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The Author

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List of Abbreviations

| | |
|------|---------------------------------------|
| ABE | Advisory Board on Energy |
| AIR | All India Reporter |
| ANG | Associated Natural Gas |
| APM | Administered Price Mechanism |
| ATF | Aviation Turbine Fuel |
| BBMB | Bhakhara Beas Management Board |
| BCM | Billion Cubic Meters |
| BICP | Bureau of Industrial Costs and Prices |
| BKWH | Billion Kilowatt Hour |
| BOO | Build Own Operate |
| BOOT | Build Own Operate Transfer |
| BSES | Bombay Suburban Electric Supply |
| BT | Billion Tonnes |
| Btu | British Thermal Units |
| CEA | Central Electricity Authority |
| CEB | Central Electricity Board |
| CIL | Coal India Limited |
| CICP | Committee on Integrated Coal Policy |
| CNG | Compressed Natural Gas |
| CPCB | Central Pollution Control Board |
| CPRI | Central Power Research Institute |
| CrLJ | Criminal Law Journal |
| CSRP | Coal Sector Rehabilitation Project |
| Db | Decibels |
| DSM | Demand Side Management |
| DVC | Damodar Valley Corporation |
| EMC | Energy Management Center |
| EPC | Erection Procurement and Construction |
| EPCG | Export Promotion Capital Goods Scheme |
| EPS | Electric Power Survey |
| FIPB | Foreign Investment Promotion Board |
| FSA | Fuel Supply Agreement |
| GAIL | Gas Authority Of India Limited |
| GLK | Ground Line Kilometers |
| GSI | Geological Survey of India |
| Ha | Hectares |
| HSD | High Speed Diesel |

List of Abbreviations

| | |
|--------------------|---|
| HT | Hindustan Times |
| HVPNL | Haryana Vidyut Prasaran Nigam Limited |
| IAA | Impact Assessment Agency |
| IBRD | International Bank for Reconstruction and Development |
| IIP | Indian Institute of Petroleum |
| IISCO | Indian Iron and Steel Company |
| IPC | Investment Promotion Cell |
| IPP | Independent Power Project |
| IREDA | Indian Renewable Energy Development Agency |
| IREP | Integrated Rural Energy Programme |
| Kcal/Kg | Kilo Calory/Kilogram |
| Kg/KWh | Kilogram per Kilo Watt Hour |
| KV | Kilo Volts |
| KW | Kilo Watt |
| KWH | Kilo Watt Hour |
| LOI | Letter Of Intent |
| LDO | Light Diesel Oil |
| MECL | Mineral Exploration Corporation Limited |
| Mg/Nm ³ | Microgram/Cubic meters |
| MOC | Ministry of Coal |
| MOP | Ministry of Power |
| MOP&NG | Ministry of Petroleum and Natural Gas |
| MMCMD | Million Cubic Meter Per Day |
| MMSCMD | Million Metric Standard Cubic Meters Per Day |
| MNES | Ministry of Non-Conventional Energy sources |
| MS | Motor Spirit |
| MTOE | Million Tonnes of Energy |
| MW | Mega Watt |
| MMT | Million Metric Tonnes |
| MMT/Y | Million Metric Tonnes/Year |
| MMTPA | Million Tonnes Per Annum |
| Mt | Million Tonnes |
| NEEP | National Energy Efficiency Program |
| NELP | New Exploration Licensing Policy |
| NCC | National Coal Company |
| NJHPC | Neptha Jhakri Hydro Power Corporation |
| NOC | National Oil Company |
| NPCIL | Nuclear Power Corporation of India Limited |
| NPTI | National Power Training Institute |
| NTPC | National Thermal Power Corporation |
| NRSE | New and Renewable Sources of Energy |
| OCC | Oil Co-ordination Committee |
| PCRA | Petroleum Conservation Research Association |
| PFC | Power Finance Corporation |
| PII | Petroleum India International |
| PLF | Plant Load Factor |
| POL | Petroleum, Oil, Lubricant |

