Chapter VI
ENERGY COOPERATION: PROBLEMS AND PROSPECTS
Our life is dependent on energy. There are several sources of energy, including coal, hydel, petroleum, natural gas, nuclear energy and others. However, petroleum and natural gas constitute the major chunk i.e. 61 per cent of our energy needs. As the world economy moves towards 21st century, a new element has entered the energy equation. In the next few years, Asia, not just Japan, but all the so-called Asian Tigers from the Philippines to China and all the Southeast Asia need huge supplies of energy. Of the Asian countries excluding West Asia, Indonesia is an energy exporter. This new situation is likely to intensify the “Great Game” in Central Asia in contemporary times. The Central Asian energy resources have already begun to attract world-wide attention. Geopolitical considerations are becoming crucial in determining the transport routes for oil and gas through pipelines.

India is characterized by a tremendous increase in its energy consumption, of which an increasing share derives from imports. Very rapid economic growth always makes it difficult to arrive at a sound balance between demand and supply, and this tends to generate waste, bottlenecks and insecurity. Although India is trying hard to provide appropriate energy, increase its energy efficiency and diversify its sources of supply, it is becoming increasingly dependent on imported oil, and the Persian Gulf is set to remain their predominant source of oil in the coming decades. Instability in the Middle East thus poses a serious challenge to the security of India, just as it does for Japan, China, the US and many European countries. The question of maintaining a stable supply of fossil fuels poses several security challenges. One is to boost one’s own production, another to diversify one’s sources of import, and a third to secure the
transportation of oil and gas on vulnerable sea routes; or over land through pipelines that depend on long-term strategic relationships with the producing countries.

Table 1

India’s Energy Generation (1990-2007)

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<tbody>
<tr>
<td>Coal**</td>
<td>211.73</td>
<td>309.63</td>
<td>341.29</td>
<td>361.25</td>
<td>382.61</td>
<td>407.20</td>
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<td>Lignite**</td>
<td>13.77</td>
<td>22.95</td>
<td>26.02</td>
<td>27.96</td>
<td>30.34</td>
<td>30.06</td>
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<td>33.02</td>
<td>32.43</td>
<td>33.04</td>
<td>33.37</td>
<td>33.98</td>
<td>32.19</td>
<td>33.99</td>
</tr>
<tr>
<td>Petroleum products**</td>
<td>51.27</td>
<td>102.51</td>
<td>111.79</td>
<td>121.70</td>
<td>127.12</td>
<td>128.88</td>
<td>148.65</td>
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<table>
<thead>
<tr>
<th>Utilities (Billion Kilowatt)</th>
<th>71.7</th>
<th>74.5</th>
<th>64.0</th>
<th>75.2</th>
<th>84.6</th>
<th>99.9</th>
<th>NA</th>
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<tbody>
<tr>
<td>Thermal</td>
<td>186.5</td>
<td>408.1</td>
<td>449.3</td>
<td>472.1</td>
<td>492.8</td>
<td>506</td>
<td>NA</td>
</tr>
<tr>
<td>Nuclear</td>
<td>6.1</td>
<td>16.9</td>
<td>19.4</td>
<td>17.8</td>
<td>17.0</td>
<td>17.3</td>
<td>NA</td>
</tr>
<tr>
<td>Total</td>
<td>264.3</td>
<td>499.5</td>
<td>532.7</td>
<td>565.1</td>
<td>594.4</td>
<td>623.2</td>
<td>NA</td>
</tr>
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| Non-utilities (Billion Kilowatt) | 25.1   | 55.0   | 63.8   | 68.2   | 71.4   | 74.1   | NA      |

| Grand Total                 | 289.4  | 554.5  | 596.5  | 633.3  | 665.8  | 697.3  | NA      |

* Provisional ** in Million tonnes *** Billion Cubic Metres
Source: http://petroleum.nic.in/petstat.pdf

India’s energy dependence is likely to increase dramatically in the years to come, hence the need for a serious examination of India’s energy security determinants. According to the statistics, the Indian energy mix is comprised of: combustible renewables and waste (38.2%), coal (33.2%), oil (22.4%), gas (4.2%), hydro (1.2%), nuclear (0.8%), geothermal, solar and wind (0.1%). (Stein Tonnesson and Ashlid Kolas, April 2006, p. 38)
By production source, India's electricity generation is derived from: coal (68.3%), hydro (11.9%), gas (11.5%), oil (4.6%), nuclear (2.8%), and solar PV, biomass and other sources (0.9%). Compared with the situation in China, gas plays a surprisingly prominent role in Indian electricity production. India is now the world's sixth largest energy consumer, and the third largest oil and gas consumer in Asia, after China and Japan. Since 2002 several major gas finds have been made that have the potential to supplement the country's dwindling oil reserves. Despite this, Indian domestic gas production is not sufficient to cover a significantly increasing demand, and India began importing gas in 2004. (Stein Tonnesson and Ashlid Kolas, April 2006, p. 39)

