**Pak-China Nuclear Energy Cooperation**

**The high-priced electricity and frequent shortages have profoundly affected commercial activities.**

[Sher Ali Kakar](https://www.nation.com.pk/columnist/sher-ali-kakar)

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China–Pakistan civil nuclear cooperation is a key aspect of the strategic partnership between the two countries. At a time when Pakistan is grappling with an energy crisis that has only worsened the country’s economic situation, China’s nuclear energy cooperation is significantly bolstering Pakistan’s power sector by adding clean, reliable, and cost-effective energy. The Chashma Nuclear Power Project Unit-5 (C-5), whose construction has officially commenced with China’s assistance, marks a landmark development for the country’s energy sector and reflects the long-term practical cooperation between Beijing and Islamabad. C-5, which will be operational by 2030, will significantly improve the power sector and boost socio-economic development.

China–Pakistan nuclear energy cooperation began in the late 1970s when Pakistan sought assistance to meet its energy demands amidst population growth and economic expansion. In September 1986, China and Pakistan signed an agreement to provide Pakistan with civil nuclear technology and assist the latter in developing its civil nuclear energy programme. Under the cooperation agreement, China agreed to transfer its indigenously developed Qinshan-1 nuclear power plant in 1991. In 1993, Pakistan began the construction of Chashma Nuclear Power Plant-1 (CHASNUPP-1 or C-1), which became operational in 2000. This was followed by the construction of Chashma Unit-2 (CHASNUPP-2) in 2005, with grid connection in March 2011.

In June 2008, an agreement was signed between the two countries to build two more nuclear reactors, Chashma-3 (CHASNUPP-3) and Chashma-4 (CHASNUPP-4), at the Chashma site, which have been operational since 2017 and 2018, respectively. The construction of power plants in Karachi—Karachi Nuclear Power Plant-2 (K-2) and Karachi Nuclear Power Plant-3 (K-3)—began in 2015 and 2016, respectively. K-2 was connected to the national grid in March 2021, followed by K-3 in March 2022. Pakistan’s first nuclear power plant at Karachi (KANUPP) Unit-1 was permanently shut down in August 2021 after 50 years of remarkable operational service. In 2023, a memorandum of understanding (MoU) to build a new unit, Chashma-5 (C-5), was signed between the two countries. Pakistan is now set to construct C-5—the largest power plant in the country.

Currently, Pakistan is operating six nuclear power plants (NPPs). All six new generations of NPPs in Pakistan are Pressurised Water Reactors (PWRs), which are designed and constructed with China’s assistance. Pakistan’s total installed capacity of nuclear energy is 3,545 MW, contributing 18.2% to the total electricity generation in the national grid during the July–March Fiscal Year 2024. The construction of C-5 is set to become Pakistan’s largest power plant by adding 1,200 MW of clean energy to the national grid and increasing Pakistan’s total nuclear energy capacity to 4,760 MW. Pakistan plans to increase its nuclear energy capacity to 40,000 MW by 2050, reflecting the country’s commitment to improving the power sector through clean and reliable energy.

Currently, due to the inefficiency of Pakistan’s power sector in meeting the country’s energy demands and its heavy reliance on imported fossil fuels, electricity costs have risen to unaffordable levels. The high-priced electricity and frequent shortages have profoundly affected commercial activities. Additionally, the cost of living for consumers and households has increased. Pakistan’s increased dependence on fossil fuel imports for its energy needs has severely burdened the country’s economy. In 2023, the share of fossil fuels stood at 59% of the country’s electricity generation mix. This figure further increased in the first quarter of FY-2025 by 15.74%. This worsening energy insecurity makes the country vulnerable to fluctuations in the international prices of oil, coal, and gas.

The construction of C-5 will give new impetus to socio-economic development by substantially boosting Pakistan’s power sector and ensuring energy security. It will help Pakistan overcome the deepening economic crisis by saving foreign exchange reserves, reducing reliance on fossil fuels, and boosting the industrial sector by increasing productivity, profitability, investment, and business activities, while also easing the cost of living for consumers and households. Furthermore, it will create 40,000 jobs directly and indirectly during the peak period of construction. The International Atomic Energy Agency (IAEA) has monitored Pakistan’s civil nuclear programme and has consistently praised Pakistan for its outstanding nuclear safety and security record. This highlights Pakistan’s commitment to nuclear safety and security as a paramount national responsibility and promotes the peaceful uses of nuclear technology for the country’s socio-economic development.

To conclude, China’s cooperation has significantly contributed to the expansion of Pakistan’s nuclear energy capacity. Prioritising indigenously generated energy will help boost Pakistan’s power sector, accelerate industrial growth, reduce the burden of imported fuel, and promote sustainable development.

**Sher Ali Kakar**
The writer is working as an Acting Associate Director in Balochistan Think Tank Network (BTTN), at BUITEMS, Quetta.