List of Abbreviations

| | |
|-----------------|--|
| PPA | Power Purchase Agreement |
| PSC | Production Sharing Contract |
| PTC | Power Trading Company |
| R&M | Renovation and Modernization |
| REC | Rural Electrification Corporation |
| ROR | Rate of Return |
| RRR | Reserve Replacement Ratio |
| SAIL | Steel Authority of India Limited |
| SEB | State Electricity Board |
| SERC | State Electricity Regulatory Commission |
| SC | Supreme Court |
| SCC | Supreme Court Cases |
| SCCL | Singareni Collieries Company Limited |
| SIG | Standing Independent Group |
| SKO | Superior Kerosene Oil |
| SLK | Seismic Line Kilometer |
| SO ₂ | Sulfur dioxide |
| SPCB | State Pollution Control Board |
| SSK | Seismic Squire Kilometers |
| T&D | Transmission and Distribution |
| Tg/y | Teragram Per Year |
| TIDCO | Tamilnadu Industrial Development Corporation |
| TISCO | Tata Iron and Steel Company |
| TOI | Times of India |
| TOP | Take or Pay |
| TPA | Tonnes Per Annum |
| TSP | Total Suspended Particles |
| TWH | Tera Watt Hour |
| UNDP | United Nations Development Program |
| UP | Uttar Pradesh |

List of Abbreviations

Preface

This description of the Energy Law of India and views expressed herein are in the personal capacity of the author and do not represent his employer or other organizations with which he is associated in one capacity or other.

New Delhi, September 2005
M. Naseem

Preface

Introduction

Chapter 1. General Background

§1. GEOGRAPHY AND POPULATION

1. India is a diverse country from every viewpoint which is apparent and reflected, *inter alia*, in the physical features of the land, ecological and climatic zones, fauna and flora, its cultural diversity etc. The land consists of snowbound peaks, beautiful hills, fertile river valleys, tropical rainforests, blistering deserts and breathtakingly beautiful coasts. With the largest, stable and functioning democracy, India is the second most populous country and its economy ranks sixth in the world. India is a member of Commonwealth. It has an area of approximately 3,287,580 sqkm with the Bay of Bengal lying to its east, the Indian Ocean to its south and the Arabian Sea to its west. The mountain range, the Himalayas lie to its north. India may be divided in four main regions, namely, the great mountain zone, the Ganges and Indus Plains, the desert zone and the southern peninsula. Its neighbors are Myanmar and Bangladesh lying to the east, China, Nepal and Bhutan to the north and Afghanistan and Pakistan on the northwest. Sri Lanka lies to the south, separated from India by the Palk Strait. There are several varied ecological and climatic zones. India has the highest snowbound mountain range of the world, the Himalayas and humid tropical forests on the southwest coast. The fertile Brahmaputra valley, the low mangrove swamps of the Sunderbans and the Garo Hills of Meghalaya, which is the wettest spot in the universe, are lying to the east. The Indus and Brahmaputra emerge from mountains and flow into the Gangetic plain. These rivers cause constant erosion, thereby building the vast alluvial plains of the Indus, Ganga and Brahmaputra. The latter two rivers form the world's largest and most fertile delta, the Brahmaputra valley before flowing into the Bay of Bengal. A series of low mountain ranges lie between the Deccan Plateau and the Gangetic plain, like the Aravallis and Vindhya. The plateau has the Eastern and Western Ghats flanking its sides. The western coastal plain is uneven and rivers flowing through it form beautiful lagoons and backwaters. On the western side of India are the Lakshadweep Islands in the Arabian Sea and on the eastern side lie the Andaman and Nicobar Islands in the Bay of Bengal.

2. India has three major seasons, namely, summer, winter and monsoon. The summer months are generally hot and humid in most parts of India. The summer is experienced from March to May. The winter months fall between the months of mid-November to early March and are pleasantly cool in most parts of India but

severe in the northern plains and the areas around the Himalayan range. India experiences two monsoon spells, the southwest monsoon from June to September and the northwest monsoon from October to early December.

3. The wide variety of natural vegetation found in India, ranges from tropical to tundra. India can be divided into four major vegetation regions namely:

- (a) the Himalayan region;
- (b) the tropical wet evergreen and semi-evergreen forests;
- (c) the tropical deciduous forests; and
- (d) the thorn forests and shrubs.

There are over 1,200 species of birds, which include varieties of pheasants, quails and wild fowl, mostly found in the Himalayan region. Storks, cranes, flamingoes and kingfishers can also be found in some regions of the country. The most spectacular and exquisite of all the birds is the peacock, the National bird of India which is found throughout the country. There are over 500 species of mammals in India which include the elephant, rhinoceros, bears, lions and tigers, just to name a few. India also has a large variety of marine life found in its rivers and seas around it. The protected wild life area in India spans over 90,000 sqkm of land. There are over 53 national parks and 247 sanctuaries, which act as a home to the wide variety of birds and animals.

