“ An Outlook of RES Installations in SE Europe and Future Perspectives”

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SE Europe Energy Outlook

- Positive investment climate with East Balkans and Turkey far ahead of Western Balkans in terms of actual investments and potential.
- Rising energy demand over the next 10 years but at a much slower pace than previously forecasted
- Present underdevelopment of R.E.S combined with new and streamlined introduced incentives will lead to massive investments and significant penetration by 2020/2030
- Inadequate progress in electricity and gas market liberalization
- Very high net hydrocarbon import dependence and unsatisfactory import diversification.
- Significant investment and business opportunities in SE Europe over the next decade in RES sector (SWH, Photovoltaic, Wind, Mini-Hydro, Biomass, Geothermal)

Some Latest Important Developments in RES sector

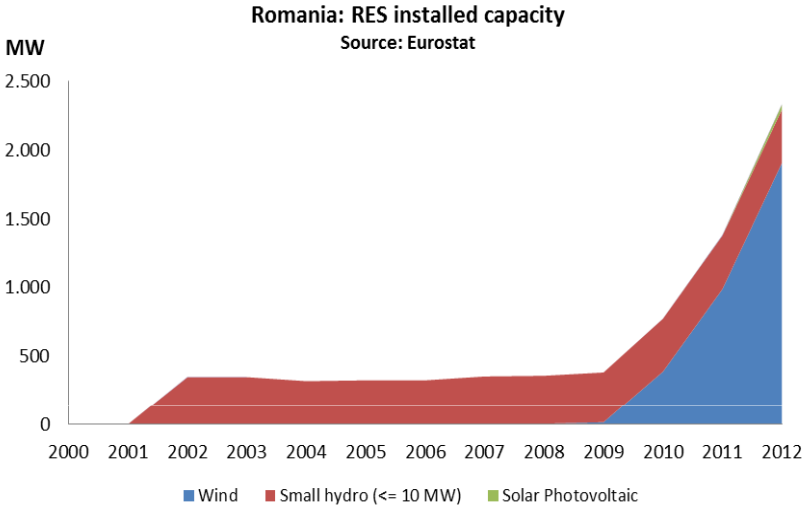
- Sharp rise in RES installed capacity in SEE countries. 12,5 GW over the last 4 years
- Solar PV in Greece and Bulgaria ~ 3.600 MW of total installed capacity (June 2013)
- Wind in Greece, Bulgaria, Romania, Turkey ~ 6.850 MW of total installed capacity (June 2013)
- Small Hydro – Albania, Montenegro, Croatia, Serbia, Romania, Greece, Turkey, Bosnia – Herzegovina ~ 2.000MW

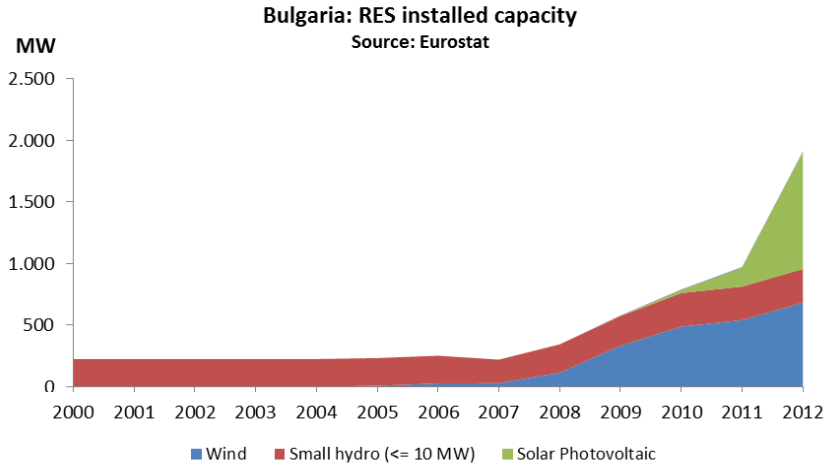
Installed Electricity Capacity in SE Europe, and the share of RES in electricity generation (MW, 2012 - 2013)

