNG has undoubtedly strengthened diversification, but it has also exposed the continent more directly to global geopolitical developments. The recent tensions surrounding the Strait of Hormuz serve as a reminder that supply security is no longer determined exclusively by bilateral relationships between producers and consumers. Maritime chokepoints, international shipping routes, and developments occurring thousands of kilometers from Europe can rapidly influence prices, market sentiment, and the availability of energy supplies. In such an environment, regional infrastructure capable of increasing flexibility and redirecting flows becomes considerably more valuable than under more stable geopolitical conditions.

These developments suggest that Europe is entering a new phase in the evolution of its energy system. The objective is no longer simply to replace one supplier with another, but to create an architecture that is sufficiently diversified, interconnected, and adaptable to withstand multiple forms of disruption simultaneously. Geography therefore regains a central role, not only as a fixed determinant of energy policy, but also as a strategic asset whose value depends on infrastructure, regional cooperation, and the ability to connect markets across multiple directions.

The rise of Southeast Europe should therefore be understood as more than a temporary response to the Ukraine crisis. Rather, it reflects a structural shift in the way Europe approaches energy security, market integration, and the energy transition. The region is increasingly becoming the meeting point between traditional and emerging energy systems, connecting LNG with pipelines, electricity with natural gas, and conventional infrastructure with future low-carbon technologies. Whether this transformation ultimately establishes Southeast Europe as one of Europe's principal energy hubs will depend on the investments and policy choices made over the coming decade. What is already evident, however, is that the continent's energy map is being redrawn, and Southeast Europe is no longer situated at its margins.

Energy security beyond diversification

Equally profound was the reassessment of what energy security itself means. For much of the past two decades, European energy policy rested on the assumption that security could be achieved primarily through diversification: increasing the number of suppliers, expanding import routes, integrating national markets, and promoting competition. While these objectives remain essential, recent geopolitical developments have demonstrated that diversification, although necessary, is no longer sufficient to guarantee resilience in an increasingly volatile international environment.

This evolution reflects a broader shift in the nature of energy-related risks. During the latter half of the twentieth century and the early decades of the twenty-first, energy security debates largely revolved around producer-consumer relationships. Concerns focused on the reliability of exporting countries, the stability of long-term contracts, and the risks associated with excessive dependence on a limited number of suppliers. Consequently, diversification strategies were primarily designed to reduce exposure to individual producing nations. Europe sought additional pipeline connections, encouraged the development of LNG infrastructure, and gradually liberalized its internal energy markets in the belief that greater competition would naturally enhance security of supply.

The disruption of Russian gas exports fundamentally validated many of these efforts while simultaneously exposing their limitations. Europe succeeded in avoiding the catastrophic supply shortages that many had predicted, largely because it was able to mobilise alternative suppliers, increase LNG imports, and strengthen cooperation among Member States. The rapid deployment of floating regasification terminals, the coordinated filling of underground gas storage facilities, and unprecedented levels of demand reduction demonstrated that European energy systems were far more adaptable than many had assumed. Yet the crisis also illustrated that energy security cannot be understood solely through the availability of alternative fuels. The ability to absorb shocks, redirect energy flows, coordinate regional responses, and maintain market stability proved equally important.

Although the two concepts are closely related, they are not synonymous. Diversification seeks to reduce dependence by expanding the number of available supply options. Resilience, on the other hand, describes the capacity of an energy system to continue functioning under conditions of disruption, regardless of where those disruptions originate. A diversified system may still prove vulnerable if infrastructure is insufficient, storage levels are inadequate, or markets lack the flexibility to respond to rapidly changing circumstances. Conversely, a resilient system is characterised by its ability to adapt, recover, and maintain reliable service even when confronted with multiple simultaneous challenges.

This distinction has become increasingly relevant as the geography of energy trade has evolved. Europe's growing reliance on LNG, while essential in replacing Russian pipeline gas, has inevitably linked the continent more closely to global energy markets. Unlike pipeline supplies, which are constrained by fixed infrastructure and long-term bilateral relationships, LNG operates within an international marketplace where cargoes can be redirected in response to price signals, geopolitical developments, or changing patterns of demand. This flexibility has significantly enhanced Europe's diversification options, but it has also exposed European consumers more directly to developments taking place far beyond the continent's borders. The restructuring of Europe's gas supply portfolio is clearly illustrated by the current import mix, where LNG and Norwegian gas have largely replaced the volumes previously supplied through Russian pipelines (Figure 2).

The recent escalation of tensions surrounding the Strait of Hormuz provides a striking illustration of this new reality. Although Europe imports relatively limited quantities of oil and LNG directly from the Gulf, the strategic importance of the Strait extends well beyond physical trade volumes. A significant proportion of globally traded LNG and approximately one-fifth of the world's oil passes through this narrow maritime corridor. Any disruption has immediate repercussions across international commodity markets, influencing freight costs, insurance premiums, price expectations, and ultimately wholesale energy prices throughout Europe.

The implications extend beyond short-term market volatility. The Hormuz crisis serves as a reminder that Europe has not escaped geopolitical energy risks. Rather, the nature of those risks has changed. The dependence that once centered primarily on pipeline infrastructure and bilateral relationships has gradually shifted towards a more complex system influenced by maritime security, global trade routes, and international market dynamics. In other words, Europe has exchanged one form of exposure for another. While this new configuration is undoubtedly more diversified, it also requires a broader understanding of resilience.

Infrastructure has become one of the defining pillars of contemporary energy security. LNG terminals provide access to global markets, but their value depends on sufficient transmission capacity to distribute imported gas across national borders. Underground storage facilities provide insurance against supply disruptions, yet their effectiveness relies upon coordinated filling strategies and adequate interconnections. Electricity transmission networks increasingly support not only market integration but also system reliability by allowing countries to share balancing resources during periods of stress. Even digital technologies and cybersecurity have become integral components of modern energy resilience as energy systems become progressively more interconnected and decentralised.

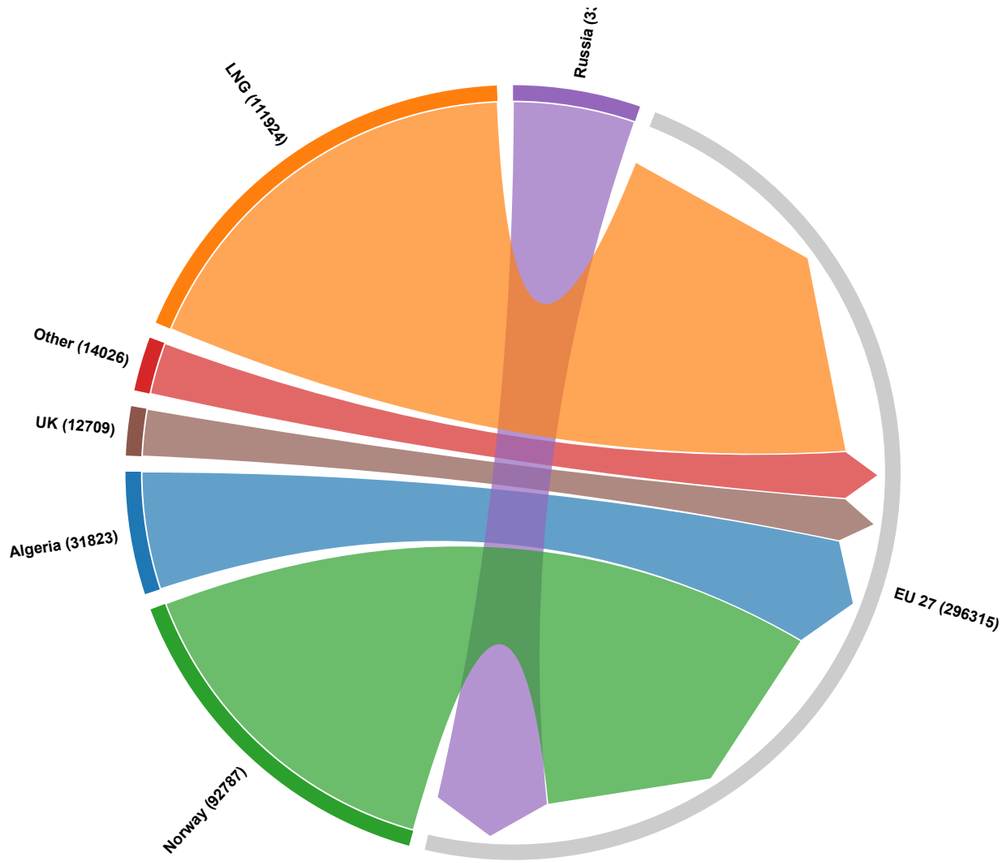


Figure 2. EU Natural Gas Imports (mil. m3) by origin, [2025]. Source: Bruegel



Regional cooperation has therefore become as important as physical infrastructure itself. One of the most important lessons emerging from the recent energy crisis is that security can no longer be pursued exclusively through national policies. Integrated markets, coordinated emergency planning, common regulatory frameworks, and cross-border infrastructure have all demonstrated their value in reducing the impact of supply disruptions. Rather than weakening national energy security, regional integration has become one of its strongest foundations.

Historically, several countries in the region occupied relatively isolated positions within the European energy system. Limited interconnections, relatively small domestic markets, and historical dependence on a restricted number of supply routes often constrained flexibility and increased vulnerability during periods of disruption. Over the past few years, however, this picture has changed considerably. Investments in LNG infrastructure, cross-border pipelines, storage capacity, and electricity interconnections are gradually transforming Southeast Europe into one of the continent's most interconnected energy regions.

This transformation carries significance that extends beyond the region itself. By increasing connectivity between the Eastern Mediterranean, the Balkans, Central Europe, and the Black Sea, Southeast Europe is helping to create alternative pathways capable of supporting the resilience of the wider European energy system. Infrastructure projects initially conceived to serve national interests are increasingly delivering regional benefits, enabling energy to flow where it is most needed and strengthening Europe's collective capacity to respond to future crises.

Importantly, resilience should not be understood as an objective that competes with the energy transition. On the contrary, many of the investments required to enhance security simultaneously accelerate decarbonisation. Stronger electricity grids facilitate greater renewable energy integration. Energy storage supports both system reliability and variable renewable generation. Interconnections improve market efficiency while reducing dependence on fossil fuel imports. The growing convergence between security policy and climate policy is one of the defining characteristics of Europe's current energy transformation.

This convergence is likely to become even more pronounced over the coming decade. As electrification expands across transport, industry, and heating, the resilience of electricity systems will become increasingly important. At the same time, emerging technologies such as battery storage, demand-side flexibility, renewable hydrogen, and digital grid management will play a growing role in supporting both security and sustainability objectives. The concept of energy security will therefore continue to evolve, reflecting a system that is simultaneously more integrated, more decentralised, and more technologically sophisticated than ever before.

The challenge facing Europe is consequently no longer limited to identifying alternative suppliers or expanding import capacity. It is to build an energy architecture capable of adapting to an environment characterised by geopolitical uncertainty, accelerating decarbonisation, and increasingly interconnected global markets. Diversification remains an indispensable component of that strategy, but it is only one element of a much broader framework centered on resilience.

For Southeast Europe, this evolution presents both an opportunity and a responsibility. The region's growing infrastructure, strategic location, and expanding regional cooperation place it at the heart of Europe's emerging resilience strategy. The question is no longer whether Southeast Europe can contribute to European energy security, but how its evolving role can help shape a more flexible, integrated, and resilient energy system for the decades ahead. The clearest expression of this ambition is perhaps the Vertical Corridor, which has rapidly evolved from a regional infrastructure initiative into one of the most significant projects underpinning Europe's new energy architecture.



Part II:*The Vertical Corridor – The backbone of regional integration*

The Vertical Corridor

Few infrastructure projects have attracted as much attention in recent years as the Frequently presented as Europe's newest gas corridor, it is often described in terms of transmission capacities, interconnectors, LNG terminals, and pipeline expansions stretching from Greece through Bulgaria and Romania towards Central Europe and, ultimately, Ukraine. While these physical assets are undoubtedly its most visible components, they tell only part of the story. To understand the significance of the Vertical Corridor, it is necessary to view it not merely as another infrastructure initiative, but as the physical manifestation of a much broader transformation taking place across the European energy system.

Throughout modern European history, major infrastructure projects have served objectives extending far beyond the transportation of fuels. They have strengthened political alliances, facilitated economic integration, influenced investment decisions, and shaped regional development. The Nord Stream pipelines, the Southern Gas Corridor, and even the early trans-European electricity networks all reflected strategic choices about how Europe should connect with its neighbours and distribute energy across the continent. The Vertical Corridor belongs to this tradition. Its importance lies not simply in the molecules it carries, but in the new geopolitical and economic relationships it enables.

The conditions that gave rise to the initiative were created long before the outbreak of the war in Ukraine. For years, Southeast European countries had recognized the need to improve north-south connectivity within a region whose infrastructure had historically developed around east-west flows. The liberalization of European gas markets, the emergence of LNG as an increasingly competitive fuel, and the construction of projects such as the Trans Adriatic Pipeline (TAP) and the Interconnector Greece-Bulgaria (IGB) had already begun laying the foundations for a more interconnected regional market. Nevertheless, progress remained gradual, largely because the existing energy architecture continued to function adequately under normal market conditions.

The sharp decline in Russian pipeline deliveries exposed structural weaknesses that could no longer be addressed through incremental improvements. While LNG imports compensated for much of the lost supply, Europe quickly realized that importing gas was only part of the solution. The ability to move that gas efficiently across borders became equally important. Infrastructure capable of transporting energy from southern entry points towards the most vulnerable markets in Central and Eastern Europe suddenly acquired strategic value that had not previously been fully appreciated.

It is within this context that the Vertical Corridor evolved from a regional infrastructure proposal into a European strategic priority. Unlike traditional pipeline projects designed to connect a specific producer with a specific consumer, the Vertical Corridor does not depend on a single source of supply. Instead, it is built around flexibility. LNG arriving at terminals in Greece, gas transported through the Southern Gas Corridor, future production from the Black Sea, and potentially even supplies from the Eastern Mediterranean can all utilize the same interconnected network to reach markets further north. In doing so, the corridor reduces dependence on individual routes while creating a system capable of adapting to changing geopolitical and commercial circumstances.

Europe's previous gas architecture was largely linear. Gas moved predominantly from east to west through long-established transmission systems designed around predictable supply relationships. The emerging architecture is considerably more dynamic. Energy increasingly enters Europe through multiple gateways before being redistributed across an interconnected network according to market conditions, infrastructure availability, and security considerations. The Vertical Corridor exemplifies this transition from a static to a flexible model of energy transport. As illustrated in Figure 3, the corridor links multiple entry points and transmission systems across Southeast Europe, creating a north-south axis capable of serving both regional markets and the wider European network.

The geographical position of Southeast Europe makes this transformation possible. Few regions are simultaneously connected to the Eastern Mediterranean, the Black Sea, the Caspian Basin, and the wider European market. This unique location enables the corridor to integrate multiple sources of supply into a single regional system, significantly increasing Europe's ability to respond to future disruptions.

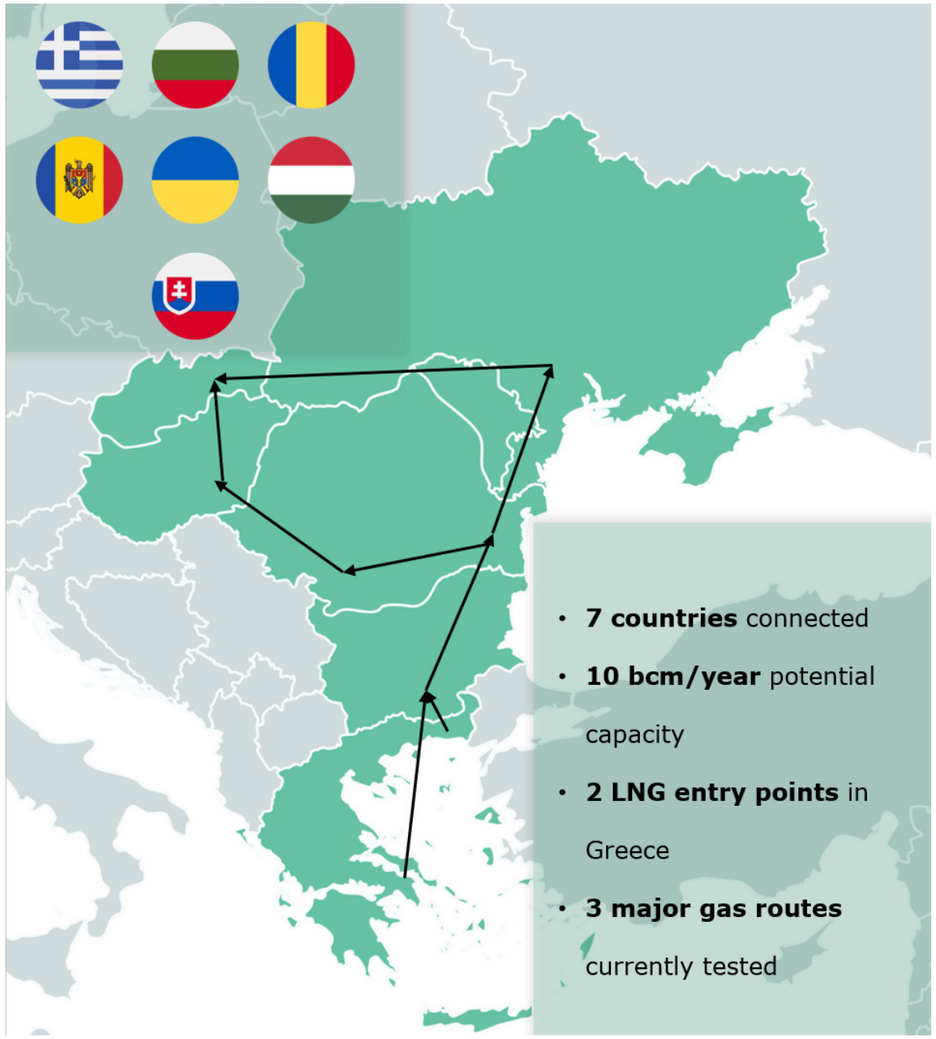


Figure 3. The Vertical Corridor. Source: DESFA

Greece naturally occupies a central position within this evolving architecture. The country has rapidly expanded its role as one of Europe's principal LNG gateways through investments in Revithoussa and the Alexandroupolis FSRU. These facilities, combined with Greece's expanding transmission network, have transformed the country from a relatively isolated end-user into one of the principal entry points for natural gas entering Southeast Europe. The significance of these investments lies not only in their contribution to domestic energy security but also in their capacity to supply neighbouring countries during periods of heightened market uncertainty.

Bulgaria represents the second critical pillar of the corridor. Historically dependent on a limited number of supply routes, the country has undergone a remarkable transformation over the past few years. The commissioning of the Greece-Bulgaria Interconnector has fundamentally altered Bulgaria's access to alternative supplies while strengthening its position as a regional transit country. Rather than functioning solely as a consumer, Bulgaria increasingly serves as a bridge connecting southern entry points with markets further north.

Romania adds yet another strategic dimension. Beyond its role as a transit country, Romania possesses one of Europe's most promising natural gas development opportunities through the Neptun Deep project in the Black Sea. Once operational, domestic offshore production could significantly enhance regional supply diversity while reinforcing the strategic importance of the Vertical Corridor. Unlike previous European diversification efforts that relied almost exclusively on imports, the Black Sea introduces the possibility of strengthening European energy security through additional indigenous production.

Although much of the discussion surrounding Ukraine understandably focuses on the immediate consequences of the ongoing conflict, the country's long-term integration into the European energy market will be equally significant. Rebuilding Ukraine's energy system will require diversified supply routes, strengthened interconnections, and deeper integration with neighbouring markets. In this respect, the Vertical Corridor is not simply supporting Europe's current energy security objectives; it is also contributing to the foundations of Ukraine's future energy architecture.

For decades, energy projects were often evaluated primarily on the basis of economic efficiency. Infrastructure was expected to minimize transportation costs, optimize existing supply chains, and respond to projected demand. While these considerations remain important, recent geopolitical developments have elevated resilience to an equally important planning criterion. Infrastructure is increasingly valued not only for the energy it transports under normal conditions but also for the options it creates during periods of disruption.