Coal is the main component of India's energy consumption and production. In 1995, it accounted for 54.3 per cent of country's energy consumption and 63.3 per cent of its production. These figures are likely to remain unchanged up to 2010. ("India: Energy Consumption", www.eia.doe.gov/emeu/cabs) According to some statistics, oil demand and supply in India would almost quadruple during the period 1990 and 2020. Not only will India remain energy deficient but the level of imports in the same period could increase to eight times the 1990 levels. This poses a challenge not only in terms of ensuring a diversification of sources to minimize the possibility of disruption, but also in terms of ensuring that the line of supply remains uninterrupted. Since the production of oil is increasingly concentrating in the Middle East alone, the diversification of energy sources means, inevitably, a diversification of energy raw materials, hydro power and gas are two more possible partial alternatives.
Natural gas is another promising partial substitute for oil. In both cases, developing links with the regional producers would not only be a way to reduce India’s dependence on the Middle East oil producers but also to sectorially promote cooperation and integration within the region thus contributing to a safer environment for India. India’s oil production has stagnated – its production of crude was 632,000 bbl/d in 2005. Its oil consumption, however, has grown by over 6% annually during the past decade, twice the world average growth, and reached 2.5 million bbl/d in 2005. This has meant a drastic increase in oil imports, which represented 68% of total consumption (1.7 million bbl/d) in 2005, of which about half came from the Middle East. (Stein Tonnesson and Ashlid Kolas, April 2006, p. 39)

An annual growth of 4 per cent in Indian oil consumption over the next decades, rising from a current 2.1 mb/d to 5.3 mb/d in 2025. According to their projections imports' will account for 85 per cent of total Indian oil consumption by 2025, most of which will need to be imported from the Middle East, with the balance from Central Asia and Africa. Indian analysts estimate that India’s oil demand will increase even faster, leading to the depletion of all of India’s current proven oil reserves by 2020. Unless new discoveries are made, India will then end up in a Japanese situation, with total dependence on imported oil.

Natural gas currently accounts for about eight per cent of the energy consumption in the country. This clearly shows that gas will have to be imported either in the form of natural gas through pipelines or as Liquefied Natural Gas (LNG). From a security point of view, this possibility is significant as it enables by itself a
diversification of sources for the same product, since Central Asia is a potential supplier.

At this crucial juncture, energy security has emerged as a new cornerstone of India’s foreign policy. India has adopted a four pronged approach to energy security, which includes import source diversification and acquisition of equity oil, the building of strategic petroleum reserves (SPRs), increased domestic exploration, and production and fuel diversification. As this suggests, India’s energy security strategies are similar to those of China, including import source diversification, production and fuel diversification, and the build-up of SPRs as stated strategic goals. Section three below will describe strategic oil reserves, section two will cover import source diversification, while section one will outline measures to enhance energy efficiency and fuel diversification, with a focus on efforts to develop the natural gas sector.

India has recently entered a new era in its gas industry with large discoveries of indigenous gas and the arrival of the first liquefied natural gas (LNG) tanker in January 2004. India will continue to import LNG in the short to medium term to close its demand gap, and is already moving to develop the necessary infrastructure. Projects are ongoing to boost India’s LNG import capacity five-fold within 10 years. In total, the Indian government has approved plans for altogether 12 new import terminals. India needs to almost triple its existing pipeline capacity for gas over the next five years in order to connect the new LNG terminals with consumers and to transport gas from its recently discovered domestic fields. The largest state sector gas projects are to be conducted by Petronet, a joint venture between ONGC, Indian Oil
Corporation (IOC), GAIL, the National Thermal Power Corporation (NTPC), and Gaz de France. Petronet is responsible for two import terminals, one at Dahej and the other at Kochi. The terminal at Dahej began operation in late 2003, importing gas from Qatar. After several delays, Petronet is planning to solicit bids for its second terminal at Kochi in early 2006, with completion by 2009. Shell also has begun construction of an LNG import terminal at Hazira in Gujarat, and has contracted for LNG supplies from Oman. The facility began its operation in November 2004. Like the Petronet Dahej terminal, it is to be linked into existing natural gas pipelines. (Stein Tonnesson and Ashlid Kolas, April 2006, pp. 41-44)

