"RES Development in SE Europe and Trends"

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SE Europe - Current Situation

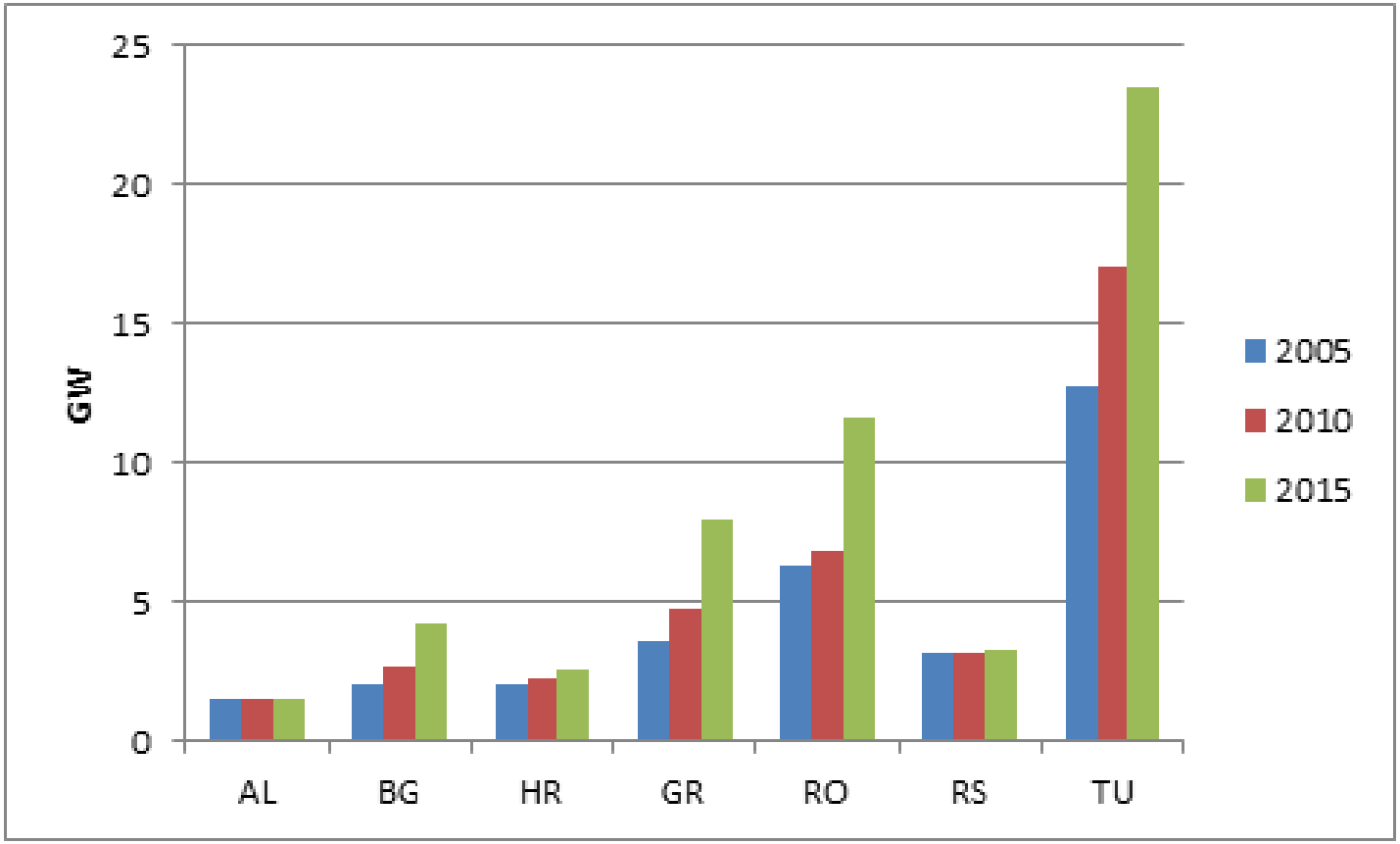
The SE European region is characterized by distinctly different (in terms of structure and operation) and frequently segregated energy markets in various stages of development:

- The EU member states (Greece, Romania, Cyprus, Bulgaria, Croatia and Slovenia) have implemented several steps toward the smooth adaptation of EU energy and environmental policies and directives

- The West Balkan countries (Serbia, Bosnia & Herzegovina, Montenegro, Kosovo, FYROM) are in a transition process within the Energy Community framework.

