

Technical feasibility of Gamesa Eólica wind turbines for Weak Grids

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The productivity of Wind Turbine Generator Systems connected to the electrical grid is constrained by several factors related to the grid characteristics. The diverse electrical concepts implemented by differing WTGS may lead to different validity for each kind of supporting grid and application. It is therefore necessary to assess, for each projected installation, which is the best WTGS electrical configuration. The interaction between the WTGS and the grid has to meet a compromise between the WTGS needs and the grid restrictions and requirements. The requirements imposed on the WTGS implies that they can act as a grid stabilising factor. In this sense, wind farms and individual WTGS are considered to be standard power plants. In the case of weak grids, the requirements imposed on WTGS may be solved with the help of adequate use of power electronics. Gamesa Eólica S.A. offers a range of wind turbines suited to match the needs for site-specific electrical regulation needs. A Weak Grid machines series has been launched. These machines are based on the standard ones, with which the Weak Grid models share the mechanical platform and aerodynamic concepts. A comparison of Annual Energy Production is undertaken, based on the power curves corresponding to the standard G52 and to the G52 Weak Grid, and taking into account a proposed scenario for a weak grid installation. Such scenario is based on requirements set by companies in charge of the electrical distribution (“utilities”). The results show how such a Weak Grid option can be a good technical solution with regard to energy production. Cost-effectiveness can then be met, but specific studies should be performed on a case-by-case specific approach, due to the variability of the social impact and economical improvements that the availability of electrical power might bring.