

Situating India in the Geo-Politics of Energy Security

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Energy security is an important area of study today. In the rapidly industrialising economies around the world, the primary concern has been ‘energy security’. In fact, world energy demand (as primary fuel) has grown by nearly 95 percent during the past 30 years and is likely to grow by over 52 percent during the next two decades. The demand for natural gas is expecting to grow by as much as 97 percent.

The “developed” world’s concept of “energy security” has evolved in the context of its excessive dependence on imported energy and the localisation of supplies in the Persian Gulf. The focus of energy policy in the developing world, till the oil shocks of the 1970s, was mainly on the issue of ‘supply management’, in its widest sense. After the oil shocks, the Organisation for Economic Cooperation and Development (OECD) countries have paid equal attention to demand management and investment in energy-saving technologies as well as alternative source of energy. The concept of energy security was, thus, made more comprehensive, including both demand side and supply side strategies. Petroleum accounts right now for 40 per cent of the total energy consumption in the world and it will increase since global demand should rise by 50 per cent during the next twenty years. Geo-politics of energy has had a major influence on world events during the 20th century and continues to do so even in the 21st century.

Coming to the developing world, Asia as a whole will be the world’s largest energy consumer by the end of this decade. Asian dependence on oil imports is expected to rise to approximately 77 percent by 2010. According to the International Energy Agency (IEA), developing Asia, encompassing China, East Asia and South Asia, has accounted for about a quarter of global GDP and total primary energy demand. IEA projects 42% increase in the primary energy demand between 2002 and 2030 in this region. The region’s share in the global energy market will reach nearly a third in 2030. Oil demand in this region will account for 26% of the world’s demand by 2030. Import dependence on oil is projected to increase from 43 percent in 2002 to 78 percent in 2030, out of which India and China’s oil import dependence rises from 69 and 34 percent respectively in 2002 to 91 and 74 percent respectively in 2030, impacting energy security of this region in major ways. Natural gas market in this region is growing rapidly and is estimated to contribute 21 percent of world incremental gas demand till 2030. Coal will also remain a prime source of energy in China and India.

As about the ASEAN, it has proven reserves of 22 billion barrels of oil, 227 trillion cubic feet of natural gas, 46 billion tons of coal, 234 gigawatts of hydropower, and 20 gigawatts of geothermal capacity. Most ASEAN power plants now use natural gas to generate power, with about 60% in

Myanmar and Singapore and about 70-75% in Malaysia and Thailand. ASEAN's proven gas reserves, at current usage rates, are expected to last for 50 years, and to about 130 years, if the probable reserves are added. In contrast, ASEAN oil reserves are depleting.

India is the sixth largest oil consumer in the world, and third largest oil consumer in Asia. India received 70 percent of the crude oil by imports and more than 65 percent comes from the Gulf region. India accounted for 12.5% of total primary energy consumption in the Asia-Pacific region and 3% of world primary energy consumption.

The current primary energy utilisation mix, for the commercial sources, in India is as follows: coal approximately 50%; oil 32%; gas 15%; hydel 2% and nuclear 1%. India's oil reserves amount to 5.9 billion barrels (0.5% of global reserves) with total proven, probable, and possible reserves of close to 11 billion barrels. The future consumption will have to be necessarily met by imports as the demand for oil is expected to be to 3.2 million bbl/d by 2010. The gas consumption too is growing and is likely to be 1.2 Tcf in 2005 and 1.6 Tcf in 2010 compared to 0.8 Tcf in 2000.[1]

It is estimated that India has 30 billion tonnes of unexplored hydrocarbon reserves. The proven reserve of crude oil is 732 million metric tonnes. The proven natural gas reserve is 763 billion cubic meters. The oil production is 86 million metric standard cubic metre per day, while the demand is 115 million metric standard cubic metre per day. The demand for crude oil will be 190 million tonnes by 2011-12, which will result in 81 per cent import dependence. India's dependence on oil imports may even grow to 91.6 percent by the year 2020. With respect to natural gas, the demand will rise to 313 million metric standard cubic metre per day in 2010-12.

