BELGRADE ECONOMIC FORUM

The Energy Outlook in SE Europe with Special Reference to Serbia

Serbia, October 30, 2024

A Brief Presentation by **Costis Stambolis**
Chairman and Executive Director,
Institute of Energy for SE Europe (IENE)

INSTITUTE OF ENERGY
FOR SOUTH EAST EUROPE

IENE

The SE European Region Defined

Core countries

- Albania
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Cyprus
- Greece
- Hungary
- Israel
- Kosovo
- Montenegro
- North Macedonia
- Romania
- Serbia
- Slovenia
- Turkey

Peripheral countries

- Austria
- Egypt
- Italy
- Lebanon
- Moldova
- Slovakia
- Syria
- Ukraine

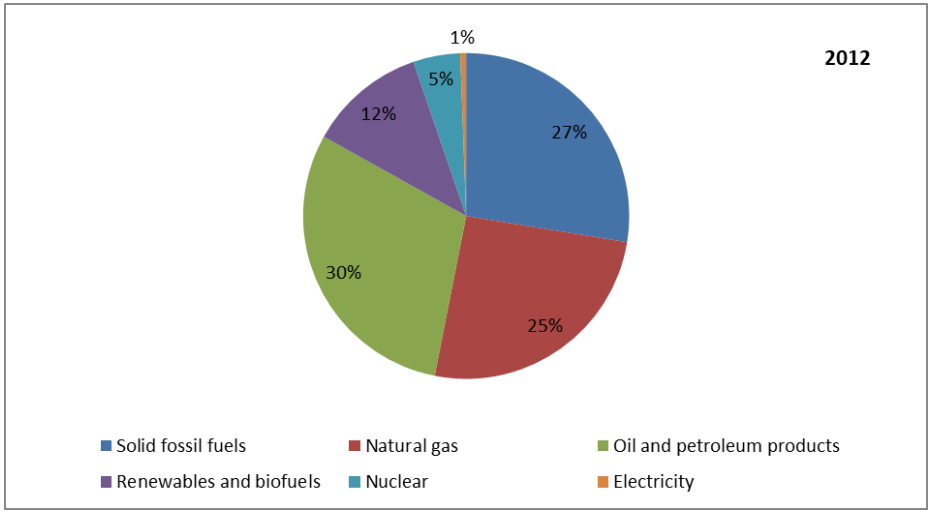
Introductory Remarks (I)

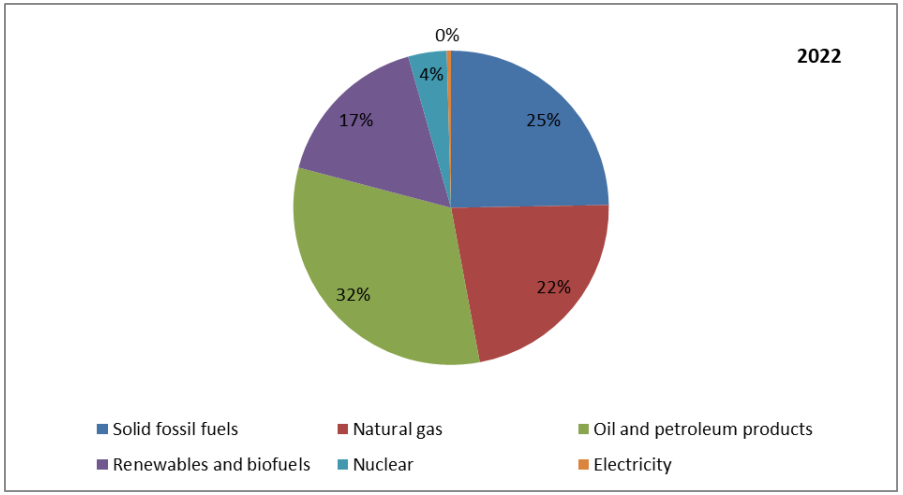
- As our part of the world is caught in the grip of a major geopolitical crisis - the war in Ukraine and the Israel-Iran conflict and their broader implications - South East Europe is fast gaining higher strategic importance.
- Energy security has emerged once again as a critical factor which can affect the uninterrupted, adequate and competitively supply of key fuels, i.e. oil, gas, electricity, in all countries in the region.
- With energy markets becoming more and more interdependent, as the almost daily cross border energy flows clearly show, it is important to understand the structure and functioning of the energy sector on a regional basis. Hence, our Institute's regional approach.
- Although the region has supposedly entered a decarbonisation mode, in line with EU's energy transition targets, there is only small differentiation of the overall energy mix over the last 15 years or so.
- Looking at the energy mix, we observe that contribution of solid fuels has dropped slightly by 2.0%, natural gas has also less participation by 5.0%, oil petroleum products have in fact increased their participation by 2.0%, RES have increased their input by 5.0%, nuclear is less by 1.0% and electricity (thanks to increased cross border trade) has increased its presence by 1.0%.
- Overall, fossil fuels have decreased their participation in the regional energy mix only by 3.0% in ten years, from 2012 to 2022 (from 82.0% to 79.0%)

Introductory Remarks (II)

