Energy Strategies in China and India and Major Countries' Views♦

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Introduction

The substantial increase in Asian developing countries' demand for energy has attracted attention as one of the factors behind the tightening international oil and energy supply and demand balance and a crude oil price spike. Among them, China and India are expected to exert an extremely strong influence on the future international energy supply and demand relationship and the stabilization of the international energy market, given their enormous energy demands, fast growth thereof, their great medium- to long-term growth potential, their proactive energy security policy development and the effects of such policy development. For Japan, which depends on imports from the international market for most of energy supply, an analysis of the energy situations and policies in such key countries as China and India is extremely important for developing policies regarding stable energy supply.

Based on an acknowledgement of the above, this report first outlines energy supply/demand trends, policies and strategies in China and India, reviews their national oil companies' business strategies and specifies how major countries view the two countries' energy policy development[1].

Chapter 1 Energy Strategies in China

1-1 Recent trends in energy supply and demand

China sustained annual economic growth of more than 10% in the first half of the 1990s. Since the second half of the 1990s, the growth pace has slowed down. However, China has maintained economic growth at levels as high as 8-9%. Leading such high economic growth have been capital expenditures in the context of spending. Among industries, a growth leader is the secondary industry, which accounts for some 46% of China's gross domestic product. The high economic growth has led China's energy demand to maintain an interrupted upward trajectory. According to the BP Statistical Review of World Energy, China's primary energy consumption grew from 688 million tons oil equivalent in 1990 to 1,386 million TOE in 2004. China's primary energy consumption in 2004 accounted for 13.6% of the global total, meaning that China was the second

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[1] For details about the impact of the two countries' energy supply/demand trends and policy development on the international energy market and Japan's responses, see "Impact of Chinese and Indian Trends on International Markets and Japan's Responses (in Japanese)," by Koyama, Ken, released on the IEEJ website in December 2006.

largest energy consumer after the United States.

China's energy consumption trends over a 15-year-period from 1990 indicate a mismatch between economic growth and energy consumption. While the economy sustained stable growth, primary energy consumption peaked at 930 million TOE in 1997, fell to 766 million TOE in 2000 and started a fast climb in 2001. The changes came as coal consumption, which accounts for most of China's energy consumption, declined substantially from 682 million TOE in 1997 to 455 million TOE in 2000 and started a sharp increase in 2001 before rising to 957 million TOE in 2004. One factor behind such sharp fluctuations in coal demand is that output (supply) declined due to the compulsory shutdown of small to medium-sized and inefficient coalmines under a coal industry streamlining policy. Another factor is that coal consumption for power generation increased fast to meet a substantial expansion in power demand in and after 2001.

While coal consumption has fluctuated wildly, consumption of alternative of energy sources such as oil and natural gas has sustained steady growth. As fast economic growth has led to rises in income levels, the launch and development of motorization, the diffusion of energy-using equipments and a shift to more convenient and better-quality energy sources, China's demand for oil expanded from 110 million tons in 1990 to 308 million tons in 2004, with an annual demand growth rate at 7.6%. The demand for natural gas increased from 13.2 million TOE to 35.10 million TOE (at an annual pace at 7.2%). Due to these demand trend changes, China's energy consumption has been shifting from coal to oil and natural gas. Coal's share of primary energy consumption fell by nearly ten percentage points from 77.8% in 1990 to 69.0% in 2004. In contrast, the share thereof represented by oil rose from 16.0% to 22.3%, and that represented by natural gas from 1.9% to 2.5%. Nuclear energy has also expanded substantially since its introduction in the 1990s, although nuclear energy's share of primary energy consumption is still limited to 0.8%.

While energy demand including oil has increased, energy sources have been supplied differently. China has retained self-sufficiency in coal and natural gas on the strength of rich domestic reserves and production capacity for these energy sources. China became a net oil importer in 1993 as its oil production growth failed to catch up with the fast demand expansion. Since then, China's oil imports have increased year by year to meet rising demand. China has replaced Japan as the second largest oil consumer in the world. It is still the third largest oil importer after the United States and Japan. This fast oil import growth indicates that China may overtake Japan to become the second largest oil importer in the near future.

While China's growing oil imports appear a symbolic case at present, its overall energy demand has sustained an expansion. China's influence on the international energy market is expected to grow increasingly important in future. The fast rise in China's coal consumption has been cited as one of the factors behind the recent coal price hike on the international market. Since China is expected to expand LNG imports, the country is likely to have a growing influence on the world's

LNG market. China's growing energy demands, including oil, has emerged as the most important demand-side factor affecting the supply/demand balance on the international energy market. According to the IEA World Energy Outlook 2005, which forecasts energy supply and demand through 2030, the world's oil demand is projected to increase by an annual average of 1.3% from 79.2 million bpd in 2003 to 115.4 million bpd in 2030. Of the demand increase totaling 36.2 million bpd for the period between 2003 and 2030, China is expected to account for 7.7 million bpd, or 21%. (The Chinese oil demand increase is the largest among countries worldwide.) The IEA outlook estimates that China's oil demand will rise by an annual average of 2.9% from 5.4 million bpd in 2003 to 13.1 million bpd in 2030. Given the recent oil demand growth (close to 10%) in China, however, we may view the IEA estimate as conservative. If China's oil demand increases faster than estimated, it may exert a great pressure on the global oil supply system and become the largest demand-side factor supporting crude oil price hikes.

1-2 China's Energy Policy and Strategy

In view of its fast growth in energy demand and imports as discussed in the previous section, China has strongly recognized the importance of a national energy policy. Its 10th five-year plan covering the 2001-2005 period points to some key challenges regarding energy, including (1) ensuring energy supply security, (2) upgrading energy supply and demand mix, (3) promoting energy-saving efforts, (4) addressing energy and environmental problems, and (5) promoting great western development regarding energy. While China has increased its dependence on oil imports, oil prices have spiked as a consequence of growing geopolitical threats, including destabilization in the Middle East. This has prompted China to recognize the enhancement of energy security as an increasingly pressing policy challenge.