Even though the Reliance Industries has discovered gas reserves in the Krishna-Godavari basin, which has a capacity of 7 trillion cubic feet, and the ONGC has also discovered gas reserves in Rajasthan, it would take at least 3 to 5 years to reach the consumers by which time the demand for natural gas would have increased to over 151 million metric standard cubic metre per day. The current demand is only 8 per cent of the world average, which is likely to increase to 20 per cent by 2025 due to fuel substitution.

The offshore Cauvery, Krishna Godavari and Mahanadi basin in the Bay of Bengal has shown some promise while exploratory survey is on, on the west coast, the Kerala-Konkan basin and Kutch offshore in Gujarat. India is scouting for oil fields in Saudi Arabia, Vietnam, Australia, Myanmar, Bangladesh, Iran, Iraq, Qatar, Kazakhstan, Syria, Egypt, Libya, Algeria, Senegal, Nigeria, Sudan, Angola, and West Africa. Along with 0.523 billion cubic metres of gas from a Vietnam gas field, it is expected to get about 5 million tones from Russia's Sakhalin field when it goes on stream next year.

Taking into account the demand-supply matrix, the three major Asian consumers will be actively pursuing their interest in the Gulf, Caspian Basin, Africa and Venezuela in Latin America. In the changing context where hydrocarbon despite being strategic commodity is moving to the arena of market to be traded as "just another commodity" the pressure of market seems to be prevailing in defining the parameter of emerging regime. One plausible scenario could be "Asia's tremendous expansion of energy demand over the next two decades will force

key regional power such as India and China to accept for greater levels of cross-border energy dependency. Whether their search will enhance the intensity to competition and conflict could be an issue of debate.

India has proposed a pan-Asian gas grid for tapping the hydrocarbon potential aimed at promoting investment in infrastructure and boost energy security in the region. With 55% of known global gas reserves being in Asia, the region also had the greatest demand for gas. The need for Asian countries to create the forum and leverage the power of offshore and onshore gas from Iran in the west, Myanmar in the east and Central Asia in the north. It needs to convert the relationship between buyers and sellers into a community of partners to have a common approach to development of gas. Russia is keen to have India invest in its energy sector and is ready to discuss different forms for this cooperation. India was also prepared to invest billions of dollars in the Russian oil and gas industry and was in turn getting stakes in Yuganskneftegas, the former Yukos, main oil production unit confiscated by the Russian Government, as well as in Sakhalin-3 Vankor and Northern Oil.

ONGC and GAIL also plan to bid for taking a stake in Russia's Sakhalin-3 oil and gas fields. ONGC Videsh Ltd. Is planning a bid with Russian state-owned Rosneft while GAIL has tied up with Gazprom. Russia plans to call for bids for Sakhalin-3 project in q2 of 2005 and India are bidding with Rosneft. GAIL already has an understanding with Gazpron for pursuing the project. It has earmarked Rs. 2,500 crore for taking a 10-20% stake in Sakhalin-3.

Russia has promised India equity in a Siberian oil field that is equivalent to 4 to 5 million tones of crude oil annually. Initially there was talk of ONGC Videsh Ltd, the foreign arm of ONGC, getting a 15% to 20% stake in Yuganskneftegaz. ONGC has sufficient funds to buy a stake in Yuganskneftegaz, and its OVL subsidiary for overseas operations can raise up to \$25 billion, the Petroleum Minister told during his Moscow visit on February 21, 2005. ONGC and Russia's natural gas monopoly, Gazprom, signed a memorandum of understanding on February 20, 2005, pledging to explore possibilities for joint-ventures in India, Russia and third countries to produce oil and gas and to build trunk pipelines. Presenting a road show for India's 2005 oil and gas exploration on February 21, 2005, Mr. Aiyar urged Russian companies to heavily invest in India and to jointly build an Asian oil and gas community that would be stronger than the European Union.

Iran has been stating that it will set up a task force to study demands by India and Pakistan seeking more gas than the earlier demand of 75 million metric standard cubic metres per day. The total consumption in Asia almost equaled its production, unlike North America, and Europe, and still the region did not have a developed oil market. Oil producing countries of Saudi Arabia, Iran, Kuwait, the United Arab Emirates, Oman and Qatar and major consuming countries such as China, Japan, Korea, Malaysia and India took part. Iran favoured establishment of an Asian Bank for Energy Development for financing energy projects in Asia and said price of energy supplies from Asian producers to consumers in the region should be lower than that of others. Referring to the need of the growing economies of Asia, particularly China, and India, the Iranian Oil Minister, Bijan Zangeneh, said Asian countries were in need of a long-term energy supply security.

