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ESIG Releases New Report: Utility Perspectives on Making Grid-Enhancing Technologies Work: Use Cases, Barriers, and Recommendations for Scalable Deployment

While major transmission expansion is underway, grid-enhancing technologies can address immediate grid needs, providing flexible, scalable technologies that can be quickly implemented to improve system performance today

Reston, Va. – The Energy Systems Integration Group (ESIG) has released a new report, *Utility Perspectives on Making Grid-Enhancing Technologies Work: Use Cases, Barriers, and Recommendations for Scalable Deployment*, discussing the ability of these flexible, scalable technologies to quickly improve system performance today, as major transmission expansion proceeds.

As the U.S. electricity system experiences rising demand, a changing resource mix, and an aging grid infrastructure, major transmission expansion is essential. Long-term reliability and efficiency depend on sustained investment in high-capacity transmission, regional build-outs, and interregional ties. Yet while these projects are foundational to a modern, resilient grid, they take time. To address immediate needs while those projects advance, flexible, scalable technologies can be quickly implemented to improve system performance today. This report grew out of the work of ESIG's GETs User Group, composed of a diverse group of transmission utilities and system operators that are actively using or planning to use GETs.

"Large-scale transmission is essential for ensuring long-term reliability and affordability as demands on the grid continue to grow, said James Okullo, director of system planning at ESIG. "At the same time, GETs can play a meaningful role in addressing more immediate challenges by better utilizing our existing infrastructure. To make these technologies effective, it is crucial to address key challenges and thoughtfully integrate them into planning, operations, and markets."

GETs in this report include dynamic line rating, advanced conductors, advanced power flow control, and transmission topology optimization, and can address these immediate needs by unlocking underutilized capacity, rerouting flows around congestion, and improving the efficiency and adaptability of existing infrastructure. Many can be installed and operational in a matter of months, often without new rights-of-way, and at a fraction of the cost of traditional upgrades.

Jay Caspary, GETs User Group advisor, explained that "ESIG's efforts are critical to better understanding the benefits and challenges of integrating new technologies like GETs as a bridge to planned grid expansion projects, as well as a complement to future network operations."

GETs' modularity allows planners to target high-impact areas, and their flexibility supports adaptation as new transmission, generation, or loads are introduced. This report synthesizes

utility experience, planning guidance, regulatory action, and real-world deployment examples. It outlines practical steps to accelerate the adoption of GETs, clarify modeling practices, align incentives, and integrate these technologies into planning, markets, and operations. By working collaboratively across the industry, stakeholders can move GETs from pilot programs to standard practice—ensuring the grid is equipped to meet the demands of today and the future, while long-term transmission projects are planned and built.

For more information on ESIG, visit www.esig.energy.

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About Energy Systems Integration Group

ESIG began in 1989 as the Utility Wind Interest Group, an organization created to educate utilities about wind power. Within ten years, it developed into a significant technical educational organization and convener of peer-to-peer workshops to assist utilities, system operators, project developers and equipment manufacturers from around the world with the integration of wind power, and then by 2011, also with the integration of solar power. With renewables becoming the mainstream sources of new generation and reliability services, the organization expanded its mission, branding and international participation in 2018 through a merger with the International Institute of Energy Systems Integration (IIESI) to become the Energy Systems Integration Group (ESIG), taking on not just the planning and operations of electricity systems and power markets, but also the growing issues for other energy vectors, including the electrification of transportation, buildings and industry for decarbonizing the entire energy supply.

ESIG now serves as a resource for a broad cross-section of the global energy industry, including utilities, ISOs, independent power producers, project developers, manufacturers, forecasters, consultants, educational institutions, and government agencies, including regulatory bodies.

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