Under such circumstances, China announced the establishment of the State Energy Leading Group headed by Premier Wen Jiabao in June 2005. This new organization was designed to enhance planning and implementation of energy policy. At its first meeting, the group decided to tackle the following measures: (1) enhancing the energy strategy, implementing and improving medium- to long-term overall energy development programs and specific plans, and promoting coordination and rational distribution of energy sources, (2) promoting sound and orderly development of coal, electricity, oil and natural gas industries, (3) promoting new and renewable energies, (4) stepping up energy-saving efforts, and (5) promoting energy industry and company reforms.

In March 2006, the 11th five-year plan covering the five-year period beginning in 2006 was approved by the National People's Congress and announced. In this new five-year plan, the Chinese word for "plan" is changed from *jihua*, as seen in *jihua jingji* (planned economy), to *guihua* (guidelines) to indicate China's ongoing transition from a planned economy to a socialist market

economy. Numerical targets in the 11th plan were reduced from the 10th. Based on projected average annual economic growth of 7.5% for the five years, it calls for a shift from investment and export-led economic development to domestic demand-led development and expansion of the tertiary industry's share of the economy to 43.3%. On energy policy, the plan emphasizes such challenges as "giving top priority to energy-saving efforts, building on supply of domestic energy resources, using coal as a basic energy resource while diversifying energy sources, optimizing supply/demand structures, and building an energy supply system that is stable, economical, clean and safe." Specifically, the plan identifies energy-saving efforts as the central pillar of its energy policy from the viewpoint of energy security and specifies a numerical target calling for a 20% cut in the intensity of primary energy consumption per GDP from 2005 to 2010. Source-by-source and other specific energy policy measures under the plan follow:

- "Orderly development" of coal: large coal base construction, etc.
- "Accelerated development" of oil and gas: domestic production expansion, overseas development, LNG facility construction, strategic oil stockpilings expansion, etc.
- "Proactive development" of electricity: enhanced thermal electricity generation, proactive development of nuclear reactors, etc.
- "Committed development" of renewable energies: expanding renewable energies' share of total primary energy consumption
- "Enhancement of policy measures" for saving energy: establishment of energy-saving indicators, development of guidelines, presentation of 10 priority energy-saving projects, etc.

The Chinese government has been drafting a "comprehensive energy law" since late 2005 in a reported bid to complete a draft in 2007. The new law is expected to require companies to implement energy-saving measures and promote the development and use of solar and other new energies. It is also estimated to include measures for stable energy supply. The author here would like to outline policies that China has thus far considered or implemented to enhance energy security. Among them are domestic energy production, alternative energy and energy-saving policies for curbing energy (oil) imports; diversification of oil import sources, promotion of independent overseas resources development and enhancement of relations with oil-producing countries for stabilizing energy (oil) imports; and oil stockpiling development and other measures for the enhancement of contingency management capabilities.

1-2-1 Curbing Energy (Oil) Imports: Domestic Energy Production and Alternative Energy Development

China has been trying to develop western inland and offshore oilfields while maintaining and stabilizing production at Daqing and other major oilfields. It considers natural gas development

to be as important as oil development. As for coal representing China's largest domestic energy resource, China has been trying to solve transportation and safety problems and to develop and fully distribute clean coal technologies based on the development of large coal production bases, large companies and corporate groups. It also emphasizes the diffusion of hydro power and nuclear power as domestically produced energy resources. Plans are afoot to boost nuclear electricity generation capacity to 15 million kW by 2010 and to 40 million kW by 2020. China has promoted the introduction of renewable energies for living standard improvements and the electrification in farming villages, as well as for energy security and environmental conservation. The government promulgated the Renewable Energy Law in April 2005 and put it into effect in January 2006. The law aims at promoting the development and utilization of renewable energies and features renewable energy industry guidance and technical support, lending, tax and other economic incentives, and a requirement that power utilities with transmission grid purchase electricity generated through renewable energy. Subject to the law are wind, solar, hydro-electric, biomass, geothermal and marine energy.

1-2-2 Curbing Energy (Oil) Imports: Promoting Energy-saving Efforts

As noted above, the 11th five-year plan identifies energy-saving efforts as a central policy challenge from the viewpoint of energy security and specifies a numerical target calling for a 20% cut in the intensity of primary energy consumption per-GDP from 2005 to 2010. It is pursuing energy-saving efforts through the advancement of industrial structure, the development and diffusion of energy-saving technologies and the institutionalization of energy consumption management and supervision.

1-2-3 Curbing Energy (Oil) Imports: Diversifying Oil Import Sources

In 2004, China depended on the Middle East for some 50% of its crude oil import. Its largest oil import source is Saudi Arabia. Oman and Iran are also important oil import sources for China. While an expected large increase in China's crude imports in future suggests growing dependence on the Middle East, China has increasingly recognized the importance of oil import source diversification in consideration of the recent crude oil price spike and the unstable political situation in the Middle East behind the spike. In this respect, China has considered and promoted plans for massive oil imports from resources-rich neighbors including Russia and Kazakhstan. As regards oil imports from Russia, China has considered an East Siberia-Daqing pipeline plan that could compete with a Pacific pipeline spearheaded by Japan. In diversifying oil import channels, China has considered a pipeline through Myanmar as an alternative Middle East oil import channel through the Malacca Straits.