India would invest \$1580 billion in 25 years in Asia for energy production. India has tied up with Iran for supply of 7.5 million tones of liquefied natural gas annually for 25 years as part of the bilateral cooperation. Under the agreement, Iran will supply LNG at \$1.2 plus \$0.0625 of Brent per million British thermal unit (mBtu). State-run Indian Oil Corporation and Iranian firm Petropars's planned to set up LNG liquefaction facilities with a capacity of nine million tones annually. The project is estimated to cost \$3.2 billion. Table I carries some information on India and its neighboring countries.

Table 1
India and its neighbouring countries

Country	Population 2004E (Millions)	Per Capita GDP, 2003E (US\$-PPP)	Per Capita Energy Consumption 2002E (MBTU)
China	1300	\$5,000	33.3
Bangladesh	141.3	\$1,900	4.0
Bhutan	2.2	\$1,300	n.a.
India	1,065.1	\$2,900	13.3
Afghanistan	28.5	\$700	n.a.
Nepal	27.1	\$1400	n.a.
Pakistan	159.2	\$2,100	12.2
Sri Lanka	19.9	\$3,700	n.a.
Myanmar	42.7	\$1,800	n.a.

Sources: Energy Information Administration (EIA), and Central Intelligence Agency (CIA)

Commercial energy mix varies significantly across the countries in this region. Bangladesh's energy mix, for example, is dominated by natural gas (66%in 2002), while India and China rely heavily on coal, Sri Lanka and the Maldives are overwhelmingly dependent on petroleum (82% and 100%, respectively); Pakistan's usage is diversified among petroleum (42.7%), natural gas (42.2%), and hydroelectricity (10%). The Himalayan countries of Bhutan and Nepal have the

highest shares of hydroelectric power in their energy consumption mix at 80% and 31% respectively, in 2002 as shown in Table- 2.

Table - 2.
Share of Commercial Energy Consumption (%)

Country	Petroleum	Natural Gas	Coal	Nuclear	Hydro-electric	Others
China	24.5	3.1	64.5	0.6	7.2	0.1
Bangladesh	31	66	1	0	2	0
Bhutan	13	0	7	0	80	0
India	32	15	50	1	2	0
Afghanistan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nepal	55	0	15	0	31	1
Pakistan	43	41	5	1	10	0
Sri Lanka	82	0	0	0	17	0
Maldives	100	0	0	0	0	0

Sources: Energy Administration (EIA), and Central Intelligence Agency (CIA)

In the mainstream discussion on energy security management a neglected dimension is the organisation of business and corporate strategy. The government played an important role in the past in creating large corporate entities with global size and competence in the energy sector.

The public sector and private sector energy companies should work in coordination and the latter should not seek to overshadow or decimate the former. The requirements of energy security as well as of national interest suggest that public sector oil and gas companies should be strengthened, made autonomous and free of political interference and bureaucratic delays in their regular functioning. Excessive bureaucracy has prevented companies like Oil and Natural Gas Corporation (ONGC), Gas Authority of India Limited (GAIL) and the Petroleum Companies from playing a more effective role at the global level. Opportunities to invest abroad, to acquire oil equity and to undertake projects at home have been missed due to a range of political and administrative constraints on the functioning of these companies. Even as India develops large

private sector companies in the oil and gas sector, as it should, it must strengthen existing public sector companies so that Indian corporate are able to compete more effectively with Western Multinational.

India is capable of building its own oil and gas multinationals, as indeed China has been trying to do. In defining our strategy for energy security, it is important that we pay adequate attention to this dimension of industrial and corporate policy, often neglected in the discussion on the issue.

High Petroleum Product Area

It should be noted that the world's 90% oil come out of the sea. High Petroleum product countries in the world today are Nigeria, Iraq, Iran, Russia, Vietnam, Yaman and Libya. According to the various reports: Gulf has 66% oil reserves, Africa has 8 % and Caspian Sea has 26% of the world reserves oil. As Africa's leading exporter of crude oil, Nigeria is set to increase daily output from 2.2 to 3 million barrels in 2005 and raise it to 4.42million barrels by 2020. In 2002 Angola, Africa's second largest producer emerged from 15 years of civil war and by 2020 it expects to double its output to 3.28m barrels a day. Equatorial Guinea currently holds the record (along side Angola) for oil prospecting permits. Over the next 20 years it could become Africa's third largest producer (ahead of Congo and Gabon) with 740,000 barrels a day.