4. According to the 1991 census, the population of India is 840 million. At the growth rate of 2.11 per cent per year the projected population for 1998 is 980 million approximately and has crossed the one billion mark in June 2000. Indians belong to diverse ethnic groups and India has the largest and most diverse mixture of races. The five major racial types – Australoid, Caucasian, Europoid, Mongoloid and Negroid – find representation among the people of India. Various phases of Indian history show waves of invaders and settlers including the Aryans, Greeks and Central Asian's coming into India, intermingling, settling and merging with the local population. This explains the racial, linguistic and cultural variety and diversity of India.

§2. LEGAL AND POLITICAL STRUCTURE

5. After its independence, India adopted a parliamentary form of democracy for managing and developing her heterogeneous society and strengthening the ideal of national unity. On 26 January 1950, a Constitution drafted by a Constituent Assembly was enacted which is still in operation today. The Constitution, as amended, makes India a union of states with a strong federal center and declares India a democratic, sovereign, socialist and secular republic. The Constitution closely follows the British Parliamentary model with the difference that in England, Parliament is supreme whereas in India it is the Constitution. Thus, Indian courts are vested with the authority to adjudicate on the constitutionality of laws passed by the legislature. The Constitution guarantees fundamental rights to the citizens against

the State, e.g. the right to equality, the right to freedom, the right against exploitation, the right of freedom of religion, cultural and educational rights etc. The right to enforce the fundamental rights and to seek remedies against the State through issuance of writs, is also a fundamental right. The Constitution also prescribes fundamental duties like the duty to respect the constitution, the national flag and the national anthem; to develop scientific temper; to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavor and achievement etc. The Directive Principles of State Policy contain principles and aspects, which should be kept in view by the State while framing laws and policies of the State, but these are not binding and enforceable against the State. The laws in existence at the time of the promulgation of the Constitution or framed thereafter must confirm to the Constitution. In case of any inconsistency or derogation of any law with the constitutional provisions, such law shall be void to the extent of its inconsistency or derogation.

6. The Parliament, the supreme legislative body of India, comprises of the President of India and the two houses: *Lok Sabha* (House of the People) and *Rajya Sabha* (Council of States). The president is the executive head of the State and Supreme Commander of the armed forces (Article 53 of the Constitution). The President is elected from an Electoral College consisting of elected members of both Houses of Parliament and the elected members of the Legislative Assemblies of the States (Article 54 of the Constitution). The President holds office for a period of 5 years and can be re-elected for a further period of 5 years (Articles 56 and 57 of the Constitution). The division of legislative power between the center and the States has been achieved through grouping the items of legislation in three lists namely, the Union List, the State List and the Concurrent List. The Union List contains matters on which Parliament has the exclusive right to make laws. The State List includes items over which a State Government has the power to make laws and the Concurrent List contains items over which both center and States have authority to make laws. The States enact their own laws on education, public health and local taxes, while the center deals with income tax, defense, foreign policy, railway, postal department, telecommunication etc. The subject of police force, education, agriculture and industry fall in the State List and are reserved for the States. Each State has an elected legislature headed by a Chief Minister. In the States, the executive is structured in a central pattern, with the Governor as the head of government, who is appointed by the President for a five-year term and holds the office at the latter's pleasure. The Chief Minister is the head of state executive. The States are divided into districts, districts into subdivisions, and subdivisions into basic units called *taluks* or *tehsils*. Large cities have corporations led by a mayor with authority to make rules on certain local matters.

7. In India, the Constitution, legislation, customary law and case law are the main sources of law. The Parliament, State legislatures and the legislatures of Union Territories, local bodies make law, rules and regulations. Further, a vast body of subordinate legislation has developed in the form of rules, regulations, orders, and by laws made by either the Central or State Governments or by the local authorities. The subordinate legislation is necessary because legislature can not