As a part of the Indian government's response to the 1973 oil crisis the Petroleum Conservation Research Association (PCRA) was set up in 1976 to make recommendations for conserving petroleum products in various sectors of the economy. The PCRA was entrusted with the task of sponsoring R&D activities for the development of fuel-efficient equipment/devices. The oil marketing companies have also been making efforts to promote oil conservation, and a conservation cell has been established within the Ministry of Petroleum and Natural Gas. However, none of these measures seem to have had much effect.

In 2001 India's energy efficiency (energy consumption per dollar GDP) stood at 25,307 Btu in 1995. This made India one of the least energy efficient countries in Asia, surpassed only by Pakistan (26,229 Btu) and the extremely inefficient China (35,619 Btu). India's low level of energy efficiency is due in large part to the growth of unproductive energy-intensive industries during its economic expansion, coupled
with the virtual absence of measures to enhance energy efficiency and conservation. The Energy Conservation Act of 2001, implemented by the Bureau of Energy Efficiency (BEE) under the Ministry of Power, promotes the training of energy managers and auditors in energy management, project management, financing and implementation of energy efficiency projects. (Stein Tonnesson and Ashlid Kolas, April 2006, pp. 41-44.)

Securing imports and developing strategic alliances In recent years India has proved willing to take on the political and financial risks inherent in overseas investments. Observers have concluded that India is emulating China in its overseas energy security strategies. By improving ties with resource rich countries, India hopes to enhance its energy security. Indian oil and gas companies are thus encouraged to invest overseas and to build strong relations with strategically important countries. In addition to upstream investments, India has entered into agreements on energy cooperation with several countries, including a ‘strategic energy partnership’ with Saudi Arabia. India apparently seeks ‘niche markets’ that have remained off limits to more politically sensitive multinational oil companies. (Stein Tonnesson and Ashlid Kolas, April 2006, pp. 44-45.)

India receives more than 50 per cent of its imported oil from the Middle East, and has a great interest in diversifying its sources of oil. India’s major state-owned oil company is ONGC (Oil and Natural Gas Corporation), which has an international subsidiary, ONGC Videsh Ltd. (OVL). ONGC stands for 77 per cent of India’s crude oil and 81 per cent of its natural gas production, and is currently the most profit
making corporation in the country. During the past few years, India's public sector oil companies such as ONGC and IOC have made successful bids in oil exploration and production deals in a number of countries, including Australia, Egypt, Iraq, Iran, Ivory Coast, Libya, Burma, Syria and Central Asia. Since it started looking abroad in 2001 ONGC has acquired interests in at least 14 oil and gas projects in eleven countries around the world. The largest stakes so far are the company's 25 per cent share of the Greater Nile Oil Project in Sudan, in which CNPC is the majority stakeholder, and a 20 per cent share of the Sakhalin 1 project in Russia, led by ExxonMobil. In December 2005 OVL completed a 741 km multi-product pipeline linking Khartoum Refinery to Port Sudan. Among OVL's exploration assets are a 100 per cent share of Iraqi Block 8, a 100 per cent share of Qatar's Najvat Najem, a 70 per cent share of Egyptian North Ramadan and a 49 per cent share of Libyan NC 188 and 189. This record seems impressive, yet according to a Reuters report, despite that ONGC has acquired minority shares in projects such as Sakhalin 1, Iran's Yadavaran oilfield and Sudanese properties abandoned by Western investors, the company has yet to take a lead role in any concession. The Indian government would like to see ONGC boost its reserve-to-production ratio, or the number of years its reserves will last with the current level of output, by improving its drilling technology and management practices. ONGC's ratio is currently at 22 years. (Stein Tonnesson and Ashlid Kolas, April 2006, p. 46.)