Iraq has the second largest proven oil reserves in the world (115 billion barrels) after Saudi Arabia. Certain estimations put it as high as 250 billion barrels because more than 90 per cent of the underground resources remain unexplored. This high quality crude is easy to transport. While trying to take control of Iraq's mineral resources, the Americans were trying to further ensure their own supplies and at the same time, gain control of energy sources upon which their main rivals, China and Europe, would otherwise depend for decades to come. Geo-politics of energy has had a major influence on world events during the 20th century and continues to do so even in the 21st century.

“Controlling Iraq is about oil as power, rather than oil as fuel,” says Michael Klare, Professor of Peace and World Security Studies at Hampshire College and author of Resource Wars. “Control over the Persian Gulf translates into control over Europe, Japan, and China. It's having our hand on the spigot.”² According to that strategy, taking control of Iraq's oil while plotting to seize Iran's is tantamount to acquiring the means of tightening the energy noose around China, thus discouraging Beijing's temptation to challenge American supremacy in the future. That is a major card to make the twenty-first century an American-dominated one.

The Afghanistan war has already given the USA a pretext to get hold of the Central Asian and Caspian Sea Oil producing regions, amounting to 26 per cent of the world reserves and making it harder for China to access them without American cooperation. US troops have been positioned in Kazakhstan and Uzbekistan to protect the oil routes. Military instructors have been deployed in Georgia, host to a key segment of the pipeline connecting the Caspian Sea with the Black Sea and Mediterranean. As it is the 1,500 km pipeline, stretching from Kazakhstan's Tengiz oil field to Russia's Black Sea port of Novorossysk, carrying 14.78 million tonnes (295,000 b/d) of crude for export during 2003. In the longer term, the American objective is to make sure that Russian

oil is directed to the West and not towards Asia while encircling China within a network of alliances with Russia, India, South Korea, Taiwan and Japan.

The Pipelines Corridor Game

The Caspian Basin during the Soviet period had pipelines going only toward Russia and it is part of the US design now to change the direction of this flow. The US would like to build pipelines through Afghanistan toward the Arabian Sea, keeping Russia as well as Europe out of these supply routes, but the problem is that Afghanistan is landlocked and the pipelines in this direction must then pass through Iran (the shortest route) or Pakistan, neither of which the US currently finds reliable. The US prefers the building of a system of oil and gas lines starting through Kazakhstan and Turkmenistan, then running under the Caspian Sea to Baku, then through Georgia and Turkey to the Mediterranean.

This would keep Russia out but would facilitate supplies to Europe. The main point in any case is that the direction of pipelines is of great geo-political importance. For example, under a different dispensation of global power, pipelines could conceivably be constructed from the Caspian Basin to the Chinese provinces of Xinjiang, which China would like to develop 'industrially'.

Those same pipelines could conceivably be extended across China to take oil and gas to its coastal regions and then, beyond that, to Japan. The construction of such pipelines would be very expensive but, as a result, China and Japan could be substantially free from US domination over their supplies. The US would never allow that because such possibilities feed into one of its two worst nightmares, namely Chinese and Japanese interest could one day converge and, together, they could lead a vast zone of industrialised countries of East and Southeast Asia in a bloc that could outdo the US itself within a foreseeable future.

India-Russia Cooperation

The British had been telling India for 150 years that it had no oil, but then Russians came and helped India find oil and build its production from zero to 33 million tones a year. Even the erstwhile Soviet Union played a major role in protecting Indian territorial integrity during the first 50 years of India's independence. Now the Russian Federation, can play a critical role in ensuring India's energy security. Asia being the fastest growing energy market, Russia and India should jointly build an Asian oil and gas community, similar to Europe's steel and coal union which has led to the European Union, and in case of Asia may lead to a much closer alliance between Asian nations.

India has stepped in with a plan to link the region with Asian markets whose thirst for energy is growing around 4% every year, double that of the rest of the world. India could cooperate in a project to build an oil pipeline from Russia's Caspian coast, to the Black Sea and across to the Mediterranean. This pipe could then connect to the proposed pipeline that India and Egypt might build to link the Red Sea with the Mediterranean. If this goes through, Caspian oil could be pumped straight on to India bound tankers in the Red Sea.

