

INDIA'S GREAT VULNERABILITY: ENERGY INSECURITY

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The search for energy security is a major driver of change in the world order today. It is a veritable new great game, engaging players across the globe, industrial and industrialising countries, energy suppliers and consumers. It is spawning a web of bilateral and multilateral deals for securing stable access to energy sources in conflict, competition or cooperation with each other.

Next to water shortage, energy deficit is India's greatest economic vulnerability. Its incremental energy demand over the coming decade is projected to be among the highest in the world. This stems from accelerating economic growth, scarcity of domestic energy resources, increasing population and an expanding cohort of high-energy consuming middle class with rising incomes. Populist offerings to the rural population and urban have-nots, who together comprise a majority of the electorate, are adding to the energy crunch. Within a democratic framework, no federal or state government can hope to survive without this bank of votes. Hence, the hybrid pricing models across the country, ranging from free power to a cocktail of subsidies to turning a blind eye to massive electricity thefts.

The galloping oil bill is costing the exchequer over 30 percent in foreign exchange reserves. There are no prospects of prices falling in the short to medium term. The massive industrialisation in China and India, comprising some 2.5 billion people, is fuelling the competition for scarce resources between traditionally low and high energy user nations.

According to Prime Minister Singh, an investment of around US\$130 billion is necessary in the power sector alone to boost generation, upgrade transmission and distribution networks. India needs to install an additional 100,000 MW power generation capacity to meet the goal of 'Power for All' by 2012. That is considered the minimum requirement to sustain the Government's target of 8 percent annual GDP growth rate.

India and Fossil Fuels – A Snapshot

- **India has 17% of the world's population and just 0.8% of known oil and natural gas reserves.**
- **After US 1st and China 2nd, India is the 5th largest consumer of primary energy in the world. Since 2002, only China has exceeded India's growth rate of energy consumption.**
- **India is the sixth largest consumer of oil. It will continue to import 70%-75% of its oil and gas needs in the foreseeable future.**
- **India is the third largest consumer of coal. It has coal reserves for the next 70-80 years, but their recovery is constrained by difficult locations, abysmal mining infrastructure, and high ash content of the coal. Consequent thermal inefficiency of power plants and environmental degradation are endemic problems.**
- **India's current domestic and imported gas supply is 85 million cubic meters per day, well short of demand double that. Gas consumption is expected to rise to 400 million cm a day by 2015 if the economy grows 7-8 percent per annum.**
- **A Price Waterhouse report predicts a shortfall of 36000 engineers in the oil & gas sector by 2019. In response, the Government is establishing a centre of excellence, the Institute of Petroleum Technology.**
- **India is set to emerge as an export hub for refined petroleum products. Current refining capacity is 160 Mt slated to rise to 241 Mt by 2011.**
- **Conscious of fuel supply chain vulnerabilities, India is establishing strategic reserves of crude oil. The first storage facility for 5 million tonnes will be completed by 2008.**

India is aggressively developing alternative environment-friendly energy sources. Indeed, wind generated installed capacity is more than nuclear power generation. But alternatives to mainstream energy sources can make a significant contribution to the national grid only in the long term. The Asian Development Bank has calculated that while India ranks fifth in the world with hydropower potential of 84000 MW, only 20 percent has been harvested so far. In effect, India's energy outlook will depend ultimately on how nimbly it navigates on the other two game boards - the hunt for fossil fuels, and for sanction-free access to nuclear technology and fuel.

THE QUEST FOR OIL & GAS

India's economic diplomacy is in an overdrive to secure energy assets abroad, pursue long-term LNG contracts and promote trans-national gas pipeline ventures. It has also revamped the legal and regulatory regime to encourage the development of domestic resources. It allows the private sector to play a major role in the sector from exploration in on-shore and off-shore blocks to retailing oil and gas products.