To help meet its growing demand for gas imports India has also acquired overseas gas production assets in Vietnam and Myanmar. OVL currently holds a 45
per cent share in the Vietnamese Block 6.1 (where Statoil used to have a share), which produces 7.5 million standard cubic meters of gas per day. Together with Korean companies Daewoo International and KOGAS, the Indian companies OVL and GAIL (Gas Authority of India Limited) are also stakeholders in the Burmese offshore Shwe gas field. OVL has further been negotiating with Russia’s Gazprom over a string of major oil and gas deals, involving the production and shipping of gas, as well as petrochemicals and oil. The two companies have signed a memorandum to jointly develop energy projects in India, Russia and other countries. One of the planned projects involves gas production in the Russian Sakhalin, and building LNG facilities on the Pacific coast. (Stein Tonnesson and Ashlid Kolas, April 2006, p. 46.)

Besides, India is optimistic about a strong cooperation with the Central Asian Republics in the energy sector.

India has an enormous potential for improving its energy efficiency, and this presents a promising area for technological cooperation with Central Asian countries. Some analysts have suggested that steps should also be taken to slow the rise in energy consumption in India, especially the growth of electricity demand. This is ethically and politically difficult since per capita energy consumption is in fact much higher in the mature market economies of North America, Europe and Japan than in India. However, in recent years the growing concern for energy security, and rising oil prices, has led to a much increased awareness of the importance of energy efficiency among Indians. Improving energy efficiency is hence regarded as a key measure for
Oil and Natural Gas Export Infrastructure in Central Asia

Sources: U.S. Department of State.
enhancing energy security, and development cooperation in this field would no doubt be highly appreciated.

ENERGY COOPERATION WITH CENTRAL ASIA

The development of relations with Central Asia in the field of energy is, though politically more risky, very important. At present, most of the hydrocarbon projects in these regions of the former Soviet Union are focused on satisfying the demands of the Western nations. It should be noted that Europe is saturated with natural gas. In contrast, India is considered the largest emerging market in the world and constitutes, therefore, the object of covetousness of oil and gas companies. This potential relationship between India and Central Asia, however, gives rise to misgivings on two counts:

1. it involves countries at war or operating in a climate of conflict and/or political uncertainty. The persistence of the Afghan conflict, for instance, rules out for the present any hope of the import of natural gas from Turkmenistan. The difficult political relations prevailing between Iran and Pakistan are causing substantial complications in the development of trade exchanges not only between the latter and Central Asia but also between India and Central Asia.

2. it gives rise to the question of the possibilities of a bilateral and multilateral cooperation between the states of South Asia on one hand and the member states of the Organisation for Economic Cooperation on the other. There is also the question of the possibility of a cooperation between these two entities. What is at state here is the eventuality of an integrated approach to the
question of energy and the pivotal role that Pakistan might subsequently be led to play in this perspective. It is indeed the issue of how Indo-Pakistan relations evolve.

Since 1991, India and Pakistan have followed a consisted policy of getting closer to Central Asia by the exclusion of each other. Both believed they could benefit from the economic vacuum left by Russia. They differed, however, in their strategic objectives. The so-called transition of Central Asian states towards democratic structures and market economies was viewed by India as a fallout of confrontational power politics and shifting alliances that would be settled by the Central Asian nations themselves. Pakistan, on the other hand, considered that this process was in itself an opportunity to expand its influence in the region. The two countries agreed that the new Central Asia today was neither communist nor Russian but Islamic in character. This similarity of analysis created, however, a conflict of interests in the region, for India's strategic interest envisaged strengthening the secular aspect of states of the Central Asian region, whereas many in Pakistan considered that a common Islamic identity would create a similarity of interests that could be used as a means to promote Pakistan and gain influence.

Central Asia has large reserves of natural gas but its development as a major natural gas exporter is constrained because of a lack of pipeline infrastructure. All countries of Central Asia have centralized government planning systems that have placed strong and sometimes repressive leaders at their helms. The economic development of these countries, and in turn their energy sector development, depends
largely on the countries’ level of market transparency and their governments’ stability. Turkmenistan and Uzbekistan sit on large reserves of oil and natural gas reserves yet both countries face challenges in getting those reserves to world markets. Neither country prefers to export their resources through Russian-controlled pipelines.

