

IRENA – Energy Community Joint Workshop on Grid Integration of Variable Renewable Energy Sources

Vienna, 7 November 2018

Summary Report

BACKGROUND

In the context of the increasing role of renewable energy sources in the Energy Community Contracting Parties, the Energy Community Secretariat and the International Renewable Energy Agency (IRENA) organized a joint workshop on Grid Integration of Variable Renewable Energy Sources (VREs), held on 7 November 2018 in Vienna. The event is another step in the ongoing efforts to support the creation of more conducive frameworks for renewables, coordinated within the frameworks of the Renewable Energy Coordination Group as well as IRENA's [Regional Initiative in South East Europe](#).

The meeting took place against a backdrop of an unprecedented pace of change in the energy sector. Last year marked the sixth consecutive year in which additional power generation capacity from renewables outpaced conventional sources and represented more than half of the capacity additions in the global power sector. Increasing deployment of renewable energy resulted with significant socio-economic benefits, including the development of new value chains, job creation and improved livelihoods.

In less than a decade, renewable energy has moved from the side lines to the center stage of the global energy landscape thanks to supportive policy frameworks, technological innovation and rapidly decreasing costs. Increasing deployment and technological innovation have led to sharp cost reductions and improved cost-competitiveness of renewables over the last few years. In particular, solar PV module costs have fallen as much as 80%, and wind turbine prices have dropped by almost a third since 2009.

While the Contracting Parties have experienced rather limited deployment of those technologies so far, there are several developments in 2018 that prove the wide-spread interest in solar PV and wind in the region, e.g.: i) solar PV auctions in Albania, Bosnia and Herzegovina, and Montenegro; ii) ongoing construction of new wind projects in Serbia, Bosnia and Herzegovina, and Ukraine; and iii) advanced steps of the Republic of Moldova to hold RE auctions in 2019.

WORKSHOP OBJECTIVES

The event addressed the challenges and opportunities for the development and operation of clean, competitive and secure energy systems with significant share of variable energy sources, as well as discussed latest advancements and best practices in various facets of grid integration of those resources. It enhanced local capacities at the technical, regulatory and operational level and offered a platform for discussing some of the concerns and issues that the countries might be facing, such as uncertainties in planning and operational process due to increased intermittency of generation, load and congestions in the internal grid and in interconnections etc. In addition, the workshop helped IRENA and other partners active in the region to identify areas and ways of supporting Contracting Parties in developing the necessary skills and mechanisms relevant for such systems.

PARTICIPATION

The workshop gathered more than 70 participants from policy makers, regulators as well as transmission and distribution system operators from Contracting Parties of the Energy Community - Albania, Bosnia and Herzegovina, Georgia, Kosovo*, the Former Yugoslav Republic of Macedonia, Republic of Moldova, Montenegro, Serbia and Ukraine. It also attracted representatives of multilateral financial institutions, bilateral development agencies, European regulators, transmission system operators, energy companies, associations, academics and other energy experts who shared their perspective.

SUMMARY OF THE DISCUSSION

The grid integration of variable renewable energy resources involves different aspects of power system planning and operation which starts from long-term years-ahead planning for RE deployment to short-term intra-hour generator dispatch to balance the variability of renewables output. The workshop intended to cover all these different aspects of grid integration and, thus, included the following sessions:

- Planning for the future clean, competitive and secure energy systems
- A market design fit for renewable energy
- A Balancing Act: Power System Flexibility
- Grid Integration of Variable Renewable Energy

In addition, it featured presentations of the Contracting Parties on their experiences in long-term planning of energy systems as well as a panel discussion on some of the challenges faced by Contracting Parties and actions required to ensure effective integration of renewables.

Highlights of the discussion:

- A long-term vision for power sector transformation can avoid costly misinvestments and facilitate integration of VREs. Planning for the power system must be holistic and should account for all aspects of the grid development as well as the issues related to the increased generation variability. Thus, coordination among different planning processes across different institutions is crucial for successful deployment of renewables. Furthermore, regional coordination of electricity markets is seen as key to ensure effective integration of renewables. The establishment of day-ahead and intra-day markets would facilitate creating further premises for market integration at regional level.
- An increase penetration of the use of renewable energy is a chance to reform the electricity market. Its new design needs to reflect the uncertainty that results from forecast errors of variable renewables, e.g. by reducing time-granularity of generator dispatch and increasing load-following reserves. The good examples of market designs include: value-based auctions in Mexico, Enhanced Frequency Response in UK, Demand Response Programs in SCE (Southern California Edison), and Embedded Networks in Australia. In addition, the regulatory frameworks are needed for storage integration, flexibility, ancillary services, and the role of aggregators in planning for renewable energy resources.
- The new legal regime for renewable energy in the EU's Clean Energy Package is giving more weight to market principles, including the competitive selection process for renewables support while priority

* This designation is without prejudice to positions on status and in line with the United Nations Security Council Resolution 1244 (1999).

dispatch and exemption from balance responsibility will be limited to small-scale installations and demonstration projects only. Self-consumption, citizens' participation and distributed generation is gaining significant traction in Europe and regulations should be forward looking and encourage prosumers in the system, while addressing the impact of increased number of renewable energy installations at distribution level.

- Technology and successful VREs grid integration practices exists, but often there is lack of policies and regulations that provide the right incentives for renewables integration. In Portugal, for instance, the successful integration of renewable energy resources has been achieved due to: i) effective energy policy design; ii) new long-term system security of supply methodologies (pumped hydro and backup capacity from CCGTs); iii) new planning processes for transmission grid capacity focusing on interconnections; and iv) global TSO cooperation.
- There has been significant advancement in generation technology that improves the controllability and response rates of conventional generation. In addition, multiple flexibility options can be provided through distributed technology using blockchains, electrification of heating and transport sectors, demand response and energy storage.
- In parallel to the technological advancements, electricity markets have been evolving to utilize the flexibility of the power system optimally – more and more system operators introduce new market products and ancillary services that are designed to encourage the provision and utilization of flexibility from new and conventional energy sources.
- Existing electricity system and networks can easily handle small shares of renewables with minor enhancements to system operation. Only large shares of renewables require flexibility assessments of the power system.
- There are several different methodologies and tools to support planning for power systems with high shares of renewable energy resources. International and regional organization are in position to provide more support to the Contracting Parties if closed collaboration with the relevant national stakeholders is ensured. Reliable data is a major challenge when performing analysis.
- Multi-stakeholder involvement at national and international level provides a unique opportunity to have an inclusive process and prepare for a successful transition to clean, competitive and secure energy systems.