- On the other hand, we observe much greater change when it comes to power generation as solid fuels have decreased their input by 5.0%, gas has gained share by 8.0%, oil products have decreased by 1.0%, nuclear has lost share by 1.0% and Renewables are the clear winners as they have increased their share by 15.0% corresponding to 39.0% of power generation.
- A number of countries are leading SE Europe in this electricity transformation and these include Türkiye, Romania, Greece and Bulgaria. Admittedly, there is growing interest now from most countries in the region, including Serbia, for a much faster penetration of RES in their power generation mix and the whole scene could be a lot different by 2030.
- As RES penetration is growing in all countries in the region, a number of problems are surfacing, including curtailment of RES generated electricity, due to a mismatch of demand and supply, lack of storage and poorly managed electricity grids which need serious upgrading and the introduction of modern load management tools, including power electronics.
- A general observation at this stage is that although the power generation mix of the region is changing fast the overall energy mix, i.e. primary energy production and final energy consumption, is changing very slowly at an almost glacial pace. This is unlikely to change any time soon as the system's demand characteristics are not affected that easily - largely dominated by energy demand for transportation, industry and buildings (see IENE's energy demand scenarios further down the presentation).
- Obtaining and improving energy security, which will remain a prime concern for all countries in the region, will depend on the rational management of existing and future resources, the securing of base load systems, the wide use of energy efficiency and the attainment of an optimum balance between conventional and new/clean energy sources.

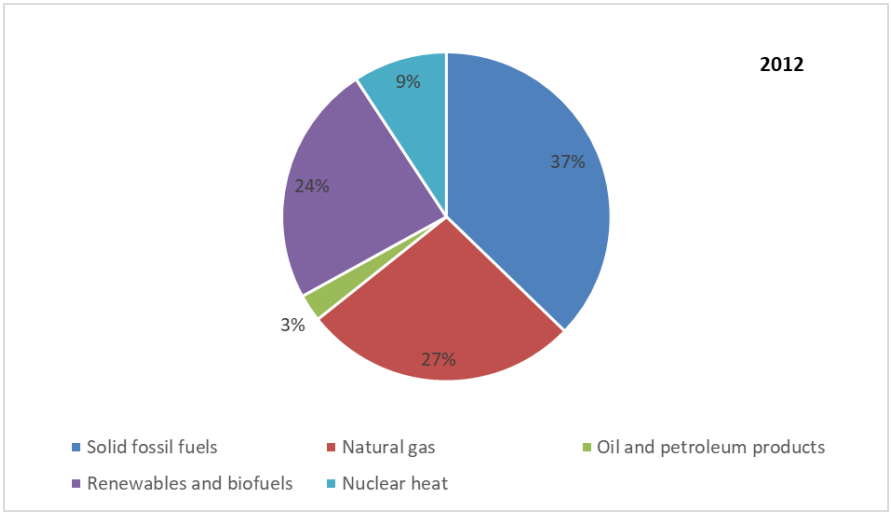
SE Europe's Energy Mix, Including Türkiye, 2012 and 2022 - High Oil and Gas Import Dependence