1-2-4 Curbing Energy (Oil) Imports: Promoting Overseas Oil Development

China National Petroleum Corporation and other Chinese oil companies have attracted global attention through promoting their independent overseas oil development and entering foreign upstream sectors. In particular, CNPC, the largest Chinese oil company, has proactively participated in oil exploration and development projects in Kazakhstan and other Central Asian countries, Indonesia and South America, as well as in Sudan, Iran, Iraq and other countries on which the United States and other Western countries have placed restrictions on oil imports. By April 2005, Chinese oil companies had invested $7 billion in overseas oil exploration and development and produced 60 million tons of crude oil overseas. Chinese oil firms have participated in more than 100 oil exploration and development projects in more than 30 countries. The three Chinese national oil companies produced 22.07 million tons in crude oil overseas in 2005, achieving the 2005 target of 15-25 million tons within the 10th five-year plan. Chinese oil companies other than CNPC have also engaged in overseas operations. In particular, China National Offshore Oil Corporation, which primarily conducts offshore oil development, has enhanced its acquisition of gas assets in line with its LNG operations. CNOOC also attracted global attention by making a bid for Unocal Corp. of the United States in 2005, although the bid failed due to opposition from the U.S. Congress.

1-2-5 Curbing Energy (Oil) Imports: Enhancing Relations with Oil-producing Countries

In response to its fast rise in oil imports, China has been trying to enhance relations with major oil-producing countries such as Saudi Arabia, Iran and Russia since the second half of the 1990s. China has exploited VIP diplomacy and official exchange visits to conclude cooperation agreements for stronger energy relations with these oil-producing countries. Since 2000, it has expanded VIP diplomacy to enhance relations with African oil-producing countries (such as Nigeria and Algeria) and oil producers in the Americas (including Venezuela, Canada and Brazil). In enhancing relations with oil-producing countries, China has deepened overall economic relations in a profound fashion and promoted mutual energy sector investment. For example, China has signed a contract with Iran to import LNG while participating in Iran's upstream oil and gas development.

1-2-6 Enhancing Contingency Management Capabilities: Oil Stockpiling System Development

China had felt little necessity to develop oil stockpilings because it had been an oil-exporting country. In fact, China had not had any national oil stockpiling system or any requirement for oil companies to reserve oil. Oil firms had only maintained the commercial inventories required for their operations. Since China became a net oil importer in 1993, however, fast-increasing oil imports and the recent crude oil spike have stimulated China's interest in oil stockpilings. A report on an outline of the 10th five-year development plan came up with a policy of developing a system to build up stockpilings of oil and other strategic materials. As a national oil

stockpiling system, China is now reportedly constructing its first oil stockpiling bases in Daqing in Liaoning Province, Huangdao in Shandong Province, and Zhoushan and Zhenhai in Zhejiang Province. A reported, though not official, plan calls for achieving oil stockpilings equivalent to 30 days' net imports (14 million tons) by 2010 and building additional bases for 28 million tons by 2020 to boost oil stockpilings to an equivalent of 90 days' net imports.

Lastly, the author would like to outline China's energy market restructuring, including the liberalization and deregulation thereof. Since the second half of the 1990s, China has implemented various industrial organizational reforms and market system changes. In 1998, China shifted from the horizontal division of labor regarding upstream and downstream sectors to the two vertically integrated groups -- CNPC and Sinopec -- through redistribution of assets. China's oil industry has thus shifted to a new structure. Under the new industrial structure, China has carried out the regulations on petroleum product imports, the enhancement of a crackdown on oil smuggling, the elimination of small oil refineries, the modification of domestic oil price systems (adoption of a link to international prices) and other measures one after another. Through these measures, China has tried to enhance the financial profile and competitiveness of its oil industry.

In exchange for being allowed to join the World Trade Organization, China made commitments to eliminate or reduce oil-related tariffs, to expand or eliminate oil import quotas and to gradually liberalize oil retail and wholesale markets. It has been steadily implementing these commitments. Therefore, China is now compelled to further enhance the efficiency and competitiveness of its oil industry. In this respect, national oil companies have begun to pursue substantial personnel cuts and other unprecedented restructuring measures in a bid to prepare for a future market and competition environment that is expected to grow tougher. While promoting such rationalization and restructuring measures, they have been implementing strategies to tackle domestic oil and natural gas development projects, expand overseas oil and gas business operations, increase oil refining facilities for growing crude imports and enhance their sales divisions through the expansion of service station networks in order to secure their future growth and survival.

While China's domestic and external crude oil sales prices are linked to international prices at present, prices for domestic petroleum products remain under the control of the National Development and Reform Commission. Therefore, petroleum products price changes in China lag behind those of international prices. Domestic price hikes are more limited than international price hikes. Particularly, the government provides uncompetitive businesses and public industries (including public transportation and taxi sectors) with subsidies to further reduce the effects of price hikes. As crude oil prices exceeded domestic petroleum products prices, however, oil companies

quickly expanded petroleum products exports , leading to supply shortages in some regions including Guangdong Province. Later, the government imposed restrictions on exports, prompting national oil companies to incur losses at their oil refining divisions. In 2005, Sinopec and PetroChina Co. booked their respective refining division losses of $160 million and $740 million. The Chinese government provided Sinopec with subsidies to cover the loss, while requesting that the two corporations consolidate upstream and downstream revenues to produce net profit.

China's liberalization of oil and other energy markets is coupled with its energy demand and market expansion to provide new business chances for all international energy market players (including oil-producing nations, multinational oil companies and energy industries in Japan and other Asian countries). How oil and other energy industries in China change has become a focus of attention.

1-3 Chinese National Oil Companies' Business Strategies

The three main national oil companies in China have boosted profits mainly through their upstream divisions thanks to the crude oil price spike in recent years. In 2005, PetroChina expanded net profits by 30% from the previous year to 139.6 billion yuan, Sinopec by 23% to 39.6 billion yuan and CNOOC by 57% to 25.3 billion yuan. But their downstream divisions including refining and sales operations have seen their profitability deteriorate as they have failed to pass cost hikes on to petroleum products prices under the government-controlled pricing system. PetroChina and Sinopec incurred downstream divisions losses despite their cost-saving efforts. These national oil corporations will have to further streamline themselves and cut costs to survive the tough future competition. They are expected to take measures including forming alliances with foreign companies to enhancing crude oil production, invest in overseas upstream projects, expanding gas, refining and petrochemical business operations and strengthening their retail operations.

