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FOR SOUTH-EAST EUROPE

South East Europe Energy Outlook **2021/2022**

Concise presentation at the
13th SE Europe Energy Dialogue (SEEED),
Thessaloniki

June 16, 2022

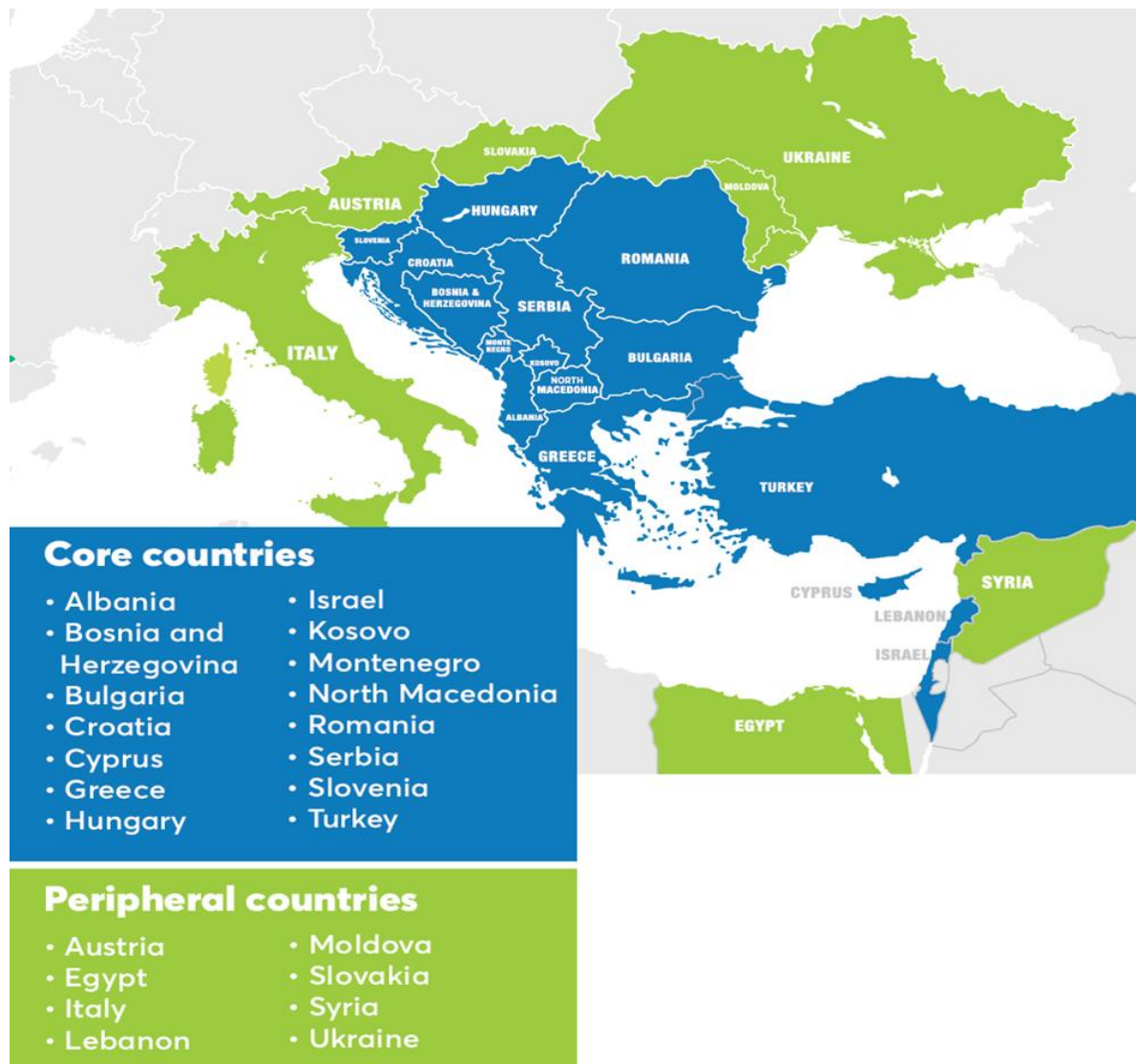
By **Costis Stambolis**
Chairman and Executive Director of IENE



Contents of SEEO 2021/2022 Study



The SE European Region Defined

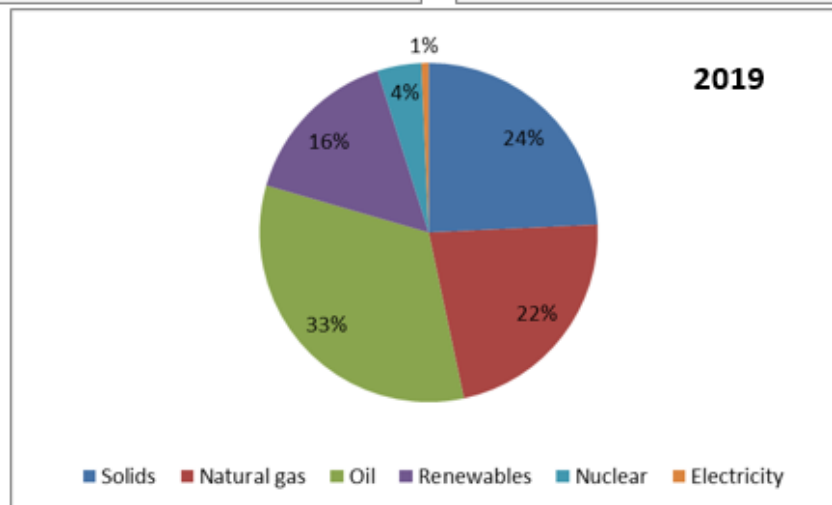
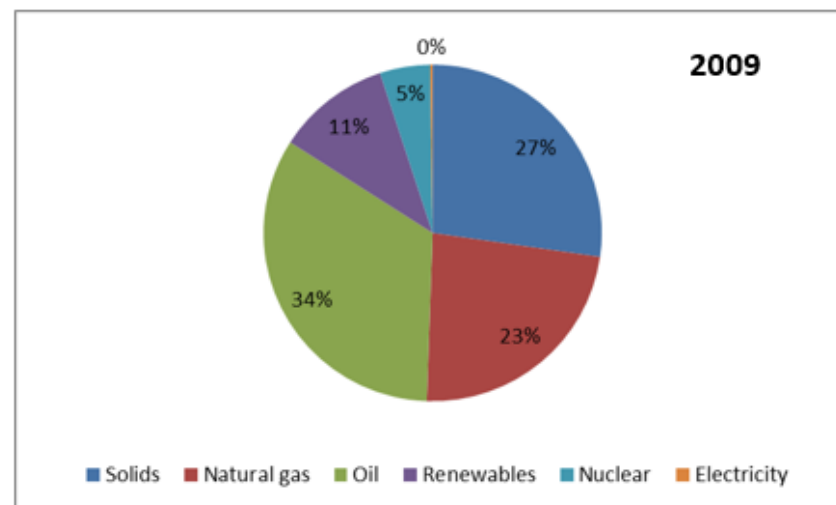
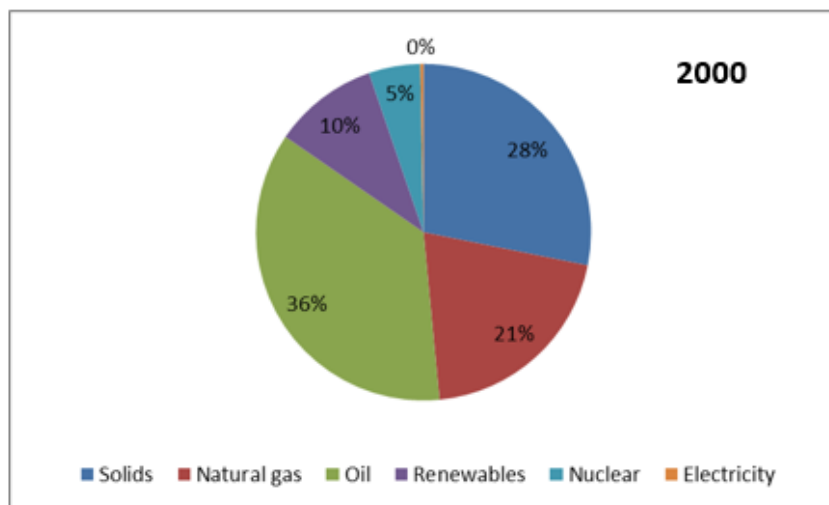


