Potential of Renewable Energy in Balochistan:

Solar Potential:

While specific estimates are difficult to find, Balochistan's geography, irradiance, and location make it one of Pakistan's most high-potential provinces, with respect to renewables. According to satellite data, approximately 40% of Balochistan receives direct solar radiation greater than 6 kWh per square meter, and the World Bank calculated a total solar potential of 1.2 million MW in Balochistan. According to World Bank VRE Study, the most suitable areas are in northeastern Balochistan where good solar resources come together with existing grid infrastructure. The areas in Balochistan have an interesting long-term potential which is not yet developed and needs a major investment into transmission line construction. Some potential Solar Photo Voltaic (PV) sites based on grid capacity availability identified in VRE Study are; Kuchlak 200 MW, Panjgur 100 MW, Mastung 100 MW, Bostan 100 MW, Khuzdar 100 MW, Qila Saifullah 100 MW, Khanozai 100 MW, Mach 50 MW and Muslim Bagh 50 MW.

Concentrated Solar Power (CSP) is a solar technology which is alternative to PV, where the heat of the sun irradiation is used to heat up a medium (usually thermal oil or molten salt) and then used to run a steam turbine just like the thermal power plants. While CSP generally have higher capital expenditure than PV, but it has its additional benefit of easy storage. Thus, making it an attractive case for utility scale operation because its generation and dispatch is generally stable. Its site requirements are somewhat different because it requires a high Direct Normal Irradiation (DNI), whereas PV requires high Global Horizontal Irradiance (GHI). CSP can be used to replace the costly thermal power plants as its generation is rather similar to the generation of thermal power plants. In Pakistan, Balochistan is practically the only province which is suitable for CSP. The area around Quetta and vicinities has very good DNI and also grid capacity availability. According to World Bank VRE Study suggested sites for CSP are Kuchlak 200 MW and Khanozai 100 MW.

Wind Potential:

The U.S. National Renewable Energy Laboratory (NREL) estimated a wind potential of 20,000 MW in Balochistan, with a significant potential existing in Chaghi District and Makran Region. According to World Bank VRE Study, the Chaghi Wind Potential can be exploited by a recommended Transmission line that goes from Chaghi (western Balochistan) to Muzaffargarh in western Punjab. Some potential Wind Power sites based on grid capacity availability identified in VRE Study are; Panjgur 200, Khuzdar 200 MW MW, Qila Saifullah 200 MW, Mach 100 MW and Muslim Bagh 100 MW.

Based on Wind Resource Assessment by Engro Energy limited (EEL) at Chaghi, the Chaghi Wind Corridor has the best wind resource in Pakistan. Year wise load flow increase was suggested in the Engro Preliminary load flow study i.e. starting from 50 MW and scaling it up to 500 MW by increasing the transmission capacity of Grid.