The Indian government has approved an additional investment of \$1.07 billion by ONGC-Videsh Limited (OVL) in the giant Sakhalin-I oil and gas field in Russia. This will be over and above the \$1.7 billion already cleared for investment in this major offshore oil project. The other partner of OVL in Sakhalin-I, include the oil major, Exxon Mobil, the Russian National Companies, Rosneft and SMNG-S, and a consortium of Japanese companies, Sodeco. The decision to approve the higher investment was taken at a meeting of the Cabinet Committee on Economic Affairs (CCEA). The additional amount of \$ 1.07 billion would include about \$503 million towards 'carry loan' to Russian parties in the production sharing agreement (PSA). The CCEA has also directed OVL to take all necessary steps to ensure that all cost recoverable under the PSA. "The additional investment in the project will help in increasing oil security for the country." ONGC-Videsh Ltd. Now had a 20 percent stake in the Sakhalin-I project. OVL acquired 20 percent participating interest in the Sakhalin-I project from two subsidiaries of the Russian government oil companies, Rosneft-SMNG-S and Rosneft-S in July 2001. Exxon Mobil has 30 percent equity stake in the project, while Rosnet and SMNG-S have 20 percent sake and Sodeco holds 30 percent. Exxon Mobil is the project operator.

Natural gas production from Sakhalin-I is expected to begin from the third quarter of 2005 while crude oil production from the offshore fields will commence from January 2006. The biggest hydrocarbon producer outside the OPEC cartel, Russia is sitting coy as old rivals China and Japan fight over plans to unlock the 16 billion barrels of east Siberian oil reserves through pipelines that will cost up to \$6 billion.

One proposal is to move oil from Siberia's Angarsk to China's Daqing city. Another is to move to Nakhodka on the sea of Japan. Japan had lobbied for the terminus to be at the Pacific port of Nakhodka to ensure its access to the oil without possible Chinese interference, and offered \$5 billion towards the cost of the pipeline as an incentive. The Russian government's disposal of Yukos assets has been challenged in a US court, and the Putin administration may want to draw in China, and possibly India, as cards to use against American governments.

Either of the pipelines will reduce the region's dependence on West Asia for oil. Russian companies will also be work with \$15-20 billion worth of infrastructure project in India in the coming next 5-10 years. The Russia is interested in building more nuclear power plants for India even as the Koodankulam nuclear plant is underway.

Pipeline from Iran

Here are four major ways to bring gas from the Persian Gulf to India:

1. Offshore from Persian Gulf to the Gulf of Oman and India.
2. Onshore and offshore, from Iran and along the Pakistan coast to India.
3. Onshore, from Iranian gas fields terminal at Assaluyeh to the Pakistan border and through Pakistan to India.
4. Shipping of liquid natural gas (LNG) from Iran to India by tankers. (Iran is planning to install large facilities to export LNG of South Pars field).

The pipeline reaches the area where the Indus River meets the Arabian Sea. The expected cost for transmitting gas would be \$4 billion higher than the land route.

The overland pipeline option is economically the most viable (\$3-4 billion for transmitting 30bcm per year of gas with low operating cost). As the pipeline will have to come through Pakistan many analysts in India have said that the security aspect of the pipeline needs to be comprehensively studied.

The other option for India to transport Iranian gas through a deep sea pipeline is prohibitively expensive. Apart from this there are technical difficulties for construction and maintenance of a pipeline at a depth of three thousand meters on the mountainous seabed.

Qatar-India Pipeline

A 1670 km gas pipeline from Qatar's North Field extending through the port of Diba in UAE could bring gas to Karachi through sub-sea route. The pipeline is supposed to be technically feasible and it would bypass Iran. An alternative option could be picking up Iranian gas along the way to India via Pakistan. This will bring down the costs and open up a larger market. However, due to financial weakness and uncertainty about the future demand growth, Pakistan appears to be less enthusiastic about the project.

