

INSTITUTE OF ENERGY FOR SE EUROPE



INSTITUTE OF ENERGY
FOR SOUTH-EAST EUROPE

South East Europe Energy Outlook **2025/2026**

Presentation at the
**IENE Roundtable on Energy Security in SE
Europe**

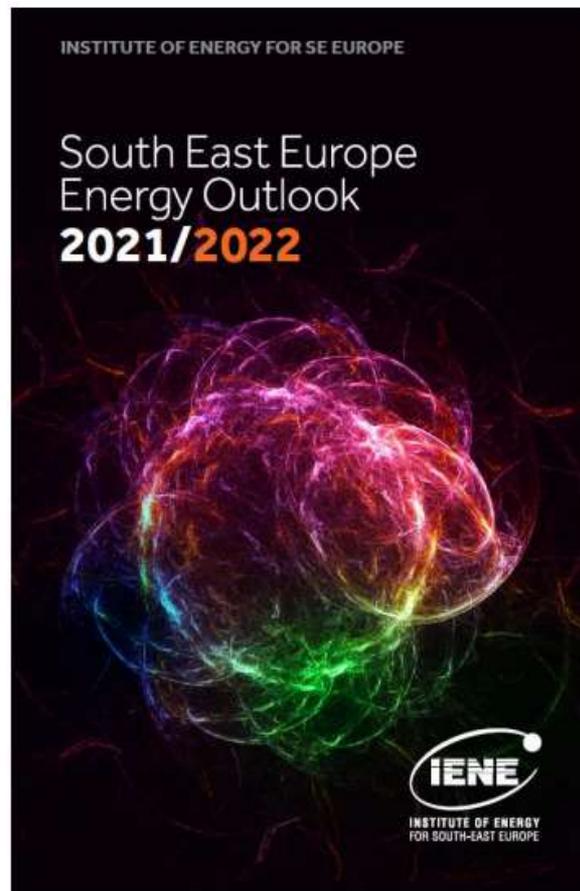
European Parliament, Brussels

March 19, 2026

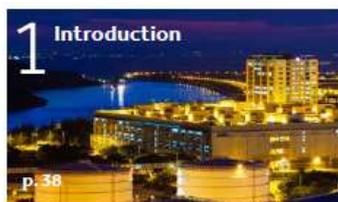
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Chairman and Executive Director of IENE





Contents of SEEO 2025/2026 Study



Contributors of SEEEO 2025/2026



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Energy Outlook
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Raison d' Être



□ Why a regional approach?

Because SE Europe, on the strength of its history, cultural background and current urban and industrial setting, constitutes a region both geographically and geopolitically and it has a strong impact on the rest of Europe and the East Med (see Energy Security).

- The need to **understand** the geopolitical and geographical sphere within which IENE operates, but also to **define** and **evaluate** in an objective manner the major policy challenges of the energy sector of the region.
- To **study, analyse** and **understand** the region's energy market structure and associated energy flows.
- To **identify** the important investment and business opportunities across the SE European area and assess the region's energy related investment potential within the given business climate.
- Energy Atlas of the region.
- An in-depth study of the energy prospects and perspectives of a particular geographic region, such as SE Europe, has an impressive cumulative effect, as the **sum often exceeds the value of its constituent parts**. Very much along the lines of Aristotle's logic when he proclaimed the *"The whole is greater than the parts"*.

The SE European Region Defined



Study Scope and Focus



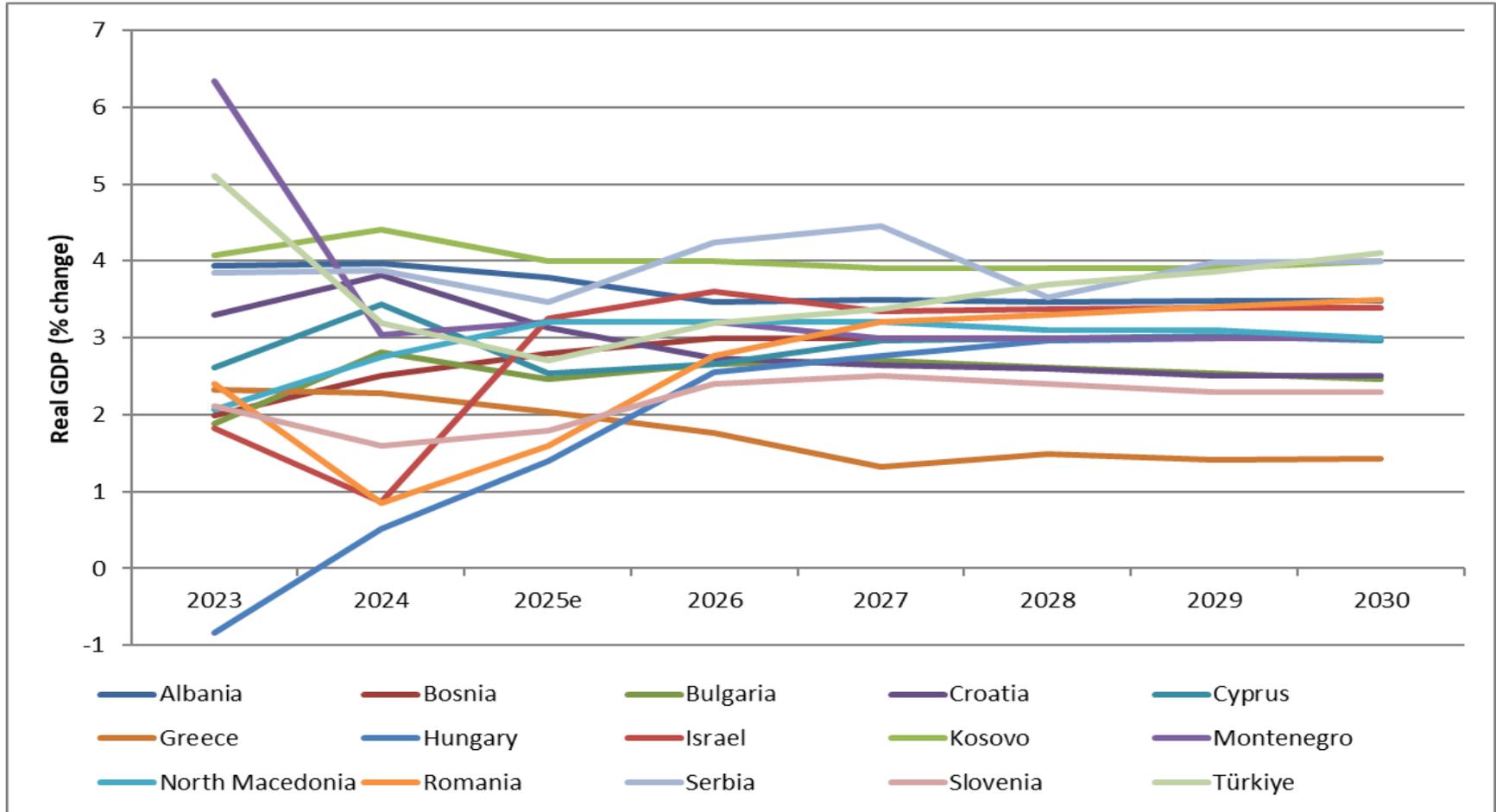
□ Study Scope

- (a) To present a **critical assessment** of the current status of the energy market in SE Europe
- (b) To bring together the latest available knowledge on energy developments in the region and also **provide comprehensive data** on energy demand/consumption, the major energy projects, pursued energy policies as well as trends, estimates and projections
- (c) Taking into consideration the economic and political background of SE Europe, the study **analyses the dynamics** of regional integration process from an **energy perspective**
- (d) To provide an outlook for energy supply/demand, consumption and energy mix in the region
- (e) To highlight key policy issues related to energy, such as **energy supply, energy security, emissions, energy transition** to clean fuels, **new energy technologies, contentious political issues** with energy policy bearings, etc.

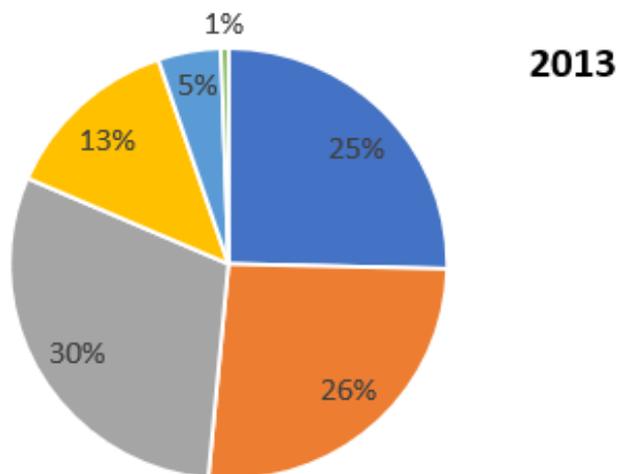
The Economies of SE Europe – Real GDP



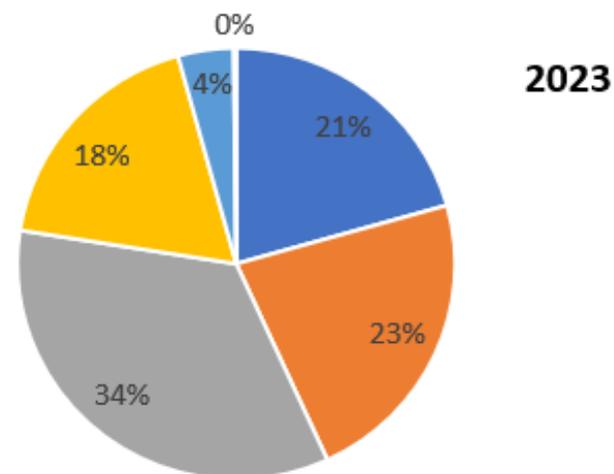
The graph illustrates a generally positive but moderate upward trend for most economies in the region by 2030. There appears to be a convergence of growth rates between 2% and 4% for the majority of SEE countries, with only limited fluctuations over time.



SE Europe's Energy Mix (Gross Inland Consumption), Including Türkiye, 2013 and 2023

