ISSUE BRIEF

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Deepening IAEA-Pakistan Partnership for Peaceful Nuclear Cooperation

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(Views expressed in the brief are those of the author, and do not represent those of ISSI)

The International Atomic Energy Agency (IAEA) Director General, Rafael Mariano Grossi, visited Pakistan on February 12- 13, 2025. During the visit, he met with Prime Minister of Pakistan, and visited Chashma 5 as well as the Institute of Nuclear Medicine and Oncology (INMOL), Lahore. This was Mr. Grossi's second visit to Pakistan and illustrated longstanding history of collaboration between the IAEA and Pakistan. Pakistan's use of nuclear technologies in the field of energy, agriculture, medicine and industry to promote socioeconomic development was showcased during Mr. Grossi's visit. Pakistan has had an impeccable nuclear safety and security record for six decades, making the country's peaceful nuclear programme a success story.

Director General Grossi met Prime Minister Shehbaz Sharif and the two discussed prospects of closer cooperation on secure and peaceful uses of nuclear technology. They also discussed global challenges and underscored the importance of multilateralism. Pakistan reaffirmed the commitment to "further strengthening its collaboration with the IAEA."[1] The Prime Minister emphasized: "With the IAEA's

[1] Visit of Director General International Atomic Energy Agency to Pakistan," Press Release 52/2025 Ministry of Foreign Affairs, February 16, 2025, https://mofa.gov.pk/press-releases/visit-of-director-general-international-atomic-energy-agency-to-pakistan.

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support, Pakistan has made significant progress in nuclear power generation, industrial development, healthcare, and agricultural advancements, contributing to the country's socio-economic growth."[2]

Mr. Grossi also met Deputy Prime Minister/Foreign Minister Mohammad Ishaq Dar and discussed the role of nuclear energy in mitigating climate change as well as adaptation and financing of nuclear power. In the context of climate change, Pakistan is among the most vulnerable countries in the world. Pakistan is responsible for only 0.4 percent of global carbon emissions. However, it has been at the forefront of bearing the brunt of climate change devastation in the form of massive floods in 2022, which claimed thousands of lives and caused widespread material damage totaling more than US$30 billion. Thus, it is more important than ever that Pakistan must work on mitigating the effects of climate change in collaboration with the IAEA.

Mr. Grossi also traveled to Chashma Unit 5 site where construction recently began. The DG IAEA viewed concrete pouring for the Chashma 5 reactor and inaugurated an incinerator for the treatment of radioactive waste. Pakistan's biggest achievement in terms of nuclear technology is in the energy sector, which was showcased to Mr. Grossi. Currently, Pakistan has six nuclear power reactors at Chashma and Karachi with a total electricity generation capacity of 3262 MW.[3] In 2023, nuclear power generated about 17.4% of electricity in Pakistan.[4] Pakistan's Nuclear Energy Vision 2050 envisages 32 nuclear power plants with a 40,000 MW capacity, providing 25% of the country's energy needs.[5] Cooperation with the IAEA would be vital in achieving this goal. This will contribute to the goal of achieving zero carbon emissions for the energy sector by 2050. Currently, all of Pakistan's nuclear power plants are under IAEA safeguards.

Pakistan Nuclear Power Plants

[2] "IAEA Director General Meets Pakistan's Prime Minister to Strengthen Collaboration on Energy, Health and Food," February 13, 2025, https://www.iaea.org/newscenter/news/iaea-director-general-meets-pakistans-prime-minister-to-strengthen-collaboration-on-energy-health-and-food.

[3] Pakistan – Nuclear Energy Country Profile, IAEA, https://cnpp.iaea.org/public/countries/PK/profile/preview.

[4] Ibid.

[5] Ghazala Yasmin Jalil, "Pakistan's Nuclear Journey: Security and Development," CSCR, June 9, 2023, https://cscr.pk/explore/themes/defense-security/pakistans-nuclear-journey-security-and-development/.