India, Bangladesh, Myanmar, Nepal and Bhutan Cooperation

Bangladesh and Myanmar have significant natural gas reserves. On the other hand, other members like India, Sri Lanka, and Thailand are major energy importers. Collaboration among them through joint development of natural gas infrastructure facilities including gas field development and establishment of natural gas pipeline networks and/or LNG facilities could result in better economic use of energy resources, benefiting both producing and consuming countries.

The gas reserves in Myanmar, where ONGC and GAIL have 20 and 10 percent stake respectively, and India's own gas reserves in Tripura cannot be exploited optimally because of the absence of local market and gas transportation infrastructure. The proposal of transporting gas from Myanmar to India through pipeline via Bangladesh is one from which all the parties stand to gain. Bangladesh could think of supplying its gas to India on the same lines, adding to revenue earnings for allowing passing of Myanmar gas to India through its territory.

The proposed 290 km pipeline would run through Arakan (Rakhine) state in Myanmar, then via the Indian states of Mizoram and Tripura before crossing Bangladesh to Kolkata (India). If this proposal does not materialise due to opposition from Bangladesh, then India can opt for ferrying gas through a 1,450 km route from Myanmar's A-1 gas field through the mountainous North East of India.

Bangladesh has proposed regional energy sector cooperation on January 12, 2005 with India and Myanmar on the proposed trans-boundary gas pipeline. Dhaka's proposal at the Yangon meeting would also include passage through Indian territories to import electricity from Nepal and Bhutan in exchange for allowing the tri-national gas pipeline through Bangladesh territory. The proposed gas pipeline will transmit gas from Myanmar to Tripura, from where gas will join the pipeline flow and through the Jessore border end in the Indian province of West Bengal.

India-Sri Lanka Energy Cooperation

Hydroelectricity contributes the major share of Sri Lanka's power portfolio but there is not much hydro potential to be economically exploited. Sri Lanka is looking for alternative sources of generation to meet their short/medium term demand based on gas/liquid fuel, which are costlier options. Sri Lanka may look into the possibilities of conserving hydro resources by importing power from India as base load and supporting Southern Grid of India during peak demand.

Indo-ASEAN Energy Cooperation

At present, India-ASEAN trade stands at \$12 billion. It is growing at the rate of 25 per cent per year. India's export to ASEAN was \$4,618.54 million while imports came to about \$5,150.17 million.

The master plan study for the Trans-ASEAN Gas Pipeline has identified seven new possible gas interconnections covering a length of 4,500 kilometers, with total investment requirements of US \$ 7 billion. The AGP project would optimise the utilisation of natural gas by linking gas demand and utilisation centres with a pipeline infrastructure tapping the gas fields of the Andaman Sea, the Gulf of Thailand, the South China Sea, and Kalimantan and Sumatra in Indonesia. The major gas demand centres are Bangkok, Kuala Lumpur, Singapore, Jakarta, Surabaya and Manila. The infrastructure could be further extended to link the East Asian markets.

Russia-China-India Pipeline

ONGC-Videsh Limited has considered pipeline from Russia to Turkmenistan- Uzbekistan- Kazakhstan to Kashi (in western China) and then along the military cease-fire line with China in the Siachen glacier in Kashmir to India. The proposed pipeline is expected to enter India through Ladakh in Kashmir or Himachal Pradesh and then further down to Delhi. China is trying hard to have greater access to Russia's oil fields so that it can play a direct part in exploiting estimated 120 billion barrels of known oil reserves of Russia. Last year, China's total oil demand grew about 15 percent, to 5.8 million barrels. Russia may also invite China to build a pipeline to branch off from the new Siberian line, which will come to within 60 kilometers of the Russia-Chinese border. Russia has also promised to increase rail shipments of oil to China. China has been looking to Russia to help satisfy its rocketing demand for oil and natural gas. China has pledged \$12.5 billion for four oil and gas pipelines from Central Asia and Russia, apart from acquiring oil concessions for over \$8 billion in Sudan, Venezuela, Iraq and Kazakhstan. The 48th ESCAP session held in Beijing in April 1992 endorsed the study of the southern corridor of the Trans-Asian railway, one of the three Asia-Europe rail-land bridges.

Alternative Energy Sources

Strategic Petroleum Reserves (SPR), which both China and India are planning to build, may provide some short run relief from international oil price volatility but would not afford any long

term energy security benefits. Since the region has great potential for renewable energy, nuclear energy, hydrogen energy etc, developing alternative energy resources will have a greater importance than SPR. It is important to promote investment and collaboration in these areas so as to avoid the fear of any supply shortage from abroad. Improving energy efficiency would be another area of cooperation.