2020 Basic Energy Data for SE Europe, Including Turkey

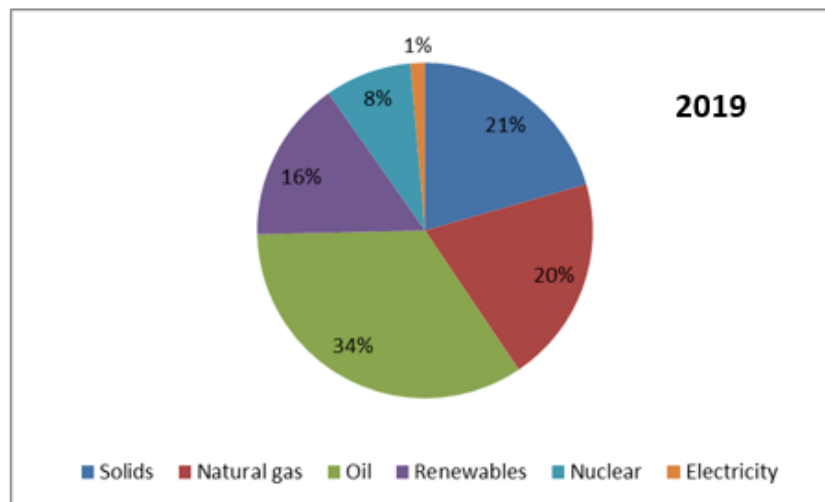
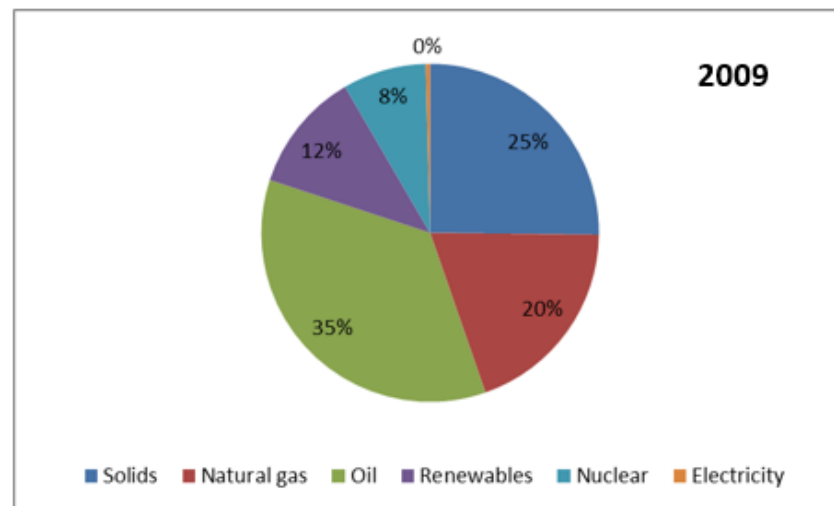
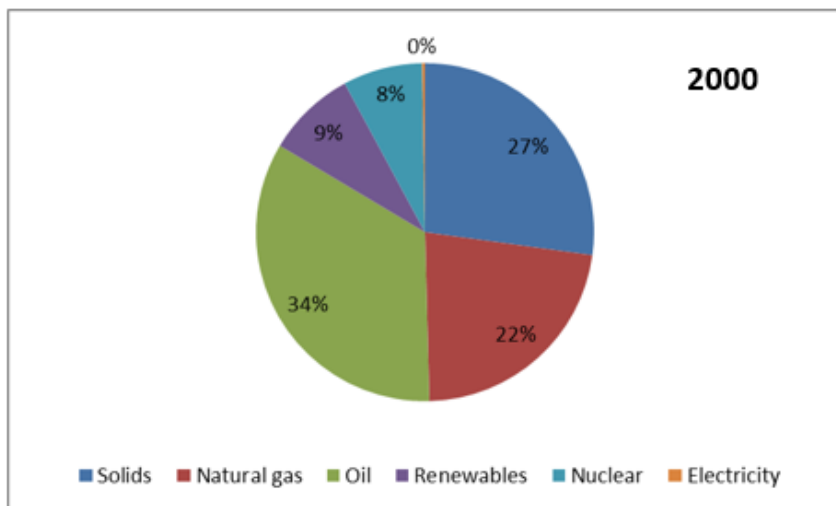
Region	Final Oil Consumption (thousand tonnes)	Gas Inland Consumption (bcm/y)	Gross Electricity Production (TWh)
SE Europe	84,737.4 (20.6% of EU-27)	86.5 (21.6% of EU-27)	597.6 (21.4% of EU-27)
EU-27	411,530.4	399.6	2,786

Source: IENE study “SE Europe Energy Outlook 2021/2022”, Athens, 2022

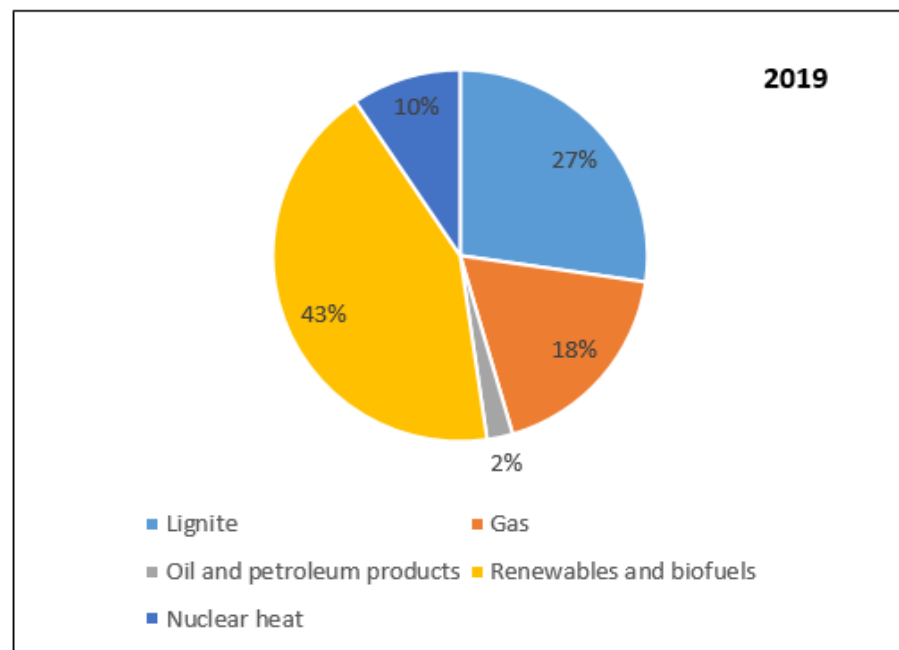
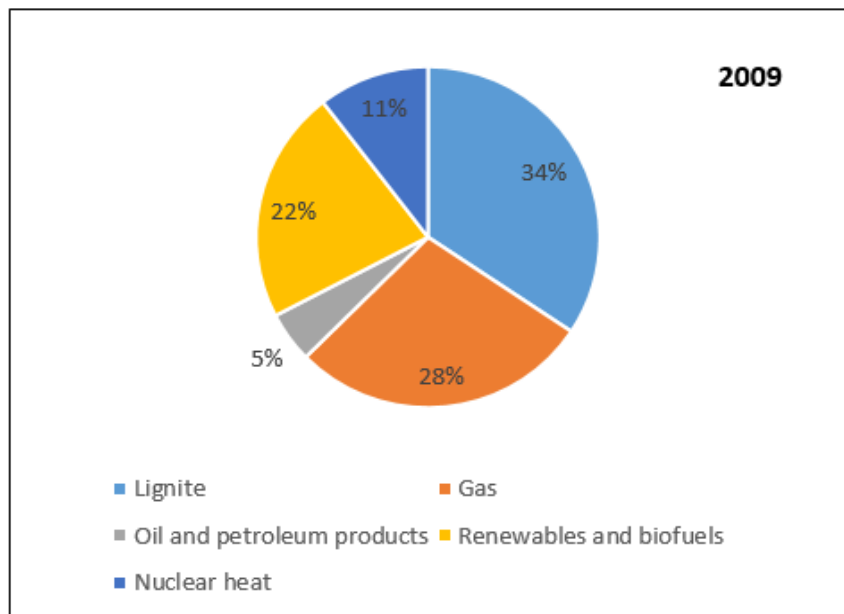
SE Europe's Energy Mix, Including Turkey, 2000, 2009 and 2019



