

ABSTRACT

Pakistan has so far neglected the significance of renewable power generation alternatives in the National integrated energy vision. The way forward is to exploit the ideal solar irradiation/ wind profile received in multifarious areas of Pakistan. In this thesis, data has been acquired and processed further for modeling an effective hybrid solar PV/ wind system. The potential sites have been identified based on the supply demand curves and further analyzed to estimate the technical and financial viability. Different Maximum Power Point Tracking (MPPT) schemes have been envisaged and further optimized through energy management fuzzy classifier. Grid coupled solar/ wind solution was implemented and validated using electrolyzer module. A technical case has been made and presented for coupled grid tied renewable routine to bring in a step change transformation in the energy sector of Pakistan.