Renewable energy can play a major role in rural electrification in this region. Villages in far-flung areas can only be electrified by using renewable resources as it is not economically viable to connect them through the conventional grid system. The features of rural electricity viz., low and dispersed loads, high R&D costs and seasonality of the load favours decentralised (small hydro and biomass based) power plants for meeting rural electricity needs in a sustainable manner. Local institutions, like Panchayats in India might play an important role in the implementation, operation and maintenance of such power plants.

TAP-India pipeline

The Turkmenistan-Afghanistan-Pakistan(TAP)-India pipeline pipeline is 1635 km which was Asian Development Bank (ADB) initially sought to promote, is economically viable and may become a reality now after the fall of the Taleban regime. The proposed 48 inch diameter pipeline would start from Dauletabad gas field in Turkmenistan and pass through Herat, Kandahar, Quetta and Multan before entering India in the north for joining India's HBJ arterial link. The pipeline is projected to supply 0.6 bcf of gas to Pakistan and 1.6bcf to India. The landed cost of gas is estimated about \$2.4-\$3 per MMBU.

India-Africa Cooperation

With 20 percent of its oil imports coming from Nigeria, its crude oil is best suited for India's refineries and hence remains one of India's most valued sources of energy. Nigeria invited to join for production with 51 percent share holder partner in Port Harcourt Veri and Kunduna refineries, as these refineries producing 1.50 million barrels and 1.40 million barrels perday. India has long-standing ties with other African countries like Sudan. In Sudan, oil and gas companies will expand production from the 345,000 barrels a day recorded in June 2004. The country has proven reserves of 635 million barrels. The largest leaseholders include China National Petroleum, Petronas of Malaysia, ONGC-Videsh of India and Sudan's Sudapet. US oil companies have recently begun to show interest in Sudan's underdeveloped oil fields.

The most potent development is the fact that Egypt is now inviting India to join it for a proposed pipeline, being billed as the Suez of oil. Together with the Blue Stream oil transportation project, the Egyptian pipeline can actually bring the Caspian oil and gas to India's doorsteps.

Angola has blocked India's 50 percent equity partnership in production of Block 18 that could have given India five million tones of crude oil from 2008. The foreign office and ONGC-Videsh are currently working out a "customised" political-economic package for Angola. The Angolan oil company, Sonangol, might tilt towards China because of a \$2billion aid package by Beijing. India had indicated that it would give development assistance of \$20 million spread over two

years apart from manpower training, railways rehabilitation project etc. Sonangol exercised its first right of refusal with Shell, it is an American company, pre-empting its bid to sell its 50 per cent of the 10 million tonne per annum offshore Block 18 to ONGC.

India-Venezuela Cooperation

As part of an energy cooperation agreement between India and Venezuela for joint production of oil and supply of petroleum on a long-term basis on March 5th, 2005 in New Delhi, Indian companies will operate by themselves or in alliance with PDVSA (the state oil company). Venezuela is the 5th oil producer in the world. Venezuela has the largest gas deposits in Latin America to the tune of 120 trillion cubic metres of proven reserves. The energy cooperation agreement with India will also extend to pacts for exploitation of India's heavy crude oil as "Venezuela have the right technology for converting heavy oils into light crude for use in refineries". Venezuela was competent to meet India's import requirement of 100 million barrels of crude. As part of the agreement too, ONGC Videsh will pick up a 49 per cent stake in a Venezuelan oil field. Indian and Venezuelan companies have joined hands in exploration and development of hydrocarbon in India too. They have been developing the Baghewala oil field in Rajasthan and Venezuelan oil experts would shortly visit different parts of India-notably Rajasthan, believed to be rich in hydrocarbon deposits, to help carry out larger and more sophisticated exploration programmes which, if successful, would enable the country to cut down on its crude imports.

Conclusion

India imports 65 per cent of its energy sources from the Persian Gulf. But this region is volatile. Besides the Gulf region, India can get energy sources from the Caspian region, South-East Asia, Australia, Africa and Europe. But in the Caspian region, existing reserves are much lower than what was estimated, they are land-locked and the current pipeline infrastructure is grossly unsatisfactory.