provide the technical details which are required for a day-to-day regulation of a particular sector. The judgements of the Supreme Court and High Courts are also an important source of law because decisions of the Supreme Court are binding on all courts in India and decisions of the High courts are binding in the same High Court and have persuasive value in the High Courts of other States. India has a well developed judicial system. The Supreme Court has its seat at New Delhi, the capital of India and the High Courts are located in the State capitals. Further, in each district, there are district courts which function under the administrative control of the respective High Courts. The Supreme Courts and High Courts have appellate jurisdiction. The writ jurisdiction and enforcement of the fundamental rights also lie with the Supreme Court and High Courts. The court procedure is based on the Anglo-Saxon system and is considered as slow. There is a separation of the judiciary from the executive. In some states Panchayat Courts also function which decide disputes of petty and local nature. The supreme court has original, appellate and advisory jurisdiction. The exclusive original jurisdiction of the Supreme Court extends to disputes between the Government of India and one or more states or between two or more states. The Supreme Court can issue a direction or orders or writs including writs in the nature of *habeas corpus*, *mandamus*, prohibition, *quo-warranto* and *certiorari*, to enforce them.

There are various recognized modes of settlement of commercial disputes in India like sole expert, conciliation and arbitration. A sole expert is appointed by agreement of the parties to the dispute. Conciliation has been accepted and given legal recognition through enactment of the Arbitration & Conciliation Act, 1996. Arbitration as a mode of settlement of disputes is prevalent and in operation since long. Recently, the Arbitration & Conciliation Act, 1996 has been brought in force which is largely based on the Model Law of the United Nation Commission for International Trade Law (UNCITRAL). It brings Indian arbitration law in conformity with international commercial arbitration law and practices.

§3. ECONOMIC CHARACTERISTICS

8. India is the fifth largest economy in the world. Being a large country, which is reasonably well endowed with a variety of natural resources, the economy is largely self-sufficient in certain spheres like agricultural produce. Indian economic power is best illustrated by the quality and sophistication of Indian skills. Thus, a major part of income come from the export of manpower. Currently, one of the most promising growth areas for exports is computer software. The Indian market is widely diversified and sophisticated, with considerable industrialization made possible by its own machine-building industry. India is one of the top emerging markets in the world today. India has become the open market for international trade and registered a very high economic performance mainly because of the liberalization policy initiated by the Industrial Policy of 1991, which has been followed by successive Governments. Foreign trade accounts for only 16 per cent of GDP, compared to 80 per cent for Japan and 25 per cent for the USA. India can produce atomic energy from nuclear reactors designed indigenously. It is now installing huge thermal power plants of 500 MW capacity and Indian industries like

textiles, sugar and cement largely run on machinery made in the country. India has attained such a sophistication and degree of skill that it can design and build large steel mills entirely on its own and has designed and put on operation its own super computer. However, Indian economy reflects the strong duality that marks Indian society and polity. Parts of it have not changed for centuries, while others are right in the forefront of technology. A good third of the Indian population lives below the poverty line, being unable to afford the bare necessities of life. Nearly half of its population is still illiterate.

§4. SOCIAL AND CULTURAL CHARACTERISTICS

9. The culture of India is varied and diverse and may be described in terms of art and architecture, music, dance, handicrafts, theatre and cinema. India has about 15 nationally recognized languages and some 844 different dialects. The Sanskrit of the Aryan settlers merged with Dravidian languages to give rise to new unique languages, that is why most of the Indian languages are Sanskrit based. Notable exceptions are Urdu and Kashmiri the script of which is based on Persian and Arabic. Tamil has a distinctive Dravidian background, and the languages of the northeastern hill tribes find their roots in Chinese and Tibetan. Hindi is the national language, which is spoken by at least 45 per cent of the population while English remains the main language used for commerce and official communication. The main religions practiced and followed are Hinduism, Islam, Buddhism, Sikhism, and Christianity.

10. The history of paintings in India lie embedded in the frescoes of Ajanta and Ellora caves and the manuscripts of Buddhist and Jain teachings. Religion has also played an important role in the early Indian paintings. The Islamic period saw the influence of Persian origin while the Ragini paintings depict the influence of musical modes and Hinduism. The modern art of India is influenced by Europe and painters like Rabindranath Tagore laid the foundation of modern art of India. Similarly, sculptures of India are famous the world over. An example of which are the carvings of Khajurao that have been pictured on the rocks.

11. Architecture has a very ancient background in India and can be traced back to the Indus Valley civilization. Hindu temple architecture which is adorned with beautiful intricate sculptures evidences of which can be found at the Badami rock-cut caves in Karnataka and the shore temple at Mahabalipuram, are also part of important milestones. Great monuments like the Qutab Minar, Taj Mahal, Agra Fort, Jama Masjid, Humayun's Tomb, Charminar and many more depict the Islamic style of architecture. The British laid the foundation of modern architecture by bringing the Western style of architecture to India. This is evident in the architectural style of the Victoria Memorial in Calcutta and to some extent in the President's House in Delhi.