This perspective fundamentally changes how projects such as the Vertical Corridor should be evaluated. Its value cannot be measured solely by annual throughput volumes or commercial revenues. Equally important are the strategic benefits associated with redundancy, flexibility, and optionality. The ability to redirect supplies during emergencies, reduce dependence on individual transit routes, and support regional solidarity represents an economic value that traditional cost-benefit analyses often struggle to capture.

The recent tensions surrounding the Strait of Hormuz reinforce this argument. Although the corridor was conceived primarily in response to the disruption of Russian gas supplies, the uncertainties affecting global LNG trade have demonstrated that Europe's future energy security will depend on its capacity to manage multiple geopolitical risks simultaneously. Infrastructure capable of integrating diverse supply sources and distributing them efficiently across interconnected markets therefore becomes increasingly valuable regardless of where future disruptions originate.

Nevertheless, the success of the Vertical Corridor should not be taken for granted. Important challenges remain. Several infrastructure projects require further expansion, cross-border regulatory coordination must continue improving, and financing needs remain considerable. Moreover, long-term uncertainty surrounding European natural gas demand raises legitimate questions regarding the pace and scale of future investments.

These uncertainties should not obscure the project's broader strategic significance. The Vertical Corridor is not simply designed to address a temporary crisis, nor is it solely intended to increase natural gas imports. It represents a long-term investment in regional resilience and European integration. More importantly, it signals a shift in the way Europe approaches energy infrastructure—from assets designed around individual suppliers to networks designed around flexibility, interoperability, and strategic optionality.

In many respects, the corridor symbolizes Southeast Europe's broader transformation. A region that for decades was largely perceived as an endpoint of European energy policy is increasingly becoming one of the places where that policy is being actively shaped. The infrastructure now under development is not only responding to today's geopolitical realities; it is laying the foundations for tomorrow's European energy architecture.

From molecules to markets

The Vertical Corridor is often presented as an infrastructure project, measured in kilometers of pipeline, billions of cubic meters of transmission capacity, or the number of interconnectors linking neighbouring countries. While these metrics illustrate the scale of the investment, they only partially explain its strategic importance. Infrastructure, by itself, does not create energy security. Ultimately, the success of the Vertical Corridor will depend not only on its ability to move molecules across borders, but also on its capacity to foster the development of a truly regional energy market. This distinction reflects a broader evolution in the European gas sector. Historically, natural gas markets were organized around long-term bilateral relationships between producers and consumers. Supply contracts often extended over several decades, prices were frequently linked to oil, and infrastructure was designed to transport gas from specific production fields to predetermined markets. The commercial landscape was relatively predictable, with limited opportunities for cross-border trading or short-term market adjustments. Security of supply therefore depended primarily on the reliability of individual suppliers and the robustness of the physical infrastructure connecting them to European consumers.

Over the past two decades, however, this model has undergone a profound transformation. The gradual liberalization of European gas markets, the establishment of trading hubs, the introduction of third-party access rules, and the expansion of LNG have fundamentally altered the way natural gas is bought, sold, and transported. Increasingly, gas is no longer viewed simply as a commodity flowing through dedicated pipelines, but as a product traded within an integrated market where prices, demand, and supply continuously interact across national borders.

With recent crises the need for a transformation was readily apparent. Yet replacing molecules was only one part of the challenge. Ensuring that those molecules could reach the markets where they were needed required an equally significant transformation of market structures, infrastructure utilization, and regional cooperation.

The region is no longer simply developing infrastructure to improve security of supply. It is gradually creating the conditions necessary for deeper market integration. LNG terminals, interconnectors, storage facilities, and transmission networks are becoming the physical foundations of a regional marketplace in which energy can move according to economic signals rather than historical supply patterns. In many respects, this evolution is just as significant as the construction of the infrastructure itself.

Only a decade ago, the Greek gas market was relatively small, largely focused on domestic consumption, and geographically positioned at the edge of the European gas system. Today, the picture is fundamentally different. The expansion of the Revithoussa LNG terminal, the commissioning of the Alexandroupolis FSRU, the operation of TAP, and the development of new interconnections have repositioned Greece as one of the principal gateways through which international gas supplies enter Southeast Europe. This transformation is also reflected in the remarkable growth of LNG imports, particularly from the United States, which have substantially increased Greece's role within the regional gas market (Figure 4).

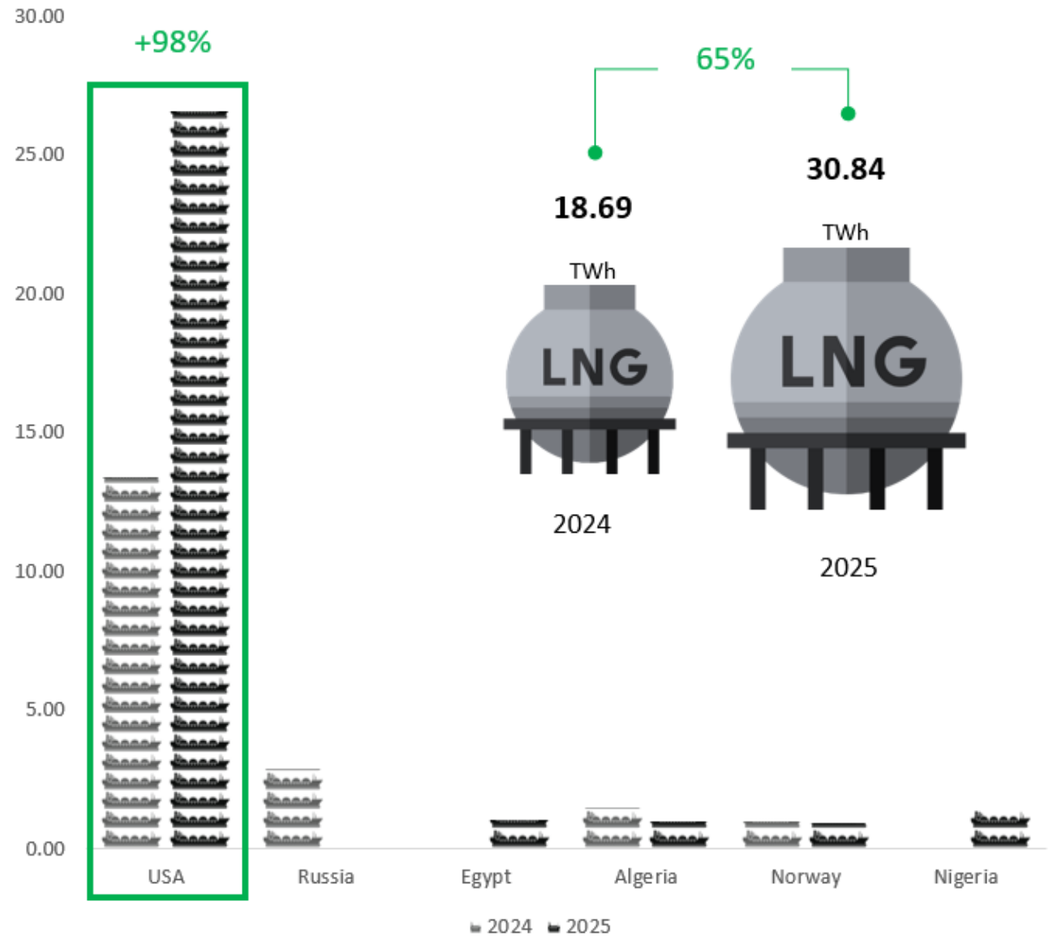


Figure 4. LNG Imports in Greece (TWh), [2024-2025]. Source: DESFA

These developments have implications that extend well beyond national energy security. Every LNG cargo arriving in Greece potentially serves multiple markets rather than a single destination. Once regasified, natural gas can move northwards through an expanding network of interconnections, reaching Bulgaria, Romania, Hungary, Moldova, and, increasingly, Ukraine. Infrastructure that was once designed primarily to satisfy domestic demand is therefore evolving into regional infrastructure serving a much wider European purpose.

The same principle applies to the broader Southeast European market. Projects such as the IGB, upgrades to national transmission systems, and the expansion of reverse-flow capabilities have gradually reduced the fragmentation that historically characterised the region. Countries that once operated largely independent gas systems are becoming participants in an increasingly interconnected market where supply can be redirected according to commercial opportunities and security needs.

Integrated markets generally allocate resources more efficiently than fragmented ones. Greater connectivity increases competition between suppliers, improves market liquidity, and provides consumers with access to a broader range of supply options. During periods of market stress, interconnected systems are also better positioned to absorb shocks because energy can be redirected towards areas experiencing temporary shortages. In this sense, market integration should not be viewed merely as an economic objective but as an increasingly important component of energy security itself.

The emergence of regional gas hubs illustrates this evolution particularly well. Mature trading hubs such as the Dutch TTF or the British NBP transformed European gas markets by providing transparent price signals, improving liquidity, and facilitating cross-border trade. While Southeast Europe is not yet characterised by comparable levels of market maturity, the gradual expansion of infrastructure and trading activity is creating the conditions for deeper regional integration. The objective is not necessarily to replicate the experience of Northwestern Europe, but rather to develop market structures that reflect the specific characteristics and strategic role of Southeast Europe within the wider European energy system.



Nevertheless, infrastructure and market integration cannot eliminate uncertainty. The geopolitical developments of recent years have demonstrated that volatility has become a structural feature of international energy markets rather than a temporary phenomenon. The disruption of Russian pipeline exports fundamentally reshaped European gas flows, while tensions in the Middle East highlighted the vulnerability of globally traded LNG. Market participants must therefore operate within an environment where geopolitical developments can rapidly influence prices, trade flows, and investment decisions.

In a fragmented system, disruptions tend to remain localized because individual markets possess limited flexibility to access alternative supplies. In an integrated market, however, infrastructure, commercial arrangements, and transparent pricing mechanisms enable energy to move more efficiently towards areas experiencing shortages. Rather than eliminating risk, market integration improves the capacity of the system to manage that risk. This ability to adapt is becoming increasingly valuable as Europe's energy transition accelerates. Although natural gas will continue playing an important role during the coming decades, particularly in balancing electricity systems with growing shares of renewable generation, the infrastructure currently being developed may ultimately support a much broader range of energy carriers. Renewable gases, biomethane, carbon management infrastructure, and eventually hydrogen could all utilize elements of today's transmission network, provided investments continue to prioritize flexibility and interoperability.

