



Global Nuclear Renaissance – OpEd

📅 September 16, 2026

By [Hafsa Azam](#)

Key Takeaways:

- Nuclear is framed as back because of demand, climate targets, and energy security. IAEA: capacity could more than double by 2050. Middle East and Ukraine wars have cut oil and refining; conflict-linked producers were cited at ~43% of oil, with 5–7 million bpd off the market and European diesel far above early 2026.
- Pitch: dense fuel, 24-hour power, less fossil-price risk. Cited: UAE Barakah, a U.S.–Saudi 123 deal (July 2026), Türkiye Akkuyu, a Swiss EPR study. SMRs and MSRs are sold as smaller and factory-built; only two SMRs run now (Russia, China). About 80 designs are in 18 countries.
- Pakistan: six plants, >3,530 MWe, C-5 building under IAEA safeguards. Vision 2050 aims at 32 plants and 42,000 MWe. The close: SMRs with China.

Nuclear power has re-emerged as a central pillar of the global energy transition, driven by rapidly growing electricity demand, the urgent need to decarbonize economies, increasing concerns over energy security and geopolitical resilience. The International Atomic Energy Agency (IAEA) has projected that global nuclear generating capacity could more than double by 2050 as more countries expand their nuclear programs and deploy next-generation technologies. Among these, Small Modular Reactor (SMRs) and microreactors, designed for factory-based manufacturing and modular assembly, offer the promise of shorter construction periods, lower upfront costs and greater deployment flexibility.

Nuclear power offers several advantages that other energy sources cannot fully replace. First, 1 kg of uranium 235 can produce energy equivalent to approximately 20,000 kg of coal, while generating virtually no carbon emissions during electricity production. In terms of energy yield, 1 kg of uranium 235 produces 24,000,000 kWh of heat compared to 8 kWh of heat produced by 1 kg of coal. Second, nuclear plants operate continuously, providing reliable 24-hour baseload electricity, unlike solar and wind power, which depend on sunlight and wind conditions respectively. Third, nuclear energy reduces exposure to volatile international prices of coal, oil, and natural gas while strengthening national energy security. Fourth, dams needed for hydropower can be built only at a few specific sites on the rivers. Countries across the world are therefore preferring Nuclear Power Plants (NPPs) as a suitable option for energy production.

The current war in Middle East has added a serious strain on the fragile energy supply-chain. According to Reuters, nearly half of the world's oil supply is currently produced in conflict-affected regions, with countries involved in conflicts—including Venezuela—accounting for 43% of global oil production, or around 45 million barrels per day (bpd) last year. The Middle East remains the most disruptive hotspot, with an estimated 5–7 million bpd of oil supply removed from the market which comes to about 13.3% of global oil supply. Likewise, global refining capacity has declined by approximately 10% amid the wars in the Middle East and Ukraine. The crisis is particularly affecting refined fuels, as Gulf states are major exporters of refined petroleum products. Global refining capacity—especially in Europe—has shrunk significantly over the past decade; consequently, European diesel prices are now 70% higher than in February 2026, reflecting the region's critical dependence on imported fuels. Meanwhile, the Russia–Ukraine conflict and embargo on Russian oil continue to disrupt fuel supplies to Europe.

These disruptions have increased global dependence on the US crude and refined fuel supply. In turn, the US is facing supply pressure as crude oil imports from Canada and Venezuela have reduced by 300,000 bpd and 40,000 bpd, respectively. Together, these developments are intensifying global energy insecurity, pushing inflation higher, accelerating the race among countries to secure alternative sources of energy and encouraging greater investment in nuclear power.

Oil-rich countries are increasingly turning to nuclear energy to ensure security of their energy supply and reduce domestic hydrocarbon consumption. According to World Nuclear Association, the UAE's Barakah NPP, with four reactors and capacity of 5,348 MWe, can supply around 25% of the country's electricity and avoid release of about 22 million tonnes of CO₂ annually. Saudi Arabia is also transforming its energy security. On 22 July 2026, the US and Saudi Arabia signed 123 Agreement for peaceful nuclear cooperation, creating a framework for a multi-billion-dollar civil nuclear energy partnership. Türkiye, meanwhile, is developing its 4.8 GW Akkuyu NPP as part of a broader strategy to reduce dependence on imported fossil fuels.

A new study by BAK Economic research institute, commissioned by the Swiss business federation Economiesuisse, has concluded that constructing a new NPP in Switzerland would be economically feasible and deliver substantial long-term economic benefits. Based on the current policy framework under the Electricity Act, the study's baseline scenario envisions the commissioning of a European Pressurized Reactor (EPR) with an installed capacity of 1.63 GW by 2050. The proposed plant is expected to generate approximately 12.1 TWh of electricity annually, including about 6.7 TWh during the winter months, enough to meet nearly 15% of Switzerland's projected winter electricity demand. The economic assessment also highlights significant domestic benefits. The construction projected to generate a cumulative domestic value of USD 8 billion, with approximately 51% of the total construction expenditure expected to remain within Switzerland.