Equity Buy-Outs and Joint Ventures

Marauding Indian public and private sector corporations are on the prowl world-wide for hydrocarbon assets and shares in fuel supply chains. The huge state-owned oil companies now have considerable policy leeway to raise capital for funding acquisitions and joint ventures stretching from Siberia to Sudan. The \$1.5 billion stake in Russia's Sakhalin gas fields and the 20 percent share in the development of Iran's biggest on-shore oilfield (of which China holds 30 percent) are prime examples. Other investment destinations include Yemen, Egypt, Trinidad & Tobago, Venezuela, Angola, Kenya, Uganda, Indonesia, Nigeria and Vietnam.

Reminiscent of the 19th century, when it was a strategic object of desire for Imperial Russia and Victorian England, Central Asia is again a coveted prize for India and the other two foremost consumers of energy – the United States and China. The former Soviet republics in Central Asia and the Caucuses, as well as Russian Siberia, have become theatres of intense US-Russian, Sino-Japanese and Sino-Indian economic and political rivalry.

Above all, India is in direct competition for energy resources with China as both race to fuel their charging economic growth. Their relationship on the energy front is best described as cooperative competition without conflict. Their hunt for oil and gas traverses most of the globe from Africa, South East Asia and South America to West and Central Asia. Both are in favour of ending what former Indian Minister of Petroleum Aiyer called "wretched Western dominance" of the sector. They are making joint bids, but also competing for equity stakes, exploration rights and pipeline building contracts.

Overall, India's success has only been modest in face of China's slick and relentless campaigns, replete with political and economic incentives and string-free aid. Last year, China trumped the Indian state-owned oil company, ONGC's US\$3.6 billion bid for oil fields in Kazakhstan, largely because of cumbersome and risk-averse decision-making processes in New Delhi. Indian behemoths are in no position to match the speed of Chinese dragons in closing deals – or their blandishments. The U.S. Military's National Defense University estimates that China disburses around US\$2.7 billion aid in Africa annually. By the end of 2006, China had invested US\$11.7 billion in that continent alone, most of it to oil producers Sudan, Angola and Nigeria.

Pipe Dreams

The emergence of independent Central Asian states in the wake of the Soviet Union's demise, China's growing economic pre-eminence in Greater East Asia, the Sino-Indian détente and Afghanistan's re-entry into regional equations are expanding the

scope of trade and other economic links across the entire Eurasian land mass. Roads, railroads, and technologies for transporting oil, gas and hydroelectric power are in the making as the 'new silk roads'.

Spurred by India's energy lust, its reserves of technological skills and labour and by possible collateral benefits of the Indo-Pakistan peace dialogue, several Central and West Asian inspired proposals are on the anvil: gas pipelines to India from Iran via Pakistan (with a possible offshoot to Yunnan), from Myanmar via Bangladesh, undersea pipeline from Oman, and from Turkmenistan via Afghanistan and Pakistan; Kazakhstan oil via the Caspian Sea to Iran, then piped or shipped to India; and transmission of Tajikistan and Kirghizstan hydel-power via the Wakhan corridor in Afghanistan and Pakistan.

Not one of these proposals is anywhere close to implementation. They will remain pipe dreams to prosperity until conflicting political and security interests of the participating nations can be melded into viable joint ventures. Oman has long been under pressure from fellow members in the Organisation of Islamic Conference against concluding a bilateral deal with India. Bangladesh remains reluctant to grant India transit rights in respect of proposals aimed at transporting energy to India's north-eastern states unless it receives concessions pertaining to other (unrelated) bilateral issues.

The Myanmar project is now very unlikely to proceed. The ruling Junta has withdrawn India's "preferential buyer" status for two off-shore natural gas fields in favour of selling the gas to PetroChina. China will build a pipeline in the opposite direction from Sittwe to Kunming. The decision is blatantly politically motivated; China's support for keeping Myanmar's human rights record off the UN Security Council agenda outweighed the economic incentives of selling the gas to India.