Major South-East Asian countries such as Malaysia and Indonesia are going to turn into net oil importers by the end of this decade. Import options from Africa and Europe are a high strategic priority as well as an economic necessity since African and European crude oil has lower sulphur content and is more environment-friendly. Russia is a potential energy asset to the Asia Pacific region. However, to transport gas from there, India will need to construct a 3,700-km long pipeline, which is not commercially feasible at the moment. Compared to other regions, transportation of energy sources from the Gulf is cheaper. Therefore, the possibility of diversifying the regions from which to acquire oil and gas supplies in the near future seems somewhat remote.

However, energy resources are not directly usable. They have to be developed, produced, transformed into usable energy and transported to consumers. Infrastructure networking is very important for ensuring smooth energy supply. But India lacks sufficient infrastructure facilities, which poses a formidable challenge to its energy security. After many years of strenuous efforts, Hydro-Carbon Vision 2025 was formulated but India still lacks an integrated energy policy. There are problems of enforcement, implementation and integration of various approaches

required for a comprehensive energy security plan. A related challenge is bureaucratic nepotism involving a plethora of Ministries and departments of petroleum and natural gas, coal, electricity, non-conventional energy resources, etc., which comes in the way of speedy formulation and implementation of a security policy. The implementation of Hydro-Carbon Vision 2025 is still hanging fire. The Government has adopted a deregulation and liberalisation policy, which includes new exploration licensing policy and dismantling of the administrative pricing mechanism (APM). The objective behind APM was to establish a free and competitive market for petroleum products and free companies from price control. But the ground reality is that decisions are still dictated by the Government.

In order to lay the foundation for an effective policy for Energy Cooperation in the coming days, the government needs to focus on the following.

1. Create comprehensive energy databases and analyses on energy production, consumption, export, import, prices, demand forecasting and elasticity values for the development of regional energy market;
2. Establish uniform energy codes, technical specifications and standards for all the countries in this region for smooth energy market;
3. Create public awareness programme regarding the benefits of regional energy cooperation and cross border sales of electricity, oil and natural gas along with commitments and bold decisions from each government in the region;
4. Establish economic and rational pricing of energy; and,
5. Rationalise crude oil and petroleum products and customise duty structure.

Individual Countries in this region need to adopt certain policy measures to create an environment for cross border energy cooperation. The guidelines include:

1. Time bound reform and restructuring of the energy sector to develop globally competitive, efficient and environmentally compatible energy structure after taking into consideration the structures and conditions of the economies and political institutions of different countries.
2. Transparent subsidy management for well-targeted marginal consumers, which should be supported from government budgets.
3. Stabilise fuel policies based solely on economic rationale.
4. Complete proper groundwork like asset valuation, demand forecasting, consumer profile, etc. before private energy companies are allowed to operate. The contract between the government and private developers must be mutually honored.

5. Establish proper regulatory framework. The regulatory agency should have international experience, independence (free from political pressure and from market forces), accountability, autonomy and expertise on technology, economics, law and accounting.

6. Combine Command and Control (CAC) and Market Based Instruments (MBI) for optimal pollution control.

Recommendations

First, it should encourage the use of renewable sources of energy like solar, wind and hydroelectricity in large scale. Second, it should take appropriate legal, fiscal and regulatory steps to create a more attractive environment for foreign investors such as streamlining the license approval process for private power producers, offering more incentives for upstream oil and gas exploration and promoting joint ventures. Third, it should improve energy infrastructure, which includes establishment of new refineries, urban gas transmission and distribution networks, a unified national grid and improved transportation facility. Fourth, New Delhi should consider promoting and strengthening its oil diplomacy on a regular basis. Fifth, it should upgrade its organisation and technical skill. And lastly, it should formulate an urgent energy security policy and implement it without delay.

Endnotes and References

1. See, Girijesh Pant, paper presented in two days seminar on “India’s Energy Security and the Gulf”, at School of International Studies, Jawaharlal Nehru University, New Delhi, March 19-20, 2004.

2. See Robert Dreyfuss., ‘Telling Truth: The Thirty Year Itch,’ published in Peace Now: The Bulletin of the Coalition for Nuclear Disarmament and Peace, Vol. 2: Issue 1, 2004, pp-17-21.

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