12. There are two prominent forms of classical music in India – the Hindustani style of the North and the Carnatic style of the South. Along with classical music

another very popular form of music is folk music, the roots of which lie in rural areas. There is an ancient tradition of classical dance dating back to 2 BC. The two forms of dances are classical and folk. Important classical dance forms are Bharat Natyam, Kathakali, Kathak, Manipuri and Odissi. Bharat Natyam is a solo dance usually for temple worship and its poses are based on the temple sculptures. Kathak is a fast paced dance originating from North India based on the Radha-Krishna dances. Kathakali is a dance drama from Kerala (a State in India) which is performed by artists wearing elaborate masks and make-up. In most regions of India there is a unique folk or tribal dance form which originates from and thrives in that particular region.

13. Indian fabric weaving and printing are renowned all over the world as Indian silk and muslin are prized all over the world. Fine muslin saris, earthy tribal shawls, silks embroidered with gold thread, hand-block-printed cottons and intricately embroidered mirror work are a few of India's fabled and famous fabrics. Carpets of Kashmir, Agra and Bhadoi are famous all over the world and same is the case of the metal based works from Moradabad, silver studded handicrafts from Hyderabad, Gujarati wood carving and ivory works from Kerala.

§5. ENERGY SCENARIO

14. The last three decades of Indian history have seen a tremendous change from a once rural India to an industrious and fast paced economy. This in turn has also brought about a mind change in energy requirements and growth patterns. After independence, there has been an expansion in the total energy use in the country with a shift from non-commercial to commercial sources. The use of commercial energy has increased ten folds over this period. However, per capita energy use remains very low and future growth requires a large increase in the supply of commercial energy. This calls for optimizing the capacity to expand domestic production of commercial energy. Even with the best efforts in this area, India will remain energy deficient and the net import of energy in the form of crude oil, natural gas, petroleum products and coal will continue in the future. The energy sector in India till some times back was heavily regulated and prices were absolutely controlled by the Government so that petroleum products, mainly kerosene, electricity may reach the weaker sections of society and rural poor at subsidized rate. However with the onset of the reform process the whole scenario has changed and the energy sector in India is moving away from a strict regulatory regime to a more liberal, open and transparent regime.

15. India accounts for about 0.8 per cent of the total geological reserves and 5.7 per cent of the proven reserves of coal in the world. The geological coal reserves in the country are estimated to be about 247.85 billion tonnes. The proven mineable reserves are currently estimated at 92.9 billion tonnes. Lignite reserves are estimated at 36 billion tonnes as against 6.5 billion tones estimated at the beginning of the Eighth Plan. The lignite deposits have been found suitable for power generation and are already being exploited for this purpose in the State of Tamil Nadu.

16. India has about 0.4 per cent of the world's proven reserves of hydrocarbons. The prognosticated geological resources of hydrocarbons in the country are estimated at 21.31 billion tonnes, of which 61 per cent are offshore and 39 per cent onland. Out of this, the geological reserves established are, however, only of the order of 5.32 billion tonnes. It is assumed that half of the prognosticated resource represents natural gas, of which only 12 per cent has been established till now.

17. According to a survey carried out during the Seventh Plan, the hydroelectric potential in the country is estimated at 600 Bkwh (billion-kilowatt hour) per year as against 472.15 Bkwh per year assessed earlier. The Central Electricity Authority (CEA) has undertaken extensive studies to identify the sites for the development of pumped storage schemes. Sixty-three sites have been identified for this with a probable potential of about 94,000 MW. There exists another 6,780 MW of potential for exploitation through mini/micro hydel schemes.

§6. MAIN ENERGY CONCERNS

I. Uneven Regional Distribution

18. There is uneven regional distribution of the primary commercial energy resources of the country. The Eastern region accounts for nearly 70 per cent of the total coal reserves, the Western region has over 70 per cent of the hydrocarbon reserves in the country. Similarly, more than 77 per cent of the total hydel potential in the country is located in the Northern and the north-Eastern regions put together. The Southern region, which has only 6 per cent of the coal reserves and 10 per cent of the total hydel potential, has most of the lignite deposits in the country. The regional distribution of primary commercial energy is given in Table 1.