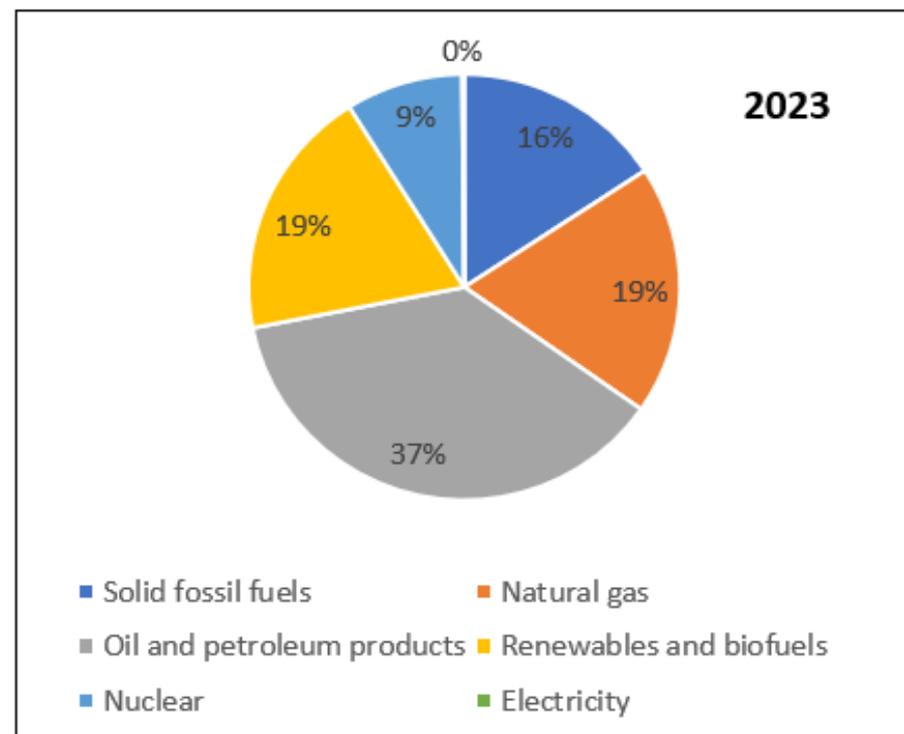
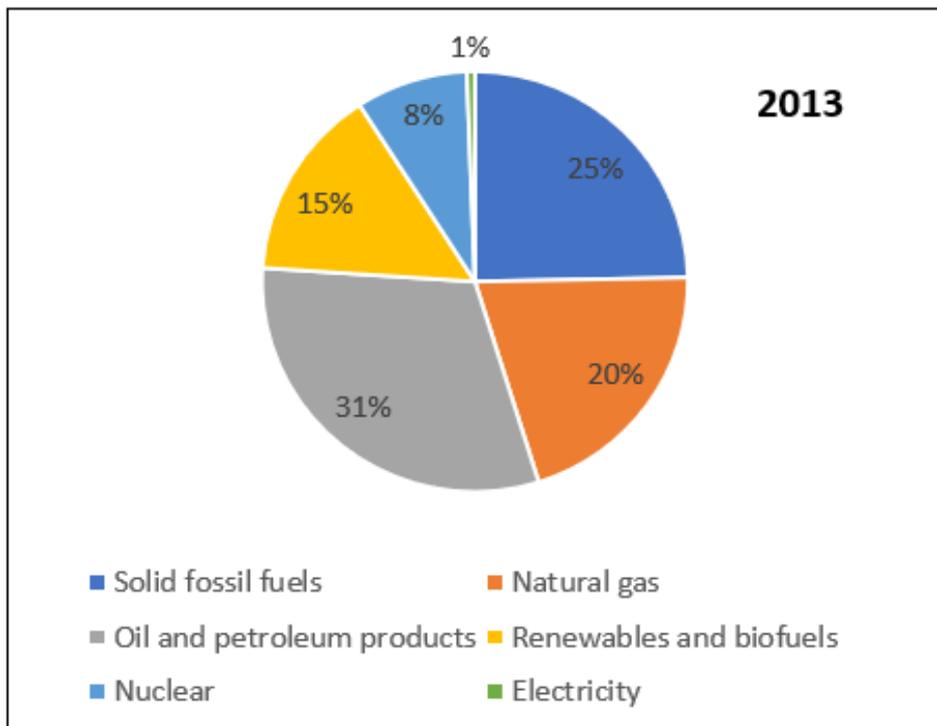


- Solid fossil fuels
- Oil and petroleum products
- Nuclear
- Natural gas
- Renewables and biofuels
- Electricity



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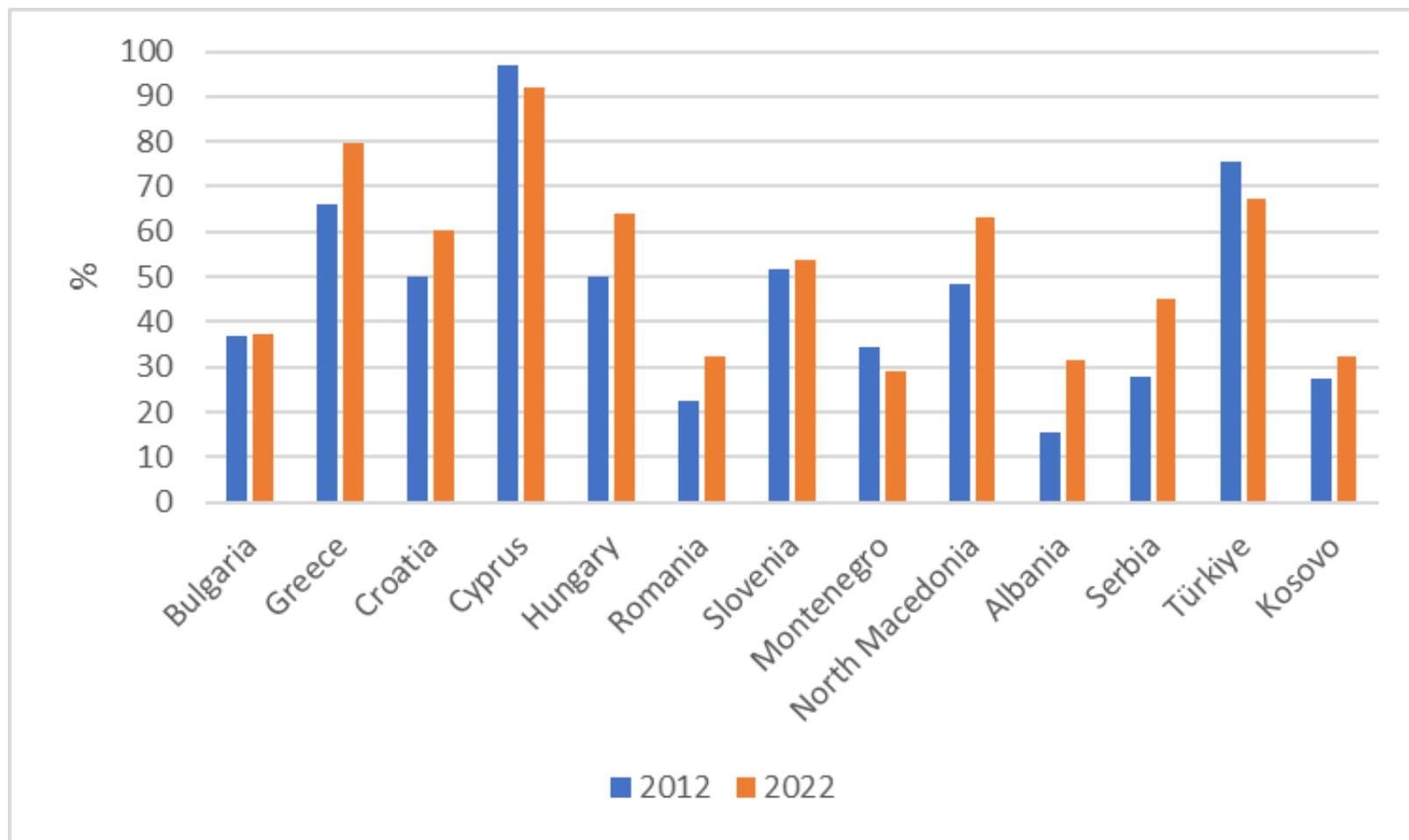
SE Europe's Energy Mix (Gross Inland Consumption), Without Türkiye, 2013 and 2023



Key Regional Energy Issues

- ❑ Marked divergence between EU and SEE energy strategies
- ❑ SEE is more vulnerable in terms of supply than the rest of Europe
- ❑ Energy security is emerging as key policy issue
- ❑ SEE's high hydrocarbon dependence
- ❑ Electricity's gas alters supply balance
- ❑ Lack of adequate electricity and gas interconnections
- ❑ Coal/lignite is and will continue for sometime to be relevant
- ❑ SEE's path towards decarbonisation is difficult and uncertain
- ❑ Nuclear remains a viable option for SEE power generation
- ❑ RES growth impeded due to repeated policy failures and electricity grid constraints

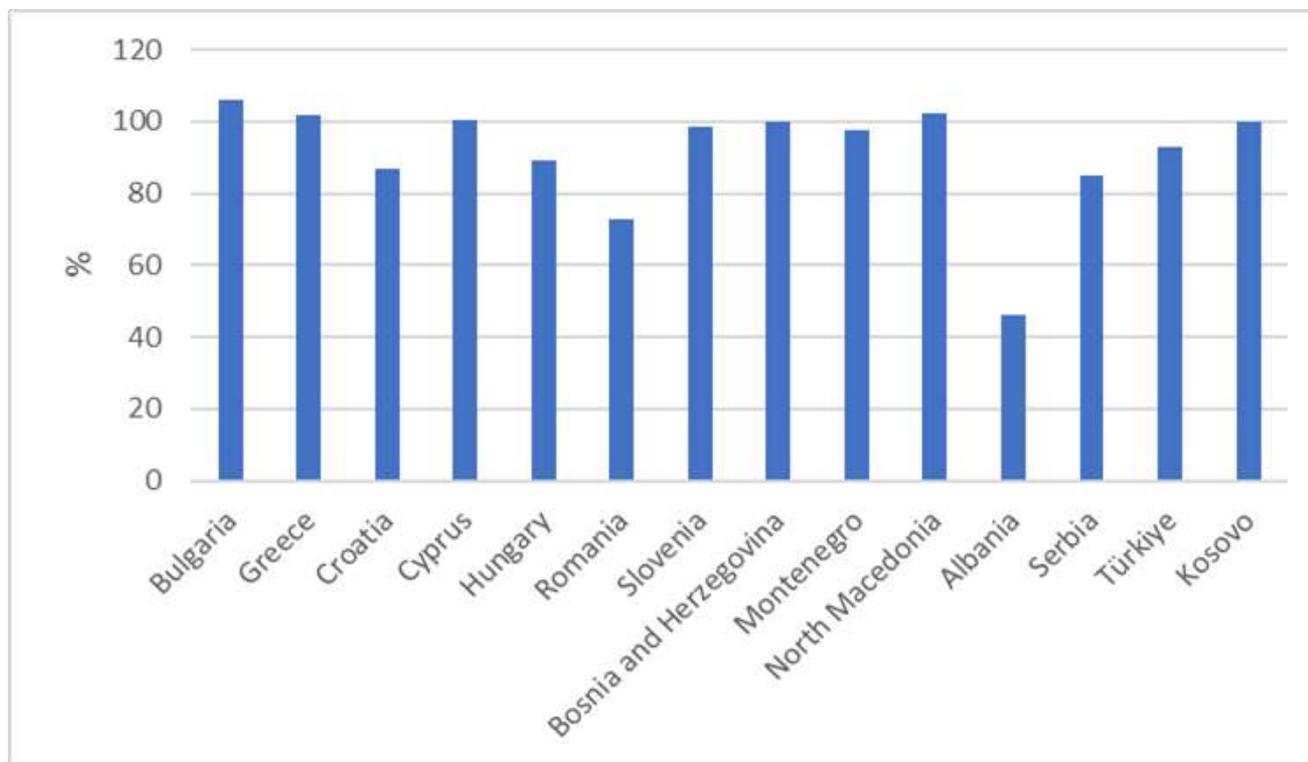
Energy Dependence in SE Europe (2012 and 2022)