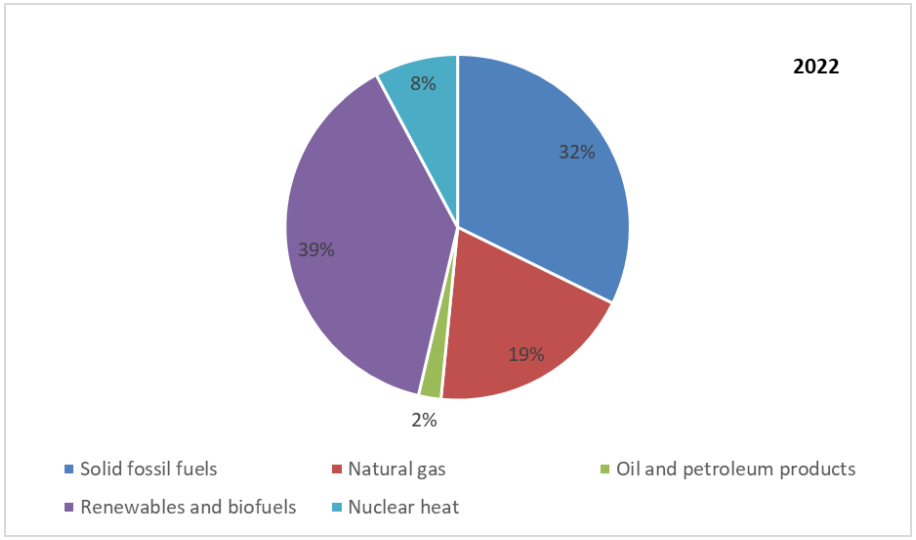




Sources: Eurostat, IENE

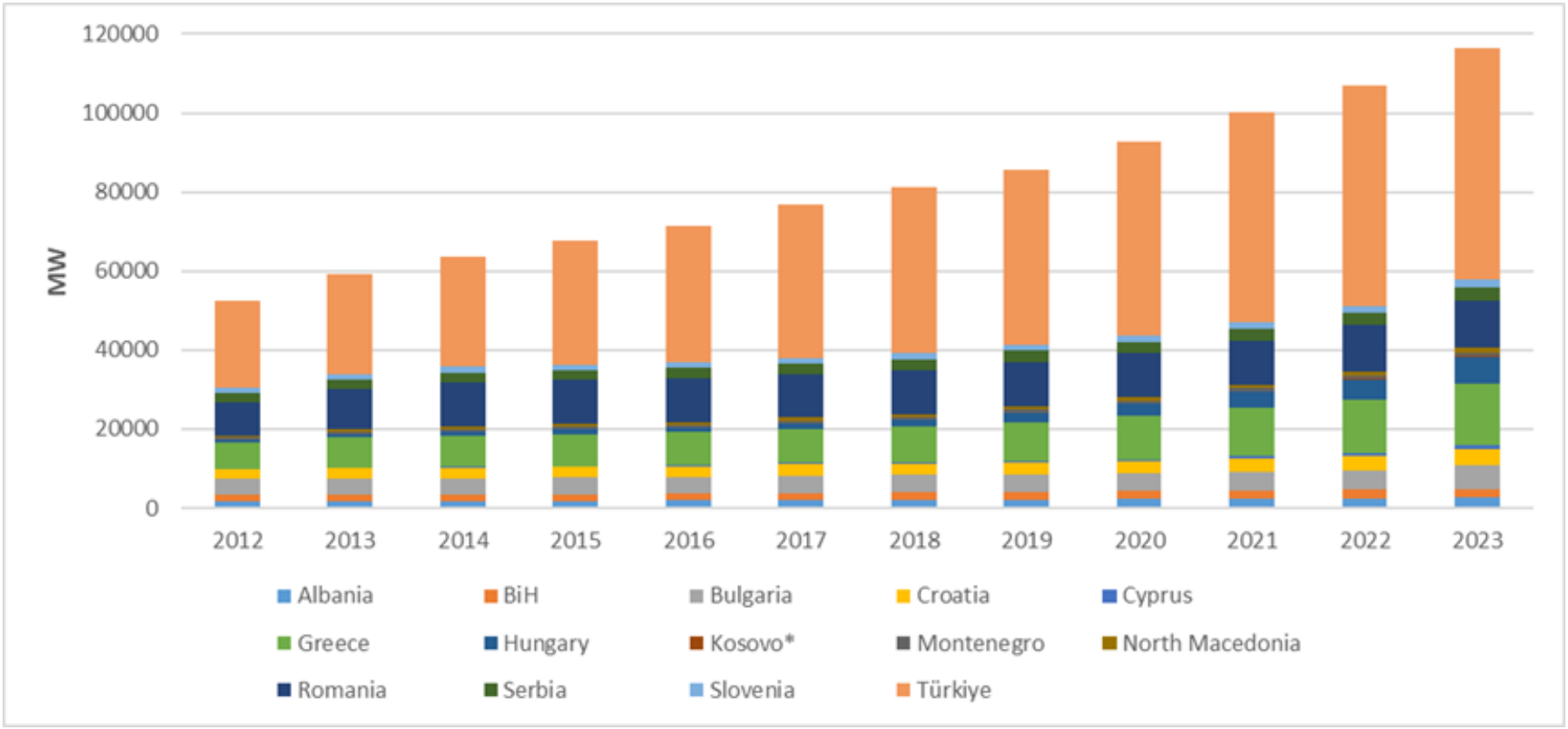
SE Europe's Power Generation Mix, Including Türkiye**, 2012 and 2022**





