FROM BLACK OUTS TO BREAK-TROUGHS

27th December, 2025

CRCSF PUBLICATIONS

Pakistan is a country blessed with an abundance of natural resources. It has the sun that shines with full warmth, rivers rushing with enough strength to generate clean and reliable energy, winds capable of running turbines, and large reserves of coal, gas, & minerals. However, these resources remained underutilized for decades, creating chronic power shortages & mounting circular debt exceeding 2.6 trillion rupees. This situation increased Pakistan's dependence on imported fossil fuels, placing a heavy financial burden on households & industries. Coal was adopted as a temporary emergency measure to keep the power system running, but it has caused serious environmental harm.

A noticeable shift, however, is now unfolding across Pakistan's energy sector. Recent data from the NEPRA State of Industry Report shows a clear upward movement: in the first 9 months of FY 2023–24, electricity production from solar & wind sources increased by nearly 35% year-on-year, while electricity produced from Re-gasified Liquefied Natural Gas (RLNG), a costly imported fuel, fell significantly. This change reflects not a temporary fluctuation but the emergence of a new direction in Pakistan's energy priorities.

A major driver of this transition is the deepening energy cooperation between Pakistan & China. When the China–Pakistan Economic Corridor (CPEC) was launched in 2015, its early projects provided critical relief, adding more than 10,000 MW of electricity to a struggling grid, according to CPEC Authority reviews. This immediate support restored industrial activity, reduced load-shedding, & stabilized the national system at a time of crisis. Today, that collaboration has entered a more forward-looking phase.

China-Pakistan are working together to develop more innovative, clean, & climate-resilient technologies. The 300 MW Gwadar Solar Power Project, approved by the Cabinet Committee on Energy in 2023, has emerged as the centerpiece of this new vision. Developed under CPEC's renewable focus, it aligns closely with Pakistan's Alternative 7 Renewable Energy (ARE) Policy 2019, which aims to achieve 30% renewable energy in the national mix by 2030. This evolution demonstrates the maturity & strategic depth of the Pakistan-China partnership. What began as an urgent effort to overcome blackouts has evolved into a structured model for sustainable development, technological cooperation, 7 long-term resilience.

As Pakistan accelerates its transition to clean energy, the lessons learned from this partnership offer hope for a greener domestic future & a promising example for the region. China has played a critical role in Pakistan's energy transformation through CPEC, setting an example for others to follow. According to the China Economic Net, Chinese companies have installed over 8,700 MW of generation capacity, representing nearly 19% of the national power system. This includes coal, hydro, solar, & wind projects, as well as transmission upgrades aimed at stabilizing the grid, reducing losses, & promoting industrial development. By combining large-scale investment with advanced engineering practices, China has helped Pakistan not only meet immediate energy needs but also build a foundation for long-term sustainability.

CPEC projects reduce the need for expensive imported fuels by operating at an average generation cost of about 8.80 PKR/kWh, much lower than the national average of 19.66 PKR/kWh. Beyond financial benefits, Chinese firms have transferred technology & global best practices, training local engineers & technicians, with 70–80% of labor on ongoing projects drawn from Pakistan. This integration of workforce development, investment, & expertise demonstrates how bilateral cooperation can simultaneously address long-term energy deficits, encourage sustainable industrial growth & accelerate transition to renewable energy.

Pakistan's current energy challenges are more about system inefficiencies than a lack of capacity. With an installed capacity of approximately 46.2 GW, the country should be able to meet demand; however, bottlenecks in transmission, outdated infrastructure, & seasonal demand spikes continue to cause shortfalls. These losses not only waste valuable electricity but also harm the economy by increasing operational costs & circular debt. Recent improvements, such as the Matiari-Lahore HVDC line, which significantly reduces transmission losses, show that system-level reforms are as important as new generation projects. To fully realize Pakistan's energy potential, modernizing the grid must become a national priority.

Energy insecurity is more than a technical issue; it slows economic growth & affects daily life. Industries face delays, investors hesitate, and households struggle with unreliable power. Pakistan’s recent rise in solar adoption shows strong public demand for affordable, reliable energy. When policies, technology, & market needs align, achieving energy security becomes possible.

China–Pakistan energy projects combine renewables for clean growth with conventional plants for stable supply. Solar & wind initiatives like Quaid-e-Azam Solar Park and Thatta farms showcase Pakistan's green potential, while coal & hydro plants like Sahiwal & Karot ensure reliability. This mixed approach avoids shortages as renewables expand. With strategic planning & investment, Pakistan can transition confidently to low-cost, climate-friendly energy.

Projects like the 350MW wind-solar hybrid system & 75MW wind plant by Mingyang Smart Energy, along with the Reon–SANY MoU for 150MW of industrial wind power, show that Pakistan's renewable energy growth is increasingly driven by both public initiatives & private partnerships. By 2024, Pakistan had imported over 16,600MW of solar modules from China, accelerating rooftop & utility-scale solar deployment & strengthening its clean-energy infrastructure.

Pakistan's energy profile is becoming noticeably more diverse as the country expands solar, wind, & hydropower capacity. According to recent energy reports, Pakistan's installed renewable energy capacity nearly doubled in 2025 to about 5,680 MW, with significant growth in solar, wind, & hydropower contributing to a greener power mix & reducing reliance on imported fossil fuels. This broader energy portfolio improves energy security & makes the system more resilient to global fuel price swings, highlighting how Pakistan's clean energy progress is evolving into a practical model for the region.

Beyond energy production, China–Pakistan cooperation is boosting the economy by creating jobs, increasing demand for local materials, & training workers in modern renewable technologies. Chinese battery storage allows 24/7 use of clean energy, supporting new industrial activity and developing technical skills across Pakistan.

Strategically, relying more on solar, wind, and hydro reduces Pakistan's dependence on imported fuels and exposure to global price fluctuations. Projects linked to Gwadar and cross-border infrastructure strengthen trade routes, making Pakistan's energy supply more reliable and supporting regional stability.

While significant progress has been made, challenges remain. High infrastructure costs, delayed payments, regulatory hurdles, and political uncertainties can slow project implementation.

Rapid expansion of private solar raises concerns about grid stability and equitable access, and coal-based projects still require careful environmental oversight. However, these challenges are manageable. With consistent policies, clear regulations, and continued China–Pakistan collaboration, Pakistan can sustain its clean energy momentum, ensuring reliable power, economic growth, and widespread benefits for households, industries, and communities alike.