

# **Viability of providing spinning reserves by RES in Spanish island power systems**

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## **Abstract-**

**This paper assesses the viability of providing down and up spinning reserves by renewable energy resources (RES) in island power systems. The process consists of evaluating the impact of providing spinning reserve on the system operation costs of different islands by simulating the unit commitment problem. The assessment is carried out for La Palma (small size) and Tenerife (medium size) island power systems, and by considering different wind source availability scenarios for sample weeks of different seasons in current and future years. This paper differentiates between up and down reserves and studies their impacts separately. Results show that enabling RES to provide just down spinning reserve has economic benefits for all scenarios, by reducing over 40% the amount of thermal generation and over 30% the systems costs for high wind scenarios. It also confirms that employing variable deloading of wind energy as a source of up reserve is advisable, mainly in scenarios with high share of wind sources. In some scenarios, using RES as reserve provider, reduces the amount of thermal generation more than 50%, compared to when RES does not participate as a source of reserve, and can even lead to a full RES coverage of demand.**

**Index Terms-** Frequency stability, renewable energy sources.

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