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Wind Energy in Oman —Current Status and Future Development—

Sultan AL-Yahyai
Sultan Qaboos University, Department of Electrical & Computer Engineering, Sultanate of Oman (s.alyahyai@gmail.com)

The wind regime in Oman coupled with an extensive coastline and vast unpopulated areas have to potential to contribute significantly to the future electricity supply of the country. However, wind energy is not quite as simple to implement as some other renewable energy sources. The analysis of ground stations measurements, indicate a higher potential in the southern parts of Oman. This region is swept by a monsoon system during the summer season. Local circulation is also contributing significantly to the wind system during the other seasons ensuring sustainable wind circulation in the region all over the year.

Few studies were published with respect of the possible use of wind energy in Oman. These studies used wind data based on ground measurements provided by the Department of Meteorology in Oman. This Department is currently running 29 weather stations scattered around the country and collecting wind data at 10m above the ground. Due to the complexity of the terrain in Oman, the spatial and temporal coverage of the actual meteorological network in Oman presents some inadequacy with the needs of the wind power industries in term of data sets and they are intended mainly to serve meteorological navigation applications.

To assess the future wind power implementation a comprehensive overview of wind resources at different scales is needed. With the current available computational power, it is possible to realize the use of high resolution Numerical Weather Prediction (NWP) models to provide wind data usable for wind energy resource assessment. Due to the uncertainties in the NWP forecasts, in-situ measurements such as wind profiler need to be considered as well for the NWP models validation.

Because of the spatial components of wind energy assessment, including potential energy demand, land use and existing transmission lines, Geographical Information System (GIS) is a valuable technology that can be also used during the planning and implementation phases of the wind energy systems to select the optimal site for the future wind farm implementation.

This paper summarizes the current state of wind energy resource assessment in Oman and highlights the framework for future studies.