

For Clear Air, Go Nuclear



Amit Garg, Saritha Sudharmma Vishwanathan & R B Grover

Globally, nuclear energy will play an important role in decarbonising and achieving net-zero targets. Under the 2015 Paris Agreement, 14 countries have assigned a significant role to nuclear energy in their nationally determined contributions (NDC), and 20 countries have included nuclear power in their long-term strategies (LTS). Also, 30 countries are considering commencing nuclear power programmes, while another 20 have expressed interest in initiating nuclear programmes.

According to the International Energy Agency report, 'Renewables 2022: Analysis and Forecasts to 2027', nuclear energy would play a significant role in providing stable base-load power to India's future energy mix toward achieving net-zero emissions. India, with its indigenous nuclear programme, is poised to significantly increase its nuclear capacity. GoI has demonstrated its commitment to this growth.

However, due to trade bans on uranium imports prior to 2008, and shortage of indigenous uranium, momentum for energy production from nuclear sources was hindered. Relaxation of guidelines by Nuclear Suppliers Group regarding nuclear trade with India has changed this scenario.

India's LTS now estimate a threefold increase in installed nuclear capacity by 2032, with plans to explore a greater role for nuclear energy and increase support for R&D. An April 2024 IIM Ahmedabad study, 'Synchronising Energy Transitions Towards Possible Net-Zero for India: Affordable and Clean Energy for All', has explored India's pathways under three economic growth scenarios and four net-zero scenarios (at a medi-

um growth rate) to achieve clean and affordable electricity.

Each of the first three net-zero scenarios emphasises the thrust on nuclear power (NZ1), fossil fuels with carbon capture and utilisation (NZ2), RE (NZ3), and the fourth is an integrated scenario (NZ4). Nuclear generation capacity can save 240-550 MtCO_{2e} (million tonnes of CO₂-equivalent) under NDC scenarios, and about 605-1,995 MtCO₂ under net-zero scenarios.

Nuclear generation capacity in 2070 will be in the 78-331 GW range (with a share in the supply mix of around 12-50%). Nominal levelised cost of electricity — a measure of average net present cost of electricity generation for a generator over its lifetime — for NZ1 2070 stabilises around 40% below that for 2020 NDC medium growth scenario at ₹2.76/kWh.

Simultaneously, investment needs for NZ1 are lower than the other three NZ scenarios. However, additional investments required in NZ1 are about 43% above those in NDC medium-growth scenario, but could be partly met through carbon markets.

Economies of scale could provide further savings. Its variable costs are low, as compared to fossil with carbon capture, utilisation and storage, or RE with storage technologies. So, nuclear energy could be the winner with almost zero GHG emissions, and the lowest landed price of electricity for the end consumer.

As a viable alternative to coal and gas,



Atomise and breathe

nuclear energy offers a host of benefits:

- ▶ Provides grid stability.
- ▶ Reduces air pollution.
- ▶ Diversifies fuel sources.
- ▶ Creates new, well-paying jobs.
- ▶ Requires less land compared to RE sources.

To fully harness these benefits, India needs to develop a strategy to build nuclear capacity, including a strategic reserve of nuclear fuel to ensure a steady supply over the lifetime of its reactors.

While this will help strengthen energy security, scaling up required nuclear capacity and generation in the next couple of decades will be challenging. Despite having the lowest investment needs among all net-zero scenarios, the nuclear option is perceived as a high-cost option due to the prevailing narrative that looks at costs only at the generator end.

Barriers include investment required to develop nuclear facilities and social challenges, such as the 'not in my backyard' viewpoint. Despite India pursuing a closed fuel cycle that gives rise to the lowest waste per unit of electricity generated, the narrative from countries pursuing an open-cycle approach is thought to apply to India.

India has a declared strategic programme and follows stringent rule-based export controls. Proliferation concerns from expansion of nuclear energy is not an issue. India has mastered pressurised heavy water reactor technology and is about to deploy its first indigenously developed fast breeder reactor. Conscious of its fuel resource profile, India continues to develop advanced concepts to ensure that nuclear can play an important role in India's net-zero scenarios for a long time.

Financing nuclear growth will become crucial for achieving net-zero targets. Scaling up nuclear energy will require investments, and further evolution of policies and regulations. India needs to include nuclear energy in its sustainable finance taxonomy to mobilise financial flows.

Garg is professor, IIM Ahmedabad, Vishwanathan is assistant professor, Kyoto University, Japan, and Grover is member, Atomic Energy Commission, GoI

India Inc's CSR Spends Up 5% in FY23 to ₹15,524 Crore

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Sreeradha.Basu@timesgroup.com

Bengaluru: India Inc.'s corporate social responsibility (CSR) spends rose by 5% from ₹14,816 crore in FY22 to ₹15,524 crore in FY23 across 1,296 NSE-listed companies, led by HDFC Bank (₹820.89 crore), Tata Consultancy Services (₹783 crore) and Reliance Industries (₹744 crore).