Key Regional Energy Issues – Oil Import Dependency



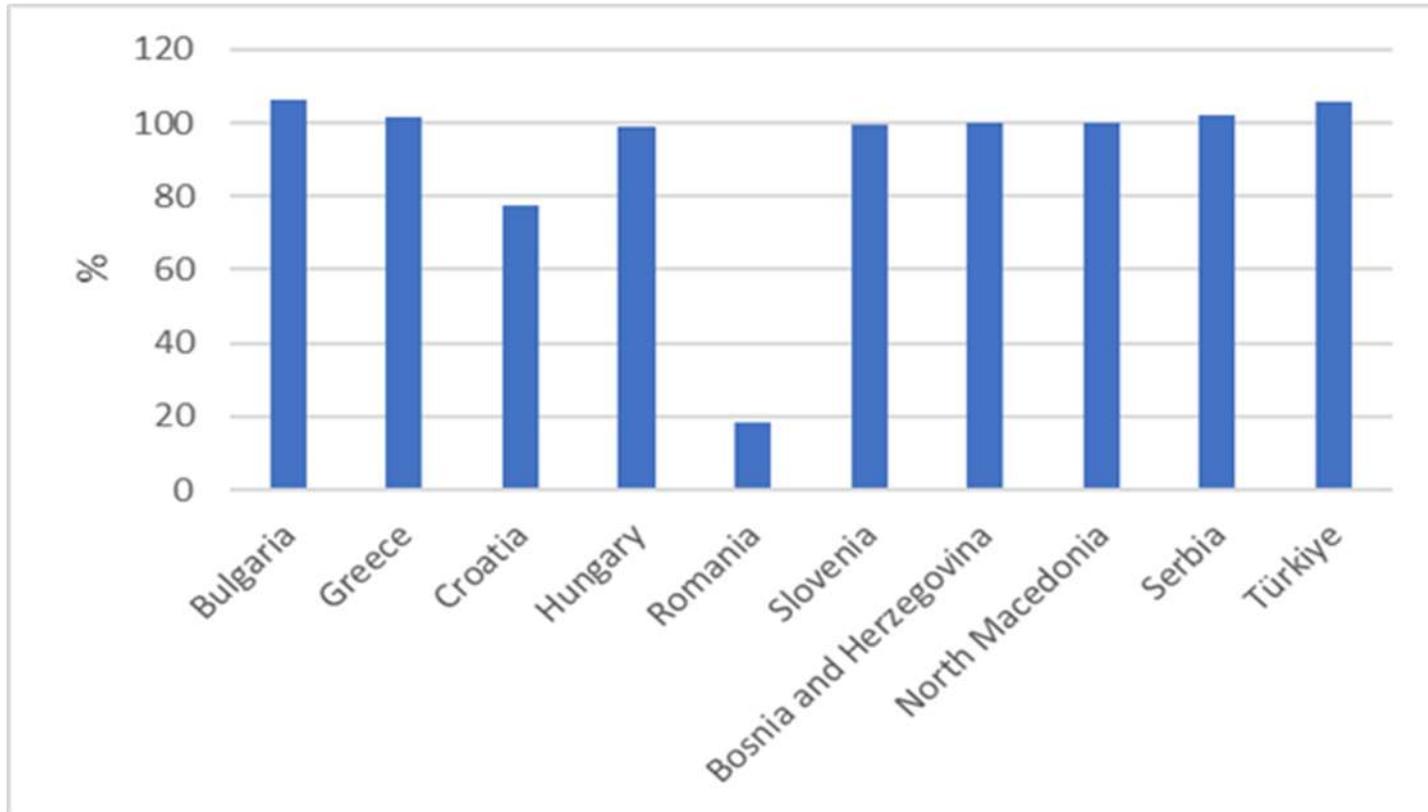
Oil Import Dependency (%) in SE Europe (2022)



Note: A dependency rate in excess of 100% relates to the build-up of stocks.

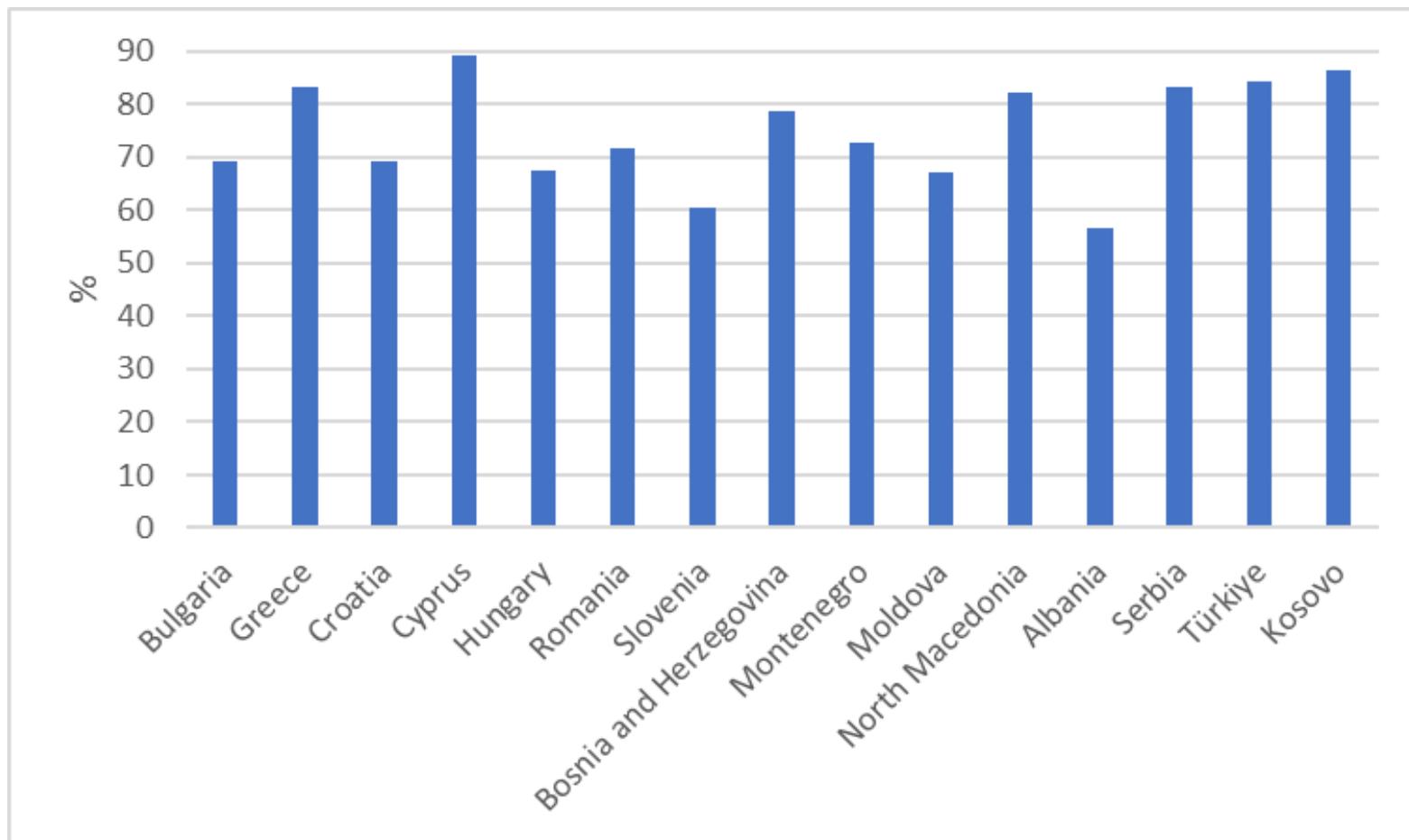
Key Regional Energy Issues – Gas Import Dependency

Gas Import Dependency (%) in SE Europe (2022)

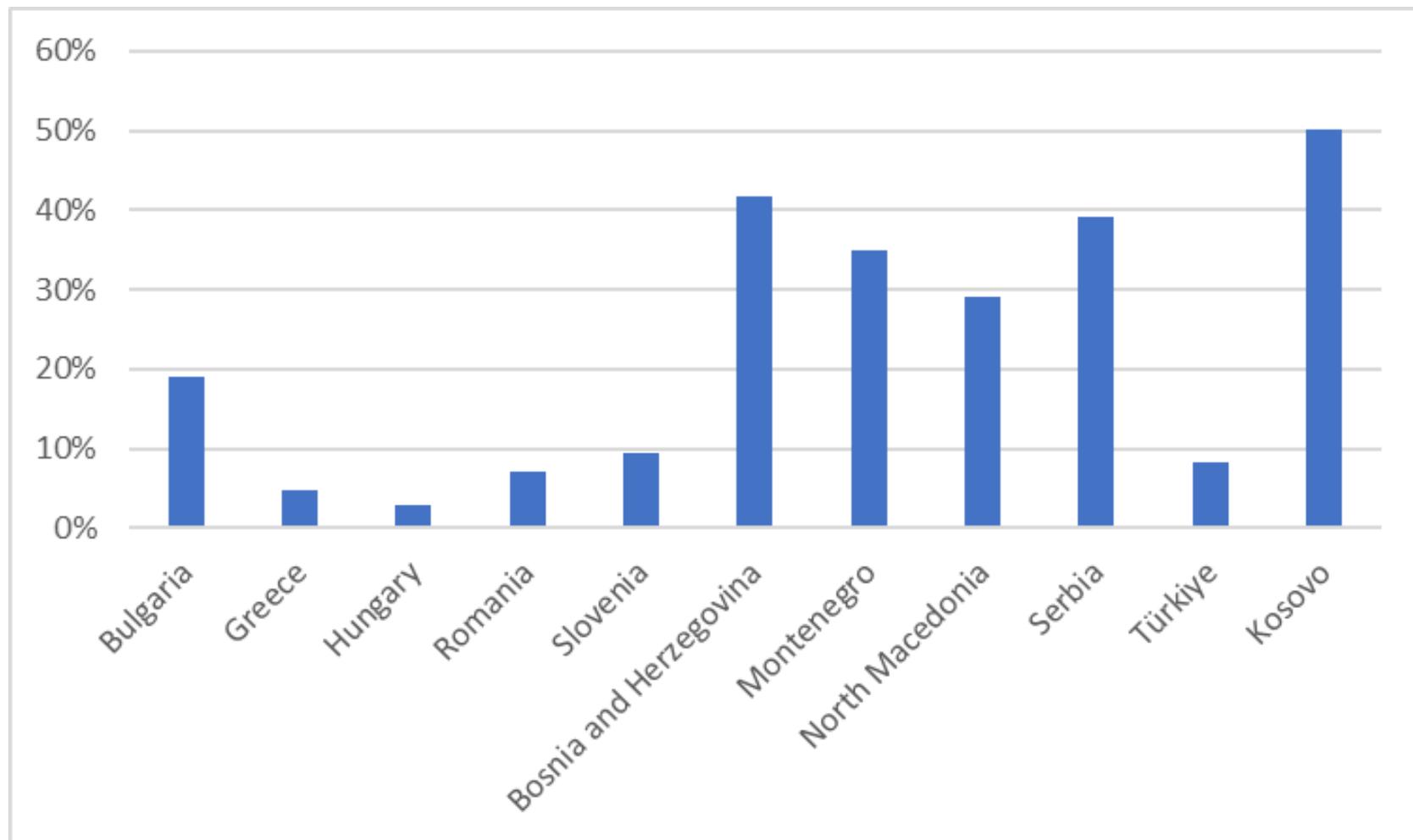


Note: Albania, Cyprus, Montenegro and Kosovo do not import natural gas

Key Regional Energy Issues – High Share of Fossil Fuels in SEE's Gross Available Energy



Key Regional Energy Issues – High Share of **Lignite** in SEE's Gross Available Energy