SE Europe's Energy Mix, **Without Turkey**, 2000, 2009 and 2019

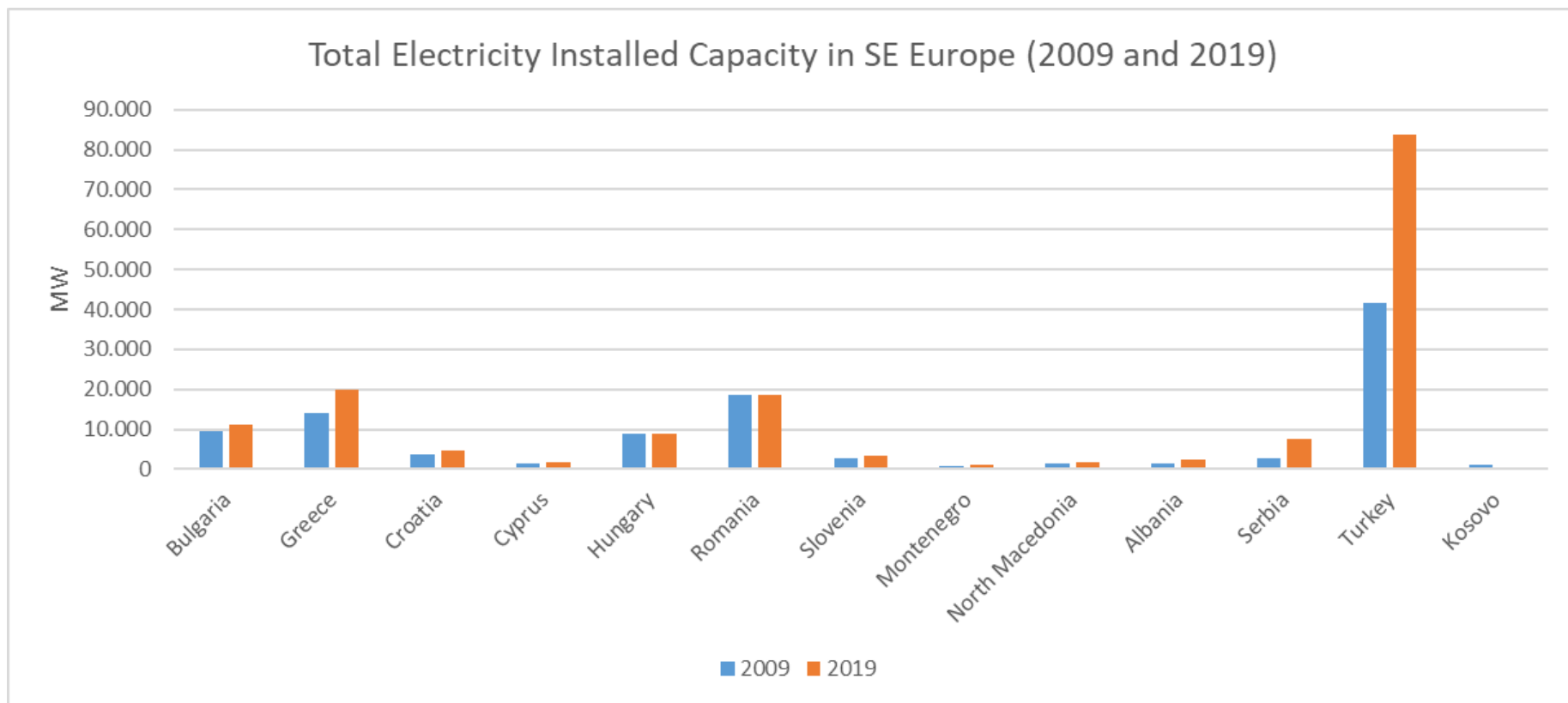


Power Generation Mix per Fuel in SE Europe (2009 and 2019), Including Turkey



Source: IENE study "SE Europe Energy Outlook 2021/2022", Athens, 2022

Total Electricity Installed Capacity (MW) in SE Europe (2009 and 2019)



Source: IENE study “SE Europe Energy Outlook 2021/2022”, Athens, 2022

Key Regional Energy Issues



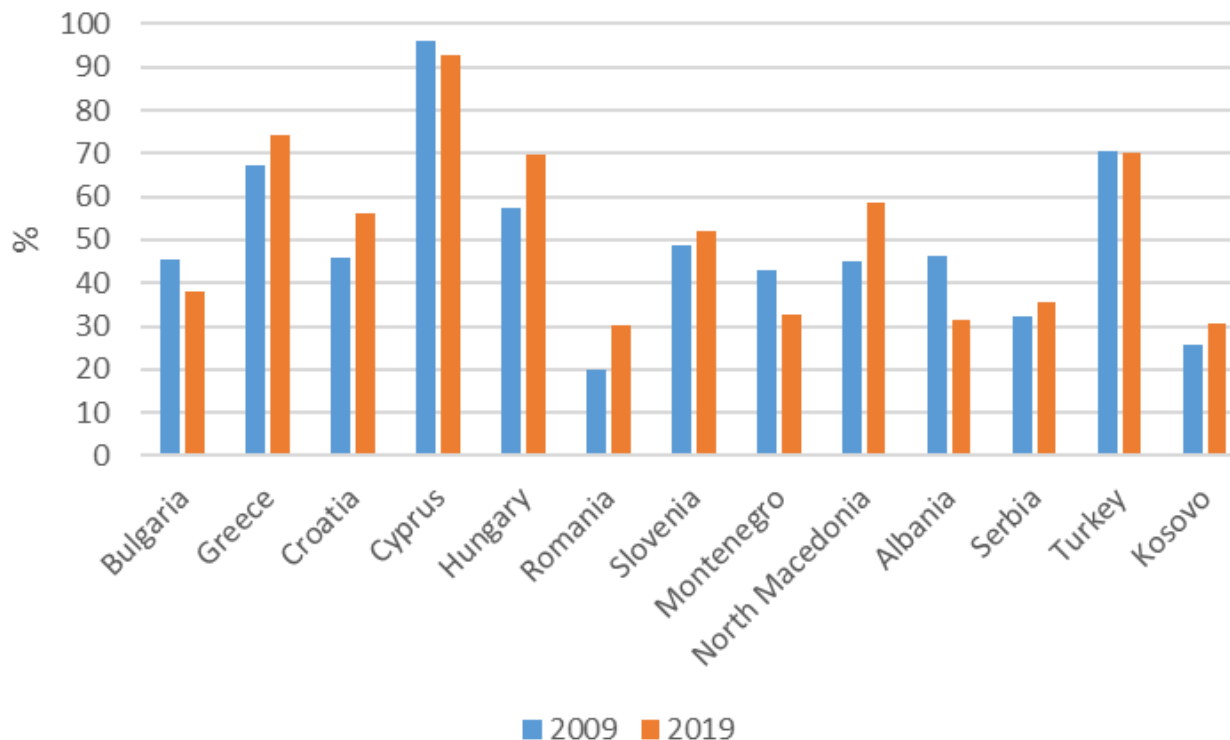
- ❑ Marked divergence between EU and SEE energy strategies
- ❑ SEE is more energy security vulnerable than the rest of Europe
- ❑ SEE's high hydrocarbon dependence
- ❑ Electricity's newcomer gas alters supply balance
- ❑ Lack of adequate electricity and gas interconnections
- ❑ Coal/lignite is and will 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