Fig. 1: Oil Production in Central Asia (1992-2004)

Source: http://www.eia.doe.gov/emeu/cabs/Centasia/Background.html

Uzbekistan’s Energy Potential

The *Oil and Gas Journal* estimates that Uzbekistan contains 594 million barrels of proven oil reserves, with 171 discovered oil and natural gas fields in the country. The majority of the known oil fields in Uzbekistan are found in the Bukhara-Khiva region, including the Kokdumalak field, which accounts for about 70 per cent of the country’s oil production. The country also has oilfields in the Fergana valley region, the Ustyurt plateau and the Aral Sea. Australia’s Santos Ltd. and Caspian Oil
and Gas Ltd. announced plans in August 2005 to explore 58 fields in the Fergana Basin that, according to the companies, have discovered reserves of 1.2 billion barrels and 5.5 Tcf of natural gas. (http://www.eia.doe.gov/emeu/cabs/Centasia/Background.html)

According to Interfax, Uzbekistani total liquids production during the first six months of 2005 decreased more than 15 per cent in comparison to production levels during the same period in 2004. During 2004, total liquids production in Uzbekistan averaged 150,000 bbl/d, of which roughly 50 per cent was crude oil. After consistent oil production decline since 1998, Uzbekistan made agreements with foreign oil companies, especially from China, to develop small oil fields. In July 2005, Sinopec signed a $106 million investment deal to rehabilitate existing oilfields with Uzbekneftegaz. In June 2005, CNPC agreed to form a joint venture with Uzbekneftegaz, the state oil and gas holding company, to develop oilfields in the Bukhara and Khiva regions. Combined, these oilfields will produce only about 20,000 bbl/d of oil and not until 2015. Petronas, a Malaysian company, announced plans to sign a $200 million joint venture with Uzbekneftegaz, to develop hydrocarbon resources in the Aral Sea. Uzbekistan is attempting to privatize Uzbekneftegaz but its desire to maintain holding control over the company may thwart its plans to attract foreign investors. Also the Uzbek government's pledge to increase tax levels by roughly 30 per cent, year-over year, on subsoil hydrocarbon production is hindering foreign investment. (http://www.eia.doe.gov/emeu/cabs/Centasia/Background.html)
Uzbekistan has three refineries, at Fergana, Alty-Arik, and Bukhara, with a total refining capacity of 222,000 bbl/d. The Bukhara refinery, which was the first refinery built in the Commonwealth of Independent States since the breakup of the Soviet Union and cost in excess of $400 million, currently has a capacity of 50,000 bbl/d, although it is expected to expand to 100,000 bbl/d and refine both crude oil and gas condensate. Due to the country's decline in oil production in recent years, Uzbek refineries are operating well below their rated capacity. Uzbekistan also imported about 82,000 bbl/d of crude oil and 6,000 bbl/d from Russia in 2004 to satisfy the requirements of its refineries. Uzbekistan's limited refined product exports move by rail and road to neighboring countries and to export ports on the Black Sea. (http://www.eia.doe.gov/emeu/cabs/CentasialBackground.html)

Since independence, regional natural gas production has been characterized by modest annual increases from Uzbekistan and by a dramatic collapse (then partial recovery) from Turkmenistan. These fluctuations occurred because after 1991, natural gas from the Caspian Sea region, mostly from Turkmenistan, became a competitor with Gazprom, the Russian state natural gas company. Since all of the pipelines connecting the region to world markets were owned by Gazprom and routed through Russia, Turkmen natural gas was squeezed out of the market. As a result, Turkmenistan's incentives for increasing its production of natural gas disappeared. The country's output dropped throughout the 1990s, plummeting from 2.02 trillion cubic feet (Tcf) in 1992 to just 466 billion cubic feet (Bcf) in 1998, when the country was locked in a pricing dispute with Russia over the export of its natural gas. In 1999,
a Turkmen-Russian agreement took hold, and in 2000, production skyrocketed to 1.64 Tcf before reaching 2.0 Tcf in 2004.

With estimated natural gas reserves of 66.2 trillion cubic feet (Tcf), Uzbekistan is the second largest natural gas producer in the Commonwealth of Independent States (after Russia) and one of the top ten natural gas-producing countries in the world. Uzbekistan produces natural gas from 52 fields in the country, with 12 major deposits—including Shurtan, Gazli, Pamuk, Khauzak—accounting for over 95 per cent of Uzbekistan's natural gas production. These deposits are concentrated in two general areas: the Amu Darya Basin and in the Mubarek area of the southwestern part of the country. Since becoming independent, Uzbekistan has increased its natural gas production by over 30 per cent, from 1.51 Tcf in 1992 to 2.03 Tcf in 2003. According to preliminary 2004 data, Uzbek natural gas production increased to 2.07 Tcf for the year. With consumption at 156,000 bbl/d in 2007, Uzbekistan imports oil now. According to APS Review (October 2006), oil production could fall to 50,000 bbl/d by the end of 2010 if significant investment in the upstream sector is not made. (http://www.eia.doe.gov/emeu/cabs/Centasia/Oil.html)