Key Regional Energy Issues – EU Decarbonisation Goals and SE Europe



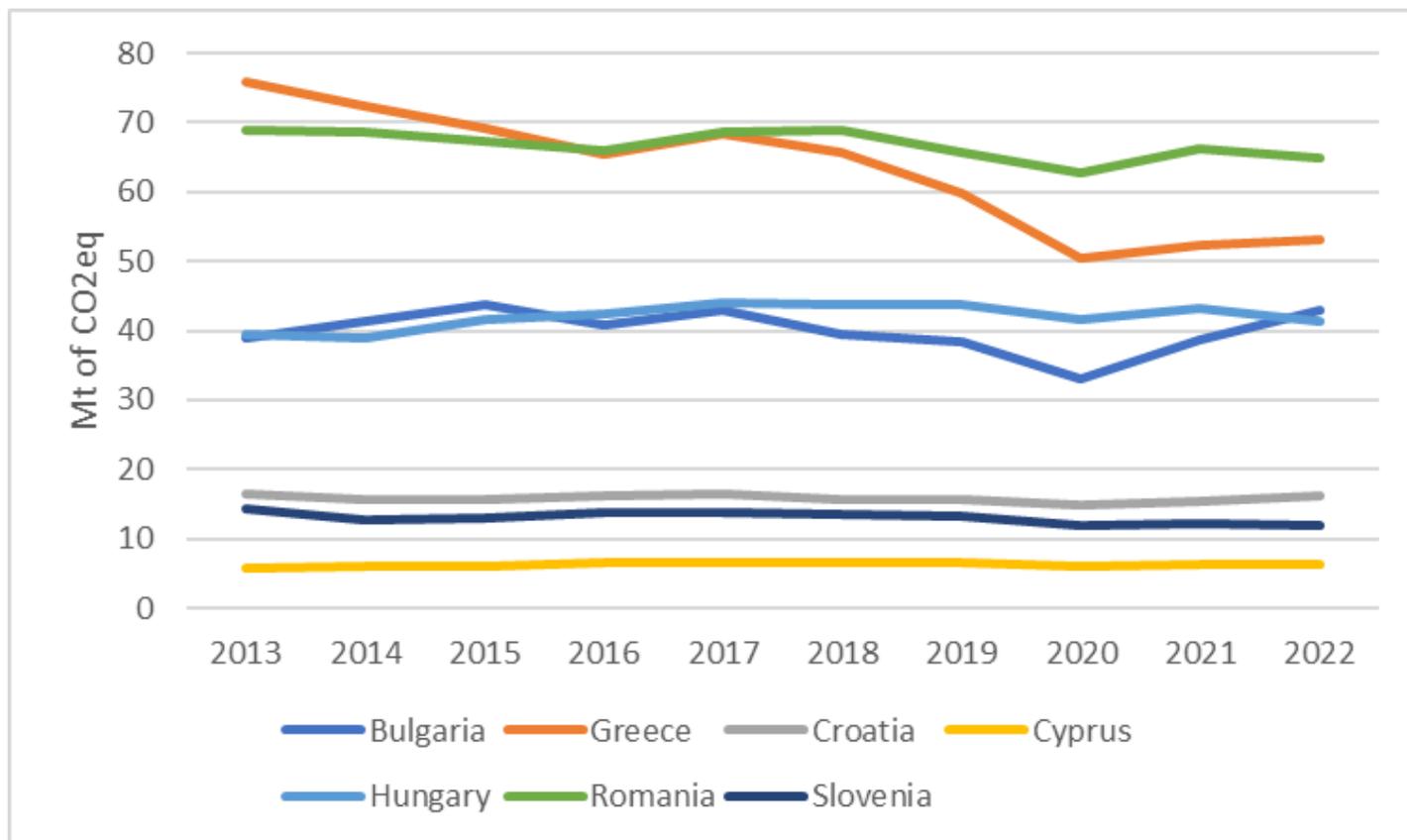
- The EU's decarbonisation goals aim to drastically reduce GHG emissions to combat climate change and transition to a climate-neutral economy.
 - By 2030, the EU targets cutting emissions by at least 55% compared to 1990 levels, and by 2050, it aims to achieve net-zero emissions, meaning any remaining emissions would be balanced by carbon removal measures.
 - These goals involve a shift to renewable energy, increased energy efficiency, cleaner transport, sustainable industry practices, and protecting natural carbon sinks, all supported by policies, investments, and regulations under the European Green Deal.
- The road to decarbonisation can be approached at two levels:
 - through **policy**, which incorporates the aforementioned energy mix issue and economic assessment through which the rate of decarbonization is determined.
 - The main question arising therefore is **how the rate of decarbonization can be related to economic development and what the investment implications are** and
 - through **technology**, whose degree of deployment depends on the policies to be implemented and could contribute significantly towards decarbonisation through, for instance, the use of CCS/CCU or dual-fuel power plants.

Challenges and Trends Towards SE Europe's Decarbonisation:

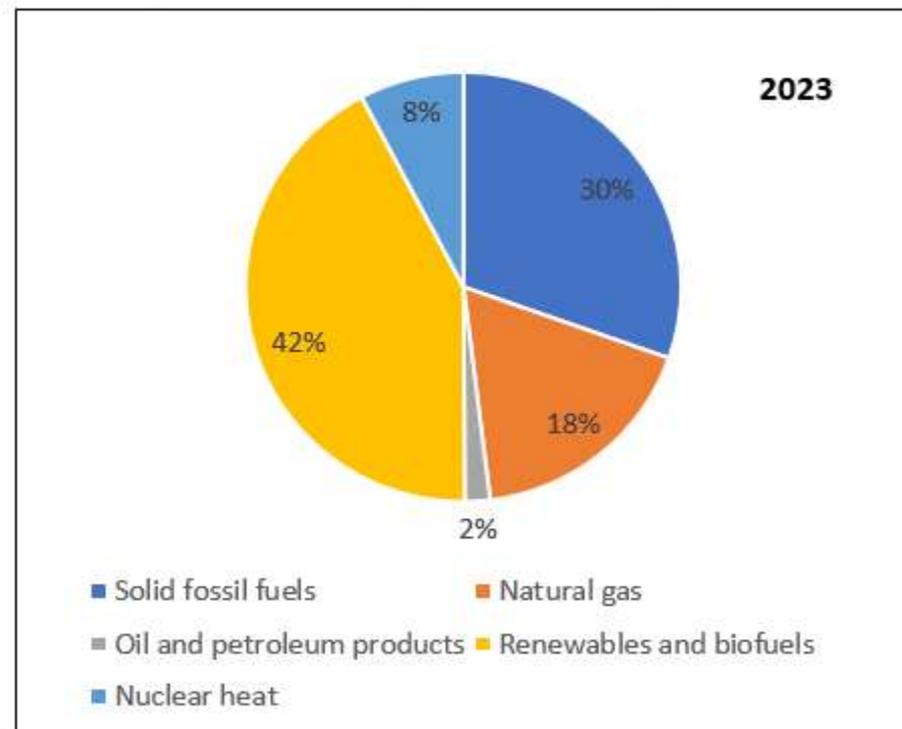
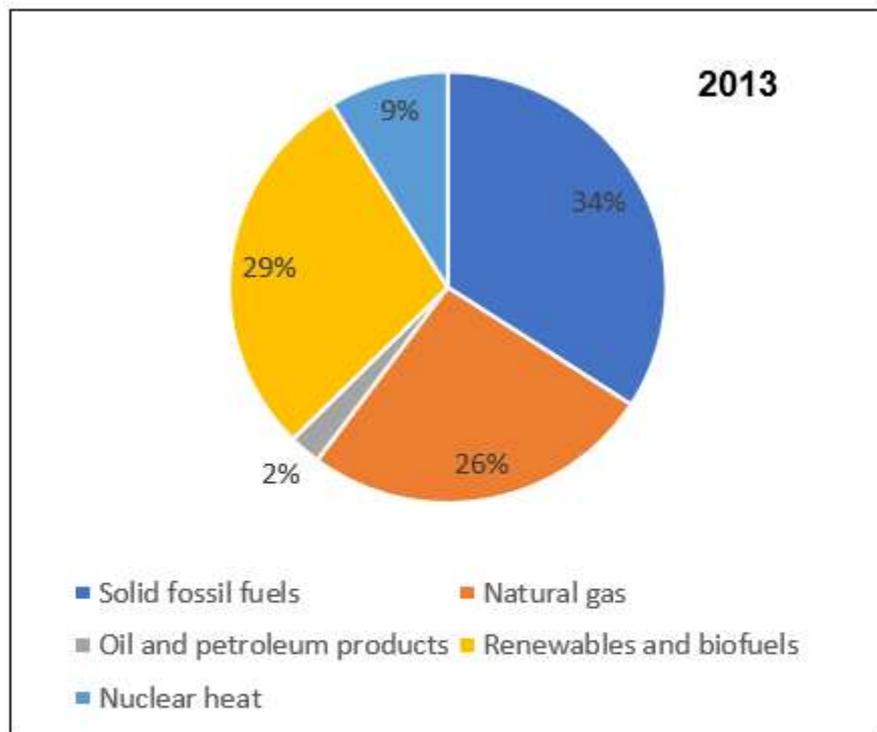
- The **coal predicament** of SE Europe – the region's great dependence on coal-fired power generation vs GHG emission reduction targets
 - According to IENE estimates, the **share of solid fuels to power generation** is anticipated to **increase steadily** in several countries of the region (most notably in Serbia, Kosovo, Croatia, Bosnia and Herzegovina, Montenegro and Türkiye) over the next 10-15 years, as they will struggle to meet increased demand.
 - **North Macedonia and Serbia are the second most coal dependent countries after Kosovo at regional level**, while proposed lignite-based/coal-fired power plants in Bosnia and Herzegovina and Serbia would not be in line with EU climate targets, and would downgrade the solar PV, wind, hydropower, and biomass opportunities in the region.
 - **Effective climate change policies in SE Europe have not been implemented so far**, but there is still room for change in order to avoid becoming further “locked in” to the use of fossil fuels.
 - In SE Europe, **economic development**, largely based on the utilization of indigenous lignite/coal resources, **will have to be reconciled with COP 30 commitments**. Therefore, the planning of clean-cut and compatible long-term energy and economic strategies becomes a real challenge.
 - A lot more analytical and assessment work (e.g. examine CCS/CCU options) needs to be undertaken before introducing realistic policies for decarbonisation.

- The Western Balkans 6 (WB6) often lean on the "energy security" narrative to justify their continued reliance on domestic coal and lignite. While it feels like a safe bet because the resource is right under their feet, this strategy is increasingly fragile.
- There are five counter-arguments to the claim that solid fuel provides genuine energy security:
 - **Operational Instability and Aging Infrastructure:** Most coal plants in the WB6 are decades past their intended lifespan. Relying on "domestic" fuel is meaningless if the plants themselves suffer from frequent unplanned outages and technical failures, which actually decreases grid reliability compared to modern, decentralized renewables.
 - **The "Carbon Trap" and Economic Isolation:** As the EU moves toward the Carbon Border Adjustment Mechanism (CBAM), electricity generated from solid fuels will face heavy taxes. This makes exports uncompetitive and creates a "carbon lock-in" that drains national budgets, redirecting funds away from necessary grid modernization.
 - **Health Costs as a National Security Risk:** True security includes the well-being of the citizenry. The massive public health burden caused by solid fuel emissions—leading to premature deaths and high healthcare costs—weakens the labor force and creates a long-term economic drain that outweighs the short-term benefits of "cheap" local coal.
 - **Import Dependency for Maintenance:** While the fuel may be local, the technology and parts required to keep aging coal plants running are not. WB6 countries remain heavily dependent on foreign expertise and expensive imported components to patch up failing systems, which is a hidden form of energy insecurity.
 - **Climate Vulnerability and Water Scarcity:** Coal power is water-intensive. As climate change increases the frequency of droughts in the Balkans, the water levels needed for cooling thermal plants (and for competing hydro-power) are becoming unreliable. Diversifying into wind and solar creates a more resilient "all-weather" energy portfolio.

