

Operational challenges and economics in future voltage control services

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Abstract-

Purpose of Review

Decarbonizing the power system entails the need to update voltage control strategies, traditionally based on synchronous generators, and energy flows from transmission to distribution grid level. We analyze the voltage control strategies implemented up to now, considering both the technical and economic views.

Recent Findings

We study how the transmission and distribution grid operators in Spain, Croatia, and Thailand improved their voltage control strategies to exploit potentials from power electronics from wind and photovoltaic generation. Moreover, we analyze economic fundamentals and market design issues related with the implementation of these new strategies, essential to set efficient economic incentives for their successful implementation.

Summary

We discuss recent innovative projects and solutions implemented in some countries that show promising and relevant potential from the implemented renewable-based voltage control strategies. However, we highlight that there are very few empirical analyses in real conditions, which are essential to implement improved and efficient voltage control strategies.

Index Terms- Voltage control · Renewables · Power electronics · Reactive energy · Ancillary services · Real-time set points

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