

# The Clean Energy Investment Challenge for SE Europe

Eurelectric Power Summit 2018

Ljubljana

June 4-5, 2018

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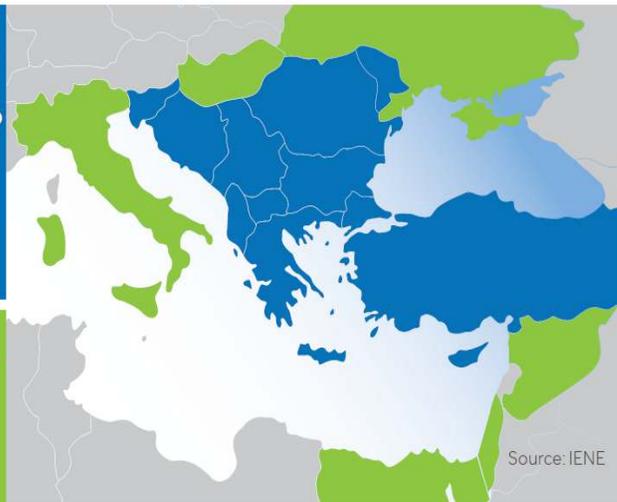
## The SE European Region Defined

### Core Countries

- Albania
- BiH
- Bulgaria
- Croatia
- Cyprus
- FYROM
- Greece
- Kosovo
- Montenegro
- Romania
- Serbia
- Slovenia
- Turkey

### Peripheral Countries

- Egypt
- Hungary
- Israel
- Italy
- Lebanon
- Moldova
- Syria
- Ukraine



## Key Regional Energy Issues

- Marked divergence between EU and SEE energy strategies
- SEE is more energy security vulnerable than the rest of Europe
- Energy supply diversification in SE Europe is less important than security of energy transportation and transmission (oil, gas and electricity)
- SEE's high hydrocarbon dependence
- Electricity's newcomer gas alters supply balance
- Lack of adequate electricity and gas interconnections
- Coal 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 policy failures, financial and regulatory framework and electricity grid constraints
- Energy poverty is emerging as a regional concern mainly related to deteriorating social conditions

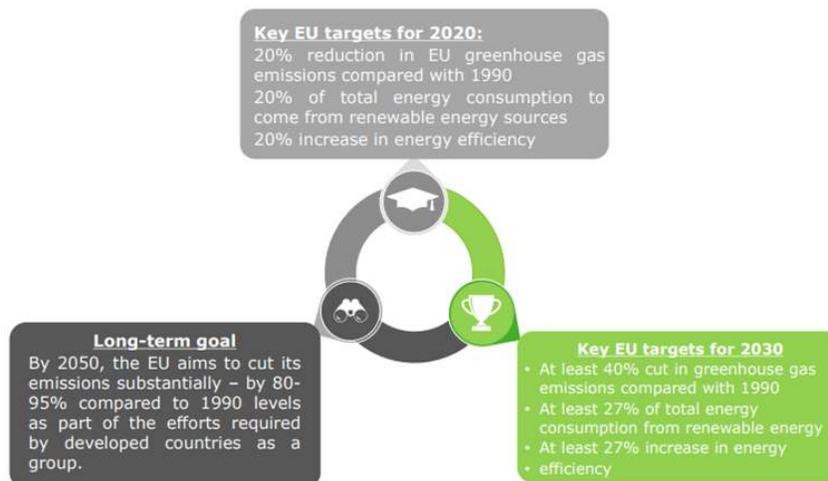
## Energy Market Integration and Transition in SE Europe (I)

- As the economies of SEE countries are catching up with those of the rest of Europe, energy plays an **important role** both from financial/investment perspective but also because of market development (i.e. liberalization, competition, etc.)
- Although **considerable progress** has been achieved in recent years on energy market integration, the region faces today serious challenges when it comes to adapting its energy systems and energy markets to meet EU basic targets (i.e. decarbonization, RES penetration, energy efficiency)
- Today, we observe **great divergence** in the degree of adaptation between the different country groups of the region. EU member states having achieved market integration to a large extent with further progress ahead, while West Balkan countries, with the help of Energy Community, trailing behind but on a firm footing as their regulatory authorities and other institutions are now taking the lead.
- In today's exposition, we are greatly assisted from the work undertaken by IENE in its latest "**SEE Energy Outlook 2016/2017**", published late June 2017. A tremendous amount of data and analysis is contained in this publication which helps us understand the economic and energy dynamics of the region.