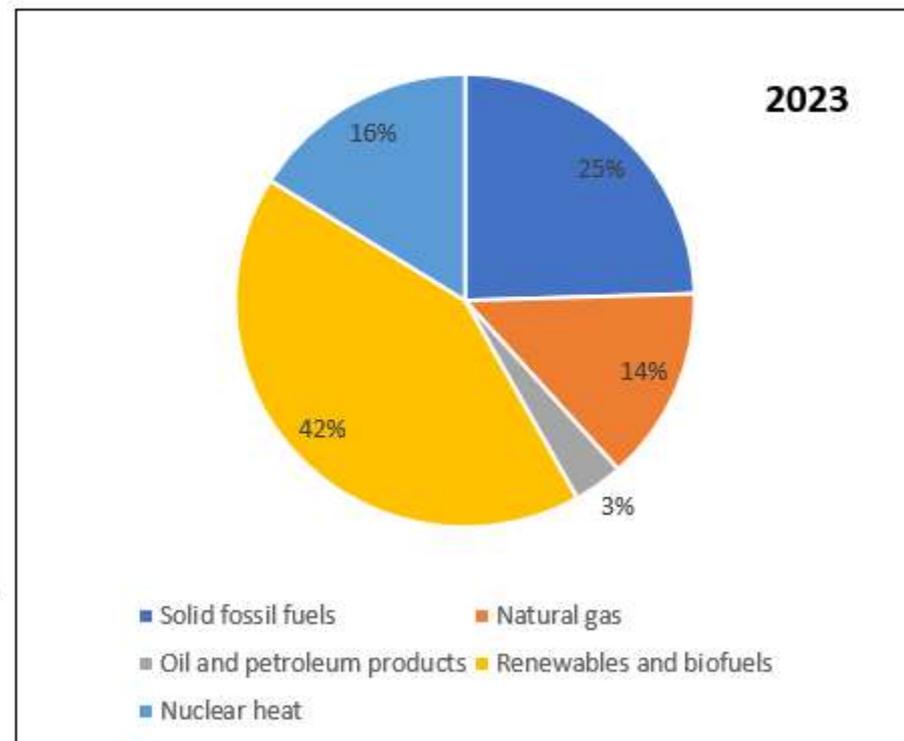
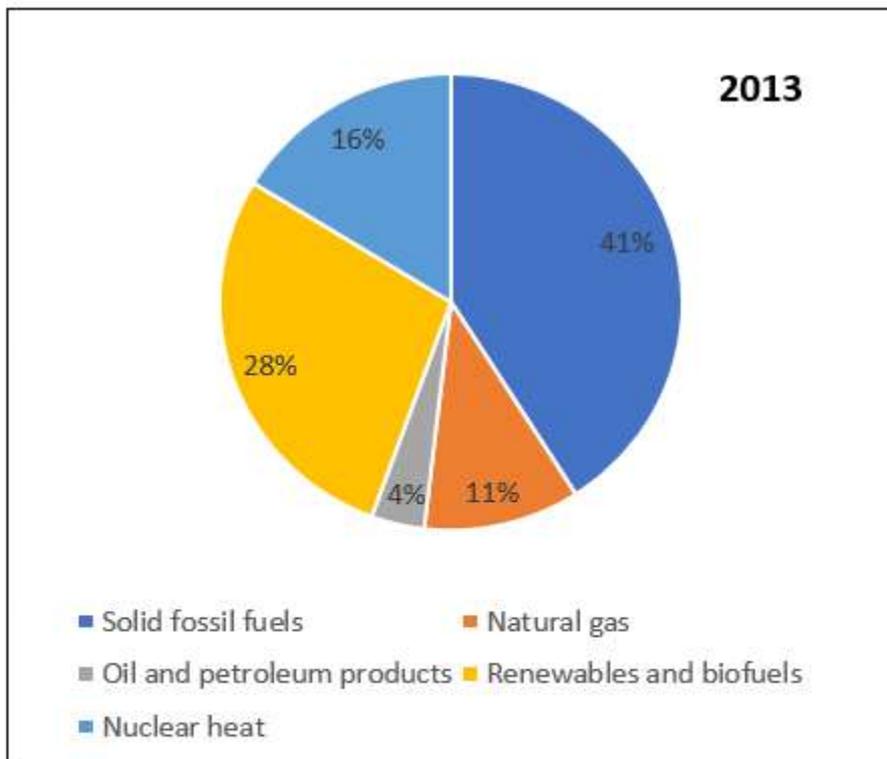
CO2 Emissions from Energy Activities in Selected SE European Countries, 2013-2022



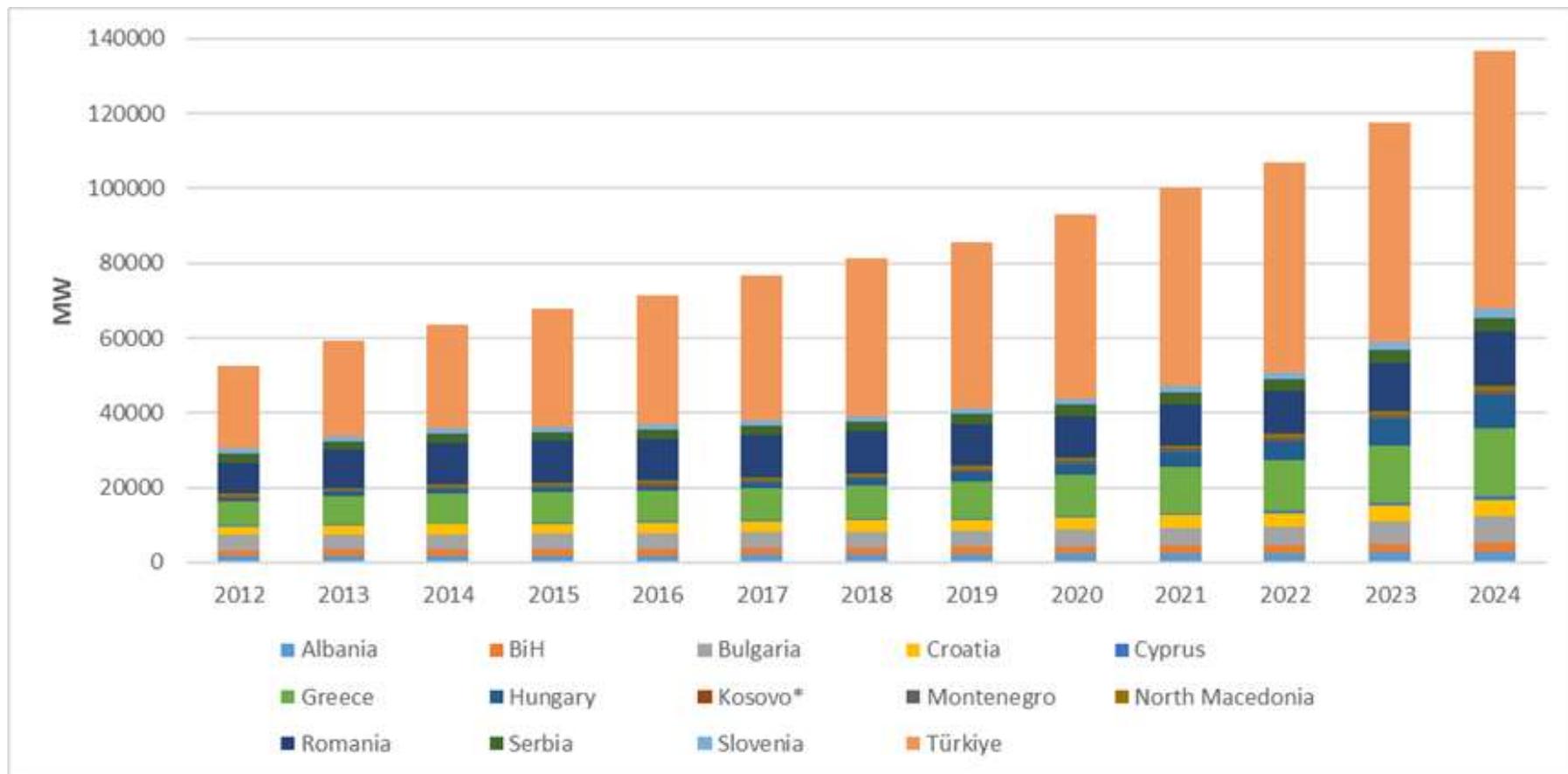
SE Europe's Power Generation Mix, Including Türkiye, 2013 and 2023



SE Europe's Power Generation Mix, **Without Türkiye**, 2013 and 2023



Total Installed RES Capacity (MW) by Country in SE Europe, 2012-2024



Key Regional Energy Issues

- Energy Security in SE Europe (I)

- SE Europe faces **high energy security risk**
 - Because of its geography, its proximity to **high-risk conflict zones** (i.e. Syria, Iraq, Ukraine), refugee flow from the Middle East and North Africa and the location of some of its countries at vital energy supply entry points, SE Europe faces **higher energy security threats** than the rest of Europe.
- Hence, there is a need to strengthen available mechanisms
 - The **strengthening of Emergency and Solidarity Mechanisms** and the **maintenance of adequate oil, coal and gas stocks**, constitute a short- to medium-term relief solution.
 - A **balanced energy mix** provides the best long-term option in enhancing energy security both at country and regional level.
- Security of **supply/demand** and **differentiation of supply sources**
 - The focus is on gas as a strategic fuel. It is of vital importance to safeguard gas transmission routes (pipelines, LNG terminals)

Energy Security in SE Europe (II)



- Security of **transportation**, shipment of **oil and gas**
 - Gas deliveries to Europe have been repeatedly disrupted, notably during the Russia-Ukraine transit crises in 2006 and 2009, as well as through supply interruptions and contractual tensions affecting SE Europe via Türkiye and Greece in 2011 and 2016; more recently, supplies were severely curtailed following Russia's invasion of Ukraine in 2022, culminating in the complete cessation of Russian gas transit through Ukraine in January 2025, leaving TurkStream as the last remaining pipeline route to Europe.
 - **Smooth supply of electricity** and urgent need to connect various island groups to the mainland grid
 - Mitigation of possible power supply failures and shortfalls and minimization of environmental impact through the retirement of fuel oil or diesel-powered electricity generators on several islands.
- **Effective protection of energy infrastructure**
 - Mitigation of terrorist threats and advanced level of safety against of physical hazards (e.g. hurricanes, floods, earthquakes) and cyber threats.
- The various vulnerable key energy infrastructure locations in SE Europe constitute **potential energy security hot spots** and as such should be properly identified, while also crisis management plans must be prepared in order to meet any emergencies (e.g. physical hazards, large-scale industrial accidents or terrorist actions).

Oil Stock Requirements in SE Europe



Based on the EU and IEA frameworks that govern all regional obligations, the oil stock requirements in SE Europe can be summarized as follows:

- ❑ **Minimum obligation: 90 days of net imports (or 61 days of inland consumption):** All EU Member States in SE Europe (e.g., Greece, Bulgaria, Romania, Croatia, Slovenia) must maintain emergency oil stocks equal to at least 90 days of average daily net imports or 61 days of average daily inland consumption, whichever is higher.
- ❑ **Directive 2009/119/EC sets the binding legal framework:** This Directive requires Member States to hold crude oil and/or petroleum product stocks, report monthly to the European Commission, and ensure immediate availability for crises.
- ❑ **IEA membership adds an additional layer of obligation:** IEA members in the region (e.g., Greece, Slovenia) must also maintain 90 days of net imports and be ready for coordinated releases during global supply disruptions.
- ❑ **Geopolitical exposure increases the strategic importance of stocks:** SE Europe is heavily dependent on imports from high-risk regions (Middle East, Russia/FSU, North Africa), making emergency stocks a critical buffer against volatility and supply shocks.
- ❑ **Ongoing EU reforms aim to strengthen resilience:** The EU is reassessing the Oil Stocks Directive in light of the Ukraine war and the phase-out of Russian oil, with expected upgrades to storage capacity, coordination, and crisis-response mechanisms.
- ❑ **The Energy Community aims to align Contracting Parties with EU Directive 2009/119/EC,** meaning each country must ultimately maintain 90 days of net imports or 61 days of inland consumption in emergency oil stocks.