CNPC's main subsidiary, PetroChina, has taken advantage of its advanced oil exploration and developmental know-how to expand oil exploration and development investment, proven oil and gas reserves and production. It has also been trying to enhance oil-refining and sales operations and construct natural gas and oil pipelines. PetroChina has been implementing oil and natural gas exploration and development projects in the Tarim Basin, Dzungaria Basin, Songliao Basin and Bohai Bay. It plans to increase investment in these projects in 2006 by 12.4% from the previous year to 93.5 billion yuan. As for overseas oil development, PetroChina is trying to secure the rights to 15 to 20 million tons in annual overseas crude oil production by 2010 mainly through acquisitions of assets including those based on alliances with foreign companies. It plans to construct five 10-million-ton oil refineries to expand its total refining capacity to 170 billion tons by 2010. In this

respect, it has earmarked 23.7 billion yuan or 10.3% of its total investment in 2006 for the construction or modification of refineries and qualitative improvements in gasoline and diesel fuel. As for natural gas and pipelines, PetroChina plans to expand investment in 2006 by 10.3% to 15.3 billion yuan in the construction of oil pipelines in Western regions and natural gas storage facilities for utilization of Western gas resources for Eastern regions.

Sinopec has been expanding oil exploration and development investment and oil and gas production while trying to enhance oil refining and marketing capacity. As for oil and gas exploration and development, Sinopec plans to invest 29.8 billion yuan in 2006 to enhance exploration and development at the Dzungaria Basin, Ordos Basin and Sichuan Basin in the west and the Shengli oilfield in the east to produce 39.8 million tons in crude oil and 7 billion cubic meters in natural gas. Sinopec's oil refining division plans to expand investment to 14.6 billion yuan to increase its annual crude oil refining capacity to 140 million tons. In particular, Sinopec aims to expand high-sulfur and heavy crude refining capacity and increase production of higher value-added products. In a bid to boost its market shares amid intensification of competition, Sinopec aims to raise total sales (petroleum and petrochemical products) to 110 million tons and retail sales to 66.2 million tons.

CNOOC is trying to become a comprehensive energy company through a vertical integration of its upstream and downstream sectors so as to compete fairly with PetroChina, Sinopec and oil multinationals. It plans to further expand investment in 2006 to enhance oil and gas exploration and development in the Bohai, East China and South China Seas in order to expand annual oil and gas production to 50 million TOE by 2010. To this end, CNOOC has proactively formed alliances with oil multinationals and other firms to absorb foreign technology and know-how. In a bid to become a vertically integrated energy firm, it has been undertaking participation in oil refining and petrochemical operations. In regards to the supplying of LNG, CNOOC has started natural gas imports form Australia through its Guangdong LNG terminal project. It is also conducting the construction of Phase 2 Guangdong, Fujian and other LNG terminals. As for overseas upstream operations, CNOOC has taken advantage of its offshore oilfield development know-how to implement 18 oil and gas exploration and development projects in seven foreign countries. In line with its domestic LNG services, CNOOC is securing stakes in upstream natural gas projects in such foreign countries as Australia and Indonesia.

China's national oil companies, which have previously served as government organs, have transformed themselves into independent self-supporting corporations. Integration of governmental and industrial sectors for management and production in the oil industry has disappeared. However,

the Chinese oil market remains under the oligopoly of the three national oil companies, meaning that they are major players having the key to China's oil security. Even while gradually deregulating the oil market, the government is expected to retain substantial control over the three firms (as their largest shareholder). Under the new oil industry structure, the government can no longer issue directives or administrative orders to directly intervene in the business operations of oil companies. Instead, it supervises industrial activities by way of the law and government policies. Even though still under the government's macro policy control, the three national oil companies have had subsidiaries for production or other operations made public in foreign countries. These companies have thus been partially privatized. They give considerations to shareholders' interests and conduct business operations more efficiently and independently than before.

The Chinese national oil companies' upstream development investment deals, though placing the usual emphasis on business investment issues, feature some instances wherein they receive the government's political and financial support, under its energy security policy, to undertake combine efforts which deviating far from international standards, with some economic assistance to obtain contracts from oil-producing country governments involved in international disputes. Such investment deals' sustainability is doubted by many people from the viewpoint of pure economic rationality. If crude oil prices decline from present high levels, such investment deals may grow more irrational. Actions that ignore economic efficiency may prove unsustainable over a long time under market principles. However, some other people view the Chinese national oil companies' investment behavior as an optimum business behavior in the present environment. Their view is that the Chinese national oil companies' investment levels far above international standards and economic assistance spending indicate these companies are taking full advantage of "information asymmetry" to prevent their expanding profits from being collected as tax by the government and secure their survival and interest while citing national energy security reasons. The view is based on the so-called principal-agent theory. In this case, the Chinese national oil companies' behavior will remain an optimum one for them unless their behavior is dramatically reformed due to external factors. In this sense, their present investment behavior can be viewed as sustainable. Views are thus divided over the Chinese national oil companies' upstream investment behavior. In future, we will have to keep close watch on such behavior.

Chapter 2 Energy Strategies in India

2-1 India's Energy Supply/Demand Trends

Indian economic growth has accelerated under the full-scale introduction of economic liberalization policies that began to be introduced in the early 1990s. India's annual GDP growth stood at around 4% in the early 1990s and accelerated to more than 7% in the three years after 1994.

