Renewable energy storage pakistan

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Renewable energy in Pakistan is a relatively underdeveloped sector; however, in recent years, there has been more and more interest to explore renewable energy resources for the energy production. Around 10.57% of Pakistan"s total installed power generation capacity (in 2020) comes renewables (wind, solar and biogas).[1] Most of Pakistan"s renewable energy comes from hydroelectricity. As per the vision of the Prime Minister, there is the aim to "induct 20% of RE by the year 2025 and 30% of RE by the year 2030."[2]

Pakistan is developing wind power plants in Jhimpir, Gharo, Keti Bandar and Bin Qasim in Sindh. The government of Pakistan decided to develop wind power energy sources due to problems supplying energy to the southern coastal regions of Sindh and Balochistan, the project was undertaken with assistance from the government of China. Another area with potential is Swat which shows good wind conditions in windpower investment. The Chagai District in Balochistan has good potential for wind power in the Nukundi area near the Afghan/Iran Border, with wind speeds often 12.5% higher than average required for energy generation.[5]

Micro Hydro more than 3000 MW micro hydropower potential exists in Pakistan only 150 MW has been utilized yet. T15 is the international standard turbine being used locally.

Tidal power has not yet been operational in Pakistan compared to other renewable energy technologies. In Sindh, two sites, creek system of Indus delta of 170 km and two to five metres tidal heights at the Korangi Creek, are available to exploit the tidal energy. Sonmiani Beach and Kalamat are also good prospects of tidal energy in Balochistan. Government has issued licence to private companies to take measures to build tidal power stations in February 2013. Since then, the engineering work is under process, and initially a 10 MW plant is proposed at Sonmiani Bay. Construction was expected to start by the end of 2013.

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AnchorThe energy sector in Pakistan poses a challenge to its economic development. The sector has made progress since 2013 in terms of power generation and reducing power outages, but it is still facing challenges due to the high cost of fuel sources, dependence on imported energy products, insufficient natural gas supplies, mounting debt, and outdated transmission and distribution systems.

According to National Electric Power Regulatory Authority"s (NEPRA) 2022 yearly report, Pakistan"s total installed power generation capacity is 43,775 MW, of which 59% of energy comes from thermal (fossil fuels),

25% from hydro, 7% from renewable (wind, solar and biomass), and 9% from nuclear.

Pakistan is taking steps towards meeting its energy demands and reducing greenhouse gas emissions. The Government of Pakistan (GoP) is actively pursuing renewable energy investments on a large scale, as part of its clean energy goals. Pakistan has set a target to reduce its greenhouse gas emissions by 50% by 2030, and clean energy expansion will play a crucial role in achieving this objective.

AnchorIn addition to large hydro, there are prospects for the development of small-mini-micro hydropower with a revised RE policy. The GoP considers small hydropower projects as a clean and inexpensive source of energy. Small hydropower projects are mainly located in remote areas of Pakistan particularly the North of the country. Recently, the GoP has identified new generation requirements by capacity, fuel technology, and utilizing indigenous resources for power generation by announcing the Indicative Generation Capacity Expansion Plan (IGCEP). This plan aims to add 13,000 MW of hydropower capacity to the current 9000 MW capacity by 2030(.

Pakistan has an average of nine and a half hours of sunlight daily. Solar power entered Pakistan"s energy mix in 2013 after the government introduced a set of support policies to foster renewable energy development. According to the Private Power & Infrastructure Board (PPIB) of the Ministry of Energy, seven solar projects of 530 MW are operational and supplying electricity to the national grid.

With the rising costs of electricity in Pakistan and an unreliable grid supply, more industries and commercial organizations are turning to captive solar solutions. There has been a strong surge in domestic installation of rooftop photovoltaic panels in larger cities. For projects under 1 MW, net metering regulations came into effect in September 2015. The current state of the energy sector is promising for growth in solar power in the future. given rising fossil fuel prices.

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