Gas Storage Requirements in SE Europe



Based on the EU Gas Storage Regulation and regional security-of-supply rules, the gas storage requirements in SE Europe can be summarized as follows:

- ❑ **Mandatory 90% storage filling by 1 November each year:** Under the EU Gas Storage Regulation, Member States must ensure that underground gas storage facilities are filled to at least 90% of capacity by 1 November annually.
- ❑ **Interim filling trajectories are legally binding:** Countries must meet specific intermediate targets on 1 February, 1 May, 1 July, and 1 September, ensuring a smooth and predictable ramp-up of storage levels. Several Member States have struggled to meet early-year targets.
- ❑ **Storage obligations apply even in countries without storage:** Member States lacking domestic storage (e.g., Greece) must secure equivalent storage capacity in other EU countries, ensuring proportional access to stored gas during crises. This is part of the broader EU security-of-supply framework.
- ❑ **High storage levels have become the new norm post-2022:** Since Russia's supply cuts, EU-wide storage has consistently exceeded 80–90% well before winter, reflecting both regulatory pressure and market adaptation. SE Europe follows this trend, with early filling becoming standard practice.
- ❑ **Regional risk groups shape obligations and coordination:** SE Europe falls under the “Southern Gas Corridor / South-East risk group” in the EU SoS Regulation, which governs cross-border cooperation, joint risk assessments, and coordinated emergency measures—including storage utilisation.
- ❑ **No binding, EU-style storage obligation currently exists for Energy Community Contracting Parties in SE Europe:** They are not yet legally required to meet the EU's 90% storage-filling target or follow the EU's mandatory filling trajectory.

Contentious Issues and Trouble Shots in SEE and the East Mediterranean (I)

□ Geography related

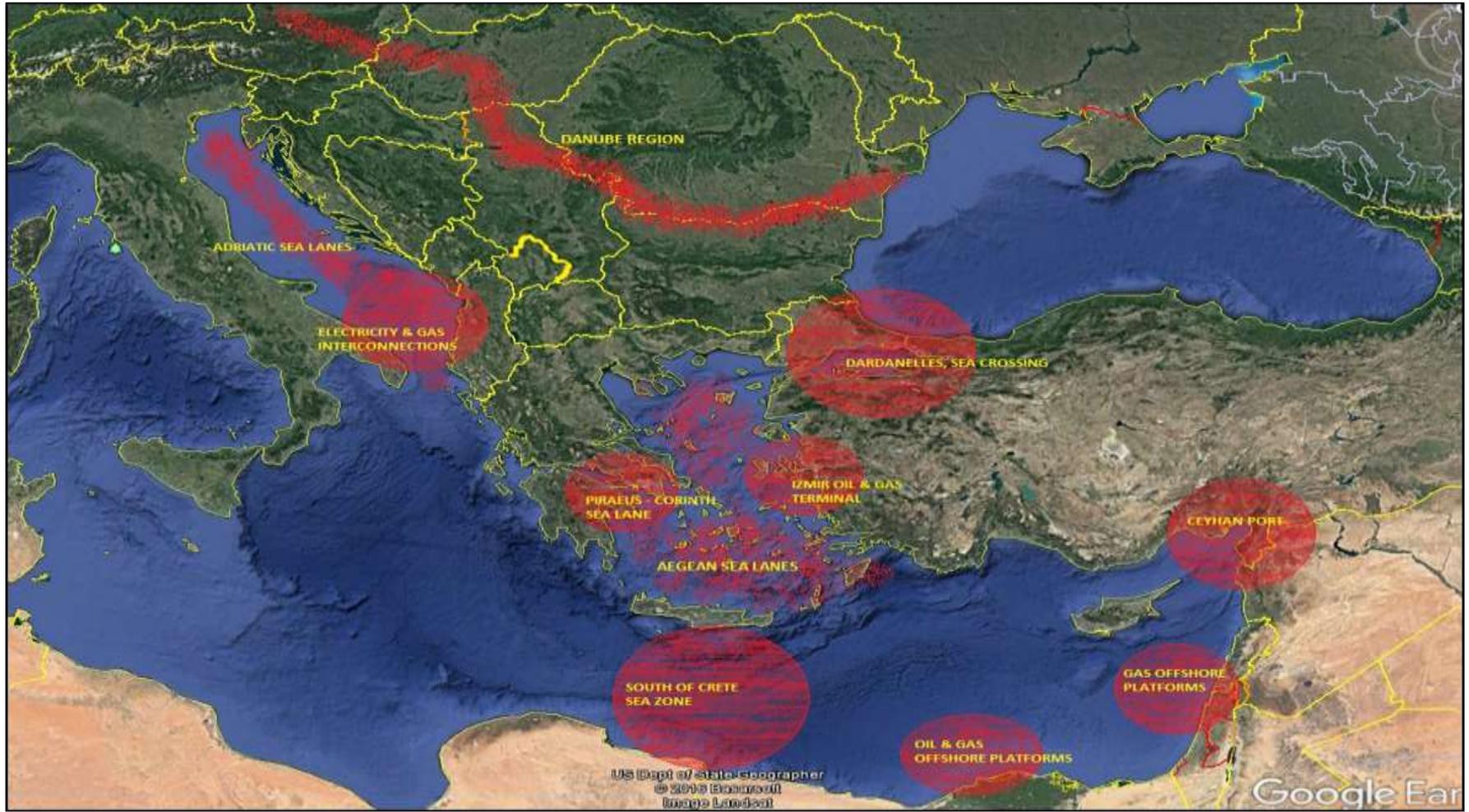
- Potential choke points exist in the region and are related to the shipment of oil and gas. These can be found in the Dardanelles, in the sea passage south of Peloponnese and the Suez Canal and refer to both oil and LNG
- Areas of concern also include the construction of underwater electricity links and underwater gas pipelines in the Aegean and in the East Mediterranean
- New cross border electricity links in the Western Balkans could become a potentially contentious issue
- The ongoing supply of Russian crude oil to certain countries in Central Europe through the Soviet-era Druzba pipeline network continues to pose security concerns

□ Market related

- There have been several instances where electricity market operation in SEE, based on the Target Model, has resulted in difficult to justify high prices.
- High price volatility has become a more or less permanent characteristic of electricity market operation in SEE
- Of equal concern are the problems faced in gas markets in SEE, where EU market regulation and conflicting gas import policies are preventing smooth cross-border gas transit (e.g. this has lately impacted the shipment of gas through the Vertical Corridor)

Contentious Issues and Trouble Shots in SEE and the East Mediterranean (II)

- Oil, Gas, Electricity and Security implications -- The Regional Energy Hot Spots



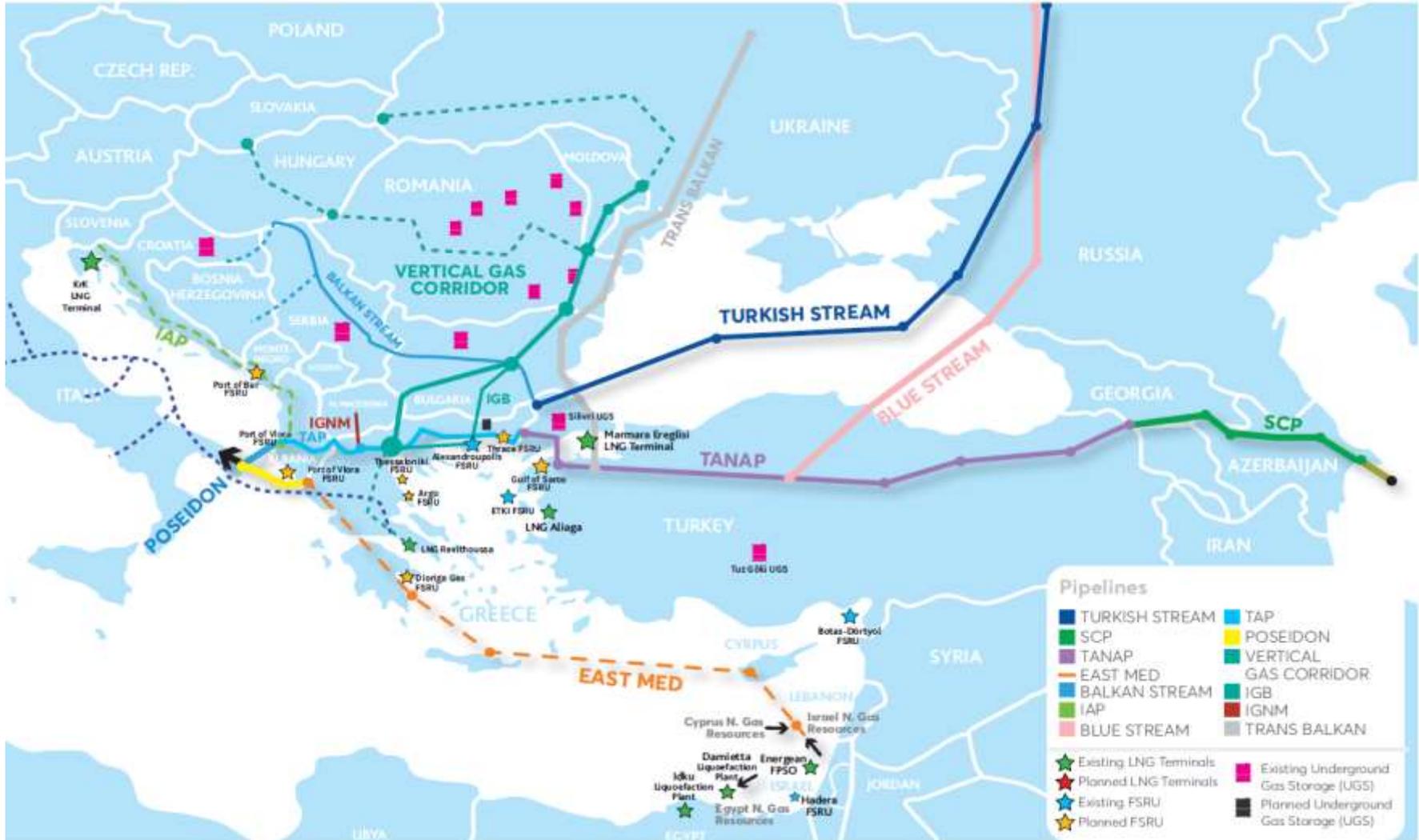
Major Energy Suppliers to SEE: **Azerbaijan's** Role in Supporting SE Europe's Energy Supply

- ❑ **Southern Gas Corridor (SGC):** Azerbaijan supplies natural gas to Europe via TANAP-TAP system, reaching Greece and Italy, directly strengthening East Med energy security.
- ❑ **Supply Diversification:** Azerbaijani gas reduces East Med dependence on single suppliers, supporting EU and regional diversification strategies.
- ❑ **Regional Interconnectivity:** Gas delivered to Greece can be redistributed through interconnectors to SE Europe and Eastern Mediterranean markets.
- ❑ **Strategic Partnerships:** Azerbaijan maintains strong energy cooperation with Greece, Italy, and the EU, aligning with East Med energy stability goals.
- ❑ **Future Expansion Potential:** Long-term contracts and planned capacity increases position Azerbaijan as a reliable bridge supplier for East Med demand growth.

Major Energy Suppliers to SEE: **Kazakhstan's** Contribution to Strengthening SE Europe's Energy Supply

- ❑ **Caspian Oil Production:** Kazakhstan is one of the world's major oil producers, supplying crude that reaches East Mediterranean markets via international export routes.
- ❑ **Transit via the Caspian–Black Sea–Mediterranean Corridor:** Kazakh oil is transported through Caspian Pipeline Consortium (CPC) and alternative routes to Mediterranean terminals, supporting regional supply stability.
- ❑ **Supply Diversification:** Kazakhstan provides non-regional, non-OPEC supply, helping East Med countries diversify energy sources.
- ❑ **Reliability & Scale:** Large reserves and long-term production capacity enhance predictability and security of supply for Mediterranean refiners.
- ❑ **Strategic Energy Partner:** Kazakhstan cooperates with EU and Mediterranean partners on energy trade and infrastructure resilience.