Viewed from this perspective, the Vertical Corridor is best understood not as a project dedicated exclusively to natural gas, but as the first stage in the development of a broader regional energy platform. The pipelines being expanded today may eventually transport different energy carriers. The commercial relationships currently emerging around LNG trading may evolve into integrated markets for low-carbon gases. The institutional cooperation established to improve gas security could later support electricity markets, hydrogen trade, and broader regional energy planning.

Europe's energy future will not be determined solely by the infrastructure it builds, but by the markets it creates around that infrastructure. Physical assets provide the foundations of resilience, yet it is integrated markets that transform those assets into a flexible, efficient, and adaptable energy system.

The transition from molecules to markets therefore represents far more than the liberalization of the gas sector. It marks the evolution of Southeast Europe from a region characterised by fragmented national systems into one increasingly capable of functioning as a cohesive energy marketplace. If the Vertical Corridor provides the physical backbone of this transformation, market integration provides its economic logic. Together, they form the basis of a regional energy architecture that is considerably more resilient than the one it is gradually replacing and one that will be better equipped to support Europe's evolving security and decarbonisation objectives in the years ahead.



Part III:*The Emerging Energy Corridor*

Interconnections, electricity and flexibility

The transformation of Southeast Europe's energy landscape cannot be understood solely through the evolution of natural gas infrastructure. While the Vertical Corridor represents one of the most visible manifestations of the region's growing strategic importance, it is only one component of a much broader process that is reshaping Europe's energy system. As the continent accelerates its transition towards climate neutrality, electricity is assuming an increasingly dominant role, gradually becoming the primary energy carrier for transport, heating, industry, and an expanding digital economy. Consequently, the infrastructure that will underpin Europe's future energy security extends well beyond pipelines and LNG terminals. High-voltage transmission lines, cross-border interconnections, energy storage facilities, and increasingly digital electricity networks are becoming equally important in ensuring both security of supply and the successful integration of renewable energy.

This evolution reflects a fundamental difference between the energy transition currently underway and previous transformations of Europe's energy system. Historically, expanding electricity networks largely meant increasing generation capacity and strengthening national grids to accommodate rising demand. Today's challenge is considerably more complex. Europe is simultaneously electrifying sectors that have traditionally depended on fossil fuels while replacing dispatchable conventional generation with renewable energy sources whose production varies according to weather conditions. Managing this transition requires an electricity system that is substantially more interconnected, considerably more flexible, and capable of balancing supply and demand across much larger geographical areas than ever before.



For Southeast Europe, these developments present both an opportunity and a challenge. The region possesses some of Europe's most promising renewable energy resources, yet these resources are unevenly distributed geographically and rarely coincide perfectly with centres of electricity demand. Greece enjoys exceptionally high levels of solar irradiation, while significant onshore and offshore wind resources are distributed across the Aegean, the Adriatic, the Black Sea, and the mountainous regions of the Balkans. Harnessing this potential efficiently depends not simply on constructing additional renewable capacity but on developing transmission infrastructure capable of transporting electricity across borders and allowing surplus generation in one market to satisfy demand in another. As renewable penetration increases, electricity interconnections become less a question of market integration than a prerequisite for maintaining system reliability. The growing importance of cross-border electricity exchanges is already evident in Greece's changing import-export balance, highlighting the increasing integration of the country's electricity market with neighbouring systems (Figure 5).

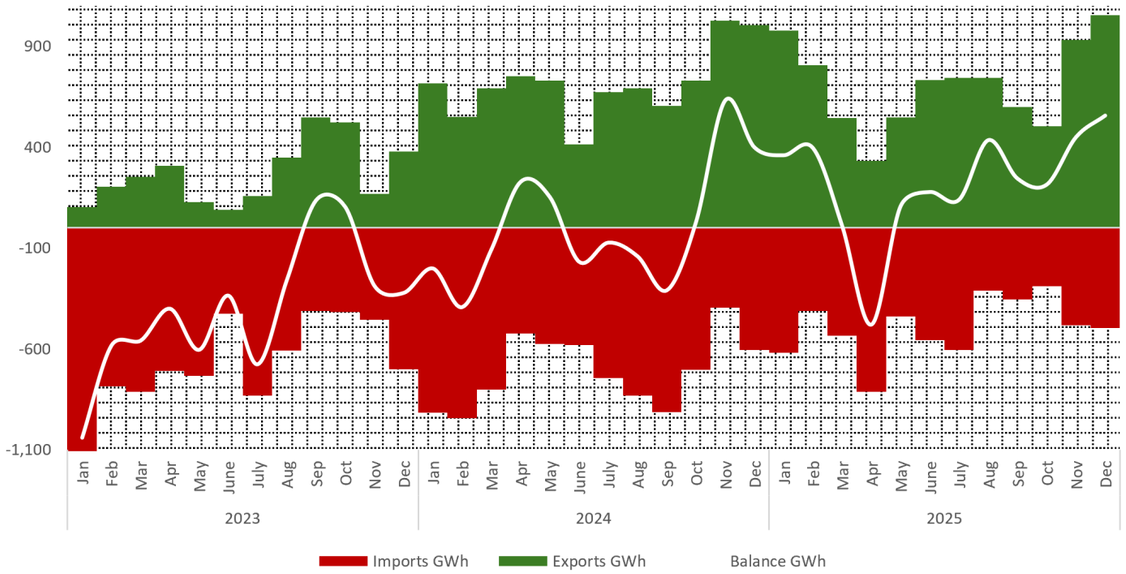


Figure 5. Electricity Imports & Exports in Greece (GWh), [2023-2025]. Source: IPTO

The European Union has long recognized the importance of electricity interconnectivity, placing it at the centre of initiatives such as the Trans-European Networks for Energy (TEN-E) and successive Packages for the Internal Electricity Market. Nevertheless, the geopolitical events of recent years have significantly strengthened the strategic rationale for these investments. The disruption of natural gas markets highlighted the risks associated with insufficient connectivity, while the rapid deployment of renewable energy across Europe has exposed the limitations of electricity systems designed around predominantly national generation portfolios. Cross-border interconnections are therefore no longer viewed merely as instruments for increasing competition or reducing wholesale prices. They are increasingly regarded as strategic infrastructure capable of enhancing resilience by allowing electricity systems to support one another during periods of stress, generation shortages, or extreme weather events.

This changing perspective is particularly evident in Southeast Europe, where a growing number of interconnection projects are gradually transforming what was once a relatively fragmented collection of national electricity systems into an increasingly integrated regional market. Existing links between Greece, Bulgaria, Italy, North Macedonia, Albania and Turkey continue to expand in both technical capability and commercial significance, while several ambitious projects promise to extend the region's role even further. Interconnections linking Greece with Cyprus and Israel through the Great Sea Interconnector, together with proposals connecting Greece and Egypt via the GREGY project, illustrate how Southeast Europe is increasingly positioned not simply as a consumer of electricity but as a gateway connecting multiple regional power systems.

The strategic significance of these projects extends well beyond the countries directly involved. Interconnecting the electricity systems of Southeast Europe with those of the Eastern Mediterranean and North Africa would substantially increase the geographical diversity of renewable generation available to European markets. Solar resources in Egypt, offshore wind potential in the Eastern Mediterranean, and expanding renewable capacity throughout the Balkans could together contribute to a more diversified and resilient European electricity system. At the same time, greater interconnectivity would enable neighbouring countries to respond more effectively to fluctuations in renewable generation, reducing curtailment during periods of surplus production while strengthening security of supply during periods of elevated demand.

The growing importance of interconnections also reflects a broader change in the economics of electricity systems. Unlike conventional thermal power stations, renewable generation is characterised by relatively low operating costs but considerable variability. Electricity production no longer follows demand in the same predictable manner; increasingly, demand must adapt to generation patterns, while electricity systems require sufficient flexibility to manage short-term imbalances. This flexibility can be provided through a combination of storage technologies, dispatchable generation, demand-side response, and cross-border electricity exchanges. No single solution is sufficient on its own. Rather, resilience emerges from the interaction between these different elements operating within an integrated regional framework.

Energy storage is becoming an increasingly important component of this framework. Current national planning reflects this priority, with battery energy storage expected to account for the majority of future installed storage capacity over the coming decades (Figure 6). Battery storage technologies have experienced remarkable technological progress over the past decade, accompanied by substantial reductions in investment costs. Their role, however, extends beyond simply storing surplus renewable electricity. Storage enhances system stability by providing frequency regulation, balancing services, congestion management, and reserve capacity. As renewable penetration continues to increase, these services become progressively more valuable, enabling electricity systems to operate reliably despite greater variability in generation patterns. Southeast Europe has recognized this opportunity, with numerous storage projects now progressing across the region, complementing investments in both renewable generation and transmission infrastructure.

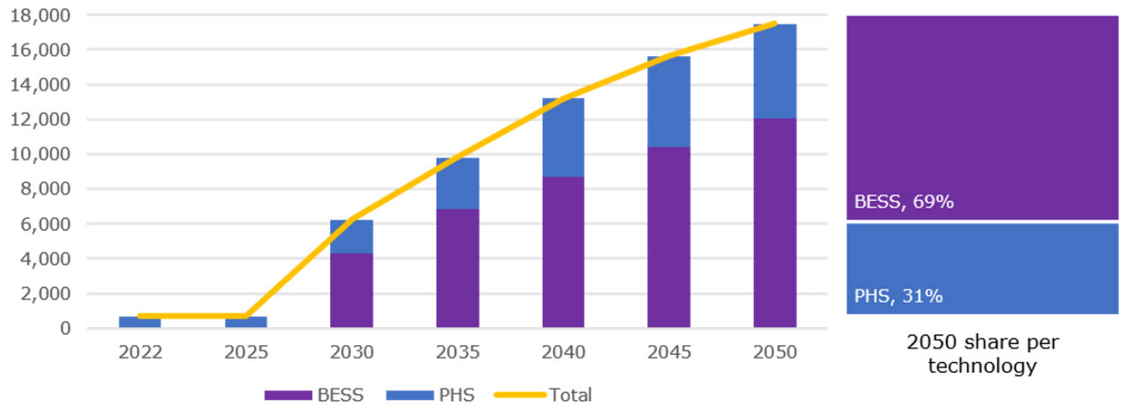


Figure 6. Electricity Storage Installed Capacities Projections in Greece (MW), [2022 - 2050]. Source: RAEWW, NECP

The emergence of flexibility as a strategic objective represents one of the most important shifts in contemporary energy policy. Traditionally, energy security focused primarily on ensuring sufficient quantities of fuel. Today, the principal challenge increasingly concerns ensuring that energy systems can respond dynamically to rapidly changing operating conditions. Extreme weather events, sudden changes in renewable output, cyber threats, equipment failures, or geopolitical disruptions all require electricity systems capable of adapting in real time. Flexibility therefore becomes a defining characteristic of modern energy infrastructure, influencing investment decisions as much as generation costs or transmission capacity.