GDP growth has ranged from 5% to 7% ever since. In line with such economic growth, India's primary energy consumption has expanded substantially. According to the BP statistics, India's primary energy consumption grew at an average annual rate of 4.9% from 193 million TOE in 1990 to 377 million TOE in 2004. The 2004 figure indicates that India was the world's fifth largest primary energy consumer after the United States, China, Russia and Japan.

Demand for oil and natural gas among energy sources has increased remarkably. Oil consumption grew at an average annual rate of 5.3% between 1990 and 2004 and natural gas at 7.0%. Coal, which accounts for most of India's energy supply, scored a steady annual average increase of 4.7% during the period. However, coal's share of primary energy consumption fell from 55.8% in 1990 to 54.5% in 2004. In contrast, the share represented by oil rose from 30.0% to 31.7% and that represented by natural gas from 5.8% to 7.7%, indicating a gradual shift in the Indian energy mix.

As for energy supply broken down by source, India, like China, has achieved self-sufficiency in natural gas whose demand in nature depends on domestic supply, as well as in coal, which is represented by enormous reserves and production capacity in India. However, domestic oil production growth has failed to catch up with fast consumption growth. India has rapidly expanded oil imports to meet fast-rising domestic demand.

India's oil consumption almost doubled from 57.9 million tons in 1990 to 119.3 million tons in 2004. While India is the fourth largest oil-producing nation in Asia following China, Indonesia and Malaysia, its oil output has leveled off at around 38 million tons. As a result, India's net oil imports (consumption minus domestic production) more than tripled from 23.1 million tons in 1990 to 81.3 million tons in 2004. During the period, India's dependence on imported oil soared sharply from 39.9% to 68.1%. India has traditionally maintained close economic relations with oil-producing Middle Eastern countries for geographical reasons. The Middle East has been a major oil import source for India.

The impact that the increase in India's oil imports has had on the international market has not been as big as that of China's thus far. This is because India's oil consumption has been far less than that of China. Since India has the second largest growth potential after China's and is expected to develop into a giant market with oil demand increasing steadily, however, its impact on the international oil market is likely to increase gradually. According to the IEA's World Energy Outlook 2005, India's oil demand is projected to increase by an average annual rate of 2.8% from 2.5 million bpd in 2003 to 5.2 million bpd in 2030. The growth rate and volume are less than China's, but they represent the second highest after China's in Asia. This increase in annual demand accounts for 7%

of the global rise at 36.2 million bpd for the same period. Oil demand growth in India and China accounts for a major part of Asia's oil demand expansion, or more than a quarter of the global increase. India as well as China is expected to lead global oil demand growth. Steady oil demand growth in India (and China) will become the largest demand-side factor affecting the global oil supply/demand balance and attract attention.

As for natural gas whose consumption had been limited to domestic production in India, Petronet LNG Ltd. has started LNG imports since India's first LNG import terminal in Dahej went on stream in January 2004. The second one in Hazira launched operations in April 2005. India's dependence on natural gas imports is expected to increase as plans to import LNG or build pipelines for natural gas imports to meet a future expansion in natural gas demand are considered and implemented. The IEA outlook, as cited above, projects India's natural gas demand to expand some 3.5-fold from 28 billion cubic meters in 2003 to 98 billion cubic meters in 2030. The projected natural gas demand expansion has attracted attention as providing key business opportunities for gas-producing nations in the Middle East and oil majors.

2-2 India's Energy Policy and Strategy

In consideration of this energy supply/demand situation, energy policy priority is now being given to the enhancement of energy security, as seen in China. Factors prompting India to enhance energy security include a substantial increase in its oil imports and its dependence on oil imports, coupled with the recent crude oil price spike and concern over growing geopolitical risks represented by destabilization in the Middle East. In India, the Planning Commission coordinates and integrates energy policy proposals of relevant government agencies and includes coordinated measures as a comprehensive energy policy into the five-year plan that represents India's basic national economic policy. Major energy policy challenges under the 10th five-year plan covering the 2002-2006 period includes: (1) expansion of coal and electricity production, (2) enhancement of hydrocarbon exploration and development, (3) acquisition of overseas oil concessions, (4) restructuring and deregulation of the energy sector, (5) management of the demand side to increase energy efficiency, (6) enhancement of anti-pollution measures, and (7) integrated energy approaches. As the energy policy as compiled by the Planning Commission for the five-year plan represents proposals by five energy-related government agencies (for coal, oil and natural gas, electricity, nuclear energy and renewable energy) and is implemented by them separately, however, the policy is inconsistent and inefficient.

Under such circumstances, rising crude oil prices, and serious electricity and other energy shortages have prompted India to draft a long-term energy policy that covers all energies and gives

considerations to the environment. In this respect, the Planning Commission has organized an expert committee to draft a national Integrated Energy Policy. The Expert Committee on Integrated Energy Policy published a draft report in December 2005[2]. The energy policy draft aims to steadily provide impoverished people and all others in India with safe and convenient energy services at lower costs in an environmentally friendly manner. It calls for six measures to realize a cost-effective energy system: (1) promotion of market competition, (2) pricing and allocation of resources through the market mechanism, (3) subsidy systems for specific purposes, (4) improvement of efficiency across the energy chain efficiency, (5) policy reflecting externality of energy consumption, and (6) policy for establishing and implementing incentives. The draft also makes proposals to address the urgent problem of electricity and coal shortages as well as medium- to long-term problems. The proposals include: (1) promotion of coal imports, (2) promotion of electricity sector reorganization, (3) reduction of electricity generation costs, (4) rationalization of fuel prices for promoting efficient fuel selection and substitutions, (5) promotion of energy efficiency and energy-saving efforts, (6) expansion of energy sources and supply, (7) enhancement of energy security, (8) enhancement of energy-related research and development operations, (9) securing energy supply for impoverished people, and (10) development of an environment for efficient competition. These measures covered by the integrated energy policy draft can be summarized into four points – "institutional reforms and system building (market and industry systems)", "secure energy supply", "efficient energy consumption" and "enhancement of energy security" through these measures.