Sources: Eurostat, IENE

Total Installed RES Capacity (MW) by Country in SE Europe, 2012-2023



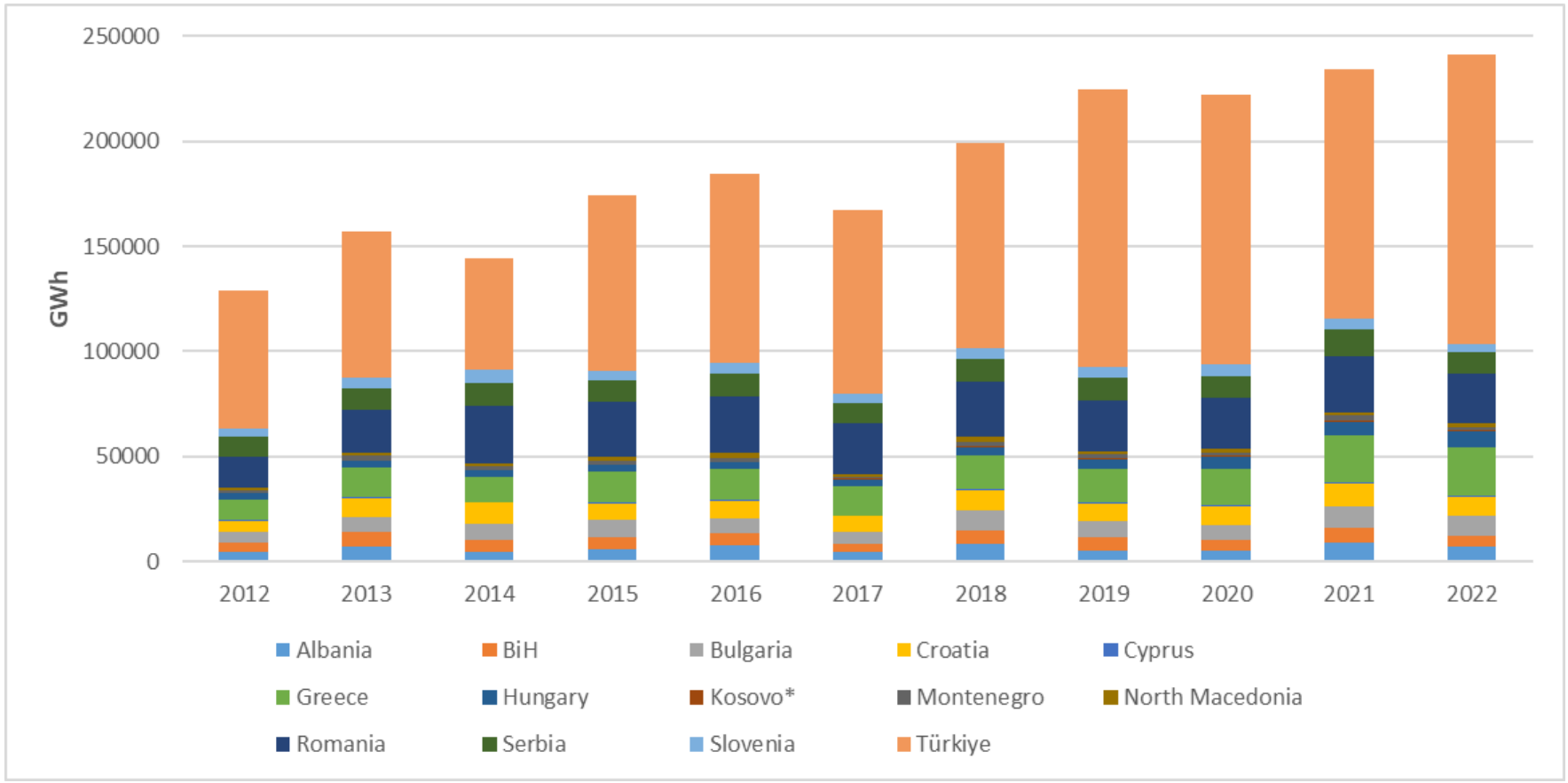
Source: IRENA

Renewable Electricity Generation Capacity (MW) in SE Europe, 2023

	Hydro	Wind	Solar	Bioenergy	Geothermal	Total
Albania	2493		163	1		**2657**
Bosnia and Herzegovina	2258	135	132	11		**2536**
Bulgaria	3390	702	2937	50		**7079**
Croatia	2206	1143	461	161	10	**3981**
Cyprus	3427	158	606	14		**4205**
Greece	3427	5220	7030	128		**15805**
Hungary	60	324	5835	534	3	**6756**
Kosovo	110	137	20			**267**
Montenegro	697	118	42			**857**
North Macedonia	696	110	535	14		**1355**
Romania	6666	3087	1917	185		**11855**
Serbia	3108	511	137	39		**3795**
Slovenia	1342	3	1034	96		**2475**
Türkiye	31779	11697	11293	2001	1691	**58461**
Total	**61659**	**23345**	**32142**	**3234**	**1704**	**122084**