Key Regional Energy Issues

- Energy Security in SE Europe (I)

- **Energy security is a complex issue** and as such cannot be considered in isolation.
 - SE Europe, 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 (i.e. Turkey, Greece, Romania) at vital energy supply entry points, faces **higher energy security threats** than the rest of Europe.
- 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.
 - The achievement of 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**
 - In the case of gas, it is becoming more important and pressing compared to other fuel sources, such as electricity, oil, coal and possibly uranium.
 - Gas is a primary area of concern largely because of its rather inflexible transmission method, mainly by means of pipelines.

Energy Dependence in SE Europe (2009 and 2019)



Source: IENE study “SE Europe Energy Outlook 2021/2022”, Athens, 2022

Energy Security in SE Europe (II)



- Security of **transportation**, shipment of **oil and gas**
 - Gas deliveries were twice disrupted (i.e. 2006 and 2009) with the shipment of Russian gas, through Ukraine, to Europe but also from Turkey and Greece (i.e. 2011 and 2016).
- **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 (*IENE organised an Ad hoc meeting for energy security on March 15, 2017*).
- 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).

An Expanded South Gas Corridor



Note: The TANAP, TAP and Turk Stream have been completed, while BRUA and IGB are still under construction. The IAP, the IGI Poseidon in connection with East Med pipeline and the Vertical Corridor and the IGF are still in the study phase. Blue Stream and Trans Balkan are existing pipelines.

The Growing Importance of LNG in SE Europe



- Today, there are **6 LNG importing terminals in operation** across SE Europe:
 - 2 land based and 2 FSRU in Turkey
 - 1 FSRU in Croatia (Krk)
 - 1 land based in Greece (Revithoussa)

- By 2025, a number of **new LNG terminals** will be added:
 - 1 FSRU in Turkey (Gulf of Saros)
 - 2 FSRU in Greece (Alexandroupolis and Dioryga Gas)
 - 1 FSRU in Cyprus (Vassilikos)

LNG Terminals in SE Europe



Source: IENE

Nuclear Power Plants in SE Europe

- On February 2, 2022, the European Commission presented a **Taxonomy Complementary Climate Delegated Act**, which may reignite nuclear projects in SE Europe. There appears to be **limited interest for new nuclear power plants in the region**. Only Romania and Turkey have specific plans.



Source: IENE study “SE Europe Energy Outlook 2021/2022”, Athens, 2022

Power Exchanges in SE Europe

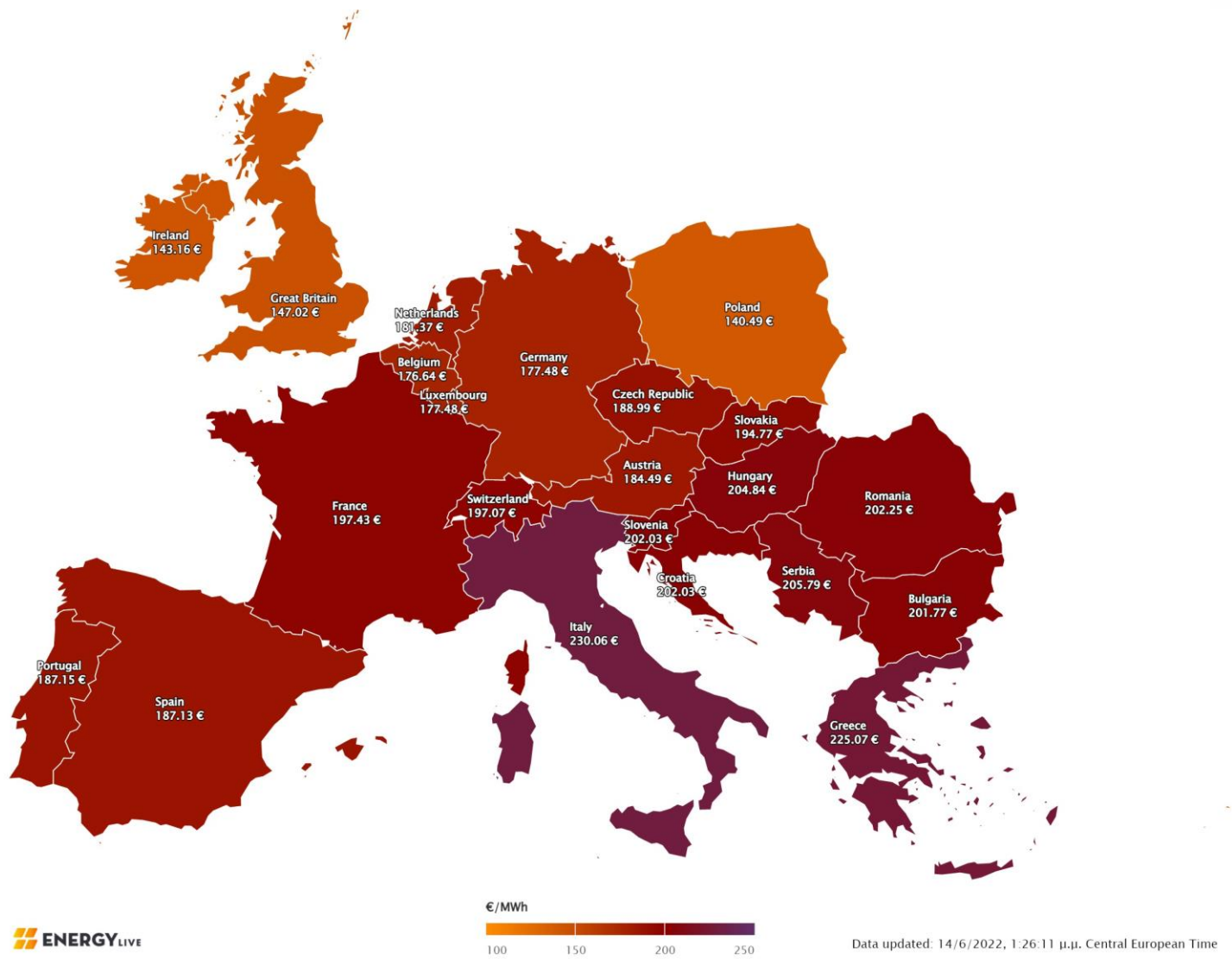


- Currently, there are **eight active power exchanges** in SE Europe: in Bulgaria, Hungary, Croatia, Greece, Serbia, Romania, Slovenia and Turkey.
- However, there are plans for the establishment of power exchanges in Montenegro and a joint energy market between Albania and Kosovo.
- In Turkey, Intraday market started on July 1, 2015, while power futures market started on June 1, 2021.**