- Turkey With a rapidly growing economy, Turkey has become one of the fastest growing energy markets in the world. Projections show that demand growth trend will continue.

RES growth in Selected Countries



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

RES Development for Power Generation in SE Europe (2015)

Countries	Wind (MW)	PV (MW)	SmH+ Hydro Large (MW)	Deep Geothermal	Biomass RES (MW)	Total Power Capacity	Total RES Installed Capacity (%) (MW)	
Albania	0.0	0.0	1.800	0.0	0.0	1.800	1.878	96%
Bosnia & Herzegovina	0.0	0.0	2.058	0.0	0.0	2.058	4.021	51%
Bulgaria	691,0	1.020	3.400	0.0	1,8	5.113	15.650	33%
Croatia	422,7	32,2	2.187	0.0	0.0	2.631	4.995	52%
Cyprus	157,0	64,8	0.0	0.0	9,7	231,5	1.740	13%
FYROM	37,0	0.0	581,0	0.0	0.0	618,0	1.987	31%
Greece	2.150	2.600	3.435	0.0	46,0	8.221	17.762	46%
Montenegro	0.0	0.0	660	0.0	0.0	660,0	886	74%
Romania	3.129	1.312	6.232	0,05	70,0	10.743	24.637	43%
Serbia & Kosovo	20,0	5,0	2.910	0.0	0.0	2.935	8.710	34%
Slovenia	3,4	257,0	1.270	0.0	0.0	1.530	4.183	36%
Turkey	4.718	54,8	23.661	600,0 (2016)	130,0	29.164	72.050	40%
Total	**11.328**	**5.346**	**48.194**	**600.05**	**257,5**	**65.704,5**	**158.499**	**41%**

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

West Balkans

Albania

- Albania passed the Law on Promotion of the Use of Energy from Renewable Sources
- The main support scheme for energy generated from renewable energy sources in Albania has been a feed-in tariff which has been applied only to small hydro power plants with the capacity of less than 10 MW
- Renewable energy has not been given priority in regards to grid connection.

Bosnia & Herzegovina - Growing renewables share in energy mix

- Ten new small hydropower and five solar plants in the Republic of Srpska to be completed by the end of 2017
- the Republic of Srpska should build two wind farms in Herzegovina, the southern region of BiH
- Construction of the wind farm Hrgud, with the installed capacity of 48 MW
- Wind farm, Trusina, will be built in the municipality of Nevesinje. Its installed capacity will be 50 MW
- The target for wind energy is very conservatively capped at 350 MW until 2019

West Balkans

Croatia - Renewable Energy Future in Question

- to maintain the status quo and postpone until 2018 the implementation of the Law on Renewable Energy Sources
- retroactive introduction of excise taxes on renewable energy
- Croatia together with Bulgaria and Romania met in 2015 its target share of energy from renewable sources in gross final consumption of energy

FYRO Macedonia

- Support schemes for various technologies have been adopted
- The targets on capacities imposed for several types of renewable sources until 2020 have to be revised
- Steps have been taken to remove some of the barriers related to administrative procedures
- Deadlines have been shortened and unnecessary procedural steps have been abolished
- No clear mechanisms for coordination of the different authorities

West Balkans

Kosovo - more effort should be made

- Kosovo should make more investments in the energy sector, and add further generation capacity from both thermal and renewable energy sources, in order to become able to plan the decommissioning of the country's two coal power plants
- the energy reforms recently implemented by the local government are not sufficient to improve the country's troubled power market
- Kosovo is expected to add 240 MW of power generation capacity from renewables, of which only 10 MW is for solar PV, while wind and biomass will account for 150 MW and 14 MW, respectively. Solar had only a few hundred kW connected to the grid as of the end of 2015

Montenegro - RES, become political issue

- Government increased the tariff subsidy for electricity from renewable energy sources and high efficiency cogeneration from 0,12 to 0,47 eurocents per kWh
- The tariff is paid by citizens through their electricity bills
- bills in 2017 will stay on the level of 2016
- the national target of 33 percent of energy from renewables has already been reached. Montenegro already reached its EU 2020 target.