Source: IRENA

Renewable Electricity Generation (GWh) in SE Europe, 2012-2022

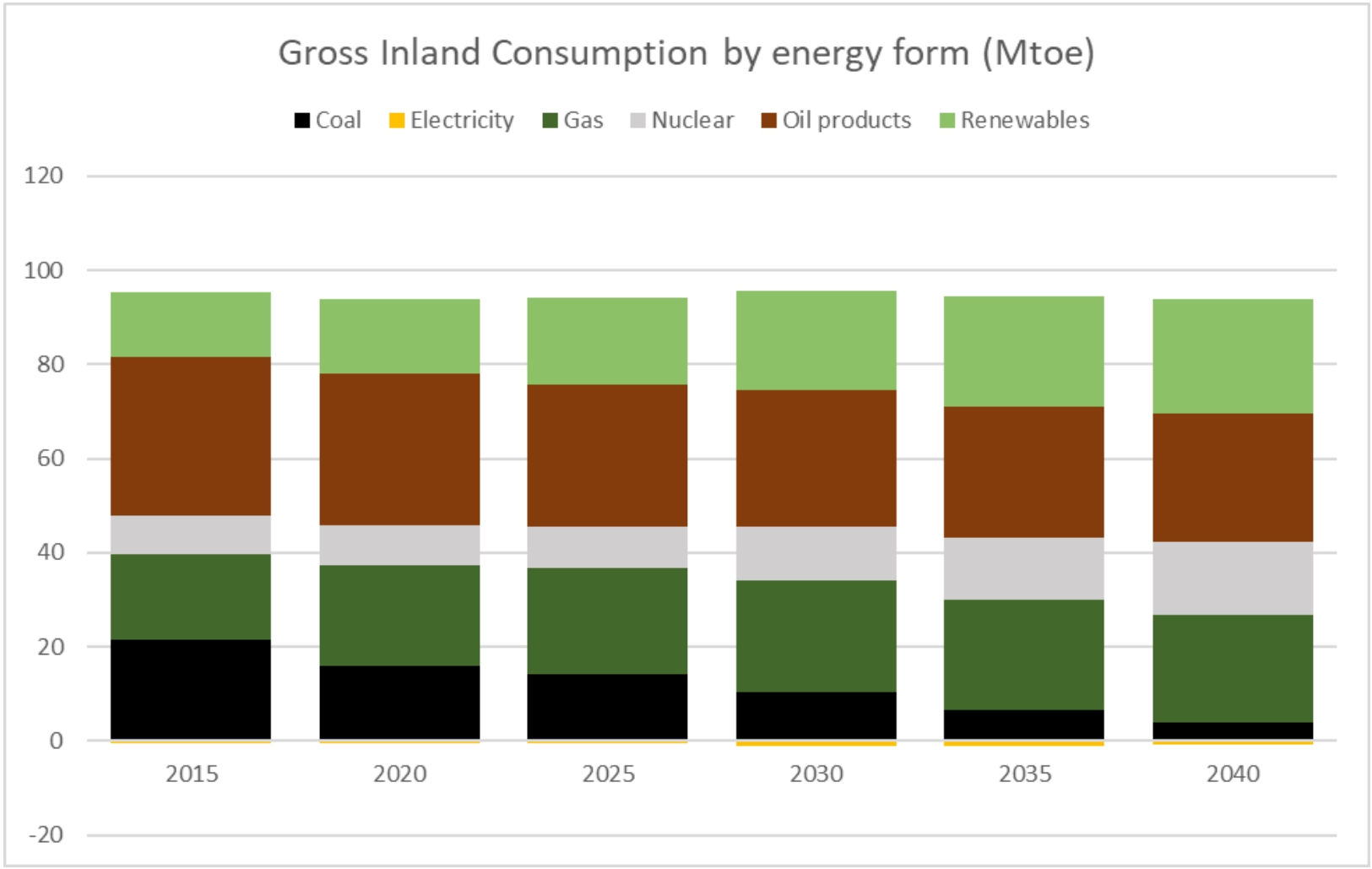


Source: IRENA

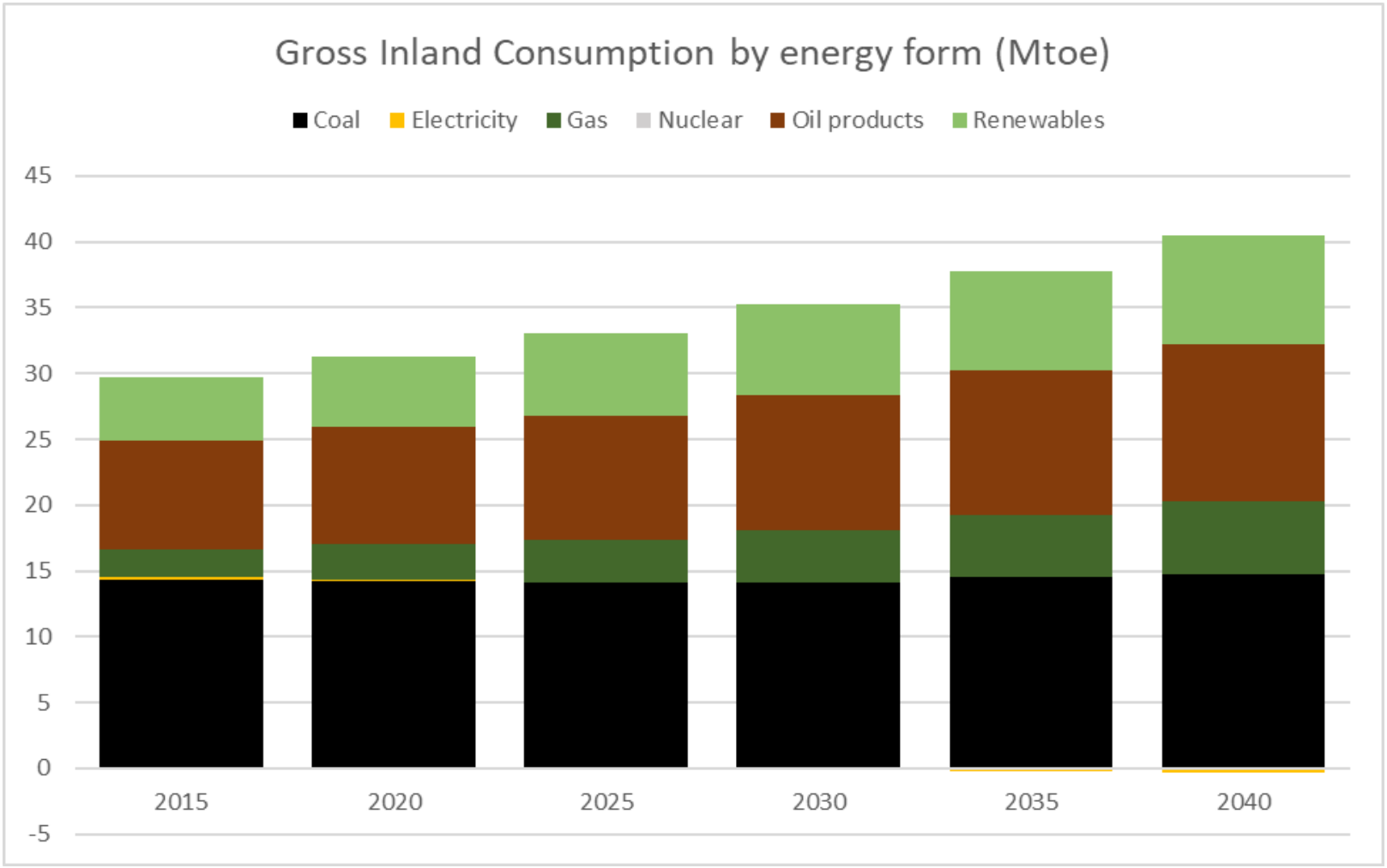
Energy Trends per Group of Countries – A Scenario Approach

