

Blockchain technology in the wind energy sector: an overview of potential applications

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The development, construction and operation of a wind farm is a complex and long proccess involving many different agents. Disputes arising from interpretations of contract clauses are usually lengthy and costly. Unprecise definition of boundaries (both physical as well as contractual) is also a source for delays and extra costs. On the other hand, blockchain technology provides the framework under which a set of data can be irrevocably and undisputably arranged in a way that all parties can share it and add elements to the blockchain in a secure way which is validated by the system itself. One of the uses of blockchain is the implementation of smart contracts witch enable the execution of certain clauses without the need of a third party external assessment. Some of the contracts are exceedingly complex to try to reduce them to a set of simple rules, but the development of smart contracts for specific aspects can be of great help to increase the efficiency of a project. In this paper, we analyse the different phases of a wind farm project (from predevelopment works to operation and maintenance) and suggest smart contracts for those elements that can be singled out as suitable for this technology. We find that, at some stages, a formal input from a third party may be needed and suggests ways to automatize this. This hybrid character is not present, however, for the operation of the wind farm, where a sensible choice of sensors may conform a fully automated system.

Biography

Francisco Orte Benedit is currently a PhD student of ETSII, UPM. He has spent the last 6 years working as a consultant in blockchain technology and its appplications. Jose Manuel Mira McWilliams, associate professor at ETSII, completed his PhD in 1995 and has published 19 papers in statistics and quantitative models. Maria Jesus Sanchez Naranjo is associate professor at ETSII, completed her PhD in 1995 and has published more that 29 papers in statistics and quantitative models. Pablo Solana, PhD, is a consultant for renewable energies and has published more than 30 papers in scientific journals.

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Session name/ number:
Category: (Oral presentation/ Poster presentation) Oral