Pakistan energy storage for renewable energy

Pakistan energy storage for renewable energy

Pakistan has tremendous potential to generate solar and wind power. According to the World Bank, utilizing just 0.071 percent of the country"s area for solar photovoltaic (solar PV) power generation would meet Pakistan"s current electricity demand.

Wind is also an abundant resource. Pakistan has several well-known wind corridors and average wind speeds of 7.87 m/s in 10 percent of its windiest areas. However, despite a number of successful projects, the installed capacity of solar and wind energy in Pakistan, at just over 1,500 Megawatts, is just 4 percent of total capacity, equal to around 2 percent of total generation.

These questions are addressed in our recently published Variable Renewable Energy Integration and Planning Study. The report was undertaken by the global engineering and advisory firm Tractebel Engineering GmbH over an 18-month period in close coordination with the Power System Planning Department at Pakistan"s National Transmission & Despatch Company (NTDC) and other key agencies.

The study has helped provide the evidential foundation for the government"s Alternative and Renewable Energy Policy 2019, and the Indicative Generation Capacity Expansion Plan (IGCEP 2047) submitted by NTDC to the National Electric Power Regulatory Authority (NEPRA) in March this year. It also confirms Pakistan"s target to increase VRE to 20 percent of its electricity mix by 2025, 30 percent by 2030, and even shows that slightly higher penetrations of solar and wind would be economically beneficial.

To achieve such targets, a massive and immediate expansion of solar and wind is required through competitive bidding which would decrease prices. Efforts to reduce power generation from uneconomic thermal plants (in particular heavy fuel oil) and continued investment in hydropower must continue as well.

While there are strong national and provincial motivations for development of domestic coal in Pakistan, including local economic development, jobs, and increased energy security, the economics do not support such a strategy because of recent VRE cost reductions. The report suggests that domestic coal would not be added to the system until at least the early 2030s, and not at all when external costs such as GHG emissions are considered; imported coal remains uneconomic under all scenarios.

Achieving the proposed scale-up of VRE, equivalent to over 24,000 Megawatts of additional capacity by 2030, will require a coordinated and sustained effort by both the federal and provincial governments. Major investment is needed in the transmission system, including new automation and control systems, as well as regular rounds of competitive bidding based on a clear capacity expansion plan. The World Bank, working closely with other development partners, stands ready to support Pakistan in this endeavor, achieving the goal of affordable, reliable power for all by 2030.

Pakistan energy storage for renewable energy

This study was funded by the World Bank"s Energy Sector Management Assistance Program (ESMAP) and the United States Agency for International Development (USAID), and was prepared by Tractebel Engineering GmbH under contract to the World Bank.

Countrywide, consumers, businessesand industries are rushing to tap into the cheap renewable power source as an alternative to the erratic and expensive state-provided, largely fossil-fuel-based energy.

Pakistan"s unreliable power grid, compounded by under-supply and poor infrastructure, means that millions of people live in constant uncertainty. Many households around the country have also been crippled by soaring energy prices over the past three years, inflated by high oil and gas prices post Putin"s invasion of Ukraine, an over-investment in thermal power plantsand government subsidy cuts to meet International Monetary Fund loan conditions.

It is unclear exactly how much of the total imported solar capacity will be installed in 2024, as government records cannot keep pace with the speed of the consumer-led transition. But for homes across the country, the energy switch is already making a difference.

His mom"s experience -- she spent two days in the hospital recovering from heatstroke after suffering inside on a scorching summer"s day without electricity -- was the catalyst for him to install solar panels on his rooftop. His colleague recommended he buy from a local company that was importing the panels from China.