Serbia

- Made some progress in upgrading its renewable energy framework
- Serbia is not on track to meet its 2020 targets of 22%.
- Serbia currently is building wind farms with a combined installed capacity of 483 MW
- The first wind farms with a combined capacity of 17 MW have already started operating in Serbia

East Balkans – Greece – Cyprus

Cyprus

- The government of Cyprus is planning to establish the renewable energy agency that will draft and implement a national renewable action plan
- Cyprus' 2020 target is 13 percent share of energy generated from renewable energy sources in gross final energy consumption, including electricity, heating, cooling and transport. The share of RES in total consumption reached 10.5% in 2016.
- From the beginning of 2017, the tariff subsidy on electricity bills doubled, from 0.5 to 1 eurocent per kWh
- The RES fund owes to the Electricity Authority of Cyprus EUR 15 million. The fund's expected revenues for 2017 stand at EUR 50.67 million

Greece - New renewable energy law provides feed-in premiums and introduces tender schemes for PV

- A new RES law (L.4414/2016) was voted by the Greek Parliament in August 2016.
- The new policy framework abandons the feed-in tariff (FIT) policy in favour of a feed-in premium scheme for systems over 500 kWp
- The feed-in premium will be valid for 20 years. The new law does not apply to Greece's non-interconnected islands.
- Greece Records Second Best Year in Wind Power Installations in 2016

Net Metering

- Greek government has signed in May 2017 the virtual net metering provisions into the law.
- The country's electricity market is changing rapidly and electricity bills will most possibly increase further. Private investors with transparent investment plans will be far more efficient to adopt net metering PV.
- According to Greece's electricity market operator LAGIE, the country did not install new solar PV capacity in 2016.

East Balkans, Romania – Bulgaria

Romania

- Romania has left the ranking of the 40 most attractive markets in the world for renewable energy investments
- The Romanian power system seems to need to digest the massive injection of uncontrollable production capacities put into operation before December 31, 2016
- Romania Removes 12-Month Expiry Date for Green Certificates
- Romania Introduces New State Aid Scheme to Support Geothermal Development

