

## **ECONOMIC AND TECHNICAL EVALUATION OF AN ENERGY STORAGE SYSTEM CONNECTED TO AN ISLANDED DISTRIBUTION NETWORK**

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### **ABSTRACT**

Increasing levels of distributed generation (DG) to support the reduction of carbon emissions requires innovative solutions and the investigation of the deployment of emerging technologies. Numerous electrically islanded power networks exist worldwide; some on geographic islands. The indigenous renewable resources of these locations bring a desire to maximise clean energy capture. The susceptibility of islanded networks to breaching intrinsic frequency and voltage constraints, through disturbances, is higher than that of interconnected systems. This paper sets out a general framework for assessing the introduction of a centrally sited, energy storage system (ESS) onto a typical islanded distribution network with load demand in the tens of MW range and with variable output renewable and conventional generation. The methodology is based on a techno-economic evaluation framework which permits the extent to which ESS can suppress network technical deviations to be quantitatively measured and the relationship between increased DG access and the ESS size to be examined. Based on the economic evaluation of the system operating costs and benefits, this paper concludes by stating the economic case for incorporating a MW sized ESS, on the case study network, is practical over a long period of time.