Notable as these examples are, there is no better illustration of the convoluted politics of trans-national energy deals than the proposed Iran-Pakistan-India gas pipeline.

Politics of Pipelines - The Iran/India/Pakistan Project

The US\$8 billion trilateral project was conceived in 1989. It has sound commercial basis. It remained victim to India-Pakistan acrimony until bilateral tensions abated in 2003. Much progress has been made since on security, project structure and financing. But it is now stalled on commercial disagreements concerning Iran's insistence on periodic price revisions and Pakistan's demands for higher transit fees. These are real enough issues, but they mask deeper, conflicting political motives and bilateral suspicions.

For India, securing Iranian gas would be a significant step in satisfying its enormous energy appetite. Accordingly, it has made a series of concessions, including de-linking the project from a long-standing demand for Pakistan to reciprocate the MFN status and allow transit rights for trade with Afghanistan. It has also abandoned its insistence on negotiating the project only with Iran, a tactic designed to place responsibility squarely on the latter to guarantee that Pakistan will meet its commitments. Still, it remains wary of the leverage a strategic commodity pipeline

would give Pakistan's unpredictable governing polity irrespective of the bilateral and trilateral agreements in place.

For Pakistan, the pipeline would be a bonanza worth well over \$1bn in transit fees. However, it remains concerned about making its arch-rival India even stronger economically. Moreover, Pakistan fears that the Iranian pipeline could become something of a slippery slope. It will set a precedent, making it difficult to resist calls by other grasping Central Asian nations for delivery conduits to India. That would undercut Pakistan's strategic leverage as a geographic barrier between India and West and Central Asian states.

For Iran, as the guardian of world's second largest gas reserves, the pipeline would guarantee captive customers over the long-term. The deal would also reaffirm the traditionally strong political and economic links with India. Notably, while India is the third largest Muslim nation, it has, after Iran, also the second largest Shia community in the world.

And then there is the United States, the mover and shaker in the global energy market. It has unequivocally labelled the project a "bad idea", warning of harsh sanctions against companies doing business with Iran. That would have serious consequences for Indian corporations, which have a strong presence in the Middle East and whose human resources, engineering capabilities and capital would inevitably be required for pipeline construction and other associated activities. American sanctions would have a severe spill-over effect on their commercial credibility and operations elsewhere.

Despite American objections, India and Pakistan are negotiating the project's modalities. They also serve a broader purpose. The Indian Government is facing stiff domestic opposition to the 123 nuclear agreement with the U.S. President Musharraf is under attack from the Islamist lobby, which accuses him of being subservient to America. Continuing bilateral talks on the pipeline imply a disregard for American concerns, providing a buffer against domestic criticism of their policies towards the United States. Hard decisions would be inescapable should an agreement be concluded. Thus India would be forced to choose between the promise of long-term civil nuclear cooperation with the US and the immediate import of gas from Iran. Arguably, it is in the interest of both Pakistan and India *not* to reach an agreement as long as the US-Iran stand-off is not resolved.

Search at home

The opening of the previously sacrosanct oil and gas sector to private operators, domestic and foreign, is one of the most visible success stories of India's economic reforms. State-owned energy giants continue to march ahead profitably – ironically retarding the possibility of their privatisation – but they are compelled to compete with home-grown and global majors throughout the sectoral supply chain.

The 1999 New Exploration Licensing Policy was a landmark event under which a steadily increasing number of on-shore and off-shore blocks are being auctioned – 52 in the sixth round in 2006, 80 this year. According to the Indian Oil Ministry, companies that won exploration rights in the previous five rounds discovered the

equivalent of 4.88 billion barrels of oil of which at least 30 percent are likely to lead to actual production.