An Expanded South Gas Corridor

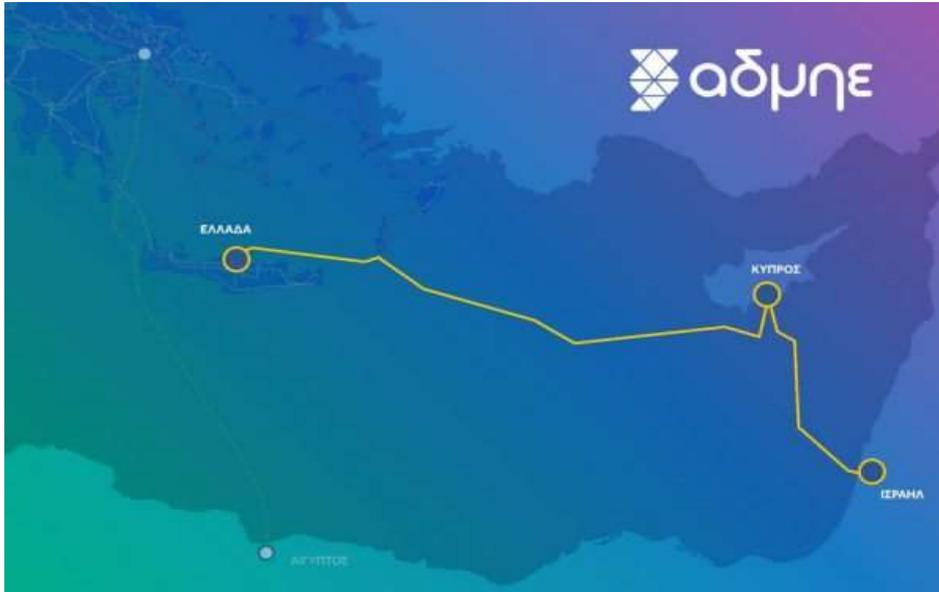


Electricity Interconnections in SE Europe



Source: IPTO's Ten Year Network Development Plan 2025-2034

Great Sea Interconnector and Greece-Egypt Electricity Interconnector

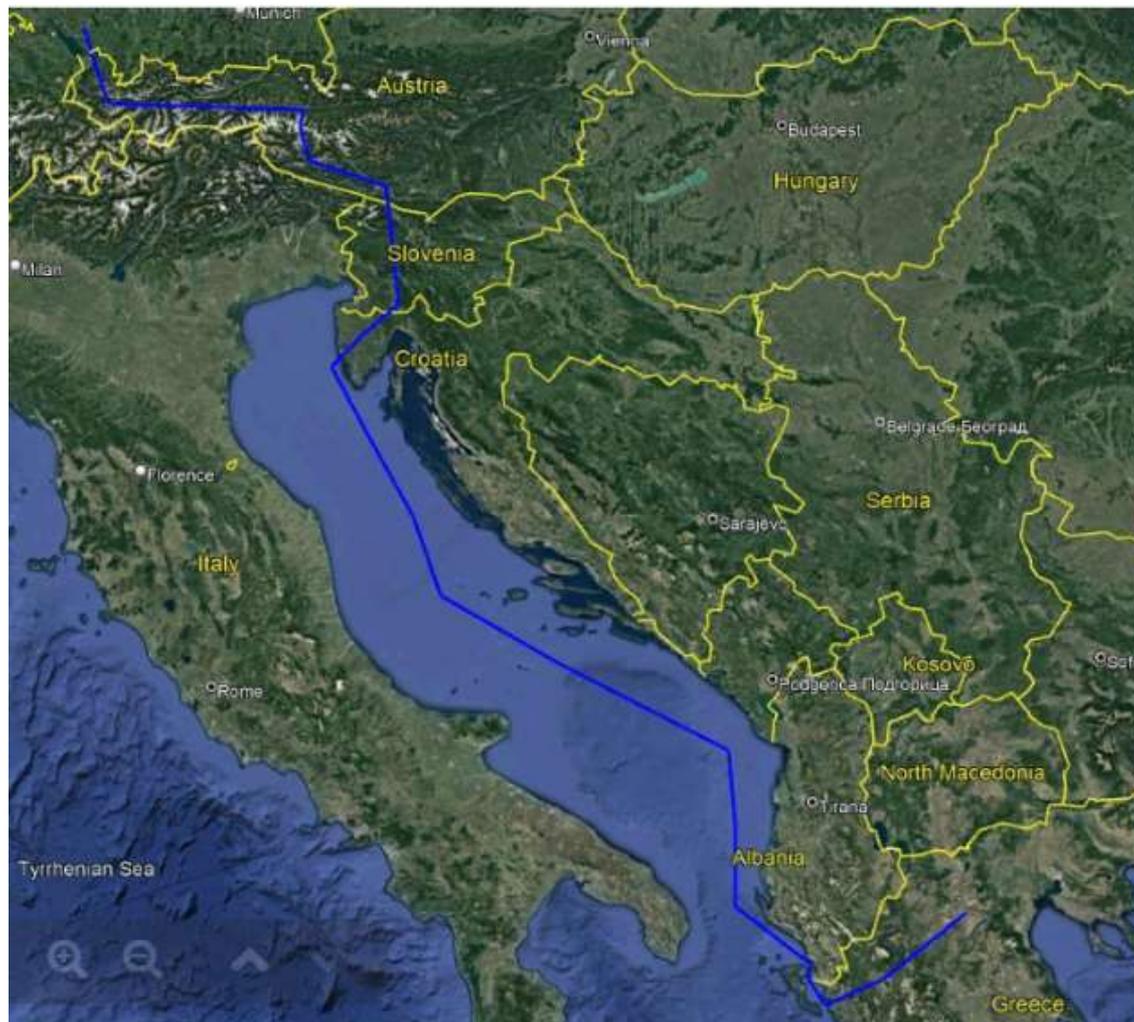


Source: IPTO



Source: COPELOUZOS GROUP

Green Aegean Interconnector



Nuclear Power in SE Europe

- ❑ Nuclear power remains an **important component** of the energy mix in SE Europe, meeting essential base-load electricity needs in several key countries—namely Romania, Bulgaria, Croatia, Slovenia, and Hungary—and aligning well with the EU’s decarbonization objectives.
- ❑ In 2023, nuclear power covered 8% of SE Europe’s (incl. Türkiye) gross electricity generation, remaining almost stable, compared to 2013 levels.
- ❑ With **Bulgaria** and **Romania** pursuing plans to expand their nuclear capacity and **Türkiye** moving ahead to introduce nuclear power generation for the first time in 2026, the role of nuclear energy is expected to **grow significantly over the next decade**, strengthening the region’s power generation base.
- ❑ Beyond traditional large-scale reactors, **small modular reactors (SMRs)** are gaining strategic importance in SE Europe, as they provide flexible, scalable, and cost-effective nuclear options suitable for countries with smaller grids or limited infrastructure.

Nuclear Power Plants in SE Europe



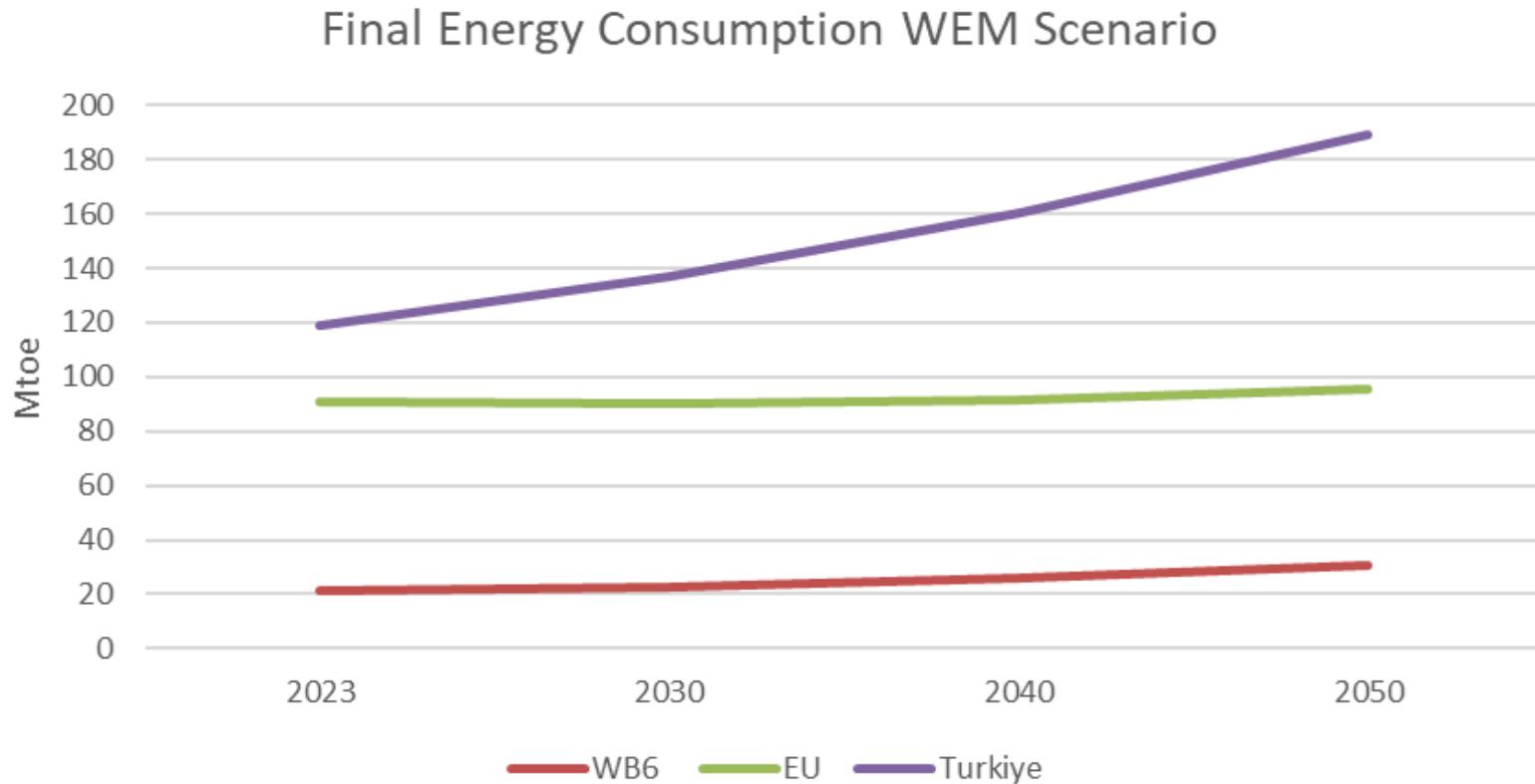
Source: IENE study “SE Europe Energy Outlook 2025/2026”, Athens, 2026