Europe's future energy corridors will carry far more than natural gas. They will increasingly transmit electricity generated from renewable resources, facilitate balancing services between neighbouring markets, support the electrification of industry and transport, and eventually integrate new technologies such as renewable hydrogen and large-scale energy storage. The distinction between gas infrastructure and electricity infrastructure is therefore becoming progressively less relevant from a strategic perspective. Both contribute to the same overarching objective which is building an energy system that is more resilient, more interconnected, and better equipped to respond to an increasingly uncertain geopolitical and climatic environment.



Southeast Europe's geographical position once again provides the region with a unique opportunity. Having already emerged as a critical gateway for diversified natural gas supplies, it is now equally well positioned to become a major crossroads for regional electricity trade. The same logic that underpins the Vertical Corridor applies equally to electricity. If realized successfully, the expanding network of transmission interconnections stretching across the Balkans, the Eastern Mediterranean, and neighbouring regions could redefine the role of Southeast Europe within Europe's future electricity system in much the same way that recent investments have transformed its position within the continent's natural gas market.

Viewed in this broader context, the development of electricity interconnections should not be seen as a parallel story to the evolution of the Vertical Corridor, but as its natural continuation. Europe's next generation of energy corridors will not be distinguished by the fuels they transport, but by their ability to connect markets, integrate technologies, and provide the flexibility required by an increasingly decarbonised energy system. The transition from molecules to electrons is therefore not replacing one infrastructure model with another; it is expanding the concept of regional integration itself, transforming Southeast Europe into one of the principal pillars of Europe's emerging energy architecture.

The green transition opportunity

The growing strategic importance of Southeast Europe has, to a large extent, been shaped by recent concerns surrounding energy security. The disruption of Russian gas supplies, the emergence of the Vertical Corridor, and the need to diversify Europe's import routes have all contributed to placing the region at the centre of European energy policy. Yet to view Southeast Europe solely through the lens of security would be to overlook a transformation that is arguably even more profound. At the moment the region is becoming indispensable to Europe's short-term security objectives, it is also acquiring many of the characteristics required to play a leading role in the continent's long-term decarbonisation strategy. This convergence of geopolitical necessity and economic opportunity is what makes the current moment particularly significant.

Unlike previous energy transitions, the transition towards climate neutrality is not driven exclusively by environmental policy. It is equally influenced by industrial competitiveness, technological innovation, strategic autonomy and, increasingly, geopolitical resilience. The experience of the past few years has demonstrated that reducing GHG emissions and reducing dependence on imported fossil fuels are no longer separate policy objectives. On the contrary, they increasingly reinforce one another. Every additional unit of domestically produced renewable electricity reduces exposure to volatile international fuel markets, strengthens the balance of trade, and contributes to greater energy independence. Consequently, investments that were once justified primarily on climate grounds are now also recognized as investments in economic and strategic resilience.

This changing policy landscape offers Southeast Europe an opportunity that would have been difficult to envisage only a decade ago. The region combines several comparative advantages that are becoming increasingly valuable within Europe's emerging energy system. Its geographical position provides access to multiple regional markets, while its climatic conditions offer some of the most favorable renewable energy resources on the continent. High levels of solar irradiation across Greece and much of the Balkans, significant onshore wind resources, promising offshore wind potential in the Aegean, and considerable opportunities for hydroelectric development collectively position Southeast Europe as one of Europe's most attractive regions for renewable energy investment. Several countries in the region already rank among the European leaders in renewable energy penetration, demonstrating that the transition is well underway (Figure 7). These natural advantages, when combined with the rapid expansion of transmission infrastructure discussed in the previous chapter, create conditions capable of supporting not only domestic decarbonisation but also the export of clean electricity to neighbouring markets.

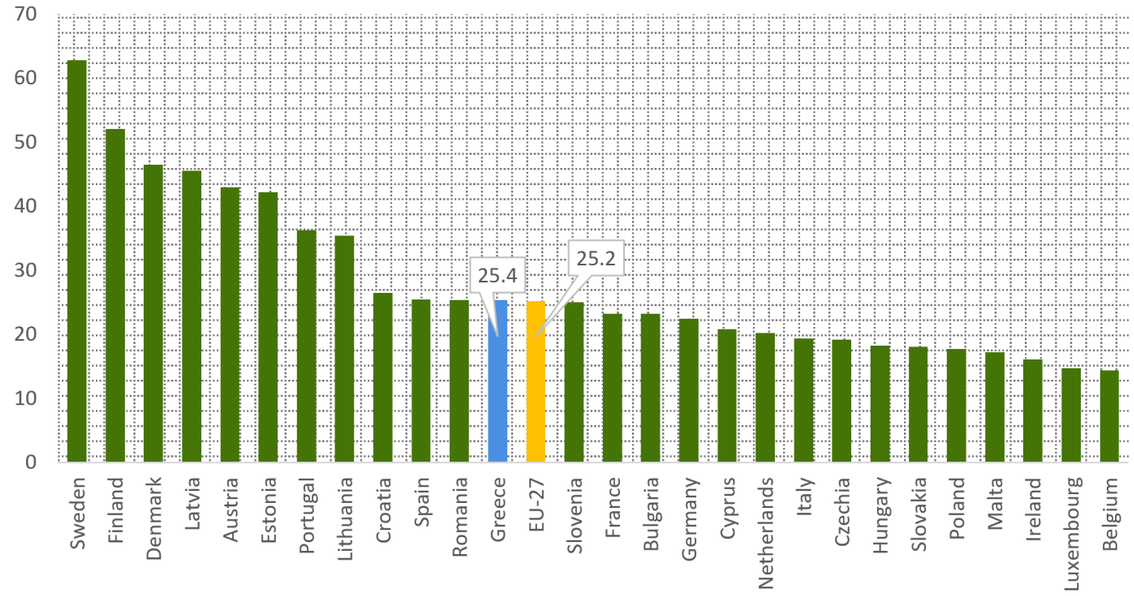


Figure 7. Share of RES in the Energy Mix in the EU-27 Member States (%), [2024]. Source: Eurostat

For Southeast Europe, this transformation carries implications that extend well beyond electricity production. Renewable energy is increasingly becoming an important driver of economic development. Large-scale investments in solar parks, wind farms, storage facilities, transmission infrastructure and associated supply chains generate employment, stimulate regional development and attract international capital. Equally important, they create opportunities for countries that have historically occupied peripheral positions within European industrial value chains to participate in emerging sectors characterised by rapid technological progress and growing investment flows.

The experience of Greece illustrates this broader evolution. The rapid expansion of both solar and wind capacity over the past decade reflects the scale and pace of this transformation within the Greek energy system (Figure 8). Over the past decade, the country has undergone one of the fastest renewable energy transitions in Europe. Following years in which electricity generation depended heavily on imported fossil fuels and domestic lignite production, renewable energy has assumed an increasingly central role within the national electricity mix. This transformation has been supported not only by positive natural conditions but also by substantial improvements in the regulatory environment, investment frameworks and electricity market reforms. The result has been the emergence of a dynamic renewable energy sector that increasingly contributes to both national energy security and regional electricity trade.

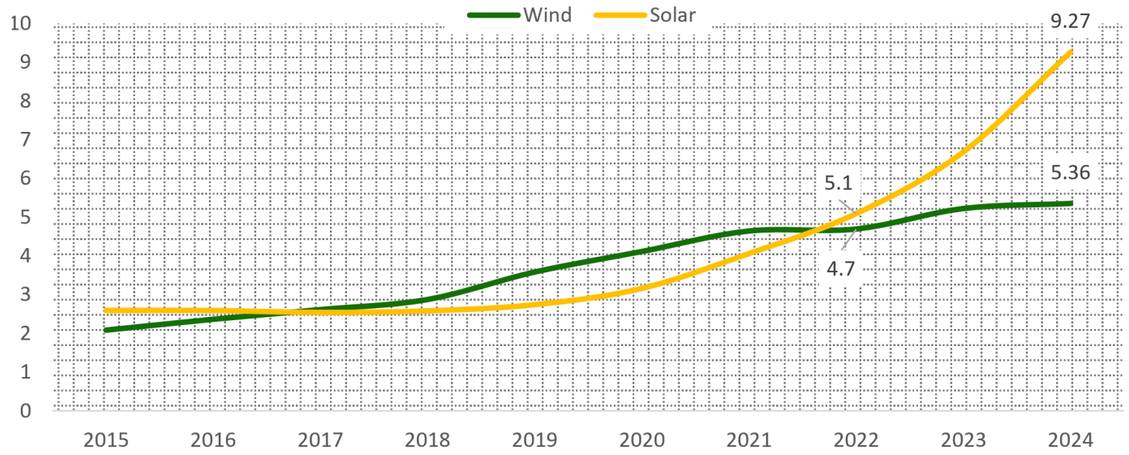


Figure 8. Solar & Wind Evolution in Greece bottom (GW), [2015 - 2024]. Source: Ember

Nevertheless, the opportunity facing Southeast Europe extends beyond renewable electricity generation itself. The European Green Deal, the Net-Zero Industry Act, the REPowerEU Plan and other recent European initiatives all point towards a broader industrial transformation in which access to affordable low-carbon energy becomes an increasingly important determinant of economic competitiveness. Industries with high electricity consumption, ranging from advanced manufacturing and chemicals to digital infrastructure and data centres, are placing growing emphasis on locations capable of providing abundant renewable electricity at competitive prices. In this context, energy policy and industrial policy are becoming progressively intertwined.