Ten companies, including these three, accounted for 33% of the total spends on CSR in FY23, according to data shared exclusively with ET by primeinfobase.com, an initiative of Prime Database Group.

Others in the top 10 in terms of CSR expenditure included Tata Steel (₹480.62 crore), Oil and Natural Gas Corp. (₹475.89 crore), ICICI Bank (₹462.66 crore), Infosys (₹391.51 crore), ITC (₹365.5 crore), Power Grid Corporation of India (₹321.66 crore) and NTPC (₹315.32 crore).

The CSR law, which came into force in April 2014, mandates that companies with net worth of ₹500 crore and above or revenue of ₹1,000 crore and above or net profit of ₹5 crore and above during the preceding financial year, have to spend 2% of average net profit of the last three years on

Beyond Profit

CSR spends by companies listed on NSE over last 9 years

	2022-23	2021-22	2020-21	2019-20	2018-19	2017-18	2016-17	2015-16	2014-15
No. of Companies	1,296	1,224	1,151	1,124	1,067	1,057	992	925	884
Average Net Profit of last 3 years (₹ lakh cr)	8.14	7.20	6.81	6.80	5.95	5.20	4.80	4.57	4.18
Actual Amount Spent (₹ cr)#	15,524	14,816	14,780	14,760	11,790	10,142	9,058	8,485	6,549

#Includes administrative expenses and impact assessment cost
Source: primeinfobase.com



CSR projects.

The average net profit of these 1,296 companies over the last three years was ₹8.14 lakh crore, up from ₹7.20 lakh crore in FY22. As per CSR requirements, the amount required to be spent by them was ₹15,713 crore (FY22: ₹13,994 crore), against which they spent a slightly lower ₹15,524 crore (FY22: ₹14,816 crore).

According to Pranav Haldea, managing director, Prime Database Group, the shortfall can be explained by the increase in the amount that remained unspent and transferred by companies to the Unspent CSR Account (₹1,643 crore) for use in future years.

Public sector unit (PSU) spending

saw a decrease of 17% from FY22. As many as 56 PSUs spent ₹3,136 crore in FY23, down from ₹3,766 crore spent by 59 PSUs in FY22.

In line with previous years, education received the maximum (₹1,211 crore) followed by healthcare (₹825 crore). In comparison to the previous year (only considering data of 536 companies for which project details were available for both years), spends on environmental sustainability increased the most (76%) followed by spends on education (41%) and rural development (26%).

In contrast, contribution to disaster management fell the most (77%), followed by that on slum develop-

ment (75%) and the PM's Relief Fund (59%).

The top five companies that posted a maximum increase in CSR spends in absolute terms over FY22 were ICICI Bank (₹196.04 crore), Jindal Steel & Power (₹111.20 crore), Hindustan Zinc (₹87.53 crore), HDFC Bank (₹84.88 crore) and Tata Steel (₹74.65 crore). All the figures refer to the increase in CSR expenditure in FY23 over FY22.

According to primeinfobase.com, 1,893 companies were listed on the NSE main board as on March 31, 2023. Of these, annual reports for FY23 have been released by 1,854 companies.

Old King Coal Still Chief Power Player

Transition challenges more political than economic

India has averted large power outages during peak summer demand by increasing its reliance on coal-fed electricity-generation capacity. Share of renewables isn't improving, partly on account of the intermittence of supply from solar and wind energy. Both thermal and renewables face tepid investor interest because of uncertainty over payments by distribution companies. The Centre has had some success in nudging states to bring down indebtedness of their distribution monopolies, but not on a scale to inspire investing confidence by private capital. The new generating capacity coming up is, thus, skewed in favour of public-funded coal-fired plants.

Distribution holds the key to capacity build-up across the electricity value chain. This is the only point in the chain where revenue enters the system, and it remains because political parties use it to price power to their advantage. The



immediate bottleneck, of discoms running up huge bills with generating companies that, in turn, was affecting payments to coal suppliers, has been corrected substantially in the past two years partly by some smart persuasion. The way forward would be to break monopolies by allowing multiple distribu-

tors to share transmission infrastructure. Here, too, challenges are more political than economic. More work also needs to be done to curb power theft through smart metering.

Tepid investment in power storage from RE sources amplifies the problem of intermittence fosters overdependence on coal. PLIs for domestic battery manufacturing have not delivered substantially, but GoI is pitching hard to foreign investors. Renewables offer India a pathway to reduce its dependence on energy imports, apart from achieving self-imposed emission reduction targets. At this point, however, India will feed its economic growth through energy from all sources, and significant energy transition will be deferred. This comes at a cost in terms of price of energy and climate mitigation. But India's growth through exports could pass some of this cost to the rest of the world.

The hard truth

Petrol trade will always be volatile. Lesson for oil import-dependent India is clear — do not overread the market



OVER THE BARREL
BY VIKRAM S MEHTA

I HAVE BEEN involved with the petroleum industry for over four decades. I do not recollect a more combustible, contrarian and confusing complex of forces bearing on it than those today.