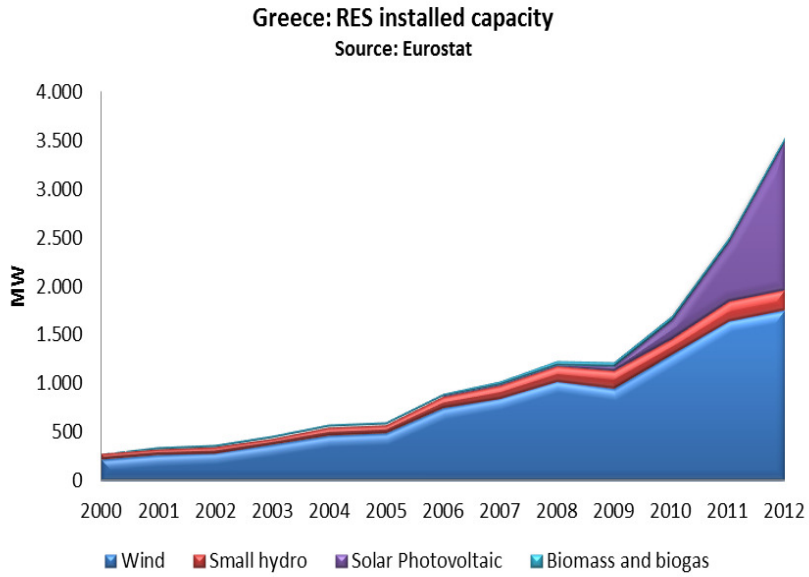
	Hydro[1]	Wind	PV	Total RES	Total Electricity (MW)	RES (total %)
Albania	1.466	0	0	1.466	1.496	96%
Bosnia & Herzegovina	2.058	0	0	2.058	3.803	53%
Bulgaria	2183	682	980	3.874	13.759	29%
Croatia	2.112	180	2.9	2.295	4.268	54%
FYROM	580	0	1	581	1.600	36%
Greece	3.060 + 218	1750	2.600	7.673[2]	17.700	44%
Montenegro	660	0	0	660	870	73%
Romania	6.400	2.095	94	8.640[3]	17.360	50%
Serbia	2.831	0[4]	2	2.833	8.360	34%
Turkey	14.000	2312	2	16.500[5]	60.121	28%

[1] Including both large and small hydro
[2] Including some 50 MW of biomass installation
[3] Including some 40 MW of biomass installation
[4] A wind farm of 120 MW is under construction since September 2013
[5] Including 180 MW of geothermal power plants

RES Installed Capacity in Selected Countries (2000-2030)







Some Observations

- All the countries of Western Balkans are net importers of electricity as they do not have sufficient capacity to meet domestic demand. There is a need for additional Base Load units (natural gas, coal).
- Western companies are reluctant to invest in the local infrastructure because of the lack of legal transparency and the continued low energy prices.
- Over the last two years, harsh winters have exposed the low level of the western Balkans' electricity security.
- The credibility of Romania and Bulgaria as suppliers of electricity in the region, and of Serbia as a transit country, has been exposed several times during the last two years.
- Corruption and other non technical barriers are likely to hint the smooth development of RES
- There is market misapprehension as investors ponder over downward revisions in Feed in Tariffs and extra new taxes in Greece and Bulgaria.

Some Observations (continued)

Greece

- Rapid and unplanned build up of renewable energy based on high feed in tariffs
- Large financial deficits for the market operator
- Big payments delays to producers
- Lack of electricity connections between islands and the mainland

Bulgaria

- Sector has large financial deficits that are increasing contingent liabilities on the State
- Bulgaria's grid is suffering from power overloads caused by a rapid increase in wind and solar capacity coupled with decreasing domestic consumption
- Regulatory independence is insufficient
- Rapid build up of renewable energy at high feed in tariffs
- Renewable capacity additions slowed down in 2013 given reductions in feed- in tariffs.
- The cost of long term agreements and renewables is well above the generation cost of the rest of State - owned power plants. This will put pressure on electricity prices

Croatia

- Significant bottlenecks, along with grid connection constraints. Croatia will need to adopt additional EU energy legislation, and adjust to more stringent requirements

Some Observations (continued)

Romania

- Infrastructure is far from being able to support the potential that the region can offer in green energy
- The country is planning to cut the maximum value of its green certificates early in 2014. Romanian aluminum producer Alro urged the government to cut the incentives after its power costs skyrocketed. Romania has already raised electricity prices by 10 percent in 2013, with about 4 percent of the increase due to clean-energy subsidies. The cost of certificates, passed on to customers, would account for almost half of a 10 percent increase in electricity tariffs. The total cost of renewables to consumers in 2013 is around €500 million.
- Uncertainty in the development planning of RES. Romania lacks a coherent strategy for the development of renewables