This shift could prove particularly significant for Southeast Europe. The region has often been perceived primarily as a transit corridor linking producers with consumers elsewhere in Europe. The accelerating deployment of renewable energy offers the possibility of moving beyond this traditional role. Rather than serving merely as a conduit through which energy flows, Southeast Europe has the potential to become a region where energy is produced, transformed and utilized to support new industrial activities. Such a transition would fundamentally alter the region's position within the European economy, allowing it to capture a greater share of the value created by the energy transition.

Emerging technologies such as renewable hydrogen further reinforce this possibility. Although large-scale hydrogen deployment remains at an early stage of development, European policymakers increasingly regard it as an important solution for decarbonising sectors that are difficult to electrify directly, including heavy industry, long-distance transport and certain chemical processes. Southeast Europe's abundant renewable resources, combined with its expanding transmission infrastructure and proximity to European industrial centres, position the region within future hydrogen value chains. Importantly, many of the infrastructure investments currently being undertaken to strengthen natural gas security have been designed with sufficient flexibility to accommodate low-carbon gases in the future, illustrating once again how today's security investments may ultimately support tomorrow's decarbonised energy system.

The strategic importance of these developments becomes even clearer when viewed against the backdrop of increasing global competition. The energy transition is no longer solely a European project. The United States, China, and several emerging economies are investing heavily in clean technologies, renewable manufacturing, battery production and hydrogen development, recognizing that leadership in these sectors will influence future economic competitiveness as much as traditional industrial capabilities once did. Europe therefore faces the dual challenge of accelerating decarbonisation while maintaining its industrial base and strengthening strategic autonomy. Regions capable of delivering abundant, reliable and affordable clean energy will inevitably occupy a stronger position within this emerging economic landscape.

Southeast Europe possesses many of the prerequisites required to succeed in this environment, but potential alone will not guarantee success. Significant investment in electricity networks, storage technologies, permitting procedures, workforce development and research capabilities remains necessary. Regulatory stability will be equally important, as investors increasingly seek predictable policy frameworks capable of supporting projects with investment horizons extending over several decades. Furthermore, continued regional cooperation will be essential if the region is to fully exploit the synergies created by its geographical diversity and complementary energy resources.

These challenges should not obscure the broader opportunity now emerging. The convergence of Europe's security priorities with its decarbonisation objectives has fundamentally changed the strategic importance of Southeast Europe. Infrastructure originally developed to diversify gas supplies is increasingly complemented by investments supporting renewable electricity, energy storage and future low-carbon fuels. Rather than representing separate policy agendas, energy security and the energy transition are gradually converging into a single strategic objective centered on resilience, competitiveness and sustainability.

This convergence represents one of the defining characteristics of Europe's evolving energy architecture. It also explains why Southeast Europe is becoming far more than a transit region. The infrastructure currently under development is not simply responding to today's geopolitical realities, but it is laying the foundations for an economy in which clean energy becomes one of the region's principal competitive advantages. If the first phase of Southeast Europe's transformation established it as a gateway for diversified energy supplies, the next phase may well establish it as one of Europe's most important producers, exporters and innovators within the emerging low-carbon economy.

Part IV: *The road to 2035*



SE Europe as the next energy hub

Several factors suggest that the transformation of Southeast Europe represent a lasting shift in the European energy landscape. First, the geopolitical assumptions that shaped European energy policy before 2022 are unlikely to return. Regardless of how the conflict in Ukraine ultimately evolves, Europe's approach to energy security has fundamentally changed.

Diversification has become a permanent policy objective rather than a temporary crisis response, while resilience now occupies a central position in infrastructure planning and investment decisions. The objective is no longer simply to secure sufficient volumes of energy but to ensure that energy systems possess the flexibility to respond to an increasingly unpredictable geopolitical environment. This strategic shift alone ensures that infrastructure capable of connecting multiple supply sources and facilitating regional cooperation will retain its importance well beyond the immediate crisis.

Second, the energy transition itself reinforces many of the same investment priorities. It has become evident that the infrastructure supporting energy security increasingly overlaps with the infrastructure required for decarbonisation. Electricity interconnections, storage facilities, digital networks, renewable energy projects and, eventually, hydrogen corridors all contribute simultaneously to greater resilience and lower emissions. Rather than competing for investment, these objectives increasingly complement one another. Southeast Europe therefore benefits from a convergence of strategic priorities that is relatively uncommon elsewhere in Europe: the same projects that strengthen today's security also contribute to tomorrow's climate objectives.

The region's geographical position further amplifies these advantages. Located at the intersection of the Eastern Mediterranean, the Black Sea, Central Europe and the Western Balkans, Southeast Europe connects regions that are likely to play increasingly important roles within Europe's future energy system. LNG arriving from global markets, renewable electricity generated in North Africa or the Eastern Mediterranean, natural gas from the Caspian region and the Black Sea, and potentially renewable hydrogen produced across southern Europe all converge within a relatively limited geographical area before reaching major European consumption centres. Few regions possess a comparable combination of geographical accessibility and infrastructure potential.

This geographical advantage, however, should not be interpreted solely in terms of transit. One of the most significant changes taking place across Southeast Europe is the gradual transition from a corridor through which energy simply passes to a region where energy is increasingly produced, traded, stored and transformed. Investments in renewable electricity generation, battery storage, LNG infrastructure, electricity interconnections and emerging low-carbon technologies are collectively creating an integrated energy ecosystem capable of generating substantial economic value beyond transportation services alone. In other words, Southeast Europe is progressively evolving from an energy bridge into an energy centre.

This evolution carries implications extending well beyond the energy sector itself. Access to reliable, affordable and increasingly low-carbon energy is becoming one of the principal determinants of economic competitiveness. Industrial investment decisions are increasingly influenced by electricity prices, grid reliability, renewable energy availability and access to modern infrastructure. Energy-intensive industries, advanced manufacturing, digital infrastructure, artificial intelligence facilities and hydrogen-based industrial processes will all require locations capable of providing secure and competitive energy supplies. Regions that succeed in developing such ecosystems are likely to attract considerably greater levels of investment than those relying exclusively on traditional industrial advantages.

Southeast Europe possesses many of the conditions necessary to benefit from this emerging economic geography. The rapid expansion of renewable generation, combined with improvements in regional connectivity, provides a strong foundation for future industrial development. Greece, Bulgaria and Romania have already begun attracting substantial investment across energy-related sectors, while broader regional cooperation continues to improve the attractiveness of Southeast Europe as an integrated investment destination rather than a collection of relatively small national markets. As infrastructure continues to expand, this process is likely to accelerate, creating opportunities that extend far beyond energy production itself.



The region nevertheless faces a number of important challenges that will determine whether this potential can be fully realized. Infrastructure development, although progressing rapidly, remains uneven. Several electricity interconnections require further reinforcement, transmission networks must continue expanding to accommodate growing renewable capacity, and additional storage facilities will be necessary to provide the flexibility required by increasingly decarbonised electricity systems. The pace at which these investments are delivered will significantly influence the region's long-term competitiveness.

Institutional challenges remain equally important. Although Southeast Europe has made remarkable progress in integrating its energy markets, regulatory fragmentation continues to create barriers to investment and cross-border trade. Differences in permitting procedures, market rules, balancing mechanisms and long-term planning frameworks increase uncertainty for investors and reduce the efficiency of regional energy markets. Addressing these issues will require continued cooperation between governments, regulators, transmission system operators and European institutions. Physical interconnections alone cannot create an integrated market; they must be accompanied by institutional integration capable of allowing infrastructure to operate efficiently across national boundaries.

The future evolution of global energy markets introduces an additional layer of uncertainty. While Europe's dependence on Russian pipeline gas has been substantially reduced, new geopolitical risks continue to emerge. The recent tensions affecting the Strait of Hormuz have illustrated the continued vulnerability of global LNG markets, while increasing geopolitical competition surrounding critical minerals, clean technologies and strategic supply chains suggests that future disruptions may arise from sources very different to those experienced over the past decade. Such developments reinforce rather than weaken the strategic rationale underpinning Southeast Europe's transformation. The greater the uncertainty surrounding international energy markets, the greater the value of infrastructure capable of providing flexibility, diversification and regional resilience.

It is therefore useful to think about Southeast Europe's future not in terms of a single predetermined outcome, but as a range of possible trajectories shaped by investment, policy and geopolitical developments. Under the most optimistic scenario, continued infrastructure expansion, deeper market integration and accelerated renewable deployment could establish the region as one of Europe's principal energy hubs, simultaneously strengthening security, supporting decarbonisation and attracting significant industrial investment. A less desirable trajectory, characterised by regulatory fragmentation, delayed infrastructure and inconsistent policy implementation, would undoubtedly slow this progress, limiting many of the opportunities identified throughout this publication. The eventual outcome will depend less on geography and more on the decisions taken over the coming decade.

Looking towards 2035, one conclusion appears increasingly difficult to dispute. Southeast Europe's growing importance is not simply the consequence of an extraordinary geopolitical crisis, nor is it solely the product of Europe's decarbonisation agenda. Rather, it reflects the intersection of multiple structural trends that are likely to shape European energy policy for many years to come: the search for greater resilience, the acceleration of electrification, the expansion of renewable energy, the increasing integration of regional markets and the recognition that energy security has become inseparable from economic competitiveness.

Taken together, these developments suggest that the centre of gravity of Europe's energy system is gradually shifting. The continent's future energy architecture will not be defined by a single supplier, a single fuel or a single transport corridor. Instead, it will consist of an interconnected network of diversified infrastructure, integrated markets and complementary technologies capable of responding to a far more dynamic geopolitical and economic environment than the one that existed only a decade ago.

Southeast Europe occupies a uniquely advantageous position within this emerging architecture. Whether it ultimately becomes one of Europe's principal energy hubs will depend on choices that have yet to be made, but the foundations are already visible. The infrastructure is being built, regional cooperation is deepening, investment is accelerating and the strategic rationale has never been stronger. The question is therefore no longer whether Southeast Europe has the potential to become a central pillar of Europe's energy future. The more pertinent question is how effectively the region will seize the opportunity that history has unexpectedly placed before it.



Conclusion / *From periphery to powerhouse*



When viewed in isolation, each of the developments examined appears significant in its own right. The rapid expansion of LNG infrastructure, the emergence of the Vertical Corridor, the strengthening of electricity interconnections, the acceleration of renewable energy deployment, and the growing emphasis on regional cooperation each represent important milestones in Europe's evolving energy landscape. Considered together, however, they reveal a much broader transformation. They point towards the gradual emergence of a new energy geography in which Southeast Europe is no longer defined by its position at the edge of the continent, but by its ability to connect regions, technologies, markets and strategic interests that will shape Europe's energy future.

