Grid impact analysis on wind power plant interconnection in strengthening electricity systems

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Author Order	2 of 4
Accreditation	
Abstract	The Timor system is one of the large systems in the East Nusa Tenggara region. Based on the general plan for electricity supply for 2021-2030, there is a plan to interconnect a 2x11 MW wind power plant. The addition of wind power plants will pose a considerable threat to the system due to the intermittency nature of renewable energy plants. Therefore, a comprehensive grid impact study is needed to convince network managers that adding wind farms will not cause disruptions to the system either locally or in general and is expected to strengthen the electricity system. The power flow simulation results, installing a 2x11 MW wind farm on the Timor system can improve voltage quality and reduce losses on both 70 and 150 kV systems. For transient stability, the frequency value on the Timor system still meets the grid code requirements. In addition, the simulation results of the intermittency impact of the wind power plant output show that the Timor system is still in a stable condition. The stability of the rotor angle of the existing power plant when the transient stability simulation is carried out shows that it is still in a balanced condition.
Publisher Name	Institute of Advanced Engineering and Science
Publish Date	2024-07-01
Publish Year	2024
Doi	DOI: 10.11591/ijeecs.v35.i1.pp32-41
Citation	
Source	Indonesian Journal of Electrical Engineering and Computer Science
Source Issue	Vol 35, No 1: July 2024
Source Page	32-41
Url	https://ijeecs.iaescore.com/index.php/IJEECS/article/view/35961/18383
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