One practical pathway to overcoming energy related challenges lies in a new generation of reactor designs. SMRs, generally producing less than 300 MWe, could transform the nuclear industry through standardized designs, factory-based manufacturing and repeatable production processes. Their smaller size especially in case of Micro reactors (less than 50 MWe output) and flexible deployment options make them suitable for regional electricity grids, remote areas and energy-intensive industrial facilities where conventional large-scale reactors may not be practical.

Another promising option is Molten Salt Reactors (MSRs), which produce less high-level radioactive waste and do not require solid fuel. They can operate using multiple fuel cycles, including uranium-plutonium and thorium-uranium, improving fuel utilization and extending fuel resources. In addition, MSR's high-temperature output supports both efficient electricity generation and industrial process heat applications. China is planning to build a 2 MW experimental Thorium Molten Salt Reactor (TMSR) with liquid fuel, located in Wuwei, Gansu Province near Gobi Desert.

According to the IAEA's Advanced Reactors Information System (ARIS) database 2024, SMRs is driving innovation throughout the nuclear power sector in 18 countries including the US, Russia, China and Canada, with about 80 SMR designs currently in various stages of development and deployment around the world. These designs encompass various technologies, such as pressurized water reactor (PWRs), high-temperature gas-cooled reactors (HTGRs), and molten salt reactors, each with unique advantages and applications.

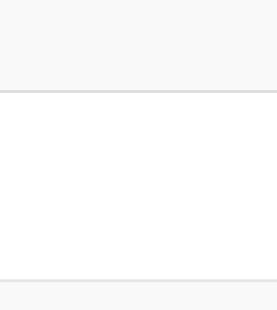
According to Statista, as of 2026, only two SMRs are operational worldwide. A floating nuclear power plant powered by SMR, Akademik Lomonosov in Russia, has been in operation since 2020, utilizing two KLT-40S reactors with a combined capacity of 70 MWe. In China, the HTR-PM, a high-temperature gas-cooled reactor (HTGR), began producing power in December 2021 and commenced commercial operation in late 2023, with an electrical output of 210 MWe. These reactors represent the only operational SMRs globally, highlighting the early stage of SMR deployment.

In Argentina, the CAREM-25 prototype reactor is under construction, with grid connection expected by 2028. The Korea Research Institute of Ships and Ocean Engineering (KRISO) received American Bureau of Shipping (ABS) Approval in Principle for a next-generation container ship powered by two small modular MSR. Under the certification process for a 15,000 TEU-class SMR-powered container ship, the KRISO, in collaboration with Samsung Heavy Industries, developed the ship's high-speed hull design, reactor and major system layout, as well as the power operation and control technologies. Meanwhile, the Korea Atomic Energy Research Institute (KAERI) is responsible for developing the MSR technology specifically designed for marine applications.

Pakistan operates six NPPs, contributing over 3,530 MWe in total energy generation. According to the World Nuclear Industry Status Report (WNISR) 2025, nuclear energy contributed about 21.7 terawatt-hours (TWh) to Pakistan's energy mix. C-5 NPP is currently under construction. All NPPs in Pakistan operate under IAEA Safeguards. IAEA has also approved Safeguards agreement for C-5. Pakistan plans to build 32 NPPs with a total capacity of 42,000 MWe, one-fourth of the country's energy needs under its Nuclear Energy Vision 2050. This Vision represents a long-term strategy to substantially expand nuclear electricity as part of the country's response to rising energy demand, dependence on imported fossil fuels, electricity-price volatility and achieve net-zero by 2050, as one of the most affected country by the global warming.

The successful integration of SMRs into Pakistan's energy landscape could lead to a more diversified and resilient energy mix. SMRs offer a sustainable solution to Pakistan's energy challenges. Pakistan, in collaboration with China, could navigate the complexities of SMR development, from regulatory frameworks to technical training.

The renewed global interest in nuclear energy represents more than a temporary policy shift. It reflects a fundamental reassessment of how nations intend to achieve energy security, economic resilience and climate neutrality simultaneously, while reducing dependence on fossil fuels.



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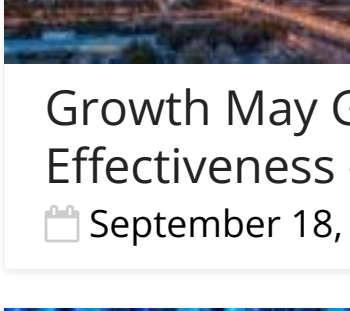
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