Uzbekistan's natural gas fields were heavily exploited in the 1960's and 1970's by the Soviet Union, and as a result, production in oil fields such as Uchkyr and Yangikazgan, began to decline. In order to offset those declines, Uzbekistan is speeding up development at existing fields, such as Garbi and Shurtan, as well as developing new fields and exploring for new reserves. (http://www.eia.doe.gov/emeu/cabs/Centasia/Background.html) Besides, Uzbekistan
has made several bilateral agreements with foreign oil companies, especially ones from Russia and Asia. In April 2001, Uzbekneftegaz signed its first PSA with Britain's Trinity Energy (through a specially formed subsidiary known as UzPEC Ltd, now controlled by Soyuzneftegaz). The $400 million project entails the development of fields in Uzbekistan's central Ustyurt and Southwest Gissar regions. However, Uzbekneftegaz cancelled the PSA in February 2005, alleging that UzPEC had not met conditions specified in the PSA. The parties signed a new PSA in February 2007, and Soyuzneftegaz agreed to invest $462 million. In June 2005, CNPC agreed to form a $600 million, 25-year JV with Uzbekneftegaz, the state oil and gas holding company, to develop primarily small oilfields in the Bukhara and Khiva regions. Combined, these oilfields will produce about 20,000 bbl/d by 2015. Petronas signed a PSA and exploration agreement with Uzbekneftegaz in 2008. Under the PSA, Petronas will be a 100 per cent equity owner and operator to develop hydrocarbon resources in the Baisun Block. (http://www.eia.doe.gov/emeu/cabs/Centasia/Oil.html) Uzbekistan also signed several energy cooperation agreements with other Asian companies such as India’s GAIL involving them in technical discussions of exploration and development efforts in the country.

**India-Uzbekistan Energy Cooperation**

India is poised for a breakthrough in its efforts to access Central Asia’s vast hydrocarbons treasure. Uzbekistan expressed its readiness to give exploration acreages to Indian firms without bidding in return for an equal share in the revenue from any discovery. During a meeting with Indian Prime Minister in Tashkent in
2006, Uzbek President Islam Karimov told reporters that the arrangement with Indian firms will be similar to those in place with Russia, China, Korea, Malaysia and European Union nations. The two countries signed two framework agreements specifying India’s role in Uzbekistan’s role in energy and minerals sectors. (The Times of India, 27 April 2006, p. 15) ONGC Videsh’s Managing Director, R. S. Butola said in New Delhi that “this is certainly a breakthrough. The understanding at the top policy making level will enable us to put our plans of investing in Central Asia in general and Uzbekistan in particular on a fast track basis.” (The Times of India, 27 April 2006, p. 15) ONGC Videsh has been working since January 2006 on an MoU for cooperation with Uzbekistan’s national explorer, Uzbekneftegaz. The Gas Authority of India Limited (GAIL) signed one of the three cooperation MoUs with Uzbekneftegaz, which would pave way for new opportunities. (The Times of India, 27 April 2006, p. 15)

**Turkmenistan’s Energy Potential**

Turkmenistan has proven oil reserves of roughly 546 million barrels, although some reports claim oil reserves of as high as 1.7 billion barrels. Most of the country’s oilfields are situated in the South Caspian Basin in the west of the country. Turkmenistan has experienced significant oil production growth since it obtained independence from the USSR, more than doubling from 110,000 bbl/d in 1992 to approximately 260,000 bbl/d in 2004. The government has frequently targeted higher oil production, but the oil sector struggles to meet its growth goals due to lagging foreign investment. Foreign investment is limited to joint-ventures (JV) and
production-sharing agreements (PSAs), and Turkmen officials hope to attract $500 million in oil-sector investment in 2005. Late President Saparmurat Niyazov had the hope to boost Turkmen oil extraction to two million bbl/d by 2020. (http://www.eia.doe.gov/emeu/cabs/Centasia/Background.html)

Turkmenistan has two refineries, the Chardzhou and Turkmenbashi, which in total provide nearly 240,000 bbl/d of crude oil refinery capacity. Turkmenistan's refinery system is also underutilized and only processed 137,000 bbl/d of oil from Jan-May 2005, a 1 percent increase from the same time period in the previous year. According to Turkmen officials, refinery output dropped because of work at the Turkmenbashi refinery. (http://www.eia.doe.gov/emeu/cabs/Centasia/ Background.html)