## Energy Market Integration and Transition in SE Europe (II)

- If we look at the region as a whole, we observe the following:
  1. Energy market liberalization (electricity and gas) and market integration are moving ahead, but in widely diverging directions.
  2. RES are definitely entering into the country and regional energy mix, but at a slow pace (i.e. **less than 1 GW of installed capacity in 2017, excluding Turkey**)
  3. Energy efficiency is also moving ahead, but cannot be quantified yet, with hundreds of projects under development in all countries. It is not at all sure that EU's goal for 27% energy efficiency by 2030 will be met.
  4. Electricity grid infrastructure is expanding and upgraded across the region.
  5. However, carbon-based power generation is also moving ahead, adding substantial capacity from now until 2025 (**1.5 GW per year for SEE and 2.5 GW for Turkey, i.e. total 4 GW per year over the next 7-8 years**).
  6. Carbon-free new nuclear capacity in SEE over last few years is **zero**.

## EU Energy Policy Framework (by 2020, 2030 and 2050)



Source: European Commission

## EU Energy Policy Framework: How Does This Stand for SE Europe?

- It seems that an **inverted pyramid arrangement** has been developed in SE Europe, compared to pursued official Energy Union policies and stated targets as economic development at all costs remains number one priority for most countries.
- The energy policy priorities in broad terms for SEE would appear as follows:
  - Further large scale development of **coal and lignite resources** without any real recourse CCS/CSU provisions and plans
  - Further development of **electricity and gas interconnections in order to maximise cross border trade**
  - Promotion of **oil and gas exploration activities (onshore and offshore)** aiming towards maximizing production in the mid- and long-term
  - Further development of **renewables** in all application areas (i.e. solar, wind, biomass, hydro and geothermal) without necessarily aiming to adhere to specific targets (set by the EU)
  - Promotion of **energy efficiency**, focusing primarily on the building sector, incentivized by EU and green fund financing facilities
  - **Diversification** of supply routes and suppliers in order to secure future gas supplies
  - Reduction of CO<sub>2</sub> emission levels (least of priorities)

## Key Regional Energy Issues – Decarbonisation in SE Europe

### 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 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 Turkey) over the next 10-15 years, as they will struggle to meet increased demand.
  - **FYROM and Serbia are the second most coal dependent countries after Kosovo at regional level**, while future proposed lignite-based coal-fired power plants in Bosnia and Herzegovina and Serbia would not be in line with EU climate targets, and thus could downgrade the solar PV, wind, hydropower, and biomass opportunities.
  - **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” 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 21 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.

## Coal Plants in SEE Countries (as of January 2018) (MW)

Country	Announced New Plants	Pre-permit	Permitted	Announced + Pre-permit + Permitted	Under Construction	Shelved	Operating	Cancelled (2010-2017)
Turkey	15.410	19.001	7.349	41.760	1.130	29.589	18.469	29.204
Bosnia and Herzegovina	2.380	0	1.700	4.080	0	0	2.073	1.020
Serbia	2.500	350	0	2.850	0	0	4.405	320
Romania	0	600	0	600	0	0	5.115	5.105
Kosovo	0	500	0	500	0	0	1.290	330
Greece	450	0	0	450	660	0	4.375	800
FYROM	300	129	0	429	0	0	800	300
Montenegro	0	254	0	254	0	0	225	1.410
Bulgaria	0	0	0	0	0	0	5.059	2.660
Slovenia	0	0	0	0	0	0	1.469	0
Croatia	0	0	0	0	0	0	335	1.300
Albania	0	0	0	0	0	0	0	800