The Indian government has been implementing various policies to enhance energy security. The author here would like to outline the government's priority challenges – domestic energy production, alternative energy development and energy-saving policies for curbing energy (oil) imports, promotion of independent overseas oil development for stabilization of energy (oil) imports, enhancement of relations with oil-producing countries, and development of oil stockpilings for enhancing contingency management capabilities.

2-2-1 Curbing Energy (Oil) Imports: Domestic Energy Production and Alternative Energy Development

The Indian government has been implementing a new exploration and licensing policy, known as NELP, to promote domestic oil and gas development. Even before the NELP was introduced in 1997, the Indian government had sought to lure foreign and private sector companies for domestic oil development. However, government policy at the time necessitated substantial waiting periods while procedures were completed to allow international biddings by foreign firms in

[2] For details, see Motokura, Mitsuru, "Overseas Literature: Draft Report of the Expert Committee on Integrated Energy Policy(in Japanese)," July 2005, IEEJ HP.

its domestic oil market while giving favors or protection to Indian national upstream oil companies (including Oil and Natural Gas Corporation, known as ONGC). Therefore, foreign and private sector firms had not been interested in such international bidding. The NELP then offered to allow foreign and private sector companies into India's domestic upstream sector by eliminating favors given to national firms and establishing fairer competitive conditions. In fact, Indian private firms and foreign companies have increased their participation in India's domestic oil development through five biddings since the NELP introduction.

The Indian government has also tried to improve productivity in mining coal resources, the largest domestic energy resources. As a national coal company has monopolized coal exploration and development of national mines, however, supply has failed to increase or catch up with demand. Since coal development is conducted at locations where mining is difficult, the development of underground coal gasification technologies has become a key challenge. The Indian government gives priority to nuclear energy as well. It plans to expand nuclear power generation capacity from 3.31 million kW at the end of 2005 to 20 million kW by 2020. India, which is rich with potential renewable energy resources including solar, wind, hydro power and biomass energies, and possesses technological capabilities for developing these resources, has promoted renewable energies for energy security and electrification of rural regions. As important challenges in this respect are to enhance these energy sources' competitiveness and to develop relevant infrastructure for their full-fledged diffusion, the government has been providing various support measures and incentives for private sector and foreign companies in a bid to promote said diffusion.

2-2-2 Curbing Energy (Oil) Imports: Promoting Energy-saving Efforts

Due to energy price hikes over the recent years, the improvement of energy efficiency and the management of energy demand have become even more important in India. Energy efficiency in India has been lower than in other developing countries. The government has considered various demand reduction measures since the 1990s and effectuated an energy-saving law in 2002. But the improvement of energy efficiency has been limited. An important challenge for the full-fledged promotion of energy-saving efforts is to reform energy price control and other relevant systems. But such institutional reforms have met political resistance and made only gradual progress.

2-2-3 Stabilizing Energy (Oil) Imports: Promoting Independent Overseas Oil Development

India, which has seen domestic oil production leveling off while expecting a future increase under the NELP, has launched and enhanced the new strategy of participation in overseas upstream oil and gas operations. Relevant government agencies have been cooperating in this respect. The Ministry of Petroleum and Natural Gas has teamed up with the Ministry of External Affairs to

set up the "Standing Advisory Committee on Oil Diplomacy for Energy Security" to consider improving energy security through the promotion of investment in overseas upstream oil and gas operations. In terms of energy policy, such investment is aimed at increasing direct access to overseas oil resources to respond to growing oil imports and secure stable energy supply. Indian companies that undertake such overseas investment are required to make effective use of their human resources and technologies, diversify business operations and increase profit. Another reason for India's recent proactive efforts to take part in overseas upstream oil and gas operations may be that other Asian countries like China and Malaysia have attracted global attention by enhancing their participation in overseas upstream operation since the second half of the 1990s. In rarticular, the fact that CNPC and other Chinese national oil companies have proactively participated in overseas operations might have stimulated India's interest in overseas investment.

In India's independent overseas oil development, ONGC Videsh Limited, an ONGC subsidiary, has taken a leading role. Indian companies have launched operations in various regions of the world, including Russia, the Middle East (including Iraq and Iran), North Africa and Asia, all cited as priority regions. They have made some achievements, investing in 15 foreign countries to secure 3.7 million tons in oil and 1.37 billion cubic meters in natural gas in fiscal 2004. Overseas production targets under the 10th five-year development plan include 5.2 million tons in oil and 4.94 billion cubic meters in natural gas for the five years from 2002.

2-2-4 Enhancing Contingency Management Capabilities: Oil Stockpiling System Development

India had previously not had any oil stockpiling system akin to a national stockpiling system or required that private sector firms stockpile oil. In the face of its growing dependence on oil imports and the crude oil price spike, however, India has gradually recognized the importance of oil stockpilings. The Indian government adopted a plan in April 2003 to develop emergency crude oil stockpilings covering 15 days' consumption (5 million tons) in the first phase of its oil stockpiling system. It later drafted a comprehensive strategic oil stockpiling plan and considered how to raise funds for oil stockpilings. In June 2004, the government founded Indian Strategic Petroleum Reserves Ltd. to manage oil stockpilings. It plans to stockpile crude oil in underground caverns in Rajasthan, Mangalore and Vizag. In May 2005, Prime Minister Manmohan Singh and his government approved the previous administration's national oil stockpiling plan. However, construction of underground oil-stockpiling facilities is reportedly estimated to take four years. These facilities are thus expected to go into operation (with crude oil beginning to be put into these facilties) in 2009.