This transformation has been driven by circumstances few could have anticipated only a few years ago. Russia's invasion of Ukraine forced Europe to reconsider many of the assumptions that had underpinned its energy policy for more than three decades. Supply diversification, once viewed primarily as a desirable objective, rapidly became an economic and geopolitical necessity. The response demonstrated the remarkable adaptability of European energy markets and institutions, but it also highlighted the importance of infrastructure that had often received relatively limited attention in previous policy discussions. LNG terminals, cross-border interconnectors, underground storage facilities and regional cooperation mechanisms proved instrumental in maintaining security of supply during one of the most severe energy crises in the European Union's history.

Yet the lessons of recent years extend beyond the disruption of Russian gas supplies. The tensions affecting the Strait of Hormuz and other critical maritime trade routes have illustrated that Europe's energy system remains closely connected to developments taking place far beyond its borders. The challenge facing policymakers is therefore no longer limited to reducing dependence on a single supplier. Instead, it concerns building an energy system capable of operating effectively within an international environment characterised by multiple sources of geopolitical uncertainty, increasingly interconnected markets and accelerating technological change. Resilience, flexibility and adaptability have consequently become defining principles of modern energy policy, complementing rather than replacing the traditional objectives of affordability, sustainability and market efficiency.

Southeast Europe has emerged as one of the regions where these new priorities intersect most clearly. The region's strategic value no longer derives solely from its geographical location, although geography undoubtedly remains one of its greatest assets. Rather, its importance stems from the growing concentration of infrastructure, investment and political cooperation that has developed around that geography. LNG import terminals are creating new gateways to global markets, the Vertical Corridor is strengthening north-south connectivity across the continent, electricity interconnections are supporting the integration of renewable energy, while expanding storage capacity and future hydrogen initiatives are preparing the region for the next phase of Europe's energy transition. Individually, these developments address different policy challenges; collectively, they contribute to the emergence of a more integrated and resilient European energy architecture.

Perhaps the most important conclusion arising from this analysis is that energy security and the energy transition should no longer be viewed as separate or competing policy agendas. Throughout much of the previous decade, these objectives were often discussed independently, with security primarily associated with fossil fuel supply and climate policy focused on renewable energy deployment.

Recent experience has demonstrated that this distinction is becoming increasingly obsolete. Renewable electricity reduces dependence on imported fuels, electricity interconnections strengthen both market integration and system resilience, storage technologies improve operational flexibility while facilitating higher renewable penetration, and infrastructure originally developed to address short-term security concerns may ultimately become indispensable to achieving Europe's long-term climate ambitions. The convergence of these objectives is likely to define European energy policy throughout the coming decades. For Southeast Europe, this convergence represents a historic opportunity.

The region possesses many of the characteristics required to become one of Europe's principal energy hubs: favorable geography, abundant renewable resources, expanding infrastructure, improving market integration and increasing political recognition of its strategic importance. Opportunities of this nature, however, are rarely realized automatically. Their successful exploitation depends on sustained investment, effective governance and continued regional cooperation. The infrastructure currently under construction must be complemented by regulatory convergence, efficient permitting procedures, coordinated planning and long-term policy stability if the region is to fully capitalize on its emerging role.

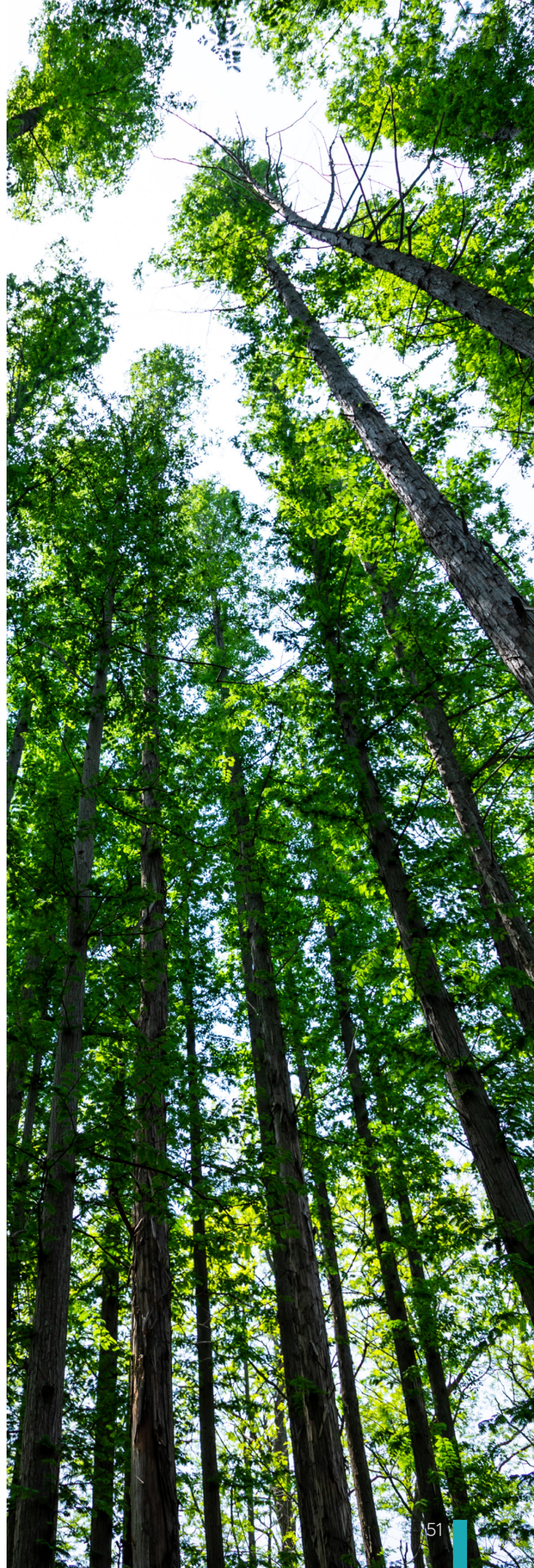
Equally important is the need to recognize that the transformation remains an ongoing process rather than a completed achievement. The European energy system will continue evolving in response to technological innovation, geopolitical developments, changing patterns of demand and increasingly ambitious climate objectives. New challenges will inevitably emerge, whether in relation to critical raw materials, digital infrastructure, electricity system resilience or future low-carbon fuels. The ability of Southeast Europe to adapt to these evolving circumstances will ultimately determine whether the region consolidates its current momentum or merely benefits from a temporary period of geopolitical significance.

There is nevertheless good reason for optimism. The investments currently taking place across Southeast Europe are fundamentally different from many previous infrastructure projects undertaken in the region. They are not designed to serve a single supplier, a single technology or even a single energy carrier. Instead, they are creating an increasingly interconnected system capable of accommodating multiple supply sources, integrating growing volumes of renewable electricity, supporting regional market development and providing the flexibility required by an uncertain future. Such characteristics are likely to retain their value regardless of how individual technologies or fuel markets evolve over the coming decades.

Looking back, it is possible that future historians of European energy will identify the first half of the 2020s as a decisive turning point. Not simply because Europe replaced one supplier with another, or because it accelerated the deployment of renewable energy, but because it fundamentally reconsidered the architecture upon which its energy system was built. In doing so, the continent rediscovered the strategic importance of connectivity, regional cooperation and geographical diversity. Southeast Europe, long regarded as a peripheral component of the European energy system, unexpectedly found itself at the centre of this reconfiguration.

The story of Southeast Europe is not merely the story of the Vertical Corridor, of LNG terminals, or of renewable energy projects. It is the story of a region whose strategic relevance has been fundamentally redefined by the convergence of geopolitical disruption and technological transformation. The infrastructure currently being developed across the region is not simply responding to today's challenges; it is helping shape the foundations of tomorrow's European energy system.

Whether Southeast Europe ultimately becomes Europe's next major energy hub remains to be seen. What can already be stated with considerable confidence, however, is that the region is no longer situated on the margins of Europe's energy debate. It has become one of the places where the continent's future energy architecture is being designed, tested and, increasingly, realized. In an era where resilience is becoming as valuable as resources themselves, that may prove to be Southeast Europe's greatest strategic asset.



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Why storage has become a strategic asset

Europe's energy transition is entering a new chapter. For years, our collective focus has been on deploying more renewable generation. Today, however, we face a different challenge: ensuring that clean energy can be delivered when it is needed, where it is needed and with the reliability that modern economies require.

In this evolving landscape, FARIA Renewables believes that the next phase of the energy transition requires a different way of thinking. Our experience across the renewable energy value chain has shown us that the future will be determined not only by how much renewable capacity we install, but by how effectively we integrate it into the wider energy system.

Renewable energy is inherently variable. Wind patterns change. Solar production fluctuates. Yet electricity grids, businesses and consumers require stability, predictability and resilience. This is why energy storage is no longer a complementary technology. It has become a strategic pillar of Europe's energy future.

Battery Energy Storage Systems (BESS) bridge two realities that often appear contradictory: the variability of renewable generation and the stability required by electricity systems. They reduce curtailments, strengthen grid resilience, improve system balancing and unlock higher renewable penetration. Most importantly, they enable renewable energy to become dispatchable rather than simply available.

Storage is not just about batteries. It is about creating an energy system capable of adapting to an increasingly dynamic world.



Beyond Batteries: The Value of Technology Expertise

As storage technologies continue to evolve, the conversation should move beyond batteries themselves.

Battery chemistry will undoubtedly continue to improve. Yet the real differentiator no longer lies in the technology alone. It lies in the expertise required to transform that technology into long-term value. The real challenge is not selecting a battery technology; it is designing an integrated solution that delivers technical performance, commercial viability and long-term resilience.

Designing efficient storage solutions demands a holistic understanding of the entire project lifecycle. It requires evaluating different storage technologies, engineering systems that maximise technical performance, selecting the optimal solution for each application, integrating assets seamlessly into the grid and optimising projects from both technical and commercial perspectives. Equally important is understanding regulatory developments, electricity markets and the growing role of hybrid renewable projects.

This integrated approach has become essential for developing infrastructure that remains competitive throughout its operational life.

