

USEA Enhances Grid Resilience in Moldova Through Advanced Planning and Renewable Integration Tools



The United States Energy Association is enhancing grid resilience in Moldova by providing its transmission operator with advanced planning tools and technical assessments to support renewable energy integration. Through real-time hosting capacity analysis and strategic infrastructure upgrades, USEA has strengthened Moldova's ability to manage system stress, prevent outages, and ensure reliable power delivery amid a rapidly evolving energy landscape.

For nearly two decades, the United States Energy Association (USEA) has collaborated closely with Moldelectrica, Moldova's national transmission system operator, to modernize the country's electricity infrastructure and facilitate its integration into the broader European energy network. Following Moldova's successful synchronization with the European Network of Transmission System Operators for Electricity (ENTSO-E) in 2022, USEA provided technical support from 2022 to 2023, focusing on strengthening the resilience of the country's transmission grid, especially as it accelerates renewable energy deployment.

As Moldova prepares to integrate over 1,200 MW of new wind and solar power,

USEA partnered with Moldelectrica to conduct a Grid Integration and Hosting Capacity Assessment. The assessment used advanced power flow simulations and N-1 contingency analysis to evaluate how the grid would perform under various scenarios, including equipment outages and conditions involving variable renewable energy. The study identified vulnerabilities, such as thermal overloads, voltage instability, and limited substation capacity, and provided a prioritized plan for reinforcements to improve system reliability and flexibility.

These efforts have measurably improved Moldova's grid resilience. By identifying and resolving potential system stress

points, USEA's technical assistance has enabled Moldelectrica to mitigate the risk of outages, enhance contingency preparedness, and manage renewable energy intermittency more effectively. Integrating real-time hosting capacity data has improved coordination with renewable energy developers, reducing delays and ensuring new generation can connect to the grid without compromising stability.

USEA's partnership with Moldelectrica demonstrates how targeted technical support and advanced digital tools can significantly enhance grid resilience, ensuring that transmission systems remain reliable, flexible, and prepared for the future in an era of rapid energy transformation.