Serbia

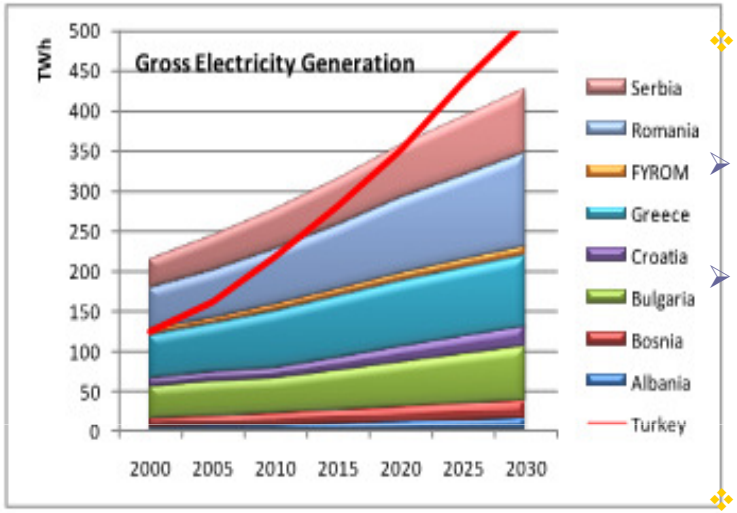
- Insufficient power grid
- Legislative hurdles
- Serbia will need the equivalent of about 3, 000 MW of wind energy installed by 2020 to meet the EU target. Serbian Government imposed a cap of 450 MW on wind investments.

Albania, B&H, FYROM

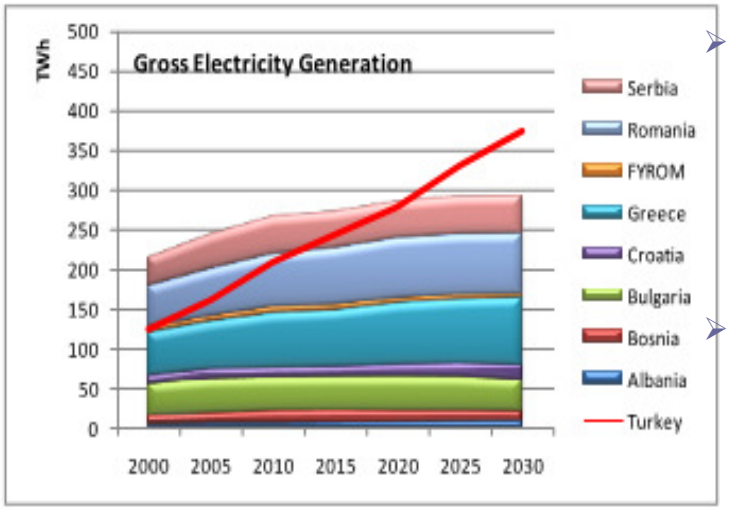
- Poor structure of electricity production
- The high share of hydroelectric power in these countries' energy balance makes the stability of energy supply highly dependent on weather conditions
- Weak transmission infrastructure, which generates significant energy losses and weakens the transmission systems' stability

Electricity Generation in SE Europe (2000-2030) and Substantial new Electricity Infrastructure is Foreseen in SE Europe by 2020 for all 12 Countries of the Region

View 2 years ago



Current View



Source: EC3 Lab, NTUA

Anticipated new power generating capacity:

Thermal/ nuclear (excl. Turkey) ~ 20.0 GW

Rewenables Low scenario ~ 15.0 GW

High scenario ~ 25.0 GW

Anticipated investments in:

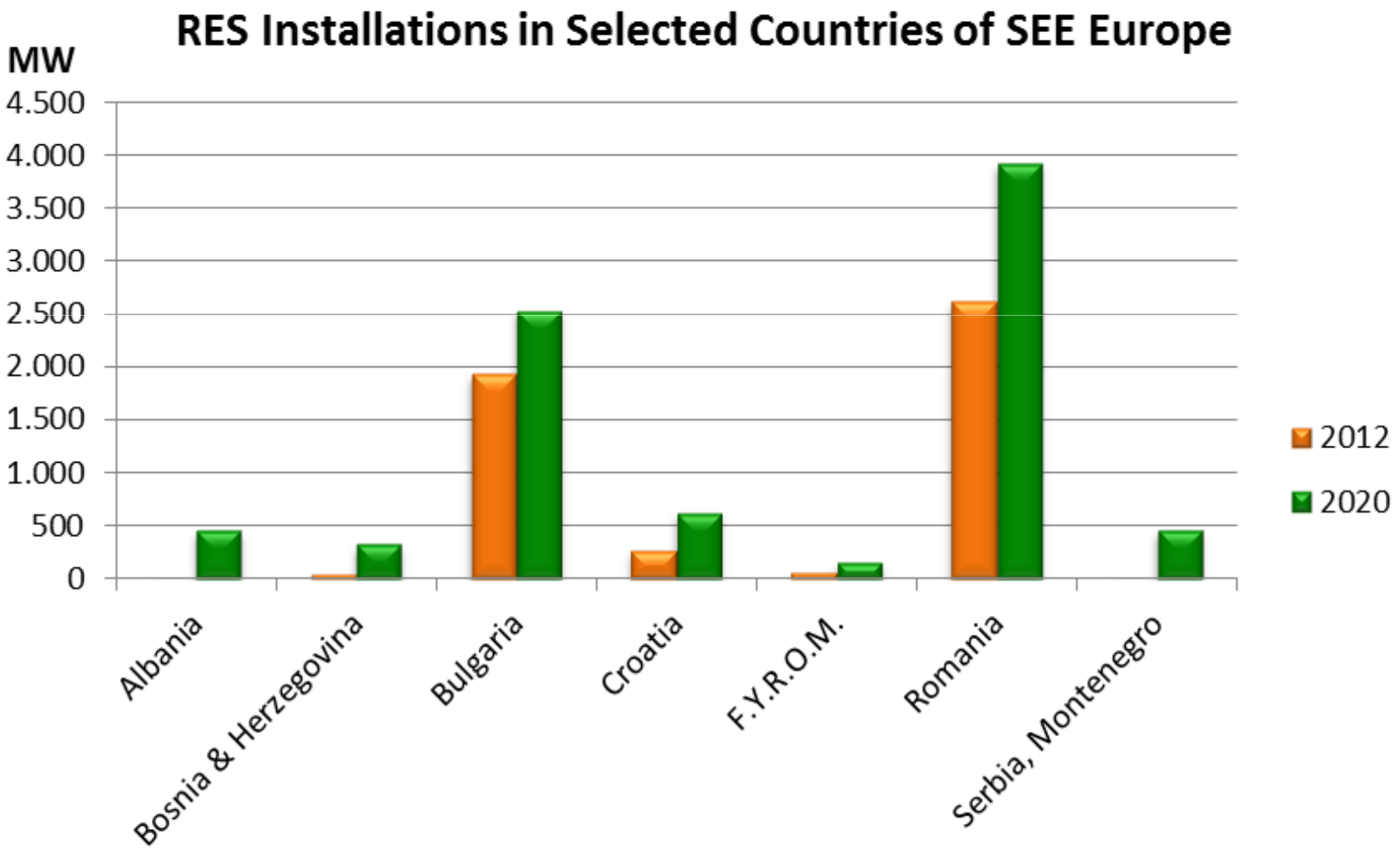
Thermal/ Nuclear plants, lignite/ coal mine

development, electricity grids, HV Transmission

lines ~90.0 Billion Euros

RES (Solar Thermal, Solar PV, Wind, Biomass, Geothermal, Min Hydro) ~35 – 50 Billion Euros

RES Electricity Installations in Selected Countries



Meeting the EU Targets for 2020

- A number of significant developments in terms of policy and infrastructure are currently taking place in SE Europe which when completed, by the end of this decade, will have helped reshape the energy landscape of the region.
- RES investments in the region should come on stream together with large-scale strategic investments on grid infrastructures and interconnections.
- RES penetration in West Balkans should be gradual on a step by step process
- Integration of the electricity market and its full liberalization are goals which can and should be achieved by 2020 and will help achieve smooth RES penetration
- The need for differentiation of the energy mix at both national and regional level is of paramount importance for energy security and for optimum energy management.
- Eliminate incentives that lead to inefficient investments

Thank you for your attention

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