

UN CLIMATE CHANGE CONFERENCE – UNITED ARAB EMIRATES

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THE SOLAR HUB



GRID INTEGRATION – WHAT NEXT IN UNLEASHING THE FULL POTENTIAL OF RENEWABLE ENERGY?

Thematic Arena 3, TA3-190, Opportunity District, Expo City, Dubai

2 DECEMBER, 2023 | 12:30 PM – 14:00 PM

Background & Rationale

Given the Net Zero Emission targets being set by countries globally, the reliance on renewable energy to meet these targets are becoming increasingly important and critical. However, inherent variable nature of the Renewable Energy (RE) poses many challenges especially on the power grid. As the share of RE increases in the energy mix of the countries, the grid management challenges will increase further requiring more ancillary services, back up supply, load shifting capabilities and improved RE generation system performance. Moreover, curtailments that lead to under-utilized evacuation infrastructure will rise if poor forecasting practices, disincentives to optimize designs, under-developed ramping arrangements, removal of transmission bottlenecks and other related challenges are not dealt with. Further, the climate change-related risks are likely to affect inter-annual and seasonal trends in RE resource availability, adding to regional / national / state dispatch coordination challenges.

Such challenges need multi-pronged approach towards deployment of innovative solutions. This include:

1. Robust transmission grids with sufficient redundancies in the system to allow for alternate paths of electricity to flow in case of unavailability of variable RE on a short notice (for instance, cloud cover). This shall require wider interconnections in the grid to allow the larger coverage of imbalances caused due to demand for and supply of RE. In India, Power Grid Corporation of India Limited spearheaded the integration of five regional grids within the country to single National Grid, one of the largest synchronously operated grids in the world. This has allowed for the seamless transfer of power across the states. This has also allowed for shift of mix of electrons from conventional (majority of the fossil fuel based pit-head power plants are in east coast of India while demand centers in northern and western India) to RE (majorly in western and southern India to demand centers across the country). This also requires stronger institutions to allow for innovations in the technology adoption to minimize the right-of-way requirements and adopt the design of the grids factoring in environmental and social considerations.
2. Promoting hybrid models in RE, such as, combining wind and solar with energy storage solutions that are configured to operate at one point of interconnection, and can have complementary generation patterns (diurnal and seasonal). This can improve the generation profile per unit of land and optimize use of associated evacuation infrastructure as compared to stand-alone single technology based RE plants.

	<p>3. Adopting shared infrastructure model to optimize on the investments in the common infrastructure facilities minimizing the future energy system costs. This shall allow for better utilization of the transmission infrastructure which can be optimized if more than one players are in the vicinity of each other. This also increases the value proposition for the RE developers as it enables them to easily access the off-takers.</p> <p>4. With consumers turning prosumers, the grid integration has to factor in the challenges at the distribution level as well. Decentralized solar systems, electric vehicle charging and vehicle-to-grid, energy efficiency, demand response measures, etc. shall be an important determinant for the investments requirements in the grid and its operations.</p> <p>5. Continuous need to align the technical, policy and regulatory compliances, for instance, through grid codes is critical. This shall include but not limited to interventions such as deployment of automated generator control systems, reactive power compensation, ancillary services, inertia, black start capabilities, energy storage solutions, amongst others.</p> <p>6. Important role played and seamless coordination required between the various stakeholders, for instance, transmission utilities, system operator, transmission system owners, generators, amongst others. Load dispatching and scheduling is extremely critical to manage the grid instability issues which are going to be further acute with an increase of RE in the energy mix.</p>
Session Objectives	The purpose of this session will be to have a knowledge exchange across the countries on seamless handling of variable RE integration to have reliable and resilient electricity grid.

Agenda

12:30 - 12:33 PM	<p>Welcome and Opening Remarks Dr Ajay Mathur, Director General, International Solar Alliance</p>
12:33 - 12:38 PM	<p>Special Address H.E. Nima BAH, Chief of Cabinet, Ministry of Energy, Hydraulics and Hydrocarbons, Republic of Guinea</p>
12:38 - 12:43 PM	<p>H.E. Lynda Tabuya, Minister for Women, Children and Poverty Alleviation, Government of Republic of Fiji</p>
12:43 - 12:48 PM	<p>H.E. Chief Adebayo A. Adelabu, Minister for Federal Ministry of Power, Federal Republic of Nigeria</p>
12:48 - 12:58 PM	<p>Keynote Address H.E. Shri R.K. Singh, Hon'ble Minister of Power and New and Renewable Energy, Govt of India and President of the ISA Assembly</p>
12:58 - 13:08 PM	<p>Presentation R.K.Tyagi, Director (Operations), POWERGRID, India</p>
13:08 - 13:45 PM	<p>Panel Discussion and Audience Interaction Moderator Ramesh Kumar Kuruppath, Chief of Unit- ISA Panellists Dr Daniel Schroth, Director Of the Renewable Energy And Energy Efficiency Department, AfDB Rajiv Kumar Porwal, Director (System Operation), Grid India James K. Wahogo, Secretary General, East Africa Power Pool (EAPP) Timoci Naleba, General Manager, Public Rental Board (PRB), Suva, Fiji Chandrasekar Govindarajalu, Lead Energy Specialist, World Bank Nirod Chandra Mondal, Joint Secretary, Power Division, NFP Bangladesh N K Panda, Chief Business Acquisition Officer, Sterlite Power</p>
13:45 - 13:55 PM	<p>QA Session Dr Ajay Mathur, Director General, International Solar Alliance</p>
13:55 - 14:00 PM	<p>Closing Remarks & Vote of Thanks Ramesh Kumar Kuruppath, Chief of Unit (PPIC), ISA</p>