

USEA Enhances Grid Resilience in Uzbekistan through Advanced Modeling and Technical Training

The United States Energy Association has enhanced Uzbekistan's grid resilience by equipping its power sector with advanced modeling tools, system stability assessments, and hands-on training to manage increasing renewable energy integration. This initiative strengthens the country's ability to operate a more flexible and adaptive transmission system—better prepared to withstand disruptions and support a reliable clean energy transition.



The U.S. Energy Association (USEA) played a pivotal role in strengthening the resilience of Uzbekistan's national power grid by delivering advanced modeling tools, conducting system-wide stability assessments, and building local technical capacity to manage the evolving energy landscape.

Uzbekistan is undergoing a major energy transition, aiming to generate 25% of its electricity from solar and wind by 2030. However, the integration of variable renewable energy sources has placed increasing strain on an already aging transmission network. Frequent outages and limited system flexibility have highlighted the urgent need to modernize the grid to withstand growing operational stress and to adapt more effectively to changing power flows.

In partnership with Uzbekistan's Transmission

System Operator (TSO) and the National Electricity Transmission Company (NETC), USEA implemented a comprehensive program to build grid resilience. This included the development of dynamic and static power system models, along with 5- and 10-year planning scenarios, to simulate future grid conditions and assess the impact of increased renewable generation. These tools enable operators to identify vulnerabilities in advance, evaluate system response under various conditions, and guide infrastructure investments that reinforce overall grid stability.

USEA also conducted a System Stability and Reliability Study to analyze how large-scale renewable integration could affect grid operations and to develop engineering solutions to mitigate those challenges. To ensure that these technical improvements are sustained,

USEA delivered a robust training program for Uzbek grid operators and engineers, centered on DIGSILENT PowerFactory – one of the industry's leading platforms for power system modeling and simulation.

By combining forward-looking planning with hands-on technical capacity building, USEA's support has significantly enhanced Uzbekistan's ability to operate a more flexible, stable, and adaptive grid. The program has helped prepare the transmission system to better absorb shocks, manage variability, and maintain performance under both normal and extreme conditions.

This initiative marks a major step in reinforcing the resilience of Uzbekistan's power sector – ensuring the grid is equipped not only for today's demands but also for the complexities of a renewable-powered future.