- **Results are presented per Group of Countries - EU Member States, West Balkans and Türkiye**
- Looking at the projection of the gross inland consumption 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.
  - The decrease of the use of coal is evident, reaching a minimum level by 2040 while oil products lose part of their share in the GIC. The winners to this change are renewable energy and nuclear energy. The group remains a net importer in the time horizon until 2040, but the import dependency is reduced between 2020 and 2030 and then stabilised at a level close to 42% until 2040. Crude oil and oil products cover the majority of imports (68% in 2040), imports of coal are reduced significantly, while imports of natural gas remain at a level close to 12 Mtoe after 2030.
- The projection of Gross Inland Consumption in the **six Western Balkan countries** (WB6: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia) presents a rather different story from that of the EU member states in the region.
  - Following the expected growth of GDP, GIC 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. Crude oil and oil products increase by 45% reaching 12 Mtoe in 2040, and renewable energy increases substantially (by 70%) to 8.3Mtoe in 2040, but still covers only 20% of the total GIC of the group of countries. The group remains a net importer of energy and furthermore, import dependency increases to a level of 42% in 2040 (from 33% in 2015). Crude oil and oil products cover the largest part of imports reaching almost 11 Mtoe by 2040 and the imports of natural gas are continuously increasing, reaching 5.4 Mtoe in 2040.
- In **Türkiye**, 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. Nuclear energy appears for the first time in the GIC of Türkiye after 2025 with the operation of the Akkuyu nuclear power plant and is increasing until 2050, following the nuclear expansion program of the country.

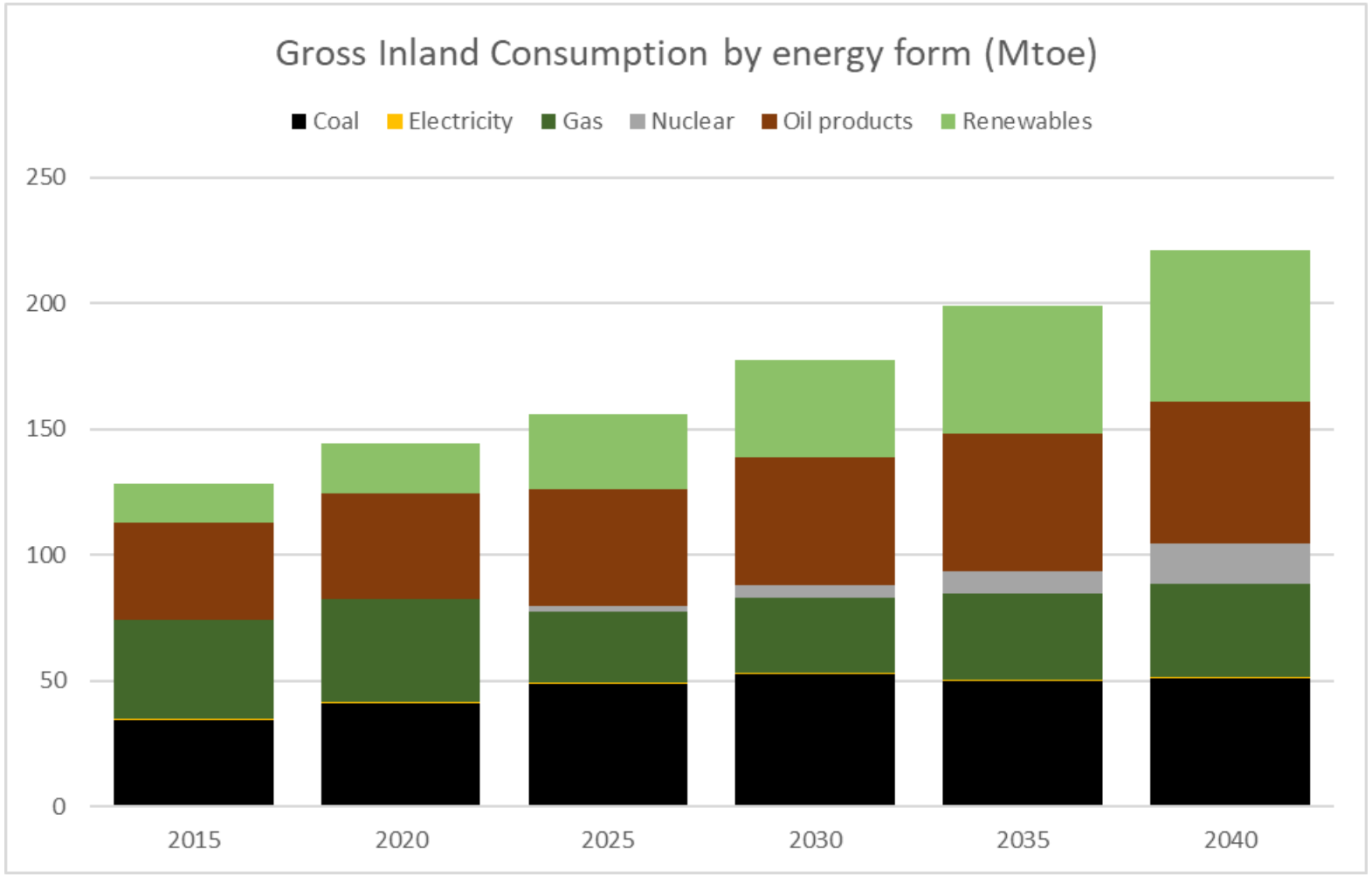
EU Member States in SE Europe: Gross Inland Consumption (2015-2040)