At FARIA Renewables, this philosophy shapes the way we approach every project. As a vertically integrated renewable energy company, we see renewable generation, storage, engineering, digital optimisation and energy management not as standalone activities, but as interconnected elements of a single energy ecosystem. We believe that lasting value is created when technical excellence is combined with market insight, enabling projects that are not only technically robust, but also commercially resilient and built for long-term performance.

Southeast Europe: a unique opportunity

The region possesses exceptional renewable resources, rapidly expanding interconnections and a strategic geographical position between European markets. These advantages create a unique opportunity for Southeast Europe to evolve from a renewable generation hub into one of Europe's most important clean energy corridors.

Whether this vision becomes reality will largely depend on our ability to introduce flexibility into the system.

Without storage, renewable capacity alone cannot fully unlock its value. With storage, however, renewable energy becomes more reliable, electricity markets become more efficient and regional energy security becomes stronger. In this sense, storage will determine whether Southeast Europe simply produces green electricity or actively contributes to Europe's long-term energy resilience.

Storage as a Pillar of Energy Security

Beyond economics, storage is also becoming a strategic geopolitical asset.
Europe's energy transition is now equally about resilience. Renewable energy combined with storage supports a more decentralised model of electricity production, reducing dependence on imported fossil fuels while strengthening the ability of electricity systems to respond to geopolitical uncertainty. Greater flexibility ultimately means greater energy security in an increasingly uncertain global environment - for grids, businesses and citizens alike.
Looking ahead, Southeast Europe has a unique opportunity not only to accelerate renewable deployment, but also to demonstrate how flexibility, storage and innovation can redefine Europe's future energy landscape.
For us at FARIA Renewables, this transition is not simply an investment cycle, it is an opportunity to contribute to shaping the next generation of energy infrastructure - one that is cleaner, smarter, more resilient and designed to create lasting value.
Because Europe's energy transition will ultimately be defined not only by how much renewable energy we produce, but by how intelligently we make it work.

Simply put, Europe needs more renewable generation not only to reduce its carbon footprint but also to maintain industrial competitiveness in an increasingly fragile geopolitical environment and safeguard the well-being of its citizens. However, expanding renewable energy without simultaneously increasing system flexibility is no longer a viable solution, as the growing share of variable renewable generation makes grid stability an increasingly critical challenge. Therefore, technologies such as Battery Energy Storage Systems (BESS) must be incorporated into the energy mix as part of a long-term strategy. Otherwise, the benefits of adding more renewable capacity will increasingly be outweighed by the challenges arising from the inherent variability and uncertainty of weather-dependent generation.
Faria understands that the transition from fossil fuels to renewable energy requires a fundamental shift in engineering philosophy—from centralized, standardized energy systems to distributed, tailor-made solutions that are flexible and capable of adapting to the requirements of the digital transformation the world is currently undergoing.

Sharing energy



At Faria Renewables, we are driven by respect and love for the communities we serve.
We strive to unlock the country's potential and bring it closer to the future we envision together.
We move forward by harnessing the power of energy.
Energy that powers growth, that puts life into motion, that connects nature with human activity.
Our goal is to be part of a better world.
A world full of possibilities and opportunities for all.
For us, energy is power to be shared.

faria renewables

Infrastructure resilience and flexibility in a dynamic energy landscape

Ioannis Maris

Trans Adriatic Pipeline (TAP) Country Representative Greece





Infrastructure resilience and flexibility in a dynamic energy landscape

World events in recent years have highlighted the importance of resilient energy systems, with energy security becoming increasingly dependent on diversified supply sources, transportation routes and adaptable infrastructure capable of responding to geopolitical, market and energy transition developments.

Changing perspectives on energy security

Europe's energy landscape has been evolving for many years, driven by changing market dynamics and decarbonisation objectives. Since 2022, geopolitical tensions and subsequent supply disruptions have further reinforced the importance of energy security and highlighted the need for resilient energy systems, while the energy transition continues to reshape the sector.

In this environment, diversification of supply sources and transportation routes have become increasingly important. At the same time, resilience depends not only on where energy comes from, but also on the ability of infrastructure and markets to adapt to evolving conditions. Connectivity, flexibility and cross-border cooperation all contribute to strengthening Europe's capacity to respond to changing circumstances and maintain secure energy supplies.

Resilient infrastructure in practice

Southeast Europe, positioned between producing regions and key European markets, contributes to supply diversification, market integration and cross-border connectivity, supporting Europe's evolving energy landscape. Infrastructure is a key part of this equation. Pipelines and interconnections not only enable access to different sources of supply, but also provide the flexibility needed to respond to changing market conditions. Within this context, TAP provides an example of how energy infrastructure can contribute to both security of supply and system resilience.

As the European section of the strategic Southern Gas Corridor, TAP transports natural gas from Azerbaijan's Shah Deniz field in the Caspian through Greece and Albania to Italy. Through its connections with the Greek and Italian gas networks, as well as regional interconnectors, the pipeline contributes to supplies in Greece, Italy and Bulgaria and enables access to wider European markets.

Since the start of commercial operations more than five years ago, the pipeline has delivered more than 60 billion cubic metres of natural gas to Europe — a volume equivalent to the annual gas consumption of approximately 45–60 million European households. Out of these 60 bcm Greece has secured around 14% of its natural gas imports in 2025.

Resilience, however, extends beyond the transportation of volumes. It also requires infrastructure that can respond to evolving market needs and changing patterns on demand. Reflecting this approach, TAP's first expansion phase entered operation at the beginning of 2026, adding another 1.2 billion cubic metres of long-term transportation capacity following the demand triggered through the 2021 Market Test process.

TAP has also broadened its operational flexibility through intra-day capacity products and products supporting eastward transportation. These mechanisms provide market participants with greater optionality and responsiveness, enabling gas flows to adapt more efficiently to changing market conditions and regional supply needs. As Europe's gas flows continue to evolve, this flexibility helps support regional market integration and broader efforts to enhance security of supply across Southeast and Eastern Europe, including through supply routes serving markets such as Moldova and Ukraine.



At the same time, TAP remains open to further expansion should additional market demand emerge through the Market Test process, demonstrating how infrastructure can evolve alongside market needs.

Looking ahead

Future energy security will depend on a combination of diversified supply, interconnected markets and flexible infrastructure capable of responding to evolving realities. Strengthening connectivity between regions is becoming increasingly important.

This was also highlighted during European Commission President Ursula von der Leyen's visit to Baku in July 2026, where she emphasised the South Caucasus' role as a bridge connecting Europe, the Caspian region and Central Asia, reflecting the growing importance of regional connectivity in supporting resilience and security.

Diversification, connectivity and adaptable infrastructure will remain essential to supporting a resilient and secure European energy system and TAP's strategic role in this grand endeavour cannot be overstated.

Energy storage as a pillar and energy management as a driver of value

Vassilis Georgiou

CEO, PROTASIS SA



PROTASIS engineering & consulting
with power, we perform

Electricity storage has emerged in recent years as one of the most critical pillars of the global energy transition. Following a decade of rapid growth in renewable energy deployment, the key challenge for modern power systems is no longer simply to increase installed capacity, but to ensure that the electricity generated can be delivered where and when it is needed.

In this context, energy storage is evolving from a technological option into a fundamental prerequisite for the continued integration of renewable energy sources, the maintenance of grid stability, and the containment of electricity prices. Europe is already moving toward a new electricity market model in which flexibility is increasingly valued, while in Greece the energy storage market is transitioning from the planning stage to large-scale deployment.



Energy markets and grid constraints

The economic rationale for energy storage is now based on multiple revenue streams, commonly referred to as revenue stacking. Energy storage systems participate in both energy arbitrage strategies and the provision of ancillary services, such as frequency regulation and system balancing.

However, this new market model is accompanied by significantly greater operational and commercial complexity. The value of a storage investment no longer depends solely on the underlying technology, but also on its ability to optimize operations in an environment characterized by volatile electricity prices and continuously evolving market conditions.

In Greece, the rapid penetration of renewable energy sources (RES) has placed new pressures on the power system. Grid constraints, network congestion in certain regions, and increasing renewable energy curtailments have highlighted the growing need for large-scale flexibility solutions.

Energy storage serves as a critical tool for relieving pressure on the electricity system, enabling more efficient use of existing grid infrastructure while reducing the loss of renewable energy that would otherwise be curtailed.

The Greek energy storage market is entering a pivotal phase of development, with total installed capacity expected to approach 800 MW by 2027, as dozens of projects are already at advanced stages of implementation.

This momentum reflects a structural transformation of the energy system: as renewable generation continues to expand, the limitations of a grid originally designed for a very different operating environment become increasingly apparent.

In this context, energy storage has already become a strategic priority for all major energy groups in Greece, with projects ranging from standalone battery energy storage systems (BESS) to installations that rank among the largest in Europe.

The role of energy management in commercial and technical performance

The transition from planning to operation brings to the forefront a factor that until recently remained in the background: the management of the energy storage facility. A modern storage plant is a dynamic system that must make real-time decisions: when and at what rate to charge or discharge, which markets to participate in, how to respond to system operator instructions, and how to manage equipment degradation.
The management of this operational complexity is carried out through the Energy Management System (EMS), which serves as the central control and optimization mechanism for the operation of every modern energy storage facility or hybrid system.
In an environment characterized by tight technical constraints, strict regulatory requirements, and increasing cybersecurity demands, the quality of the EMS directly affects both the financial performance and the overall sustainability of the investment.

The technological dimension and the role of PROTASIS

In this highly demanding environment, PROTASIS has systematically invested in the development of integrated solutions for monitoring, protection, automation, and supervision of power systems, fully aligned with international standards and technical specifications.
This expertise now enables the company to participate in the implementation of some of the largest storage and hybrid energy projects being developed in the country, undertaking the engineering, design, development, and commissioning of advanced Energy Management Systems (EMS).
Looking ahead, it is becoming increasingly clear that the energy transition will not be determined only by how much energy is produced, but by how effectively that energy can be managed by the system. In this context, expertise in critical control and energy management systems is expected to play a decisive role.



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ISSUE #09 / SEPTEMBER 2026

Southeast Europe: Building Europe's New Energy Corridor

A PUBLICATION OF:

HAEE
HELLENIC ASSOCIATION *for* ENERGY ECONOMICS