Cairn Group's oil strike in Rajasthan has advanced to a stage where it is constructing a pipeline to supply crude to refineries in western states. Reliance Industries (RIL) made the world's largest gas discovery of 2002 in the Krishna-Godavari basin in Andhra Pradesh. More recently, it struck sizeable gas reserves in the Kaveri basin on the east coast. RIL has embarked on a massive US\$12 billion investment programme of exploration and production, including a 1400 km East-West pipeline as part of its national gas grid. Over the next five years, nearly 50 percent of India's gas needs are expected to be met through domestic fields. RIL alone expects to contribute one quarter of the nation's additional generating capacity during that period.

THE QUEST FOR NUCLEAR ENERGY

The development of nuclear power generation is the most important strand in India's quest for energy security. It has little choice. Known fossil fuel reserves at home are limited. There is a measure of insecurity in relying inordinately on cross-border supplies for a country ocean-locked on three sides and ringed by prickly neighbours on land. Bringing more domestic hydrocarbon and renewable resources on stream will not only take time, but even in the best case scenario will not achieve self-sufficiency. In the context of global warming, 'cleaner' nuclear power clearly has a major role in the country's energy mix: no less than 67 percent of power generation comes from environmentally damaging coal fired plants.

India and Nuclear Energy – A Snapshot

- **India has 17 operating reactors, 7 under construction and 24 proposed by 2020. Respective figures for China are 9, 2 and 32.**
- **Indian nuclear industry employs around 50000 highly qualified nuclear scientists and technicians. This 'public' figure most likely excludes those employed in the defence establishment.**
- **Nuclear energy accounts for only 3% (4120 Mw) of India's total energy output. In China, it is 1.8%.**
- **Projections to 2030 call for nuclear energy share to rise from 3% to 26% to sustain the growth of demand for power.**
- **Conversely, generation from other sources is projected to fall: coal-fired from 67% to 47%; oil and gas from 20% to 16%; and hydro from 10% to 8%.**
- **The Government plans to open the nuclear civilian infrastructure to private sector once the deal with the US is "operationalised". Indian corporates such as TATA and Reliance have the resources to build nuclear power plants in partnership with global majors.**

As early as the 50s, the visionary Nehru decreed the harnessing of nuclear power for civilian consumption a national priority. However, the role of what he described as the “new temples” in meeting the newly-independent country's power needs was severely retarded by international sanctions after India's 1974 Pokhran nuclear test. Its subsequent pariah status was set in stone by fatwas issued by western non-proliferation ayatollahs after the 1998 nuclear tests.

On the upside, thirty years of international sanctions and nuclear exile have served as a catalyst for concerted indigenous development of nuclear power stations, R&D centres, and of an impressive infrastructure of industrial facilities servicing both military and civilian nuclear establishments. India has steadfastly maintained its three stage nuclear power programme, based on pressurised heavy water reactors, then fast breeder reactors, and finally on thorium fueled advanced reactors.

However, the Indian nuclear establishment readily acknowledges that existing nuclear stations are nowhere the state-of-art, and that they are operating at no more than 65-70 percent of their optimal capacity because of fuel (uranium) shortages. While the civilian nuclear power programme could chug along without uranium and up to date technological imports, observers estimate that the share of nuclear energy would, at best, rise from 3 percent to 10 percent over the next two decades.

Prime Minister Singh has estimated that sustaining 8 percent annual GDP growth target would require 30000 to 400000 Mw from the nuclear grid. The Government's immediate goal is to triple nuclear power output to 100000MW by 2012. It calculates that if the international restrictive nuclear transfer and trade regime were lifted, India could realistically set a target of 20000 Mw or more by 2020.

The US-India Deal

It is against this background that India has entered into the nuclear ‘grand bargain’ with the United States. The crux of this complex, nuanced deal is that the US will extend “full” nuclear cooperation to India, enabling it to access nuclear hardware and fuel as if it were a signatory to the Nuclear Non-proliferation Treaty (NPT). In return, India will separate its military programme from civilian nuclear energy facilities and place the latter under tight IAEA safeguards.