Note: Includes units of 30 MW and larger

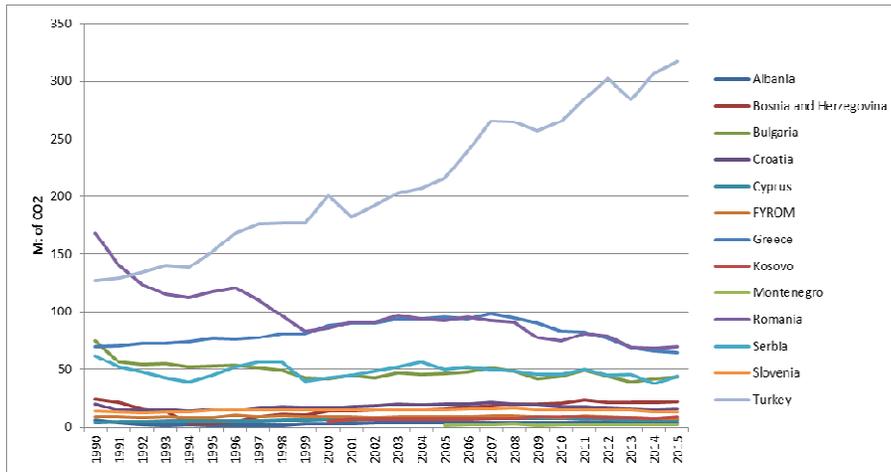
Sources: Endcoal, IENE

## Installed RES Capacity (MW) in SE Europe (2016)

Countries	Wind	Solar	Hydro	Deep Geothermal	Bioenergy	Total RES Installed Capacity
Albania	0	1	2,033	0	0	2,034
BiH	0	13	2,140	0	0	2,153
Bulgaria	700	1,032	3,219	0	64	5,015
Croatia	422.7	49	2,209	0	63	2,743.7
Cyprus	157.5	85.7	0	0	9.7	252.9
FYROM	37	17	658	0	4	716
Greece	2,374	2,611	3,392	0	58	8,435
Montenegro	0	3	671	0	0	674
Romania	3,130	1,372	6,730	0.05	124	11,356.05
Serbia and Kosovo	11	13	3,074	0	11	3,109
Slovenia	5	257	1,295	0	64	1,621
Turkey	5,376	827	26,710	775	395	34,083
<b>Total</b>	<b>12,213.2</b>	<b>6,280.7</b>	<b>52,131</b>	<b>775.05</b>	<b>792.7</b>	<b>72,192.65</b>

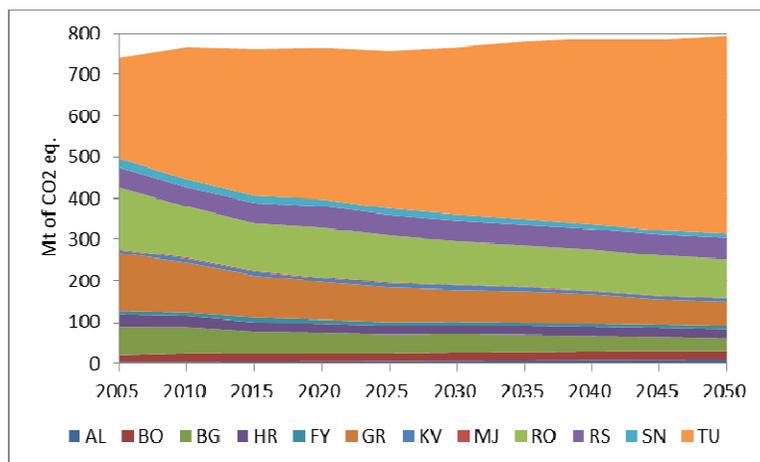
Sources: IRENA (2017), IENE study "South East Europe Energy Outlook 2016/2017", Athens, 2017

## CO<sub>2</sub> emissions in SE Europe over 1990-2015



Sources: IEA, IENE

## Total GHG Emissions (Mt of CO<sub>2</sub> eq.) in SE Europe over 2005-2050



Source: IENE

## SEE Energy Investment Outlook 2016-2025

- 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. This analysis involves **two scenarios**:
  - An **optimistic one** (with an average real GDP growth of 3% over 2016-2025 and maximum investments) and
  - A **reference one** (with an average real GDP growth of 1% over 2016-2025 and substantial part of investments) – **decarbonization scenario**.

## Findings of SEE Energy Investment Outlook 2016-2025 per country

SEE Countries	Scenario A:	Scenario B:
	Total Investments (in million euros)	Total Investments (in million euros)
Albania	7,460	8,258
Bosnia & Herzegovina	8,722	10,060
Bulgaria	11,050	12,663
Croatia	8,525	9,178
Cyprus	7,350	8,769
FYROM	3,400	4,373
Greece	23,300	30,192
Kosovo	2,605	3,377
Montenegro	2,400	3,653
Romania	20,630	22,716
Serbia	11,260	13,527
Slovenia	3,185	4,891
Turkey	124,935	141,623
<b>TOTAL</b>	<b>234,822</b>	<b>273,280</b>

Source: IENE study "South East Europe Energy Outlook 2016/2017", Athens, 2017



## Findings of SEE Energy Investment Outlook 2016-2025 per sector

Sector	Total Investment (in million euros)	
	Scenario A	Scenario B
Oil Upstream (Research, Exploration and Production)	25,450	32,288
Oil Downstream/Midstream (incl. liquid biofuels)	13,340	18,757
<b>Electricity</b>		
Thermal Plants		
Nuclear Plants		
Lignite Mine Development	139,473	146,369
Grids - Upgrade and Expansion		
HV Transmission Lines		
<b>Gas</b>		
Main and branch gas pipelines		
Gas Storage	16,550	26,460
Town grids		
LNG Terminals and Liquefaction plants		
<b>RES (Wind, PV, Biomass, Mini Hydro, Geothermal)</b>	40,009	49,406
<b>TOTAL</b>	<b>234,822</b>	<b>273,280</b>
<b>Intraregional Mega Projects</b>		
Oil Pipelines	-	1,000
Gas Pipelines	33,350	51,361
Electricity Interconnectors	4,700	7,150
<b>Grand Total</b>	<b>272,872</b>	<b>332,791</b>

Source: IENE study "South East Europe Energy Outlook 2016/2017", Athens, 2017



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# Thank you for your attention

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