2-2-5 International Energy Strategy

In enhancing its efforts to address the energy security issue, India has recognized the importance of an international strategy and taken an approach that gives priority to strengthening relations and promoting talks with major powers. In this respect, it has taken advantage of its geographical and strategic location between East Asia (including Japan and China) and oil-producing Middle East countries to lead dialogue between Asian oil producing and consuming countries. While trying to strengthen relations with the United States and other Western countries, India has enhanced military cooperation and forged new relations with Russia, its historical ally. With China, India has been stepping up economic partnership in a pragmatic manner. India has thus been implementing so-called omni-directional diplomacy. Particularly, India's proactive and diversified diplomacy has been remarkable over the past years, increasing the country's presence in the international arena.

Lastly, the author would like to outline liberalization, deregulation and other structural reforms in India's energy market. Since the early 1990s, India has steadily implemented deregulation and liberalization of the oil sector by promoting foreign and domestic private sector companies' participation in the upstream oil sector, by opening oil-refining operations to the private sector, by introducing private-sector investment in these operations and by liberalizing crude oil and petroleum products imports. The downstream oil market's liberalization is attracting special attention as a factor of great consequence to India's energy market structure.

In September 1997, the Indian government decided to phase out its administered pricing mechanism (APM) for controlling prices of petroleum products and introduce market mechanisms. Later, it eliminated a sale price system that had guaranteed an after-tax return of 12% for oil refiners and sellers. It also lowered tariffs on crude oil and petroleum products and phased out the APM for five petroleum products. In April 2002, the Indian government liberalized petroleum products imports by eliminating the APM for all petroleum products other than LPG and superior kerosene oil, for which consumer demand has been significant. In August 2002, the government permitted the three national downstream oil companies to adopt a gasoline and diesel oil pricing system reflecting international prices. In response to later hikes in international prices, however, the government froze the pricing system in January 2003. Since then, the government, though allowing gasoline and diesel oil prices to rise gradually to reduce subsidies, has left kerosene and LPG prices unchanged so as to influence the profits of downstream oil companies. As a coalition government including communists rules India at present, any appropriate price increases are difficult to implement due to strong opposition from communists. Taxes that differ between petroleum products and between states have failed to be revised.

Companies that sell petroleum products in India are required to acquire government-issued

licenses to do so. Although some conditions are set for the acquisition of such sales licenses, the government has issued new licenses to three national and as many private companies. The retail market for petroleum products has thus been liberalized gradually. As for the oil refining sector, some plans have been considered for oil-producing nations and oil multinationals to build refineries in India, although no such plans have been realized. The moves to liberalize and open the expanding Indian oil market are attracting attention from oil multinationals and oil-producing countries as well as Indian private sector companies.

2-3 National Oil Companies' Business Strategies in India

India has a total of six national oil companies in the upstream and downstream sectors. The upstream sector is separated from the downstream sector for these national companies. But some are moving to vertically integrate upstream and downstream operations. Among the national companies, ONGC, a leader of the upstream sector, has almost doubled sales and net profit over the past five years thanks to the crude oil price spike, although its oil and gas production has remained almost unchanged over the years. Sales on the part of Indian Oil Corporation, which leads the downstream sector, have expanded over the past five years, as seen at ONGC. However, IOC's net profit in fiscal 2004 decreased from the previous year. This is because the government's effective control on petroleum products prices in India has forced purchases to exceed sales in the downstream sector. In fact, IOC booked a net loss in the October-December quarter of 2005. Downstream sector companies are expected to see their business performances deteriorating further.

As for business strategies, ONGC that is a representative Indian upstream oil company has set the acquisition of overseas upstream sector stakes and the expansion of domestic production as the two pillars of its strategy. Its ONGC Videsh Ltd. unit had secured 115,000 bpd in overseas oil production on an equity stake basis as of 2005. OVL is aiming to boost overseas oil production to 400,000 bpd by 2010. Other national oil companies such as IOC and Gas Authority of India Ltd., as well as private firms like Reliance Industries Ltd., have also proactively expanded overseas operations. Given its financial capabilities, production capacity and know-how accumulation, however, OVL represents a core representative Indian player outside India.

ONGC gives top priority to the expansion of domestic production as well as the acquisition of equity stakes in overseas upstream operations. In fact, ONGC acquired the largest number of concessions through five biddings under the NELP policy introduced in 1997. In order to expand its domestic oil and gas production, ONGC will not only have to promote oil development at these concessions but will also have to develop deep-sea oilfields and improve recovery factors at earlier-developed oilfields.

Next, the author would like to outline business and investment strategies of the three national downstream oil companies – Indian Oil Corporation, Bhavat Petroleum Corp. Ltd. and Hindustan Petroleum Corp. Ltd. A strategic move seen in the downstream sector is the expansion of oil refining capacity. Capacity expansion plans in India's refining sector indicate 1.63 million bpd in additional capacity to come into being by 2010, including plans at non-state-run firms. Downstream oil companies are thus promoting extremely proactive investment plans. The substantial oil refining capacity expansion is feared to lead to excess oil refining capacity and lower profit margins in the Asian market as seen in the 1990s.

Capacity expansion investment has continued in the sales sector as well as the refining sector. India has seen a service station construction boom as downstream oil companies are racing to expand their shares of the growing Indian oil market. The number of service stations in India increased to 31,500 in 2005 from about 18,000 in 2002 when deregulation was implemented in the downstream sector (an official price control system was eliminated). Indian national oil companies in both the upstream and downstream sectors have been moving to vertically integrate upstream and downstream operations. A government-led plan to establish two major vertically integrated oil firms has failed. However, some companies are promoting the vertical integration.

Lastly, the author would like to discuss relations between national oil companies and the government. National oil companies such as ONGC and IOC give more or less considerations to the government as their largest shareholder while seeking to maximize profit. For example, ONGC's proactive overseas operations aim to not only gain profit but also secure stable oil supply sources for India. It is thus contributing to the government's energy security policy. ONGC is also required to make financial contributions to the government, including those for government subsidies for petroleum products. IOC and other national downstream oil companies are required to sell LPG, kerosene and other petroleum products at government-controlled lower prices to protect India's impoverished people.