The so-called 123 Agreement is integral to building a strategic partnership between the two long-estranged democracies. However, there are several hurdles to cross before India can come out of the nuclear cold. The US Administration has to convince an obdurate Congress to dismantle (or by-pass) the firewalls accreted over the years against nuclear-related dealings with India. It has to persuade the 45-member, consensus-based Nuclear Suppliers Group (NSG) to loosen the supply chain, a process in which China's attitude will be critical. It also has to win over members of the Missile Technology Control Regime (MTCR) to its approach of making India an “exception” to the NPT.

India too faces a long march. It has to negotiate the complicated Additional Protocol with the International Atomic Energy Agency (IAEA) on country-specific safeguards. But even before it can commence those negotiations, the Singh Government has to

build a domestic consensus on the 123 deal. The argumentative Indians are at it again. There is spirited opposition to the nuclear agreement from the Left red-card cadres as well as the environmentalist green-card holders.

However, indications are that the imperatives of achieving energy security will ultimately hold sway. Once all the hurdles are crossed, the immediate benefit for India will be access to uranium ore, which will help achieve optimum operating capacity of the under-performing existing reactors. Meanwhile, other intangible benefits are already flowing from the American imprimatur designating India as a *de facto* nuclear weapons state.

India has been admitted into the exclusive six-nation International Thermonuclear Energy Reactor project (ITER), a research and development centre designed to demonstrate the scientific and technical feasibility of fusion power. Membership of the US-led Generation IV International Forum (GIF) is very much on the cards. This eleven-member consortium is investigating innovative nuclear energy systems with the aim of developing the next generation of nuclear reactors. There are also good prospects of India being admitted into the Global Nuclear Energy Partnership (GNEP), which addresses the development of advanced technologies for peaceful uses of nuclear energy.

Membership of these diverse nuclear-related clubs and the consequent association with new frontiers of nuclear technology will be invaluable to India for advancing its nuclear programme. (Of course, that is precisely why several governments and lobbies world-wide strongly oppose the deal.) However, it is not just one-way traffic. Other club members have expectations of gaining technical results of India's long and laborious research and development efforts, albeit often unrealised, and to its scientific and technical manpower. The significance of this latter aspect should not be underestimated. Since the Three-Mile Island accident in 1979, civilian nuclear power has been on a back burner in most western countries, leading to a generational gap in education and training in nuclear technology. In contrast, a strong base of technical skills has been coalescing in India since the 1970s.

THE AUSTRALIAN CONNECTION

India faces a stark dilemma. When ratified, the 123 Agreement will open the gateway to most of the state-of-the-art nuclear technology it can afford. However, that would serve little purpose without ready and reliable access to uranium fuel, which, in turn, will depend on the NSG. Australia's attitude at that forum will be critical. Belying its middle power status, Australia has a disproportionately strong voice internationally on matters nuclear, underpinned by its 40 percent of the world's reserves of *low cost* uranium.

After decades of vociferous domestic debate in Australia on the rights and wrongs of nuclear power, a bipartisan political consensus has emerged on lifting restrictions on uranium industry's development to allow greater yellowcake exports. It is intended to abandon the 25 year old policy against commissioning new uranium mines, which made the industry not only a sacred cow, but with three operating mines already supplying 22 percent of the global output, a half pregnant one.

The Australian Government has welcomed the US-India deal. Following a review of relations with India, it has also foreshadowed the opening of Australia's yellow paddock to India. The sale will be subject to the same safeguards as imposed on China under the Nuclear Transfer and Cooperation Agreement. Despite widespread reservations in the polity about selling uranium to a country, which has refused to subscribe to the Holy Grail, the NPT, the government's decision reflects several considerations relevant to Australia's long-term economic interests in the Indian market.

