

## Muscat grid stabilization

Due to changing utility infrastructure with regards to increased penetration of inverter-based generation and retirement of conventional generation, dynamic shunt compensation solutions are becoming ever more vital for transmission system operation and reliability. The emergence of Voltage Source Converter (VSC), STATCOMs with energy storage, and Synchronous Condensers, have increased potential grid stabilization applications through grid-forming technologies. As utility requirements become more complex, the optimal solution may combine available and future technology.

This tutorial presents technology principles with example installations and an analysis of future trends expected to influence technology development and its place in the market. The technology includes legacy solutions and new developments in static synchronous compensators (STATCOM) technology such as grid-forming controls and energy storage.

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