"Renewable Energy Sources in SE Europe: Challenges and Lessons to be Learned"

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6th International Conference on RES and Energy Efficiency – New Challenges

University of Cyprus, Nicosia, November 1-2, 2018

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The SE European Region Defined





SE Europe: Gross Inland Consumption by Source, Including Turkey (2005 and 2015)



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



Regional Energy Mix: What Lies Ahead?

- The region's changing energy mix (Comparison between 2015 and 2035)
 - Substantial changes are foreseen over next 20 years with lower use of coal (lignite), stable contribution of gas and oil, more RES penetration and higher use of nuclear power.





Installed RES Capacity (MW) in SE Europe (2017)

Countries	Wind	Solar	Hydro	Deep Geothermal	Bioenergy	Total RES Installed Capacity
Albania	0	1	2,017	0	0	2,018
BiH	0	12	1,746	0	9	1,767
Bulgaria	699	1,028	2,360	0	57	4,144
Croatia	519	58	2,205	0	78	2,860
Cyprus	158	105	0	0	10	273
FYROM	37	17	664	0	6	724
Greece	2,652	2,604	3,394	0	61	8,711
Montenegro	72	4	651	0	0	727
Romania	3,030	1,378	6,662	0	127	11,197
Serbia and Kosovo	26	18	2,504	0	10	2,558
Slovenia	5	236	1,158	0	57	1,456
Turkey	6,516	3,422	27,273	1,064	450	38,725
Total	13,714	8,883	50,634	1,064	865	75,160

Source: IRENA (2018)



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

Key EU targets for 2020:

20% reduction in EU greenhouse gas emissions compared with 1990 20% of total energy consumption to come from renewable energy sources 20% increase in energy efficiency



group.



South East Europe Regional Initiative

Abu Dhabi Communiqué on Accelerating the Uptake of Renewables in South East Europe Abu Dhabi, 13 January 2017

Action Areas

- Resource assessment
- Long-term planning for RE deployment
- Enabling frameworks: technical, policy, regulatory, institutional
- Market based RE support schemes
- Socio-economic benefits vs. affordability
- Access to financing for RE projects





Source: IRENA



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

- 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 CO₂ emission levels (least of priorities)



Global LCOE from Utility-scale RES Generation Technologies (2010-2017)



Note: The diameter of the circle represents the size of the project, with its centre the value for the cost of each project on the Y axis. The thick lines are the global weighted average LCOE value for plants commissioned in each year. Real weighted average cost of capital is 7.5% for OECD countries and China and 10% for the rest of the world. The band represents the fossil fuel-fired power generation cost range. Source: IRENA (2018)

9



RES Support Schemes in SE Europe

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- Feed in Tariff / Net Metering
- Tenders
- FIT Premium / Green Certificate
- Other Mechanisms



Funding Mechanisms: Lessons To Be Learned – RES growth in SE Europe is Hindered (I)

- **Greece** and **Bulgaria** introduced exceptionally high FiTs.
 - Dramatic impact on the electric system leading to large financial deficits for the market operator with big payments delays to producers.
- Bulgaria currently has an overcapacity problem and is exporting electricity to Turkey, Greece and the rest of the Balkans, meaning there is little motivation for investment in yet more RES generation capacity.
- Romania decided to slash incentives for renewable electricity generation following a dramatic boom in the sector between 2010 and 2013.
 - Bucharest's generous "green certificate" incentive scheme.



Funding Mechanisms: Lessons To Be Learned – RES growth in SE Europe is Hindered (II)

- Question: Will SEE countries meet medium- and long-term RES targets due to the slowing of RES applications over the last 3-4 years?
- SEE countries should maintain a stable and predictable system so that investors know the longevity of the incentive systems set up over a number of years.
- □ The higher RES penetration in the electrical system of a country, the greater must be the transformation of the electricity network as a whole.
- A totally different case is Turkey where strong RES growth is expected. According to Turkey's NREAP, the target for RES generation capacity was set to 61 GW by 2023; mostly in the forms of hydro, wind and solar generation.
 - 34 GW of hydro generation capacity
 - 20 GW of wind
 - 5 GW of solar and
 - 1 GW in both geothermal and biomass generating capacity by 2023. Geothermal energy will play a small part too, increasing to 600 MW within a decade.



Is SE Europe Ready to Replace Coal?

- SE Europe is a carbon-intensive region and in most of the countries, coal constitutes an extremely important asset, which helps national economies and ensures energy security.
- COP 21 policies may be a priority for SE Europe, within the broader EU policy context, but should be **applied carefully** and in respect and in accordance with the specific national policies of each country.
- □ The **extensive use of RES** may help reduce the use of solid fuels and insulate the economy to some extent from fossil fuel price fluctuations.
- Regional cooperation in RES deployment as well as cross-border interconnections could diminish further the gap between national and European ambitions.
- Hydropower through pumped storage schemes could provide the much-needed storage capability for maximum RES utilization.
- Important role of energy efficiency, as there is a huge untapped potential in SE Europe that would enable the region to increase its energy efficiency target to 40% and beyond.



The Role of Energy Storage in the Further RES Development in SE Europe

- Currently, pumped hydro energy storage is the most established and efficient technology for storing large amounts of energy produced for a long period of time.
 - In SE Europe, there is a significant potential for new PHES
- Storage is already a reality in the SE European region and more specifically in noninterconnected systems (e.g. Greek Islands).
- □ **Thermal storage** can be another source of flexibility, both on the grid and the household level in SE Europe.
- Currently, the wholesale markets of the non-EU countries of SEE are nationally oriented. There is:
 - lack of competition,
 - lack of liquidity and
 - inadequate market price signals.

There are barriers to the development of energy storage and to a cost-efficient integration of RES.



Conclusion

- Energy security through the development of indigenous energy sources and diversification of the energy mix is emerging as a major policy driver, which also helps RES and energy efficiency.
- □ Growth of the RES and energy efficiency share in the energy mix generally contributes to energy supply diversification, in terms of technology but also in terms of resources.
- □ The further development of the **region's transmission grid** and the **proposed new cross-border electricity interconnections** are of a paramount importance in advancing the unification of the SE European electricity markets, a significant factor, which will enable faster RES penetration.
- Extensive use of RES and increase in energy efficiency can also reduce fuel imports and insulate the economy to some extent from fossil fuel price rises and swings. This is likely to contribute towards the strengthening of energy security in a region where some countries are net electricity importers.



Thank you for your attention

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