Slow-paced political and economic reforms have made the majority of the international energy companies that entered the country withdraw their investments. Turkmenistan is creating the real opportunities which will enable the country to meet the contractual obligations to supply natural gas to neighbouring countries including Russia. There is no doubt Turkmen gas will serve an important factor of ensuring energy security in the continent that is proved by the increased interest in the Turkmen hydrocarbons. Turkmenistan's hydrocarbon potential is so great that the current aspirations of Ashgabat to develop impressive large scale plans on creating multiple energy export routes system to the world market seem fully justifiable. Turkmenistan is poised to produce 120 billion cubic metre of natural gas by 2010 and
this will be doubled (approximately 250 billion cubic metre) by 2020.
(www.turkmenistan.ru)

Turkmenistan is considering several options for building pipelines towards European consumers of natural gas in bypass of Russian territory:

- Turkmenistan-Azerbaijan (across Caspian seabed)-Iran-Turkey-Europe;
- Turkmenistan-Iran-Turkey-Europe;
- Turkmenistan-Azerbaijan-Armenia-Turkey-Europe;
- Extension to Turkey and farther on to Europe of an existing pipeline that crosses Georgia, Uzbekistan and Kazakhstan, or of another operational pipeline that partly crosses Russia's territory.

As for the access to Asian markets, options are being considered, too. First, there is a project of a Trans-Afghan pipeline. Turkmen President Saparmurat Niyazov and the leaders of Afghanistan and Pakistan signed a memorandum at the end of May 2002 to support construction of a pipeline that would stretch across the territory of three countries. This project, initially supervised by an international consortium with Unocal Corp. at the head, was mothballed in 1998. The project provided for the construction of a gas pipeline from Turkmenistan to Pakistan to export gas from Dovlebad fields, the reserves of which amount to 1.7 trillion cubic meters, via Afghanistan. The pipe would have a throughput capacity for 30 bcm a year, would cover a distance of 1,500 kilometers and would cost $2 billion. Its commissioning was scheduled for 2005. Experts at Russia's natural gas monopoly OAO Gazprom
believe the project is scarcely feasible due to high political risks (the situation in Afghanistan and India's position) and low demand for gas in Afghanistan and Pakistan.

**India-Turkmenistan Energy Cooperation**

One can say about the sharp revival of interest in the Turkmenistan-Afghanistan-Pakistan pipeline project with its possible extension to India, which has been participating in the Steering Committee on the Trans-Afghan gas pipeline project realization since recently. The Asian Development Bank (ADB) has been sponsoring possible project and investment scenarios to be offered to investors and financiers. The project’s feasibility study has been completed, all necessary surveys have been carried out and basic drafts of agreements among the governments and other documents have been developed with the ADB participation.

**Turkmenistan-Afghanistan-Pakistan-India (TAPI) Pipeline Project**

In mid-2005, the ADB submitted the final version of the feasibility study of the trans-Afghan pipeline construction to the petroleum ministers of Turkmenistan, Afghanistan, Pakistan and India. It was developed by the British Penspen Company. The 56 inch (1,420 mm) gas pipeline with the normal pressure of 100 atmospheres has a production capacity of 33 billion cubic metre of gas a year. The project’s estimated cost is 3.3 billion US dollars. The project envisages construction of six compressor stations on the 1,680 kms route of the future gas pipeline running from the Dovletabat field in Turkmenistan to the Indian settlement, Fazilka, on the Pak-India border. (www.turkmenistan.ru)
At the last meeting in Turkmen capital Ashgabat, the oil and gas ministers of four countries and representatives of the ADB agreed on the delivery volumes of Turkmen natural gas and came to a number of specific agreements, particularly regarding Turkmen natural gas volumes to be purchased by Pakistan and India, and confirmed the formal invitation to India to join the project. The absolute sufficiency of natural gas reserves in the Dovletabat field necessary to realize the project was declared. The results of the audit conducted by the US DeGoyler and McNotten Company which confirmed the availability of resources were announced.

It is difficult to overestimate the significance of the trans-Afghan gas pipeline for the development of the whole region. The Kabul government hopes to get not only fuel and dividends from transit, but thousands of new jobs. It is not accidental that the Afghan authorities have declared their readiness to assume all obligations to ensure security for the gas pipeline and its construction. These obligations include protection, mine clearing on the route of the pipe. To ensure the gas pipeline construction, the Afghan government undertook to redeem all land plots located on the route of the pipeline from the landowners.