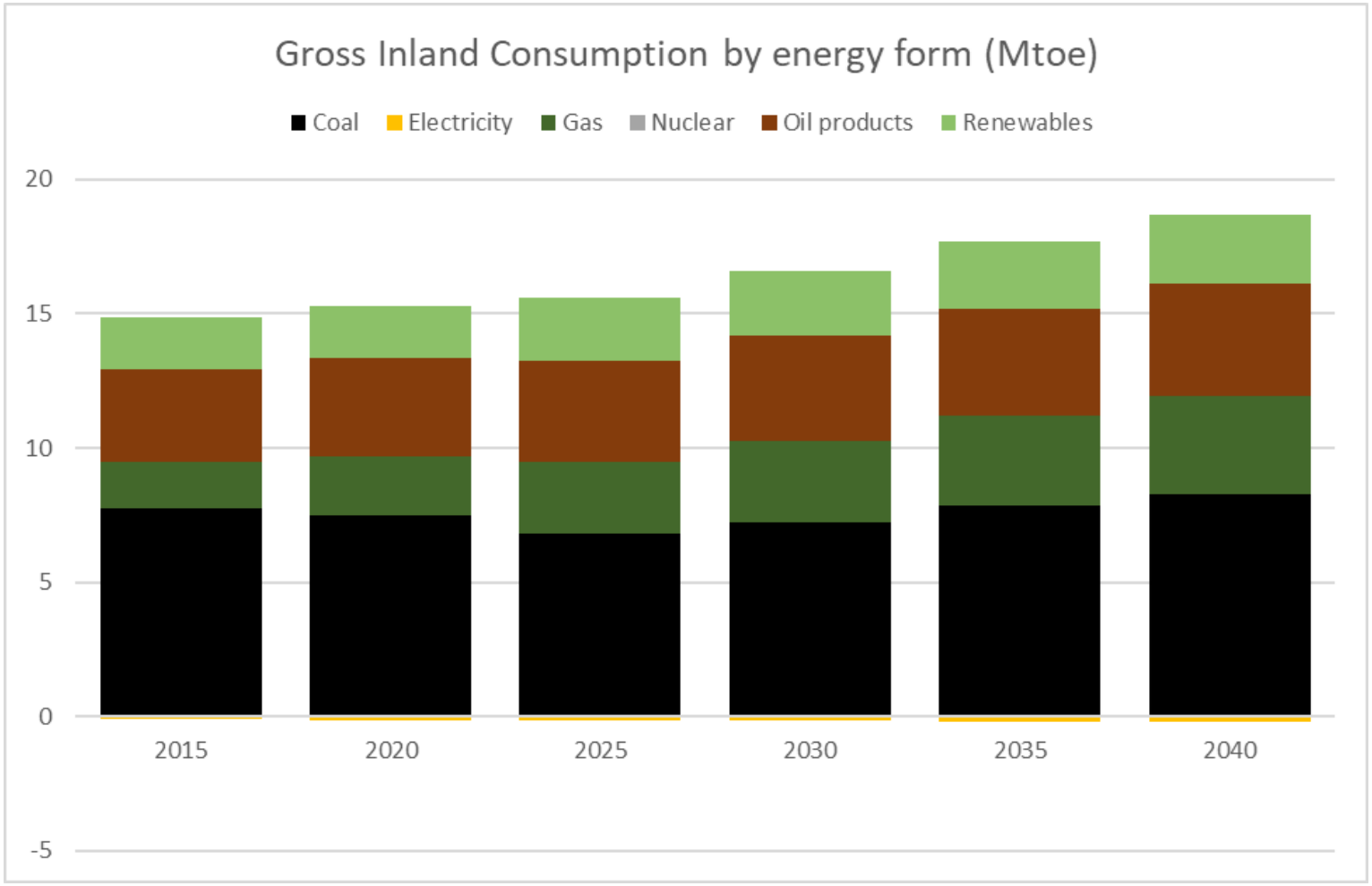
Western Balkan Countries: Gross Inland Consumption (2015-2040)