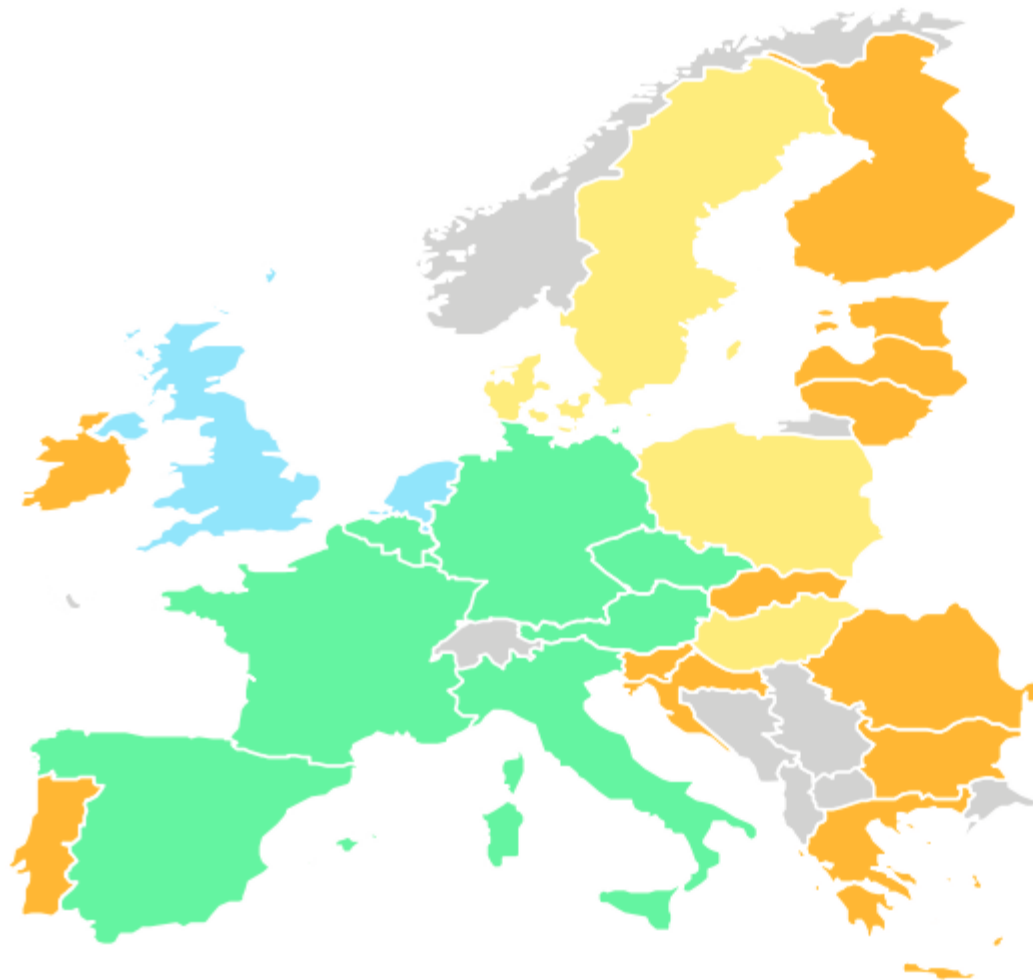
Source: IENE study “SE Europe Energy Outlook 2021/2022”, Athens, 2022

Wholesale Average Electricity Day-ahead Prices (May 2022)



- The establishment of regional natural gas hubs is expected to **facilitate the wholesale trading of natural gas between participants** in SE Europe.
- They will allow **gas supply and demand to meet in a marketplace** by providing a platform for physical and/or financial transaction.
- They will **enable competitive markets to function**, even though they will probably have an administrative role in the beginning of their operation.
- Although it is difficult, at this stage, to predict market behaviour and its reflection on spot prices, once the hubs enter full operation, based on European hub operation experience, one could safely assume that **spot prices determined through hub trading will be lower than oil-indexed ones**.
- Once the interconnections are in place and an effective gas exchange mechanism exists, traders would be willing to buy available gas, which will become available from main gas importers, by placing bids through the “hub” for both physical quantities and gas futures. Such trading activity will inevitably lead to the **formation of a new climate of competitive prices**, exerting pressure on traditional suppliers to revise their contract prices.

Where Does SE Europe Stand Today?



Established hubs

- Broad liquidity
- Sizeable forward markets which contribute to supply hedging
- Price reference for other EU hubs and for long-term contracts indexation

Advanced hubs

- High liquidity
- More reliant comparatively on spot products
- Progress on supply hedging role but relatively lower liquidity levels of longer-term products