The Pakistani authorities, whose country is in acute shortage of energy, also pin their hopes on the successful construction of the pipeline. India, too, scrutinizing all opportunities for natural gas imports from Turkmenistan and Iran and taking into account the regional situation has been more and more inclined towards Ashgabat in recent times. Moreover, in case of successful realization of the Turkmenistan-Afghanistan-Pakistan-India gas pipeline project, laying the oil pipeline along the
same route will also become a reality. This pipeline will pump the natural gas of Turkmenistan and other Central Asian republics, and possibly Russia, to the Indian Ocean. (www.turkmenistan.ru)

A fresh round of technical level talks on Turkmenistan, Afghanistan, Pakistan, India gas pipe line was being held in Islamabad recently. The talks on the project were postponed twice due to domestic problems in Pakistan. The Vice President yesterday said that the technical level talks are continuing despite some doubts are being raised about the project. ("India, Turkmenistan Sign MoU in Gas Sector", Online: Web, http://www.dailyindia.com/show/230168.php/India-Turkmenistan-sign-MoU-in-gas-sector)

First proposed some 15 years ago, the project has never been carried out, whether due to instability in Afghanistan or strained ties between Pakistan and India. But the parties involved feel that now may be the time to finally carry out the project, which would benefit all four countries. (Bruce Pannier, Online: Web)

The Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline project certainly would help the consumer countries, Pakistan and India, while Turkmenistan could make billions of dollars from gas exports. But arguably it would benefit Afghanistan most by providing steady transit fees to fill depleted state coffers in Kabul. However, the security situation in Afghanistan, long a major obstacle to TAPI, remains as much a problem today as it’s ever been.
According to plans, the 1,680-kilometer TAPI pipeline would start in the Turkmen city of Daulatabad, pass through the Afghan cities of Herat and Kandahar, before entering Pakistan at Quetta and proceeding to the Indian border town of Fazilka. Six compressor stations are to be built along the route. Plans for the pipeline call for it to export some 33 billion cubic meters (bcm) of gas from the field annually. Estimates of the cost for building the TAPI pipeline are some $6 billion. Some estimates of construction time have the pipeline completed no earlier than 2018. The Asian Development Bank is backing the project. (Bruce Pannier, Online: Web)

Turkmenistan has been pushing the project for years and even met with Taliban officials in the late 1990s to try to secure guarantees for the pipeline, which at that time did not foresee Indian participation. Turkmenistan's southern Dauletabad field is one of the few Turkmen fields that has been thoroughly checked -- by Unocal in 1997. The U.S. company estimated the field has 708 bcm of natural-gas reserves. Turkmenistan not only stands to gain financially but could also secure its place as the gas hub of Eurasia if it can fulfill all the commitments it already has to Russia, the European Union, China, and Iran.

For Pakistan, TAPI could provide both an energy resource and revenue in the form of transit fees to India. Pakistani officials, including President Pervez Musharraf, have been promoting their country as a possible hub for gas and oil from Southwest Asia and the Arabian Sea to China if road, rail links, and pipelines were built.
India's inclusion in the project makes it more viable. The New Delhi-based Indo-Asian News Service reported on April 14 that India "currently meets only 55 to 60 percent of its demand for natural gas." India had been an "observer" in previous talks about the pipeline project, but Indian Vice President Hamid Ansari during his recent visit to Turkmenistan on 4th April 2008, declared that India had full member status of the TAPI project. The IPI pipeline would be some 2,600 kilometers long, with an estimated cost of $7 billion. Iran estimates it can complete its section of the pipeline to the Pakistani border by 2013, though other estimates say Pakistan could start receiving gas from the IPI pipeline as soon as 2011. (Bruce Pannier, Online: Web)

To sum up, need for energy security, amidst dynamic development in politics and fierce competition amongst nations for Oil assets acquisitions and investments, entails India to effectively respond to and participate in these global trends based on a model of mutual interdependence, conjunction with future scenarios and application of appropriate Geopolitical Strategies, for surety of supply/return of oil/investments in Oil Assets. Longevity of cooperation in energy security depends on the country we select today, therefore before deciding on mutual cooperation risk analysis of the country’s has to be done so as to safeguard our energy security in worst political future scenarios.