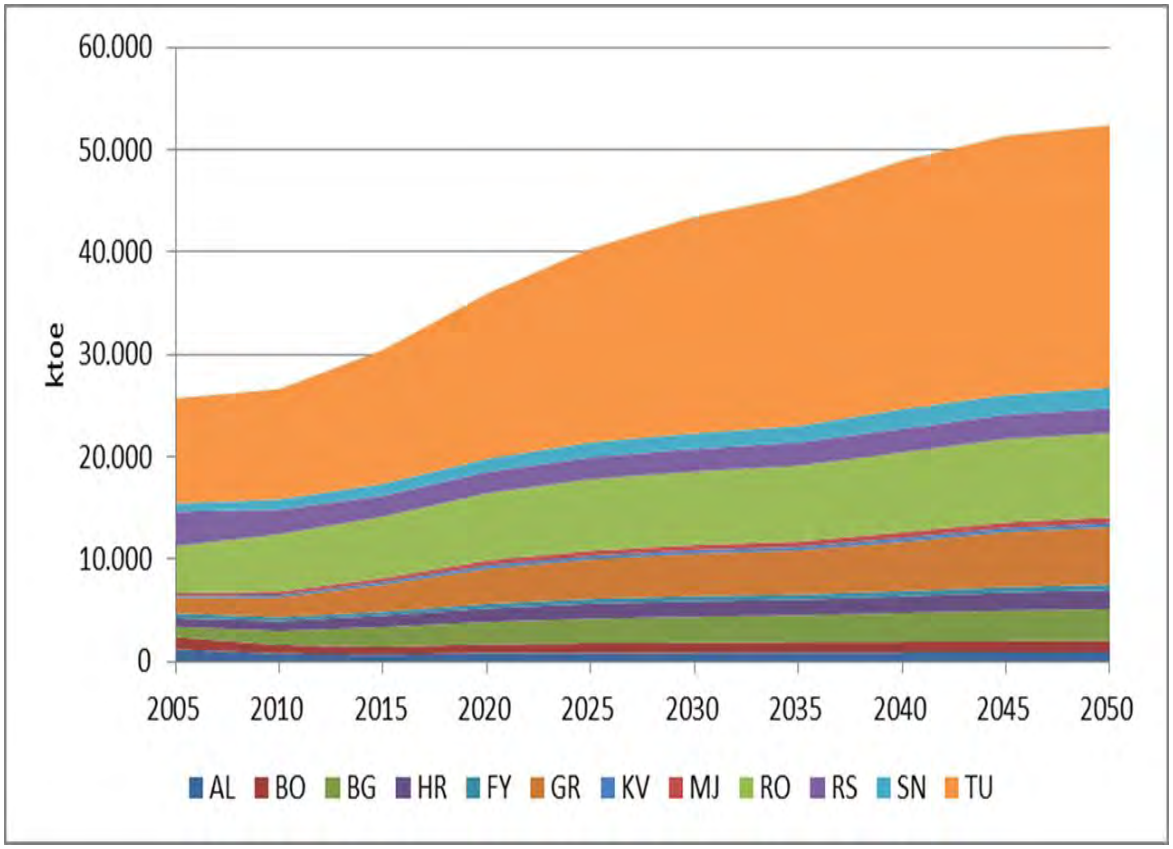
Bulgaria

- Bulgaria is among the European countries that have announced the achievement of the objectives of the "Europe 2020" strategy on renewable energy
- The sector is said to be in crisis and unsustainable
- retroactive measures against renewable energy operators have been taken
- Bulgarian electricity grid operator ESO said a total of 1,506 MW of new capacity is planned to be completed in Bulgaria by 2026
- Renewable energy output is expected to increase to 7,379,800 MWh in 2026, from 5,884,800 MWh in 2017.