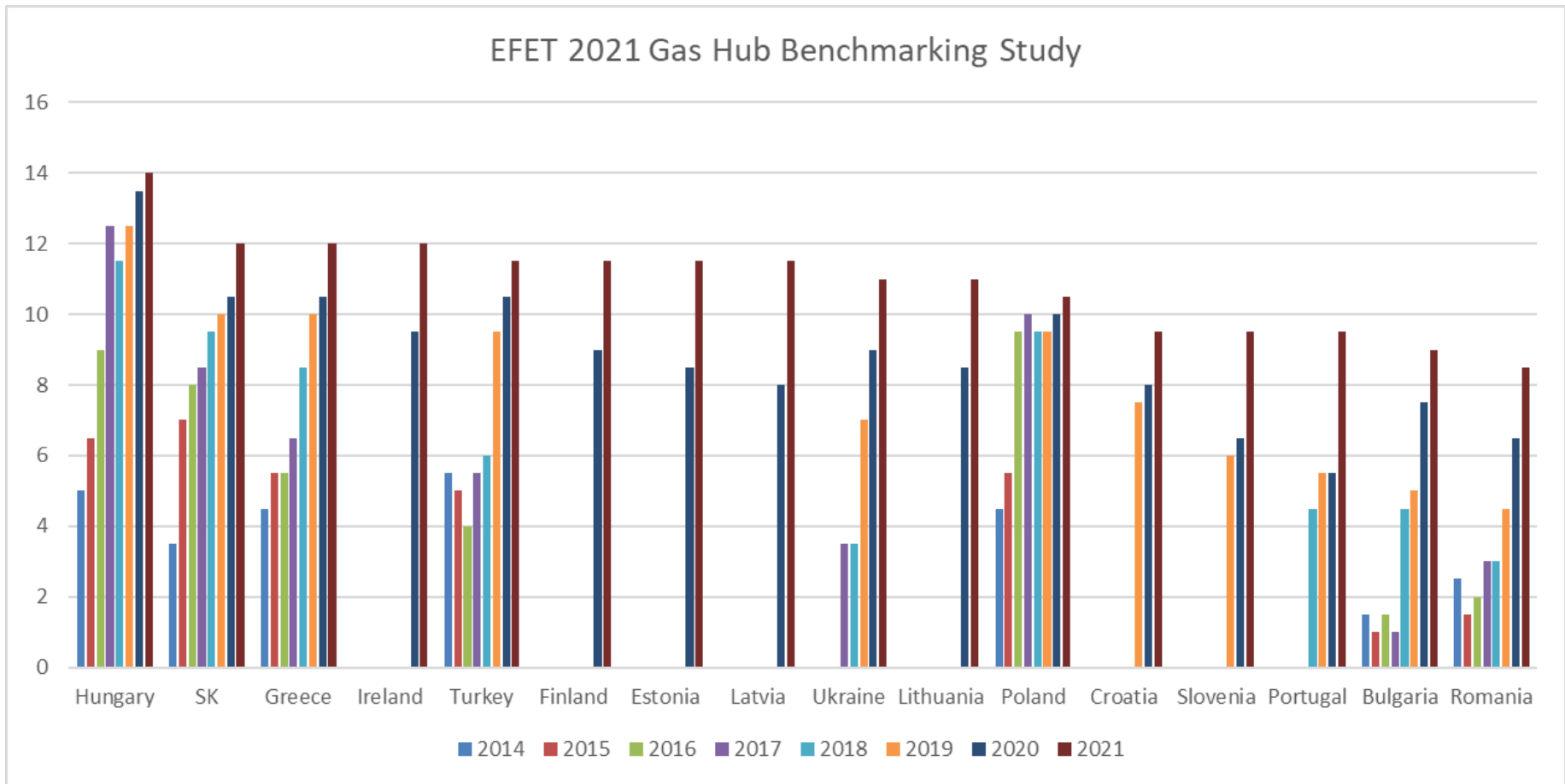
Emerging hubs

- Improving liquidity from a lower base taking advantage of enhanced interconnectivity and regulatory interventions
- High reliance on long-term contracts and bilateral deals

Illiquid-incipient hubs

- Embryonic liquidity at a low level and mainly focused on spot
- Core reliance on long-term contracts and bilateral deals
- Diverse group with some jurisdictions having
 - organised markets in early stage
 - to develop entry-exit systems

Source: ACER Market Monitoring Report 2020



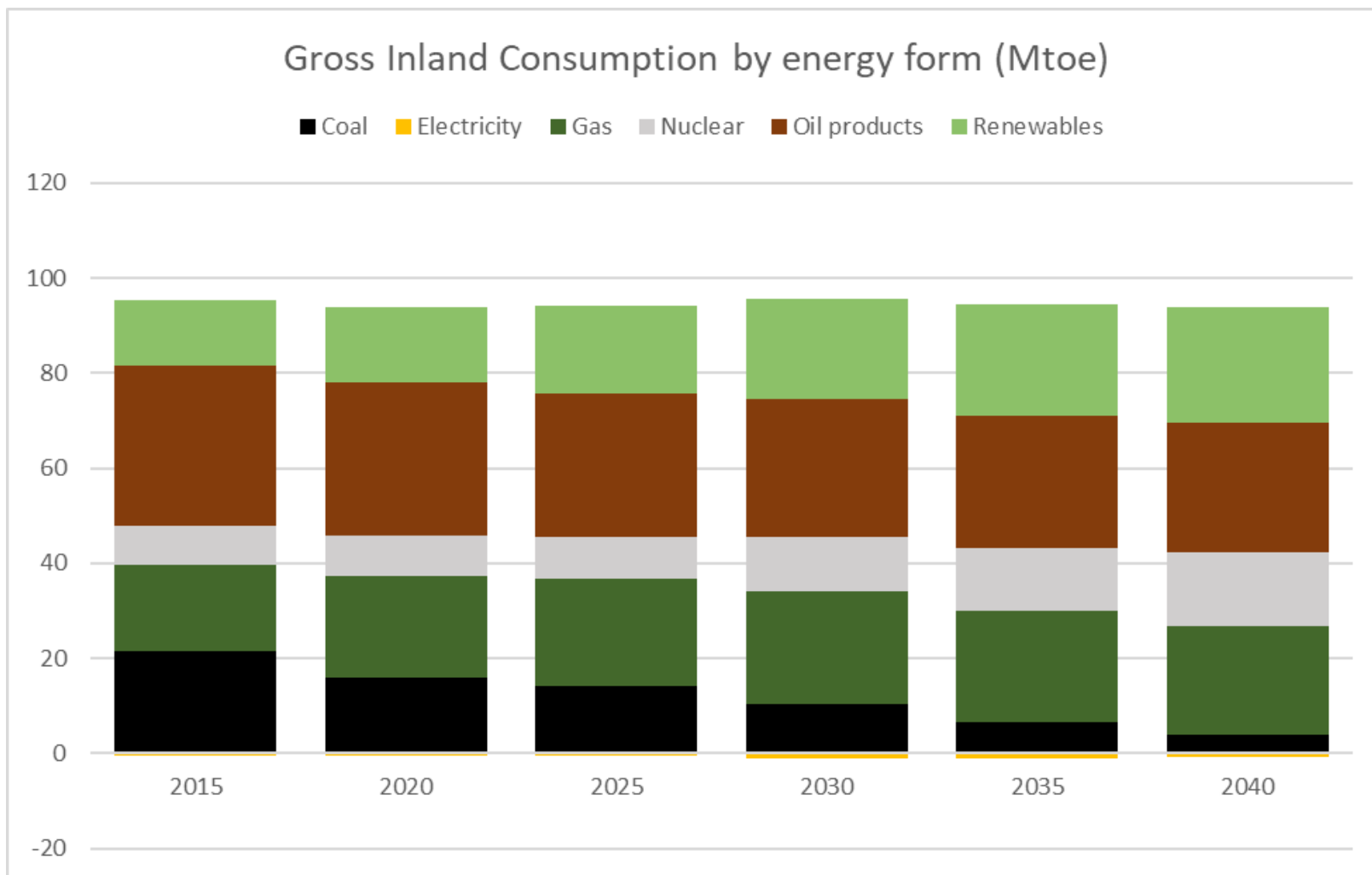
Source: EFET

- ❑ The projections for the development of the energy systems of the SEE countries under a **“Baseline” scenario** approach was considered appropriate in order to present the possible future pathways paved by current policies.
- ❑ The **most recently available studies** and the **official country submissions of strategic documents** (such as the Integrated National Energy and Climate Plans) were used in order to collect and analyse these projections.
- ❑ The purpose is to present the evolution of the national energy systems corresponding to a **“where we are heading” storyline**, providing a simple but comprehensive picture of the energy and GHG emissions dynamics under the “current policy” efforts until 2040.
- ❑ It should be noted that most of the available analyses do not include the effect of the **COVID-19 pandemic** and its possible long-term effects to the macroeconomic development and the energy systems of the countries in the region.