However, India's national oil companies have maintained some independence from the government due to the fact that their top executives as well as their rank-and-file employees are oil industry experts. Government representatives are dispatched to each company's board for coordination between each company and the government. ONGC and IOC receive no government support for their investment; they are investing their own funds. OVL independently plans and evaluates overseas business strategies. It makes investment proposals to the government only if such proposals are found to be economically feasible.

Although Indian national oil companies' overseas upstream development forms a part of the government's energy security policy, they evaluate the economy of investment areas and specific deals on their own using their or their parents' funds. In this sense, their overseas upstream development is apparently more rational and sustainable than those implemented by Chinese national oil corporations. ONGC with China's CNPC in the acquisition of a stake in a Syrian oil company was reportedly designed to exert downward pressures on the acquisition price that had risen excessively amid an intensified competition. India thus has an apparent mechanism that allows economic rationality to work. However, India's full-fledged upstream operations are in their infancy. If crude oil prices decline dramatically, some of Indian national oil companies' investment deals may suffer losses to affect their business operations. In such event, their upstream operations could be stalled.

Chapter 3 Major Countries' Views on Energy Situations and Policy Developments in China and India

This section summarizes how the United States, the European Union, Russia, South Korea and Middle Eastern countries view energy situations and policy developments in China and India. First, here are their views on China.

The United States has recognized the impact of rising Chinese energy demand on the global energy supply/demand balance, global energy price hikes resulting from growing Chinese energy demand and effects of energy supply shortages on the U.S. economy as matters of concern. While urging China to implement economic reforms and shift to a market economy, the United States has been helping China in improving energy efficiency and introducing clean energy at the government and private sector levels.

The EU expects that China will increase its political and economic presence in the international community in the future. Viewing China as a large energy consumer, the EU is about to implement technical assistance to China in energy-saving and greenhouse gas emission reduction areas in which Europe is well versed.

Russia views China as a potential oil and natural gas export destination, while China sees Russia as one of promising energy suppliers that would be useful for diversifying energy supply sources. However, Russia currently maintains both optimistic and pessimistic views about China. Optimists see China as a key partner, while pessimists view China as a geopolitical threat. The two countries signed an energy cooperation agreement in 2005 and have been trying to enhance their

cooperation in oil and natural gas exploration, production and transportation.

In South Korea, the government and oil industry players share basic understanding about the global oil market's uncertainties and Northeast Asia's vulnerable oil supply structure. The country appreciates the need for regional energy cooperation and is promoting cooperation with China through oil stockpilings and multilateral frameworks including APEC and ASEAN+3.

Middle Eastern countries view China as a major fast-growing country in the world economy, as a stable export destination for Middle East oil, and as an important buffer against the dominant U.S. influence for ensuring a political balance in the Middle East. Based on these views, they are trying to deepen energy and economic relations with China.

In regards to India, at present the United States may be less concerned about India than about China inasmuch as Indian energy demand growth is slower than that of China and has exerted less pressure on the global energy supply/demand balance. Indian national oil companies' acquisitions of stakes in overseas upstream oil development projects use more orderly means than similar actions on the part of China's national corporations and have not been viewed by the United States as a serious threat to international energy market stability or U.S. energy security. On the other hand, the United States launched energy talks with India in 2005, creating working groups on oil and natural gas, coal, electricity and energy-saving measures, new technologies and renewable energies, and civilian nuclear energy use. In 2006, the United States and India signed a private sector nuclear energy cooperation agreement to eliminate political barriers against U.S. nuclear energy companies' investment in India. This is expected to contribute substantially to India's nuclear power generation development program and to curbing demand for fossil fuels.

The EU has adopted cooperation in energy and environmental areas as a pillar of its relations with India. In particular, the EU expects that the promotion of energy-saving efforts and the reduction of greenhouse gas emissions in India will become a focus of attention in bilateral cooperation. Russia has no major political problems with India at present. Energy is cited as one of priority areas for their cooperation. Russia and India are promoting cooperation in nonmilitary nuclear energy development.

South Korea and India have had no close political or economic relations. Regarding energy, they have exchanged memorandums of understanding for cooperation in six areas – hydrocarbon, strategic underground oil stockpilings, gas hydrate, hydrogen, compressed natural gas (CNG) and fuel cells.

Middle Eastern countries view India, as well as China, as a major fast-growing country in the world economy, as a stable export destination for Middle East oil, and as an important buffer against the dominant U.S. influence for ensuring a political balance in the Middle East. They intend to take advantage of their deep historical and cultural relations with India, and their geographical proximity thereto, in order to enhance their energy relations with India.

The major countries and regions have appreciated China and India as part of the most important actors affecting the international energy situation. Oil-consuming countries such as the United States and European countries are seeking to make China and India partners in cooperation among oil-consuming nations, while remaining concerned about the two countries' possible destabilizing effect on the international energy market and their growing presence in the market. Their approach is encouraging China and India to promote market reforms and cooperate with other countries in curbing energy demand and developing alternative energies in order to stabilize markets and address environmental and other global problems. In the meantime, oil-producing countries such as Russia and the Middle East countries may be trying to enhance relations with China and India, appreciating the two countries as promising customers for their resources exports and as a counterbalance against the United States' political control of the world.

As reviewed above, China and India have substantially expanded imports from the international energy market due to their growing demand for energy sources including oil and gas. Given the two countries' great growth potential, major players in the international energy market have increased their interest in these countries in line with progress in their market liberalization. The two countries' energy market expansion, their national companies' strategic moves, and their governments' global strategies and domestic market liberalization are expected to exert great influence on the international energy market in future. Future changes in the two countries' energy supply and demand, policies and energy industries are to remain a focus of attention.

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