It has never been easy to call the timing and rate of change of oil prices. This is because they are influenced by the non-fundamentals of geopolitics, exchange rates, speculators and the predilections of corporate and political leaders. The direction of change has, however, been easier to foretell because it was driven by the fundamentals of demand and supply. Now, these fundamentals have also been tossed into the cauldron. As a result, policymakers in import-dependent countries like India face a challenge: How to manage and mitigate the consequential uncertainties?

A tour d'horizon of the international petroleum market is revealing.

Venezuela has the largest reserves of oil in the world. The US has reimposed sanctions on the country for breach of the government's commitment to hold "free and fair elections". It has done so with a self-interested twist. The US company, Chevron, has been allowed to continue the joint venture with the national oil company in Venezuela, PDVSA, and to sell crude oil to refineries in the US. The reason is, in part, to keep a lid on US petrol prices and, in part, to protect US commercial interests. President Joe Biden wants to burnish his democratic credentials and safeguard his electoral prospects.

Production of shale oil and gas is surging. The US is the largest producer of petroleum liquids in the world and the biggest exporter of LNG. It has also allocated more money than any other government (approximately \$400 billion, through the misnamed Inflation Reduction Act) to reduce carbon emissions. This presents a dilemma. At some point, the economics of fossils may have to give way to the politics of clean energy.

The US also continues to back the Ukrainian war effort — and for good reason. Unprovoked aggression should be resisted. It should be noted, however, that the conflict has boosted the profits of US petroleum companies. They have (predominantly) filled the vacuum created by the sanctions on exports of Russian gas and petroleum products into Europe. Here, the principles of global security clash with corporate commercial interests.

Russia's petroleum industry has been degraded by sanctions, drone attacks, financial constraints and poor technology. Yet, it is generating sufficient revenue to finance its war machine. China and India have replaced Europe as their major overseas markets. Last month, these two countries absorbed 62 per cent of Russia's crude oil exports. *Prima facie*, this would suggest the bark of Western sanctions is stronger than its bite. And delib-



C R Sasikumar

erately so. Were Russian oil taken off the market, the price would ratchet up sharply and hurt the electoral prospects of leaders facing elections this year. The point is, here too, there is no walking a straight line.

The Middle East is facing a witch's brew of warfare, racism and radicalism but also houses 55 per cent of the world's petroleum reserves. It was convulsed on October 7 when Hamas attacked Israel and Israel retaliated with genocidal ferocity. The conflict entered a new phase on April 13 when Iran launched 300 plus missiles against Israel directly rather than through its proxies (Hamas, Houthis, Hezbollah). The impact was minimal. All the missiles were destroyed before they reached their intended target. That did not lower the inevitability of an Israeli response. The world was on edge. The question was how and when, not whether. In the end, perhaps because of international pressure, the retaliation was relatively muted. As of the time of writing, it appears all parties have walked back from the brink of a regional conflagration. The sword of Damocles, however, continues to hover over the region. One misstep could result in the closure of the Straits of Hormuz through 30 per cent of internationally traded oil passes.

The international petroleum majors have recently declared solid profits, all because of higher production (and price) of oil and gas. Consequently, the bulk of their investable capital is directed towards fossil fuels. But they must reconcile this investment strategy with their net zero carbon emission targets.

Western sanctions on Venezuela, Iran and Russia have fragmented the petroleum market. Trading relations are predominantly regional, not global. The US is the major supplier of LNG and products in Europe; Russia is now the largest supplier of crude to India. Iran exports predominantly to China, who

care little about Western sanctions (It earned approx \$35 billion in 2023 despite the sanctions). The fragmentation will most likely deepen as European demand falters, China (and to a lesser extent, India) switches from coal to gas and Middle East gas producers concentrate on increasing their market share in Asia.

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The AI industry will need enormous amounts of electricity for its data centres, cloud storage facilities and crypto mining. Renewables will not be able to meet this requirement. People like Bill Gates and Sundar Pichai are, however, committed to net carbon-zero emissions. As such, they will face a conundrum. Should they slow down their growth plans or turn to gas-based power generation for their requirements?

The tour reveals that governments and industry (in particular, oil companies and AI) are on the horns of multiple dilemmas. It suggests that aside from geopolitics, exchange rates and Wall Street speculation, analysts should consider net zero carbon emission commitments and the AI industry's demand for electricity as two additional non-fundamental factors that will bear on the international oil market. The tour also reaffirms the hard truth; the petroleum market will be volatile.

The lesson for oil import-dependent India is clear: Do not overread the market. Instead, hedge against volatility. Build up strategic oil reserves, increase the share of natural gas in the energy basket, invest in smart infrastructure, intensify R&D on clean energy, encourage public-private partnerships and scale up renewables.

The writer is chairman and distinguished fellow, Centre for Social and Economic Progress