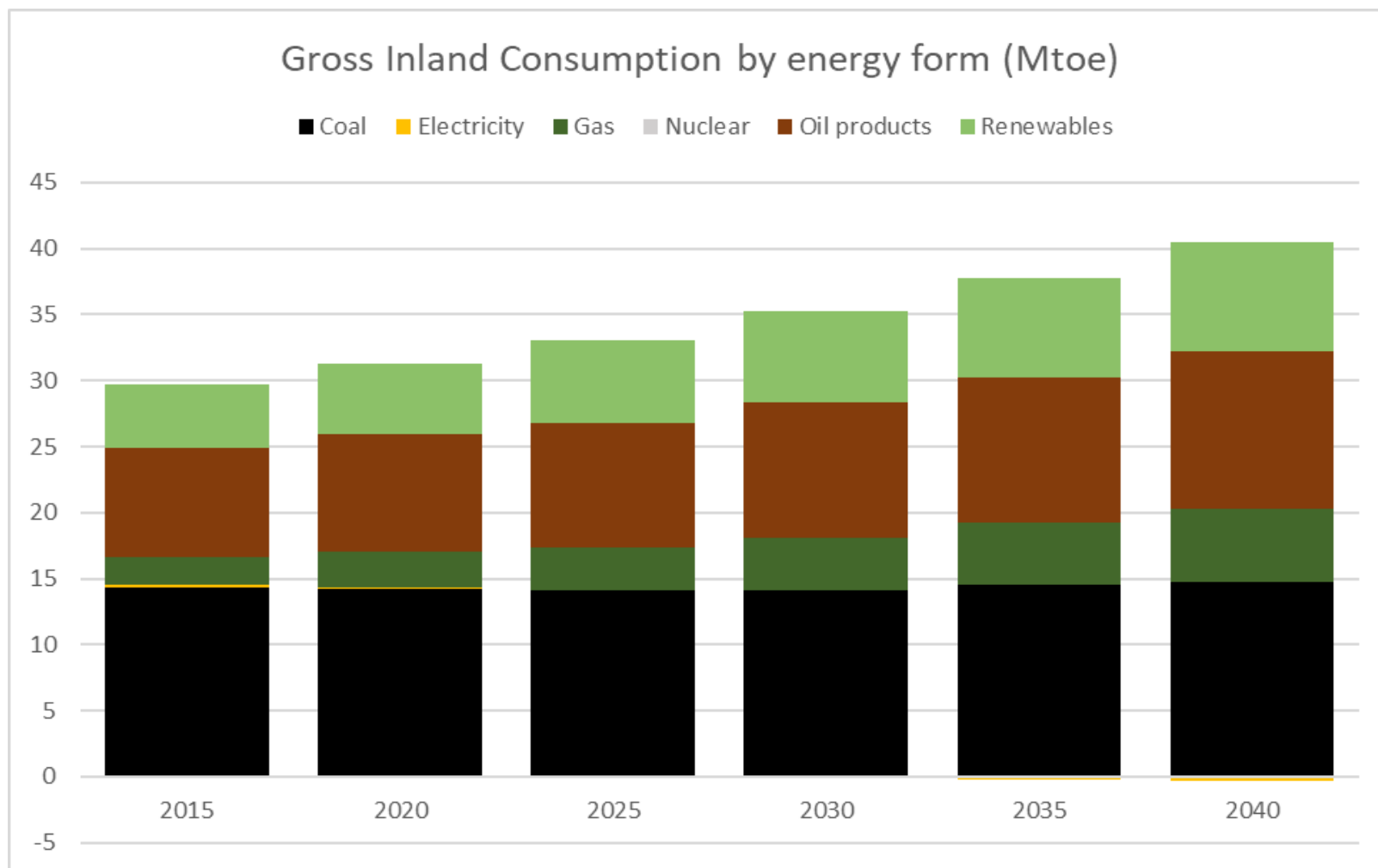
Results per Group of Countries

- Looking at the projection of the gross inland consumption (GIC) in the **EU member states of the SEE region** (Bulgaria, Croatia, Cyprus, Greece, Romania, Slovenia), the overall tendency shows a stabilisation and even a small reduction in the time horizon to 2040.
- Gross inland consumption in the **six Western Balkan countries** (WB6: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia) is projected to increase by almost 40% between 2015 and 2040, with the amount of coal being held almost constant, close to 15 Mtoe. Natural gas is the emerging fuel with a constant gradual increase, connected with the pipeline expansion projects in the Western Balkans region.
- In **Turkey**, gross inland consumption is projected to increase by more than 50% between 2020 and 2040. The role of renewable energy is seen to increase notably, reaching 28% of the GIC in 2040, the amount of coal remains at the level of 50 Mtoe with its relative contribution being reduced to 23% in 2040 and the contribution of natural gas is decreased to 17% of the GIC.

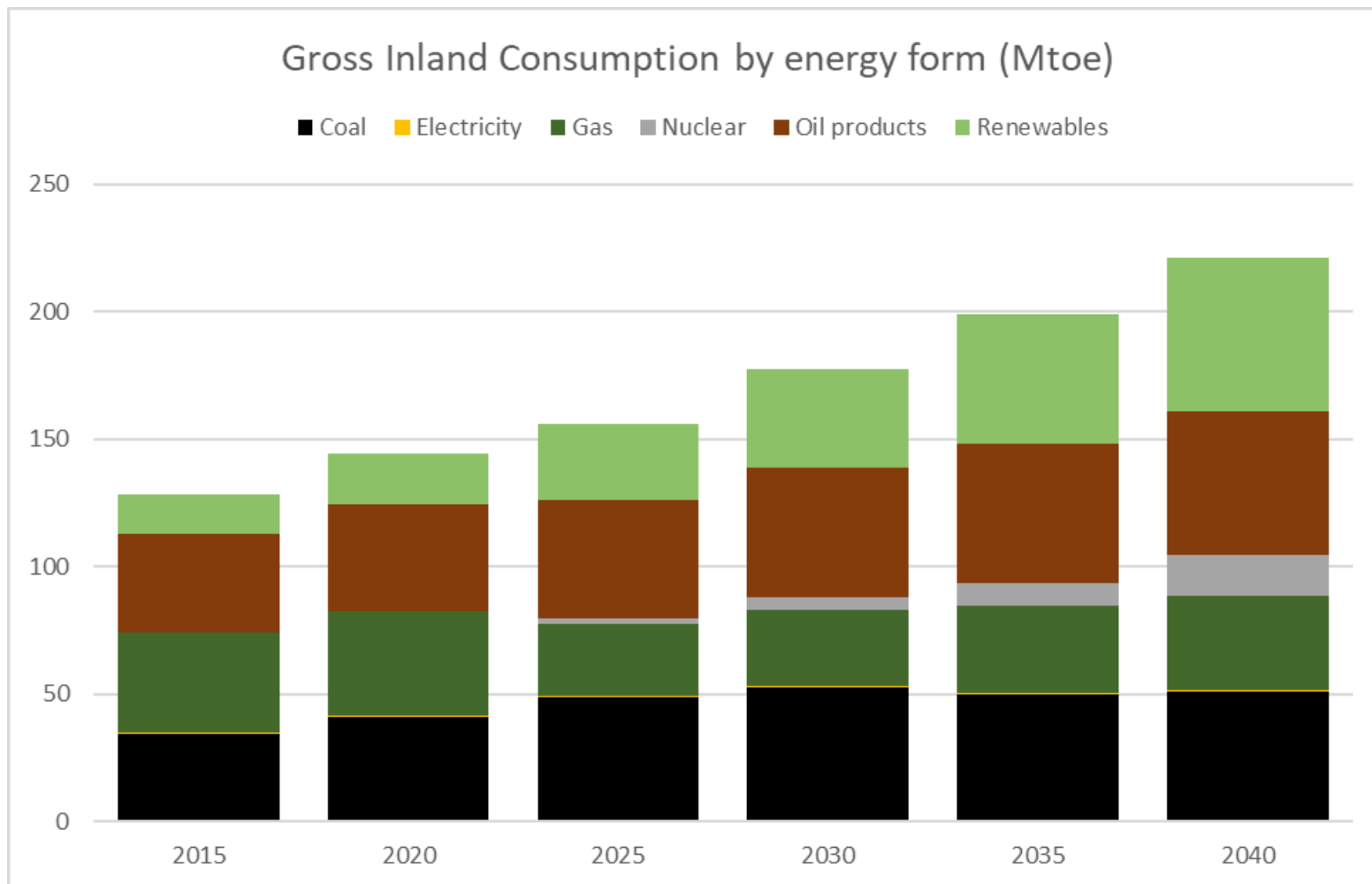
EU Member States in SE Europe: Gross Inland Consumption (2015-2040)



Western Balkan Countries: Gross Inland Consumption (2015-2040)



Turkey: Gross Inland Consumption (2015-2040)



- ❑ The **investment prospects** in the energy sector of SE Europe over the next 10 years can only be described as **positive**.
- ❑ In terms of planned investments, a group of **five countries (i.e. Turkey, Bulgaria, Romania, Serbia, Greece)** appear to be moving **much faster than others** in attracting the needed investment for a variety of energy projects, while progress in the rest of the countries is moving more slowly.
- ❑ The region as a whole can be considered as presenting **attractive business opportunities in almost all branches of the energy sector**. The present analysis shows that investment in the energy sector will be spread as follows between countries and interregional projects.

