

Solar and Wind Energy Potential Study of Sindh Province, Pakistan for Power Generation

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Abstract : Global and diffuse solar radiation on horizontal surface of southern Sindh namely Karachi, Hyderabad, Nawabshah were carried out using sunshine hour data of the area to assess the feasibility of solar energy utilization at Sindh province for power generation. From the observation, result is derived which shows a drastic variation in the diffuse and direct component of solar radiation for summer and winter for Southern Sindh that is both contribute 50% for Karachi and Hyderabad. In Nawabshah area, the contribution of diffuse solar radiation is low in monsoon months, July and August. The K_t value of Nawabshah indicates a clear sky almost throughout the year. The percentage of diffuse radiation does not exceed more than 20%. In Nawabshah, the appearance of cloud is rare even in monsoon months. The estimated values indicate that Nawabshah has high solar potential whereas Karachi and Hyderabad has low solar potential. During the monsoon months, the southern part of Sindh can utilize the hybrid system with wind power. Near Karachi and Hyderabad, the wind speed ranges between 6.2 to 6.9 m/sec. There exist a wind corridor near Karachi, Hyderabad, Gharo, Keti Bander and Shah Bander. The short fall of solar can be compensated by wind because in monsoon months July and August the wind speed are higher in the southern region of Sindh.

Keywords : hybrid power system, power generation, solar and wind energy potential, southern Sindh

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