

A successful transition to green energy emphasizes transformer maintenance and reliability

Transformer maintenance and reliability play a critical role in the shift toward green energy for several reasons. First green energy sources like solar and wind can be intermittent, and their output can fluctuate due to weather conditions. To ensure grid stability, transformers must be highly reliable and capable of withstanding varying loads and voltage levels. Regular maintenance checks and preventative measures are essential to ensure transformers remain dependable. Energy storage integration is another consideration. Battery energy storage systems (BESS) are becoming essential components of green energy systems. They play a critical role in smoothing out intermittent renewable generation. Well maintained transformers are needed to connect these energy storage systems to the grid safely and efficiently.

In the context of Distributed Energy Resources (DER), distribution transformers at the local level must be reliable to handle power flows from small-scale renewable sources like rooftop solar panels. Regular maintenance ensures that these

transformers continue to function efficiently and safely.



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Aging infrastructure is a well-known issue in the power sector, and transformers are a part of this aging infrastructure. As the demand for green energy grows, these older transformers may need refurbishment or replacement to ensure they can handle the increased demands and integration of renewable sources.

The push for energy efficiency and grid resilience is driving innovation in transformer technology. Smart transformers equipped with monitoring and control capabilities are being developed to optimize power flow, reduce losses, and respond to changes in grid conditions.





Battery energy storage systems (BESS) are becoming essential components of green energy systems, and well-maintained transformers are needed to connect these energy storage systems to the grid safely and efficiently.

With a focus on green energy, there's also a growing emphasis on the environmental impact of transformers. For example, addressing oil leaks or upgrading to eco-friendly insulating fluids like natural esters can reduce the risk of environmental contamination. In some cases, transformer life can be extended through refurbishment and retrofitting, reducing the need for new manufacturing, which can have environmental benefits. Proper maintenance practices can help maximize the lifespan of transformers.

Transformer maintenance can include measures to extend the reliable life of the transformer or improve efficiency, such as cleaning cooling systems, oil reclamation, moisture reduction, leak repairs, and upgrading insulation. Higher transformer efficiency means less energy loss during power transmission, which is especially important when transmitting renewable energy over long distances.

Reliable transformers are crucial for the safety of the grid and its operators. Proper maintenance practices ensure that transformers operate safely, reducing the risk of accidents or outages that could disrupt green energy generation and distribution.



Smart transformers equipped with monitoring and control capabilities are being developed to optimize power flow, reduce losses, and respond to changes in grid conditions, driven by the push for energy efficiency and grid resilience.

Remember, transformer maintenance and reliability are integral to the safety and success of the shift toward green energy. They ensure grid stability, facilitate the integration of renewable sources and energy storage, and contribute to the overall efficiency and sustainability of the energy infrastructure. As the energy landscape continues to evolve, maintaining and enhancing the reliability of transformers will remain a key priority for utilities and grid operators.

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Jon Bucciarelli is President of SDMyers, LLC, an electric reliability company specializing in transformer maintenance, fluid testing, field service, fleet reliability, and training. In addition to being a company focused on transformer life-extension services, it is a community-aligned company focused on advocating for its customers while building a "Good Place" – a common attitude governed by Biblical principles and values. Before joining SDMyers, Jon spent 11 years at General Motors Corporation, holding a variety of leadership positions. He eventually led the Industrial Engineer group and was a New Car Launch Manager before completing his time at GM as the Director of Engineering at the Parma Metal Center. Jon focused on his passions for engineering and education by creating a School of Engineering at Cuyahoga Valley Christian Academy (CVCA). He then took on a startup operation as the VP of Operations that used algae as a plastic extrusion supplement. He was responsible for setting up the extrusion facility and manufacturing harvesters to procure algae from catfish farms in America and lakes in China. Jon holds a BS in Mechanical Engineering from The University of Akron and an MS in Operations Management from Kettering University.