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# Power System Flexibility Tracker: Indicators to track flexibility progress towards high-RES systems

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## Abstract

Variable renewable energies (VRE), in particular wind and solar PV, constitute a key option to reduce global greenhouse gas emissions. Future policy scenarios therefore propose a dominant role for VRE. However, relying almost entirely on the stochastic weather-determined output of VRE will require a transformation of the way power systems are planned and operated: a growing amount of flexibility will be needed to match variable demand with increasingly variable supply.

Due to the complexity of power systems as well as their long investment cycles, it is crucial to prepare the strategic development of flexibility now. The key question for the transition to energy systems based on variable renewables becomes: “How can we ensure that future power systems have the flexibility needed to match demand and variable supply?” Power system operators and regulators need to assess the current flexibility level in their system, analyse all possible flexibility options, and clearly prioritise the needed actions.

This paper presents the Flexibility Tracker, an assessment methodology developed to monitor and compare the readiness of power systems for high VRE shares. The Flexibility Tracker builds 14 flexibility assessment domains, by screening systems across the possible flexibility sources (supply, demand, energy storage) and enablers (grid, markets), via 80 standardised Key Performance Indicators (KPIs) scanning the potential, deployment, research activities, policies and barriers regarding flexibility.

The methodology allows monitoring the progress made in individual power systems with respect to their potential for integrating VRE, comparing and ranking of different systems, and identifying best practices, common challenges and needed actions to enable and advance flexibility. It ensures that the complex

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