

# THE ROOPPUR NUCLEAR POWER PLANT (RNPP) – BANGLADESH

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The Rooppur Nuclear Power Plant (RNPP) is Bangladesh's first nuclear power facility, marking a significant milestone in the country's pursuit of energy diversification and sustainable development. The project traces its origins back to 1961 when initial plans for nuclear energy development were first proposed during the era of East Pakistan. However, the project was delayed due to political changes and Bangladesh's independence in 1971.



*Rooppur Nuclear Power Plant, Bangladesh. (Image Rooppur NPP via World Nuclear News)*

## 1. Background

### Historical Milestones

YEAR	MILESTONE
1961	Initial plans for nuclear power development in (then) East Pakistan.
1971	Bangladesh gains independence; nuclear plans put on hold.
2008	Government of Bangladesh announces renewed interest in nuclear power.

<b>2011</b>	Agreement signed with Russia for construction of RNPP.
<b>2017</b>	Construction officially begins on Unit 1.
<b>2018</b>	Construction begins on Unit 2.
<b>2020</b>	Major construction milestones achieved; reactor components delivered.
<b>2023</b>	Commissioning activities underway for Unit 1.
<b>July 2026 (expected)</b>	Unit 1 expected to be operational.
<b>Dec 2027 (expected)</b>	Unit 2 expected to be operational

## 2. Current Status

The first unit of the Rooppur Nuclear Power Plant is scheduled to begin supplying electricity to Bangladesh's national grid around June or early July 2026, with fuel loading expected in April 2026. Full-scale commercial operation for the 1,200 MWe unit is targeted for December 2026, following trial runs and grid integration, according to World Nuclear Association.

### Key details regarding the opening:

- Grid Connection (First Unit): Initial supply of 300 MWe is expected by mid-June 2026, ramping up to 1,200 MWe by December.
- Fuel Loading: Scheduled to begin in the first week of April 2026.
- Construction Status: As of March 2026, hot and cold run tests are complete, with final inspections underway.
- Second Unit: Commercial operation for the second 1,200 MWe unit is targeted for December 2027.

The project has faced previous delays, shifting from initial 2023–2024 completion dates due to COVID-19 and financial adjustments and due to political upheaval in the second half of 2025, but the first unit is now on track for a 2026 launch.

The total estimated cost is USD12.65 billion. The project is operated by the Nuclear Power Plant Company Bangladesh Limited under the ownership of the Bangladesh Atomic Energy Commission. The Bangladesh Atomic Energy Regulatory Authority (BAERA) oversees regulatory compliance, ensuring that all safety and environmental standards meet international nuclear regulatory frameworks. BAERA conducts regular inspections and audits, coordinating with international bodies such as the International Atomic Energy Agency (IAEA).

### 3. Technical Design

The Rooppur Nuclear Power Plant employs two VVER-1200 pressurized water reactors (PWR), designed and manufactured by Atomstroyexport, a Russian state nuclear engineering company. The VVER-1200 is a Generation III+ reactor known for enhanced safety features and improved efficiency.

#### Technical Specifications

Type	VVER-1200 (Pressurized Water Reactor)
Manufacturer	Atomstroyexport
Country of Origin	Russia
Number of Units	2
Thermal Capacity	3200 MWt per unit
Electrical Capacity	1200 MWe per unit
Coolant	Pressurized light water
Coolant Pressure	16.2 ± 0.3 MPa
Coolant Temperature Inlet	298.2 °C
Coolant Temperature Outlet	328.6 °C
Utilization Factor	92%
Moderator	Light water
Fuel	Low-enriched uranium dioxide (UO <sub>2</sub> ) pellets
Refueling Period	12 months
Control Systems	Digital control and protection systems with multiple redundant safety layers
Safety Features	Passive safety systems, core catcher, double containment structure
Cooling Source	Padma River
Cooling System	Closed Loop (with 4 x Natural draft cooling towers)
Design Life	50 years (power unit), 60 years (reactor plant)

### 4. Role in Bangladesh's Energy Needs and Energy Mix

The RNPP is a cornerstone in Bangladesh's strategy to diversify its energy portfolio, reduce reliance on fossil fuels, and meet the growing electricity demand driven by rapid industrialization and urbanization. Nuclear power offers a stable, low-carbon energy source that complements renewable energy initiatives.

Bangladesh's current energy mix is heavily dependent on natural gas and coal. The introduction of nuclear power will help reduce greenhouse gas emissions and improve energy security by providing a reliable baseload power supply.

## **5. Future Perspectives**

The successful commissioning and operation of the Rooppur Nuclear Power Plant (RNPP) will pave the way for further nuclear energy projects in Bangladesh. Bangladesh aims to expand its nuclear energy cooperation with Russia and potentially develop further nuclear power projects in the future, including potential expansion of capacity and development of nuclear expertise domestically. However, the project also faces challenges such as ensuring safety, managing costs, and maintaining public trust. Additionally, the plant's operation will necessitate the establishment of robust regulatory frameworks, safety culture, and waste management strategies.

It will enhance technological capabilities, foster skilled workforce development, and contribute to regional energy cooperation.

The plant's operation is expected to significantly reduce carbon emissions, aligning with Bangladesh's commitments under the Paris Agreement. Additionally, the project will stimulate economic growth through job creation and infrastructure development.

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