Table 1
Regional Distribution of Primary Commercial Energy Resources

| Region | Coal (bt) | Lignite (bt) | Crude Oil (mt) | Natural Gas (BCM) | Hydro Power (TWH) |
|-----------------|--------------|-----------------|-------------------|----------------------|----------------------|
| Northern | 1.06 | 2.51 | 0.03 | 0.0 | 225.00 |
| Western | 59.90 | 1.87 | 519.47 | 516.42 | 31.40 |
| Southern | 15.46 | 30.38 | 45.84 | 80.94 | 61.80 |
| Eastern | 146.67 | – | 2.19 | 0.29 | 42.80 |
| North – Eastern | 0.89 | – | 166.17 | 152 | 239.30 |
| Total | 220.98 | 34.76 | 733.70 | 749.65 | 600.00 |

Bt: Billion Tonnes; BCM: Billion Cubic Meters; TWH: Trillion Watt Hours; Mt: Million Tonnes
(Source: Tenth Plan document)

Besides, there also exists the potential of coal bed methane, oil shale and gas hydrates in the country. The potential is placed at 1,000 billion cubic meters of coal

bed methane, 6,156 trillion cubic meters of gas hydrates and 600 million tonnes of oil shale. India has adequate uranium resources to meet the lifetime requirement of the first stage of nuclear power development program of 10,000 MW. There are also large deposits of thorium in the country. The estimates show that the known deposits may yield 363,000 tonnes of thorium oxide. Thorium resources, when used through breeder reactors, would be able to produce 900,000 Bkwh of electricity.

19. Even though the size of primary commercial energy reserves is fairly large, their availability in per capita terms is quite moderate because of the large population of the country. If no significant additions to reserves are made in the future, the per capita availability will decline further in the wake of a rising population. The details of per capita reserves and reserves to production (R/P) ratios of some of the conventional sources of energy are given in Table 2.

Table 2
Per Capita Availability of Commercial Energy Resources

| | Availability | | R/P Ratio | Implications |
|---------|--------------|---------------------|-----------|---|
| | Total Capita | Per | | |
| Coal | 72 BMT Tonne | 76 | 90 | Moderately high R/P, Land degradation/Resettlement Constraints/Need for Large Imports Soon |
| Oil | 08 BMT Tonne | 0.8 | 21 | Low R/P, Large Imports Necessary |
| Gas | 660 BCM | 700 cm ³ | 30 | Low R/P, Large Imports Necessary |
| Hydro | 600 TWH | 631 KWH | – | Large Untapped Potential, Environmental, Resettlement Constraints, Need for Large Investments |
| Nuclear | 350,000 Mwe* | | | Large Potential, Technology/Safety Issues and Need for Large Investments |

* Including Thorium Resources
(Source: Ninth Plan Document)

II. Trends in Commercial Energy Production

20. Over the last five decades major steps have been taken resulting in the stepping up of the production of commercial energy. Coal continues to remain the main source of primary commercial energy not only for direct energy use in the industry but also for indirect energy use through power generation. The efforts

made in exploration and development of hydrocarbons has led to a significant step-up in the production of oil and natural gas but no major discovery after the Bombay High. Therefore, the production of petroleum has been stagnating. The hydroelectric generation has also increased significantly. There have been additions to the nuclear power generation capacity as well as the power generation from nuclear power plants. The wind power generation has also picked up significantly.

III. Primary Energy Imports

21. The energy import dependence of the country has been increasing over time. The degree of self-sufficiency in oil was around 35 per cent in 1975. It increased up to 1984–1985 and was the highest at 70 per cent during that year. Thereafter, it has declined and this trend is still continuing, in the wake of a decline in indigenous production of crude oil and a rising demand for petroleum products. In addition to POL imports, imports of superior quality coal are also needed for use in the steel industry. Imports of coal account for about 5.6 per cent of total domestic consumption in the year 2004–2005. A limited quantity of electricity of around 1.4 billion units per annum is also imported from Bhutan in the year 2001–2002.

