

## Achieving High Renewable Energy Penetration in Western Australia Using Data Digitisation and Machine Learning

**Authors :** A. D. Tayal

**Abstract :** The energy industry is undergoing significant disruption. This research outlines that, whilst challenging; this disruption is also an emerging opportunity for electricity utilities. One such opportunity is leveraging the developments in data analytics and machine learning. As the uptake of renewable energy technologies and complimentary control systems increases, electricity grids will likely transform towards dense microgrids with high penetration of renewable generation sources, rich in network and customer data, and linked through intelligent, wireless communications. Data digitisation and analytics have already impacted numerous industries, and its influence on the energy sector is growing, as computational capabilities increase to manage big data, and as machines develop algorithms to solve the energy challenges of the future. The objective of this paper is to address how far the uptake of renewable technologies can go given the constraints of existing grid infrastructure and provides a qualitative assessment of how higher levels of renewable energy penetration can be facilitated by incorporating even broader technological advances in the fields of data analytics and machine learning. Western Australia is used as a contextualised case study, given its abundance and diverse renewable resources (solar, wind, biomass, and wave) and isolated networks, making a high penetration of renewables a feasible target for policy makers over coming decades.

**Keywords :** data, innovation, renewable, solar

**Conference Title :** ICRSE 2018 : International Conference on Renewable and Sustainable Energy

**Conference Location :** San Francisco, United States

**Conference Dates :** June 06-07, 2018