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Technological Developments to Reduce Wind Blade Turbine Levelized Cost of Energy

Authors : Pedro Miguel Cardoso Carneiro, Ricardo André Nunes Borges, João Pedro Soares Loureiro, Hermínio Maio Graça Fernandes

Abstract : Wind energy has been exponentially growing over the last years and will allow countries to progress regarding the decarbonization objective. In parallel, the maintenance activities have also been increasing in consequence of ageing and deterioration of the wind farms. The time available for wind blade maintenance is given by the weather window that is based upon weather conditions. Most of the wind blade repair and maintenance activities require a narrow window of temperature and humidity. Due to this limitation, the current weather windows result only on approximately 35% days/year are used for maintenance, that takes place mostly during summertime. This limitation creates large economic losses in the energy production of the wind towers, since they can be inoperative or with the energy production output reduced for days or weeks due to existing damages. Another important aspect is that the maintenance costs are higher due to the high standby time and seasonality imposed on the technicians. To reduce the relevant maintenance costs of blades and energy loses some technological developments were carried out to significantly improve this reality. The focus of this activity was to develop a series of key developments to have in the near future a suspended access equipment that can operate in harsh conditions, wind rain, cold/hot environment. To this end we have identified key areas that need to be revised and require new solutions to be found; a habitat system, multi-configurable roof and floor, roof and floor interface to blade, secondary attachment solutions to the blade and to the tower. On this paper we will describe the advances produced during a national R&D project made in partnership with an end-user (Onrope) and a test center (ISQ).

Keywords : wind turbine maintenance, cost reduction, technological innovations, wind turbine blade
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