One, there can be no sustainable 'planetary' game plan for tackling global warming without addressing the needs of China and India, which are two of the world's largest emitters of greenhouse gases. Under the froth and bubble of the debate on combating global warming, there is a glaring contradiction between identifying India as a major contributor to the greenhouse gas emissions and denying it the means to deal with that problem. That is consistent with the stated objectives of the Asia-Pacific Partnership on Climate (AP6), including Australia and India, which approves the option of nuclear energy to counter climate change.

Two, Australia can hardly ignore the determination of its ally, the US, to forge a strategic partnership with India, one objective of which is to place it on no less a footing than China for accessing nuclear supplies. This reflects its apprehensions about China's looming might for the balance of power in Asia.

Of course, the US is also driven by the commercial charms of a multiplying, 300 million strong, Indian middle class. American high-tech corporations, in particular Westinghouse and GE – and Russian, British, French and German companies - are salivating at the prospect of selling nuclear hardware to India. There is little doubt that as soon as the decks of the 123 Agreement are cleared, India will embark on a buying spree, starting with 1000 mw light reactors.

Three, Australia has a growing economic stake in India, its fastest growing export market since 2002. Provided Australia is flexible on uranium sales to a non-NPT signatory, its economic and political leverage will increase. But that would be seriously jeopardised if it were any less responsive to India's energy security needs than to China's.

Four, the argument that divvying up the yellow cake for sale to India would undermine the non-proliferation regime holds little water. In contrast to China's less than transparent record on proliferation, India has an impeccable non-proliferation record. Indeed, that fact underpins the US case for the nuclear accord with India.

Five, it is in Australia's (and western alliance's) interest to bring 'oiloholic' India into the nuclear fold to provide sound alternatives to its debilitating dependence on, and strategic compromises with, problematic countries such as Iran. A nuclear energy option would certainly diminish the attractiveness of the Iranian pipeline or other energy projects perceived as inimical to western interests. Besides, in the long-term, a decrease in demand for conventional energy resources has the potential to reduce price pressures at the oil pump and the burden on the Australian economy.

Finally, Australia is in a driving seat for harvesting hundreds of million dollars annually from uranium exports to India. It has a more mature technological capacity for 'absorbing' greater quantities of Australian uranium than, say, China. But Australia has no monopoly in the uranium market. With reserves around half that of Australia, Canada is the world's largest exporter of uranium. Other potential sellers to India include Kazakhstan, Namibia, Niger, Russia and Uzbekistan.

Australia's response to satisfying India's energy insecurity will be the single most decisive issue in determining whether its long-term business interests have a place on the Indian high table to partake what an up and coming economic superpower has to offer. For India too, this issue represents something of a litmus test of Australia's commitment to developing a substantive bilateral relationship.

CONCLUSION

One irony says a great deal about India's energy prospects. Indian companies are competing worldwide from Indonesia to Nigeria for contracts to build power plants and construct pipelines. Clearly, it is not the lack of capital or technological skills, which is retarding India's quest for energy self-sufficiency; it is the lack of conventional and nuclear resources to which they can be applied.

India faces one incontrovertible fact. Geo-political and economic constraints make quick fixes by jostling on the fossil fuel game board an unrealistic option. It is also self-evident that whatever successes India might have in bringing conventional domestic resources on stream, including alternative fuels, it can not achieve self-sufficiency in the near future. India's reliance on importing 75 percent of its primary energy needs, rising oil and gas prices and a vociferous domestic green lobby leave it little choice but to adopt the nuclear option to feed its booming economy. The landmark nuclear Agreement with the United States is on the point of providing the gateway to an exponential leap on that front.

Arguably, apart from its leading global role in the heyday of the non-alignment movement, India has never engaged in geo-political plays as intensely as it is now doing to tap energy resources. Indian intelligentsia prides itself on having learnt the lessons of the Great Game as Kipling described the politics of regional balance of power in the 19th century. But a new great game on a much wider scale and with very different objectives is now in progress. India's energy security will depend on how successfully it employs imaginative, multi-dimensional resource diplomacy to gain access to diversified energy resources from across the globe.