

## *The Energy Blockchain: Technical Issues in Power Systems Applications*

Being recognised among the 10 top strategy digital technological innovations in 2018 by Gartner, the Blockchain is now loosing appeal from many observers. The reasons, in the energy field, are many and essentially relate to some technical challenges not already solved, on one hand, and to the idea that this technology can jeopardize the leading role of some of the main actors of the energy market in the short term. This paper offers an overview about the energy blockchain implementations over the world and discusses the energy market models that could easily integrate the blockchain technology. The technical challenges of P2P electricity trading, as well as the possibility to transact ancillary services, are discussed in the particular case of blockchain applied to electricity exchange over microgrids. Also the issue of power losses allocation is considered in case of multiple transactions that take place at the same time. In relation to these particular applications, the different types of commonly adopted blockchain platforms will be critically revised. Finally, a few experimental tests are described. One concerns an experimental setup for electricity data reading and storage over the blockchain using the Tendermint platform, others refer to the use of OPF and tracing algorithms for assessing losses and reactive power provision service for optimizing the grid operation. These algorithms should indeed be part of smart contracts ruling the relation between parties in a P2P energy market environment.