Exploring the Viability of Hybrid Power Plants (RES and Batteries) in Contemporary Electricity Markets

Contemporary power systems are undergoing transformation at a scale and pace never experienced before. The steadily increasing share of renewable energy technologies (RETs) in the energy balance, the enhancement of their performance and competitiveness, and the extensive use of information and communication technologies (ICTs) in power system operation are leading to new operation rules. Additionally, energy markets have seen exponential reductions in the cost of energy storage (especially batteries), as well as the growth of ICT solutions, which enable reliable integration of dispersed power generation assets and real-time interaction with the grid.

From another point of view, considering the energy transition as a pathway toward the transformation of the global energy sector from centralized and fossil-fuel-based power systems to sustainable and resilient grids, the stakeholders focus on the most reliable means of achieving this goal, namely information technologies, energy storage technologies, energy automation systems, policy frameworks, and market instruments.

Therefore, it is clear, a sustainable energy system that needs to ensure its reliability and commercial viability, mitigating all the corresponding environmental impacts, will certainly require massive reliance on hybrid power plants within an integrated and intelligent management framework. In this presentation, a review of the integration of hybrid power plants in energy systems are emerged and investigated.