Findings of SEE Energy Investment Outlook Per Country (2021-2030)



Country	Estimated Investment (mn €) 2021 Estimate	Estimated Investment (mn €) 2017 Estimate	GDP growth 2021 (%) IMF World Economic Outlook	GDP growth annual projection to 2025 (%)
Albania	4,500	7,460	5.3	3.5-4.5
Bosnia and Herzegovina	9,400	8,722	2.8	3-3.2
Bulgaria	47,000	11,050	4.5	3.1-4.5
Croatia	21,000	8,525	6.3	3.2-5.8
Cyprus	16,200	7,350	4.8	2.7-3.6
Greece	44,400	23,300	6.5	1.5-4.6
Hungary	25,300	-	7.6	2.6-5.1
Israel	39,300	-	7.1	3.2-4.1
Kosovo	7,400	2,605	4.8	n/a
Montenegro	4,600	2,400	7.0	2.9-5.6
North Macedonia	10,400	3,400	4.0	3.6-4.2
Romania	50,100	20,630	7.0	3.6-4.8
Serbia	15,200	11,260	6.5	4.0-4.5
Slovenia	12,100	3,185	6.3	2.9-4.6
Turkey	130,000	124,935	9.0	3.3
TOTAL	436,900	234,822		

NB. Hungary and Israel were not included in the 2017 SEE Country Survey and hence no estimates have been prepared by IENE.

Findings of SEE Energy Investment Outlook Per Sector (2021-2030)



	Project sector	Description	2021 Investment estimate (€ mn)	2017 Investment estimate (€ mn)*
OIL	Upstream	<ul style="list-style-type: none"> Field Exploration Development of new oil and gas wells 	63,000	38,790
	Downstream	<ul style="list-style-type: none"> Refining (upgrading) Loading Terminals Storage facilities Crude / Product Pipeline(s) 		
GAS	Country Gas Network	<ul style="list-style-type: none"> Grid development Main intra country pipeline(s) Storage facilities FSRU and LNG Terminals 	25,150	16,550
ELECTRICITY	Power Generation	<ul style="list-style-type: none"> Lignite Coal Gas (including CHP) Nuclear Large Hydro 	150,150	139,550
	Electricity Grid	<ul style="list-style-type: none"> New H/V transmission lines Upgrading and expansion of existing grid 		
	RES	<ul style="list-style-type: none"> Small Hydro Wind farms Photovoltaics Concentrating Solar Power Biomass (including liquid biofuels) Geothermal 	109,900	40,009
ENERGY EFFICIENCY		<ul style="list-style-type: none"> Buildings Industry Electric vehicles 	88,700	-
Total anticipated investments by 2021-2030			436,900	234,822
Gas infrastructure			23,303	33,350
Electricity Interconnections			8,440	4,700
Cross-border energy projects (total)			31,743	38,050
Grand Total			468,643	272,872

*(1) This estimate refers to Scenario A as stated in SEE Energy Outlook 2016/2017, p. 1123-1124.

(2) No investment estimates for Energy Efficiency applications were provided in the SEE Energy Outlook 2016/2017.

- The **main sources of finance** for planned energy infrastructure projects in SE Europe include:
 - Government/own resources
 - International Financial Institutions (IFIs)
 - European Commission
 - European Bank for Reconstruction and Development (EBRD)
 - European Investment Bank (EIB)
 - World Bank
 - German government-owned development bank KfW
 - European Western Balkans Joint Fund (EWBJF)
 - International Development Association (IDA)
 - Commercial banks/private investors
 - Financial facilities for investments in energy efficiency and renewable energy

Key Messages (I)



- ❑ **Geography**, followed by **economy**, has emerged as a key factor in SEE's energy assessment
- ❑ **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)
- ❑ There is **clear failure at EU policy level** in achieving national targets especially in RES, as conflict is in evidence over strict budgetary rules and allowed deficit levels
- ❑ The **coronavirus pandemic (COVID-19)** led governments to impose unprecedented containment measures on transportation and economic activity in general. Combined with a fall in global oil prices, especially during March-May 2020, this crisis is producing imbalances in the energy sector, affecting both investments and the transition to decarbonisation
- ❑ 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 rarely looked so uncertain
- ❑ **Peripheral countries** are playing an increasingly more 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

Key Messages (II)



- ❑ **Market liberalization** in the electricity sector has made huge strides over the last five years with unbundling having taken place and competition in the retail area now evident after many years of protectionism. Less impressive is progress in the natural gas sector where competition, is largely limited to the industrial sector with retail lagging seriously behind
- ❑ **Nuclear power**, although it contributes only 4.1% to total gross inland consumption in SEE, (including Turkey), remains a viable option since it covers important base load requirements in certain key countries (Romania, Bulgaria, Croatia, Slovenia, Hungary) and is fully compatible and supportive of EU's (revised) decarbonisation policies
- ❑ **Energy efficiency** in SE Europe until very recently was not given enough priority or attention although its role has been recognized in all EU Member States. Further efforts are required to introduce Energy efficiency as an integral part of national energy planning
- ❑ 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)
- ❑ Alongside power grid reinforcement, a diverse mix of **flexible generation technologies** in SEE can facilitate the integration of variable RES – especially wind and solar PV.
- ❑ In SE Europe, the **Electric Vehicle deployment** is still at a very early stage, even though it shows significant annual growth.

Key Messages (III)



- ❑ Looking at the **projection of gross inland energy consumption in the EU member states of the SEE region**, the overall tendency shows a stabilisation and even a small reduction in the time horizon to 2040
- ❑ In contrast, the **projection of gross inland energy consumption in the six Western Balkan countries** presents a rather different story from that of the EU member states in the region. Following the expected growth of GDP, gross inland energy consumption is projected to increase by almost 40% between 2015 and 2040, with the amount of coal being held almost constant, close to 15 Mtoe
- ❑ **Gross inland energy consumption in Turkey** is slated to increase by more than 50% between 2020 and 2040
- ❑ **Investment prospects** for energy related basic infrastructure and energy projects across the board look positive over the next decade
 - ❑ Compared to projections made in 2017 for the period 2016-2025, total estimated energy related investment in the region is much higher and amounts to €483.7 billion.
 - ❑ Corresponding investments for the original 13-country group (as they appear in the 2017 Outlook) are slated at €387 billion, which is 41.8% higher compared to the 2017 estimates.
 - ❑ **This is a vast improvement compared to 5 years ago and clearly shows the substantially increased interest and appetite for energy investments in SE Europe.**

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The background of the slide is a dark blue image of a globe showing city lights at night. Overlaid on the globe are numerous glowing blue lines that represent energy transmission or a network. These lines are curved and interconnected, creating a complex web of energy paths across the continents.

*Thank you
for your attention!*

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