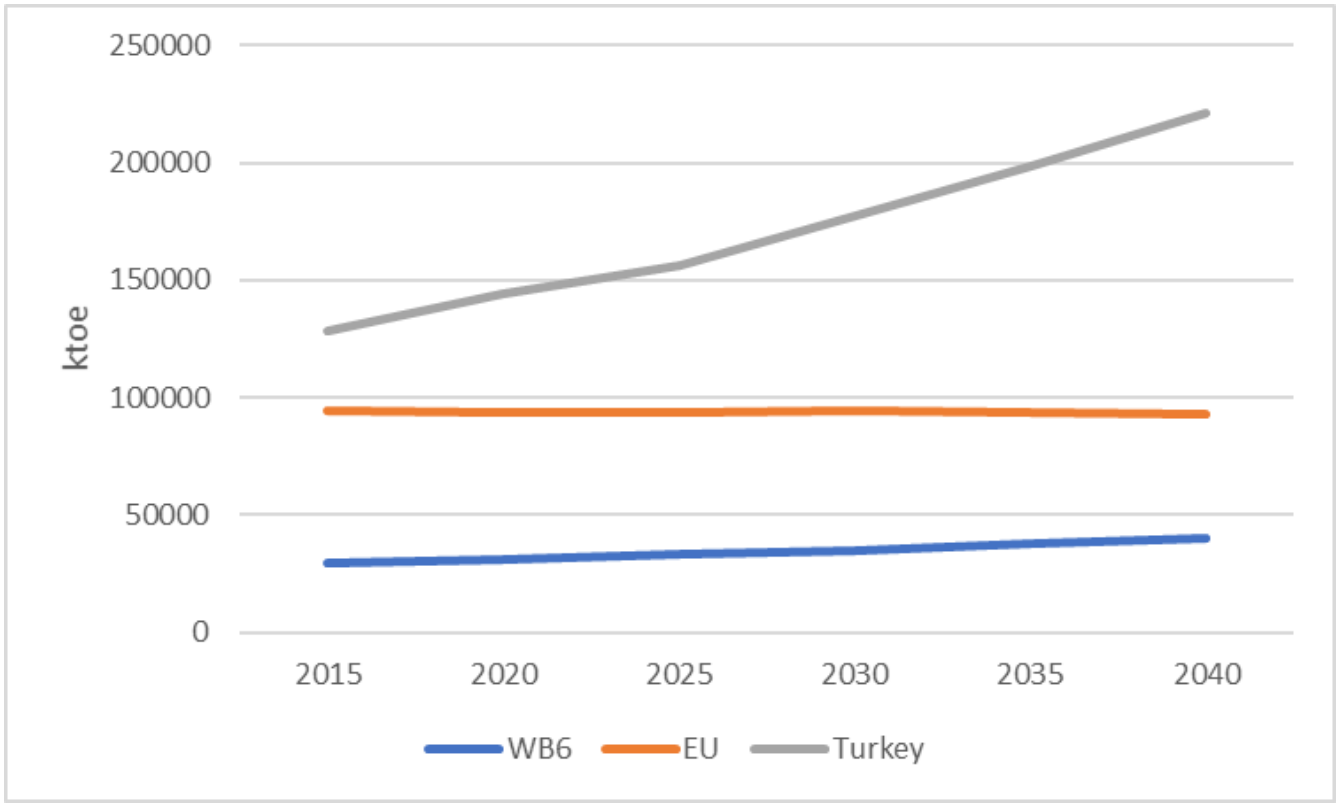
Türkiye: Gross Inland Consumption (2015-2040)



Serbia: Gross Inland Consumption (2015-2040)



Gross Inland Consumption in SE Europe per Group of Countries (2015-2040)



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**
Türkiye	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 Energy Investment Outlook Per Sector in **Serbia** (2021-2030)

	Project sector	Description	2021 Investment estimate (€ mn)
OIL	Upstream	• Field Exploration • Development of new oil and gas wells	2,000
	Downstream	• Refining (upgrading) • Loading Terminals • Storage facilities • Crude / Product Pipeline(s)	
GAS	Country Gas Network	• Grid development • Main intra country pipeline(s) • Storage facilities	2,400
ELECTRICITY	Power Generation	• Lignite • Coal • Gas (including CHP) • Large Hydro	4,000
	Electricity Grid	• New H/V transmission lines • Upgrading and expansion of existing grid	
	RES	• Small Hydro • Wind farms • Photovoltaics • Biomass (including liquid biofuels) • Geothermal	1,800
ENERGY EFFICIENCY		• Energy upgrading of buildings	5,000
	Total anticipated investments by 2030		**15,200**

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