Turkey - Renewable Energy Tops Turkish Agenda

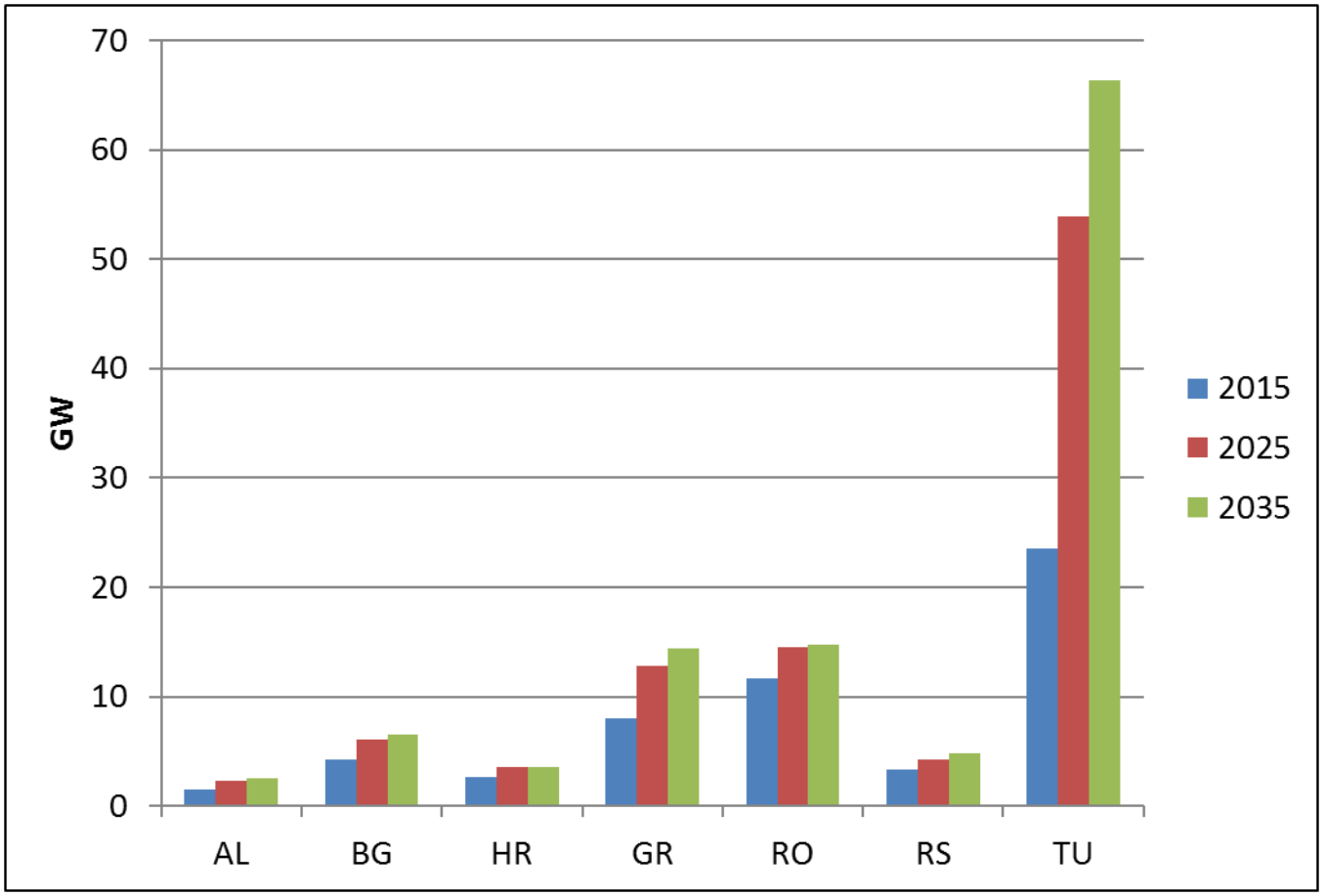
- Turkey's renewable energy market has been expanding and developing since the Renewable Energy Law was enacted in 2005
- By developing a detailed system for renewable energy investment, Turkey is allowing investors to bypass the usual risks.
- The Turkish Ministry of Energy and Natural Resources (MENRA), the state aims to increase wind generation to 10,000 MW and solar generation to 3,000 MW by 2019.
- In October 2016, a regulation on renewable energy zones (REZs) was introduced
- REZ – A reverse auction
- REZs are expected to overcome the existing financing difficulties facing renewable energy projects
- A strong RES growth is expected in Turkey. According to the Turkish 'National Renewable Energy Action Plan' the target for renewable energy generation capacity was set to 61GW by 2023; mostly in the forms of hydro, wind and solar generation. Turkey plans to have 34GW of hydro generation capacity; 20GW of wind; 5GW of solar; and 1GW in both geothermal and biomass generating capacity by 2023. Geothermal energy will play a small part too, increasing to 600 MW within a decade. These goals would require a sevenfold increase in non-hydro renewables output in less than a decade. The country also aims to be meeting 10% of the energy needs of its transport sector through renewable energy by 2023.

Projection of the average share of renewables in gross final energy consumption



The average share of renewables in gross final energy consumption, as Figure shows, is projected to increase gradually throughout the study period, reaching levels of almost 30% in 2050 and demonstrating the upward trend in renewable energy penetration in the region of SE Europe.

SE Europe: Net RES Generation Capacity in 2015, 2025 and 2035



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

Total Anticipated Energy Investment per Sector up to 2025

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
Electricity		
Thermal Plants		
Nuclear Plants	139,473	146,369
Lignite Mine Development		
Grids - Upgrade and Expansion		
HV Transmission Lines		
Gas		
Main and branch gas pipelines		
Gas Storage	16,550	26,460
Town grids		
LNG Terminals and Liquefaction plants		
RES (Wind, PV, Biomass, Mini Hydro, Geothermal)	40,009	49,406
TOTAL	**234,822**	**273,280**
Intraregional Mega Projects		
Oil Pipelines	-	1,000
Gas Pipelines	33,350	51,361
Electricity Interconnectors	4,700	7,150
Grand Total	**272,872**	**332,791**

A large segment of the above investment is earmarked for RES power generation projects in photovoltaics, wind, large and mini hydro, biomass and geothermal energy. In fact, RES geared investment represents a disproportionate high amount as it is likely to exceed €40.0 billion for a projected installed capacity in the range of 30GW. Thus electricity and RES form the backbone of investment activity in the region's energy market and it is in this area that new business opportunities are mainly to be found.

Thank you for your attention

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