# Reactive power management

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In its latest monthly column for pv magazine, IEA-PVPS provides a comprehensive overview of the state-of-the-art practices, best practices, and recommendations for managing reactive power amidst the growing integration of distributed energy resources (DERs). The article describes the regulatory frameworks and practical applications, underscoring the essential role of reactive power management in maintaining a stable and efficient power grid.

Image: Sterling Lanier/Unsplash

As the global energy landscape shifts towards renewable energy sources, effective reactive power management becomes critical for ensuring grid stability and reliability. The recent report by IEA PVPS Task 14, “Reactive Power Management with Distributed Energy Resources,” delves into state-of-the-art practices, best practices, and recommendations for managing reactive power amidst the growing integration of distributed energy resources (DERs). This article provides a comprehensive overview of the report''s findings, regulatory frameworks, and practical applications, underscoring the essential role of reactive power management in maintaining a stable and efficient power grid.

The Importance of Reactive Power Management

Reactive power management is essential for maintaining voltage control, ensuring high power quality, and enhancing overall grid stability. It helps prevent issues such as harmonics, flicker, unbalanced loads, and power oscillations, which can negatively impact power quality and the ability to transfer power effectively. With the increasing integration of DERs like photovoltaic (PV) systems, these resources must assume greater responsibility for providing reactive power control. This improvement in power system stability is crucial for preventing problems like load shedding and system collapse, ultimately enhancing the security and reliability of the power system.

Objectives and Purpose of the Report

The IEA PVPS Task 14 report aims to provide a management summary on the state-of-the-art practices, best practices, and recommendations for reactive power management. It explores regulatory frameworks in selected countries, highlighting diverse approaches to managing reactive power. The report offers insights into the current state and future prospects of reactive power management in the context of increasing DER integration and investigates the effectiveness of various regulatory frameworks in supporting reactive power management.

Regulatory Requirements and Practices

The report covers the regulatory requirements in selected Task 14 countries and research and application examples from these countries. It provides an overview of reactive power regulations across various countries, detailing grid codes and frameworks that shape the requirements for connected DERs to provide reactive power control. Task 14 exemplarily examines how these regulations influence the operation of power systems with increasing integration of renewable energy sources. As an example of the regulatory requirements, Germany will be mentioned in this article.

Example: Germany"s Grid Codes for DER Reactive Power Provision

In Germany, current grid codes mandate that DERs must provide controllable reactive power during feed-in times. The guidelines ensure that DERs contribute effectively to grid stability by providing necessary reactive power. This capability allows Distribution System Operators (DSOs) to utilize DER for additional system services. The requirements vary based on the voltage level: