

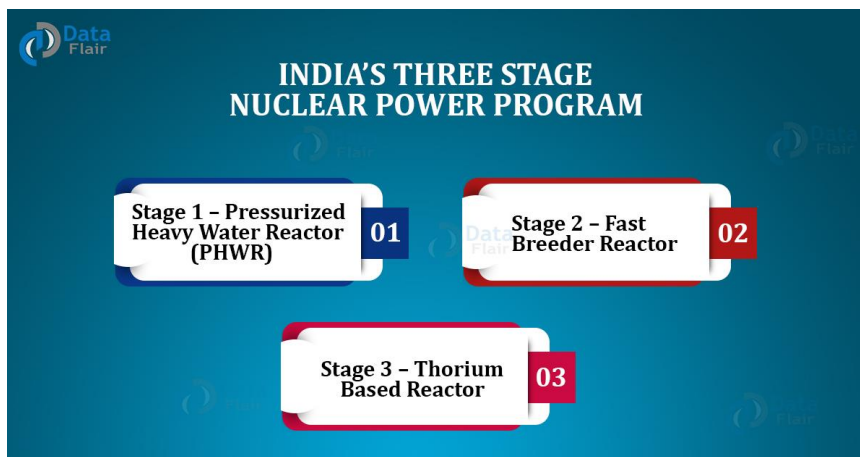
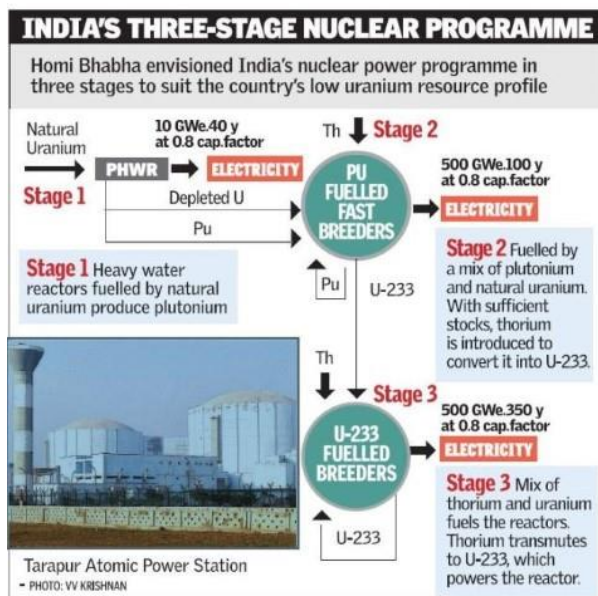


Shutdown this misguided energy policy

The vulnerabilities of reactors and their high costs are strong reasons why India must cancel its nuclear expansion plans.

Nuclear technology is hazardous:

- The world was reminded of this in March 2022, when a fire broke out near the Zaporizhzhia nuclear plant in Ukraine (Europe's largest) during the course of a military battle.
- Eleven years ago, the people of Japan were not as fortunate. In March 2011, multiple reactors at the Fukushima nuclear plant suffered severe accidents after an earthquake and a tsunami.
- The aftershocks of the Fukushima disaster were felt beyond Japan and led to a slump in nuclear energy in most of the world. Yet, some policymakers insist on expanding nuclear power, ostensibly in response to climate-change concerns.



Misguided Indian Policy:

- In December 2021, the Indian government informed Parliament that it plans to build "10 indigenous reactors... in fleet mode" and had granted "in-principle approval" for 28 additional reactors, including 24 to be imported from France, the U.S. and Russia.

12.03.2022

Saturday



<http://www.sriramsias.com>

2. Given the post-Fukushima global and national trends in the nuclear industry, such a policy seems misguided; nuclear power is neither an economical source of electricity nor a viable route to meeting India's climate goals.

Renewable Energy: Cheaper and Safer

1. In contrast, renewable-energy technologies have become cheaper. The Wall Street company, Lazard, estimated that the cost of electricity from solar photovoltaics and wind turbines in the U.S. declined by 90% and 72%, respectively, between 2009-21.
2. In 2020, the International Energy Agency dubbed solar energy the “new king of electricity”.

Unviable imports and Electricity:

1. Such targets were based on the expectation that India would import many light-water reactors after the India-U.S. civil nuclear deal. But, the deal has not led to the establishment of a single new nuclear plant, over 13 years after it was concluded.
2. We estimated in 2013 that had the six planned EPRs at Jaitapur in Maharashtra been constructed on schedule, electricity from these reactors would cost at least ₹ 15 per unit excluding transmission costs.
3. Compare that figure with recent low bids of ₹2.14 per unit for solar power, and ₹2.34 for solar-wind hybrid projects; even in projects coupled with storage, bids are around ₹4.30 per unit.
4. If nuclear electricity is to be sold at a competitive rate, it would have to be greatly subsidised by the Indian government, which operates all nuclear plants through the Nuclear Power Corporation of India.

12.03.2022

Saturday



<http://www.sriramsias.com>

Nuclear Power plants in Operation

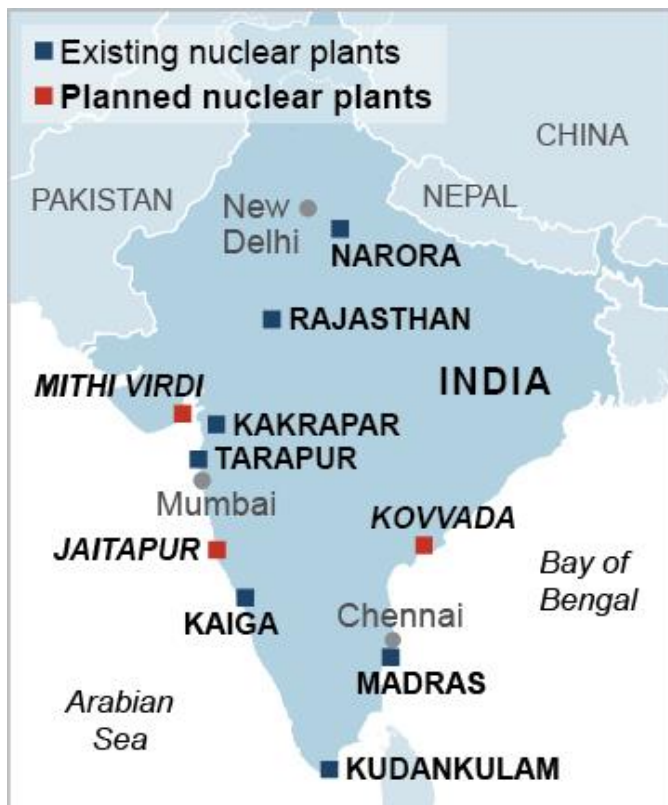
Rawatbhata (Rajasthan)
 Tarapur (Maharashtra)
 Kudankulam (Tamil Nadu)
 Kakrapar (Gujarat)
 Kalpakkam (Tamil Nadu)
 Narora (Uttar Pradesh)
 Kaiga (Karnataka)

Nuclear Power Plants under Construction

Kakrapar 3&4 (Gujarat)
 Rawatbhata (Rajasthan)
 Kudankulam 3&4 (Tamil Nadu)
 Kalpakkam PFBR (Tamil Nadu)

Planned Nuclear Power Plants

Jaitapur (Maharashtra)
 Kovvada (Andhra Pradesh)
 Mithi Virdi (Gujarat)
 Haripur (West Bengal)
 Gorakhpur (Haryana)
 Bhimpur (Madhya Pradesh)
 Mahi Banswara (Rajasthan)
 Kaiga (Karnataka)
 Chutka (Madhya Pradesh)
 Tarapur (Maharashtra)



Three Stage Nuclear Power Programme

<p>World class performance</p>	<p>Globally Advanced Technology</p>	<p>Globally Unique</p>
<p>Stage - I PHWRs</p> <ul style="list-style-type: none"> • 14 - Operating • 4 - Under construction • Several others planned • Scaling to 700 MWe • Gestation period has been reduced • POWER POTENTIAL \cong 10,000 MWe 	<p>Stage - II Fast Breeder Reactors</p> <ul style="list-style-type: none"> • 40 MWth FBTR - Operating since 1985 • Technology Objectives realised • 500 MWe PFBR- Under Construction • POWER POTENTIAL \cong 530,000 MWe 	<p>Stage - III Thorium Based Reactors</p> <ul style="list-style-type: none"> • 30 kWth KAMINI- Operating • 300 MWe AHWR- Under Development • POWER POTENTIAL IS VERY LARGE
<p>LWRs</p> <ul style="list-style-type: none"> • 2 BWRs Operating • 2 VVERs under construction 		<p>Availability of ADS can enable early introduction of Thorium on a large scale</p>

Understanding risks

1. Contrary to the condescending opinion held by some nucleocrats, peoples' concerns are not based on an irrational fear of nuclear energy.
2. In a densely populated country such as India, the land is at a premium and emergency health care is far from uniformly available.
3. Local citizens understand that a nuclear disaster might leave large swathes of land uninhabitable — as in Chernobyl — or require a prohibitively expensive clean-up — as in Fukushima, where the final costs may eventually exceed \$600 billion.
4. Concerns about safety have been accentuated by the insistence of multinational nuclear suppliers that they be indemnified of liability for the consequence of any accident in India.



5. Under pressure from multinational manufacturers, India's liability law already largely protects them. But the industry objects to the small window of opportunity available for the Indian government to hold them to account.

Climate concerns

1. Climate change will increase the risk of nuclear reactor accidents. The day after the fire at the Zaporizhzhia nuclear plant, a wildfire approached the Hanul nuclear power plant in South Korea.
2. In 2020, a windstorm caused the Duane Arnold nuclear plant in the U.S. to cease operations. The frequency of such extreme weather events is likely to increase in the future.

Conclusion:

- Therefore, nuclear power is not the right choice to “adapt” to climate change, which requires resilience in power systems. It is also not the appropriate choice for mitigating India's carbon emissions since it cannot be deployed at the necessary scale. The resources spent on nuclear plants will yield quicker results if they are redirected to renewables.
- Given the inherent vulnerabilities of nuclear reactors and their high costs, it would be best for the Government to unambiguously cancel its plans for a nuclear expansion.