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Reactor Name	Alternative Name	Model	Reactor Type	Net Capacity (MWe)	Construction Start	First Grid Connection
CHASNUPP-1	Chashma Nuclear Power Plant 1	CNP-300	PWR	300	1993-08	2000-06
CHASNUPP-2	Chashma Nuclear Power Plant 2	CNP-300	PWR	300	2005-12	2011-03
Chashma Nuclear Power Plant Unit 3	Chashma Nuclear Power Plant 3	CNP-300	PWR	315	2011-05	2016-10
Chashma Nuclear Power Plant Unit 4	Chashma Nuclear Power Plant 4	CNP-300	PWR	313	2011-12	2017-06
K-2	Karachi 2	HPR1000	PWR	1,017	2015-08	2021-03
K-3	Karachi 3	HPR1000	PWR	1,017	2016-05	2022-03

Source: "Country Profile: Pakistan," https://world-nuclear.org/information-library/country-profiles/countries-o-s/pakistan

Pakistan has also made tremendous strides in using nuclear technology in the health sector. DG Grossi visited INMOL (Lahore) where the IAEA is helping to upgrade the cyclotron used in cancer diagnosis and treatment. On the occasion of inauguration of new facilities, Mr. Grossi said: "We are proud and grateful to continue our collaboration with cancer care in Pakistan and beyond. INMOL is a valuable asset in this fight against non-communicable diseases. We will continue and do more together."[6] IAEA also supports the Nuclear Medicine Oncology and Radiotherapy Centre in Abbottabad under its technical cooperation program.

Currently, Pakistan operates 19 cancer hospitals under the auspices of the Pakistan Atomic Energy Commission (PAEC), which provides diagnostics and treatment to over a million patients each year. The Nuclear Medicine, Oncology, and Radiotherapy Institute (NORI) in Islamabad was among the first five centers under the IAEA's Rays of Hope initiative,[7] that aims to provide middle and low-income countries with cancer treatment.

Mr. Grossi also participated in a conference on "Women in Nuclear Science." It was jointly organized by Pakistan's Nuclear Regulatory Authority (PNRA) and Women in Nuclear Pakistan (WIN-Pakistan). The Director General talked about the IAEA's initiative for more women inclusiveness in the nuclear field. Consequently, the IAEA has doubled women's employment in the last five years. He praised and encouraged the mainstreaming of women in nuclear and related fields in Pakistan.

Mr. Grossi also participated in a seminar on the "Role of Nuclear Science and Technology in Achieving Sustainable Development Goals" where Pakistan's achievements in successfully utilizing nuclear

6 "IAEA Director General Meets Pakistan's Prime Minister."
7 Rays of Hope contributes to SDG 3 which pertains to Good Health and Well-Being.

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technologies for socio-economic development were discussed. Mr. Grossi also discussed the growing global momentum toward nuclear energy, stressing the need to accelerate its development. He noted that the U.S. is committed to advancing nuclear energy, China is building 26 more reactors, and India is constructing 6 reactors, while Japan is restarting 14 nuclear reactors, with plans for 9 additional ones. Mr. Grossi refuted the idea that nuclear energy is a thing of the past. He highlighted that the ongoing global energy debate is increasingly showing the positive potential of nuclear energy.

Pakistan is also using nuclear technologies to fight the adverse effects of climate change. In collaboration with the IAEA scientists at Pakistan's Nuclear Institute for Agriculture and Biology (NIAB) have developed climate-resistant crops and seeds, leading to more nutritious food crops, and sustainable cotton varieties. Pakistan has also used nuclear technologies for pest control, water management, plant nutrition, animal health and productivity, and food preservation.

Cooperation between Pakistan and IAEA goes back a long time. Pakistan was one of the founding members of the IAEA in 1957. Pakistan-IAEA collaboration has strengthened over the years and now Pakistan is also helping other countries under the IAEA umbrella. Under the 2021 Practical Arrangements, Pakistan is providing technical expertise and collaboration to African states in a number of fields such as energy, agriculture, health, and regulation.[8]

The visit of Director General Rafael Grossi will further strengthen Pakistan-IAEA cooperation in nuclear technology for the socioeconomic development of the country. Pakistan has not only demonstrated 60 years of safe operation of nuclear power plants, highlighting its spotless safety and security record, but it is also using nuclear technology to achieve many of the 17 UN Sustainable Development Goals (SDGs). Pakistan's strides in using nuclear technologies in health, agriculture, hydrology, industry, and climate change mitigation have contributed to SDGs like affordable and clean energy, zero hunger, health and well-being, clean water and sanitation, quality education, innovation in industry & infrastructure, and mitigation of climate change. Pakistan is now in a position to help other countries to achieve SDGs. Strengthening cooperation between Pakistan and the IAEA is important, not only for Pakistan but also for the broader region. The visit of the Director General IAEA underscores the salience of this partnership and aligns with the shared goals of promoting peaceful uses of nuclear technology, regional development, and global security.

[8] "IAEA and Pakistan Atomic Energy Commission Sign Agreement for the Peaceful Use of Atomic Energy," October 4, 2021, https://www.iaea.org/newscenter/news/iaea-and-pakistan-atomic-energy-commission-sign-agreement-for-the-peaceful-use-of-atomic-energy.

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