Energy Demand and Supply Projections in SEE

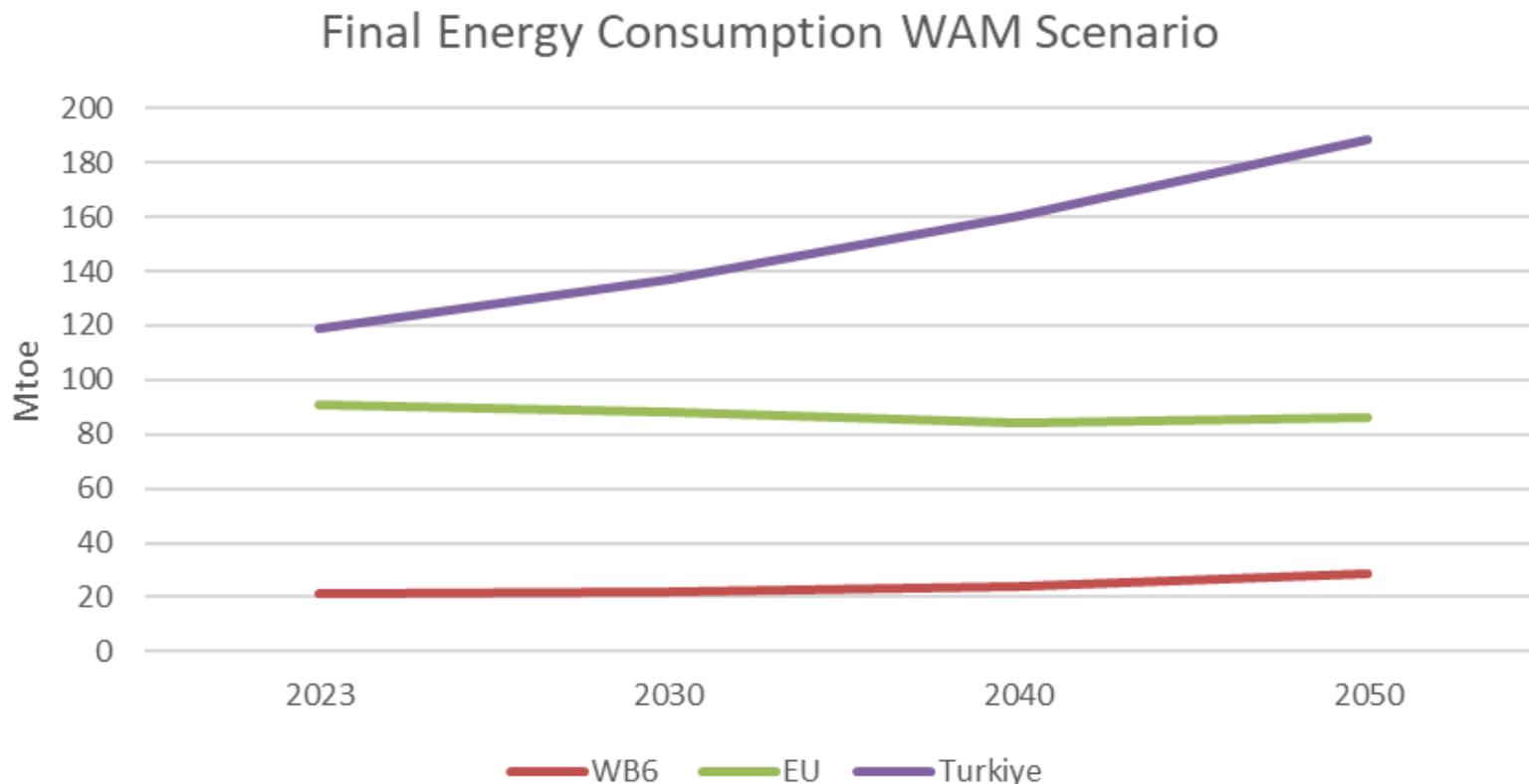


- The development of the Outlook to 2050 was carried out using the **KINESYS+ modelling framework**, built on the **TIMES (The Integrated MARKAL EFOM System) model generator**.
 - TIMES is a widely recognized bottom-up, technology-rich, cost-optimization modelling platform developed under the IEA-ETSAP programme.
 - The KINESYS+ framework has been configured to support multi-regional modelling with detailed regional energy system representations and explicit handling of interconnections and commodity trade. This modelling exercise targets the long-term decarbonisation of the SEE energy systems by exploring alternative scenario pathways based on contrasting policy and technology narratives, aligned with EU targets and regional commitments.
- **Three scenarios** are analysed in this study as described below:
 - The **WEM scenario (With Existing Measures)** represents a continuation of current efforts and policies, capturing a CO₂ trajectory at the sectoral level derived from the national strategies, National Energy and Climate Plans and UNFCCC submissions of the countries, without additional mitigation ambition.
 - The **WAM scenario (With Additional Measures)** reflects enhanced efforts still within a non-net-zero framework; it applies more ambitious but still realistic sectoral CO₂ reductions, based on the same national sources as WEM.
 - The **NZ (Net Zero) scenario** builds upon the sectoral goals of the WAM scenario and applies an overarching constraint of achieving net zero GHG emissions at the national level for each of the targeted countries, thereby forcing a system-wide transformation in line with long-term climate neutrality targets

Final Energy Consumption in SE Europe: WEM Scenario (2023-2050)



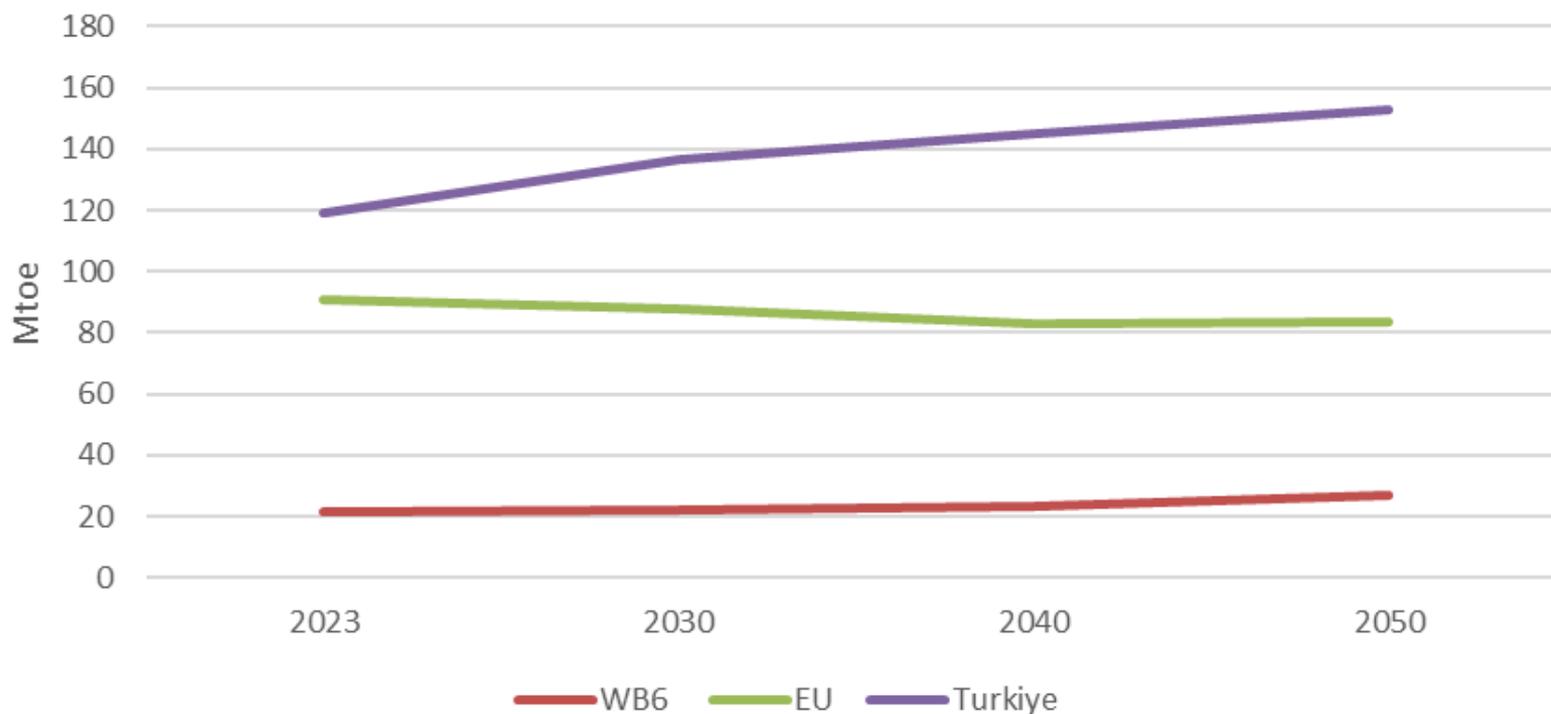
Final Energy Consumption in SE Europe: WAM Scenario (2023-2050)



Final Energy Consumption in SE Europe: NZ Scenario (2023-2050)



Final Energy Consumption NZ Scenario



Findings of SEE Energy Investment Outlook Per Country (2025-2035)



Country	Estimated Investment (mn €) 2025 Estimate	Estimated Investment (mn €) 2021 Estimate
Albania	6,725	4,500
Bosnia & Herzegovina	4,500	9,400
Bulgaria	65,000	47,000
Croatia	47,100	21,000
Cyprus	20,650	16,200
Greece	93,000	44,400
Hungary	28,950	25,300
Israel	29,500	39,300
Kosovo	7,400	7,400
Montenegro	4,600	4,600
North Macedonia	10,400	10,400
Romania	60,500	50,100
Serbia	52,150	15,200
Slovenia	17,550	12,100
Türkiye	212,200	130,000
Moldova	8,000	-
Total	668,225	436,900

Findings of SEE Energy Investment Outlook Per Sector (2025-2035)



	Energy sector	2025 Investment estimate (€ mn)	2021 Investment estimate (€ mn)
OIL	Upstream	79,895	63,000
	Downstream		
GAS	Country Gas Networks	42,070	25,150
ELECTRICITY	Power Generation	210,530	150,150
	Electricity Grids		
	RES	180,150	109,900
ENERGY EFFICIENCY	Energy Efficiency	155,580	88,700
	Total anticipated investments by 2025-2035	668,225	436,900
	Gas infrastructure	27,564	23,303
	Electricity Interconnections	15,216	8,440
	Cross-border energy projects (total)	42,780	31,743
	Grand Total	711,005	468,643

Key Messages (I)



- ❑ **Energy strategies and policies:** There is considerable divergence between stated objectives and actual progress on the ground (e.g. Decarbonisation, RES penetration, regional co-operation)
- ❑ The SEE region's **energy mix** is still characterized by glacial change in terms of differentiation of the dominant fuels
- ❑ The **persisting relevance of solid fuels** is explained on account of the large amounts of indigenous coal and lignite deposits and are seen as partly preventing a determined move towards decarbonisation
- ❑ The SEE region is characterized by **high oil and gas import dependence**
- ❑ The outlook for the SE European **upstream oil and gas industry** has become somewhat less uncertain, as global market sentiment has shifted toward a more favourable stance on fossil fuel development. This shift has boosted investor confidence and improved access to capital for the sector
- ❑ **Peripheral countries** are playing a very influential role in the channeling of energy flows into the SEE region
- ❑ **Natural gas is becoming increasingly important** to the energy mix of the various SEE countries, both for power generation and commercial/domestic use
- ❑ **Nuclear power** remains a viable option since it covers important base load requirements in certain key countries and is fully compatible and supportive of EU's (revised) decarbonisation policies. Beyond traditional large-scale reactors, **small modular reactors (SMRs)** are gaining strategic importance in SE Europe.

Key Messages (II)



- ❑ **Energy efficiency** in SE Europe is becoming more relevant. The “Energy Efficiency First” principle serves as a crucial policy framework, emphasising demand reduction before supply expansion.
- ❑ The SEE countries have particularly high levels of **energy poverty** due to low incomes, high energy needs stemming from energy-inefficient housing, and limited access to diversified energy supply
- ❑ In terms of **security of energy supply**, the SEE region as a whole appears more vulnerable than the rest of Europe (mainly Western European countries)
- ❑ **Electricity price disparities** within SE Europe have become increasingly evident in recent years, reflecting structural variations in energy mixes, levels of market integration, and infrastructure development.
- ❑ **RES curtailments** have become an increasingly pressing challenge in SE Europe as the region accelerates its clean energy transition.
- ❑ At present, most **green hydrogen** initiatives in SE Europe are driven more by political ambition than by economic viability
- ❑ **Carbon Capture, Utilisation, and Storage (CCUS)** in SE Europe, although still at an early stage, is moving ahead with actual projects.
- ❑ **Investment prospects** in the broader SEE region for energy related basic infrastructure and energy projects across the board (i.e. electricity, natural gas, RES, thermal power plants, oil and gas exploration, energy efficiency) look positive over the next decade, with total investment potential surpassing €800 bn.

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The background of the slide is a dark blue image of a globe. Overlaid on the globe are numerous glowing blue lines that represent energy or data connections. These lines are curved and intersect, creating a complex network pattern across the globe's surface.

*Thank you
for your attention!*

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