The total final energy consumption has increased from 84.5 MTOE in 1953–1954 to 290.4 MTOE in 1996–1997 at an implicit rate of growth of 2.91 per cent per annum compound. The share of commercial energy in the final energy consumption has increased from 24.1 per cent to 56.1 per cent during this period whereas that of non-commercial energy has declined from 75.9 per cent to 43.9 per cent. The share of coal is declining in the final commercial energy consumption whereas that of petrol, gas and electricity is increasing. Petrol and gas accounted for nearly 44.9 per cent of the total final commercial energy consumption in 2001–2002. Since these figures relate only to final energy consumption, only the direct use of coal, oil and natural gas in the industry, households, transport sectors, etc. has been considered. The use of these energy sources for indirect use through power generation is not included. Presently, about 71 per cent of the total coal consumption and 30 per cent of the total natural gas consumption is used for power generation. The economy is progressively becoming oil-intensive in view of the increasing share of natural gas and petroleum products in the final commercial energy use due to the increasing use of oil products in sectors like household and transport. The relative shares of oil products like LPG, SKO, MS, and diesel have increased from 54.9 per cent in 1970–1971 to 70.4 per cent in 1996–1997.

IV. Long-term Energy Scenario

22. It is estimated that the requirement for primary energy is likely to increase from 412 MTOE at the end of the Tenth Plan (2002–2007) to around 554 MTOE by the end of the Eleventh Plan (2007–2012). Of this, the share of commercial energy demand is expected to grow at an average rate of 6.6 per cent during the Eighth Plan and 6.1 per cent during the Eleventh Plan while that the share of non-commercial energy will decline. The annual growth rate of commercial energy is

therefore 6.35 per cent. The energy import dependence has also increased from about 25 per cent at the end of the Eighth Plan to 29.41 per cent at the end of the Ninth Plan. Against this background, both refining and marketing operations have been opened to the private sector. A new exploration licensing policy for making exploration and production competitive and attractive has been announced under which bids have been invited and are being processed for award on regular basis. The growing requirement of coal and the inability of the domestic production to meet this requirement may necessitate increased imports of coal even for power generation. The entry of the private sector in coal production, without the captive consumption restriction has been allowed which will go a long way in increasing the availability of coal. Indian coal is not of a very good quality as the ash content of the coal is very high. This not only leads to difficulties in utilization but also generates larger quantities of fly ash, the management of which becomes a difficult environmental problem. Clean coal technologies are a must in order to reduce the detrimental environmental effects associated with high-ash coal utilization. Also, there is a need for the induction of improved mining technologies in order to mine coal from lower seams, which will help improve the quality of coal.

Therefore, the key issues facing India with major energy implications are, the rising population which eats away the fruits of development, the need for economic growth, the access to adequate commercial energy supplies, financial resources, rational energy pricing regime, improvements in energy efficiency of both energy supply and consumption, technological up-gradation, a matching research and development base and environmental protection.

V. Energy Pricing

23. Until recently, the prices of commercial energy sources in the country were entirely administered. The basic approach was to arrive at a retention price that would permit full recovery of the average costs and allow a reasonable rate of return on the capital employed in the industry. Steps have been taken to deregulate energy prices and to shift to market-based pricing. Fixation of administered prices was not done in a transparent manner and it also ignored sound economic principles on efficiency and sometimes on the grounds of public good. The subsidies meant for the vulnerable section of the society have in fact accrued to those who were not intended to be the real beneficiaries.

VI. Energy Conservation

24. At present, over 70 per cent of the oil requirements are met from imported sources. As a result, petroleum products account for the outgo of a large proportion of the total export earnings of the country in foreign exchange. In 2003–2004, India imported crude oil and petroleum products worth USD 21.67 billion (Rs. 93,205 crores).

The degree of self-sufficiency (measured as the ratio between indigenous production of crude oil and consumption of petroleum products in crude oil equivalent

terms) is currently about 38 per cent. Therefore, energy conservation is a most important factor and has received considerable attention worldwide since the first oil shock in 1973. The Fuel Policy Committee (1974) and the Working Group on Energy Policy (1979) had laid emphasis on the need for energy conservation. The Report of the Inter-Ministerial Group on Energy Conservation in 1983 examined specific areas of energy conservation in different sectors. In pursuance of the recommendations of the Advisory Board on Energy (ABE) the Energy Conservation Act of 2001 was passed under which a Bureau of Energy Efficiency has been set up. The Petroleum Conservation Research Association (PCRA) under the Ministry of Petroleum and Natural Gas has done a pioneering work in bringing about a general awareness to conserve the petrol and gas. The Department of Power has set up the Energy Management Center to undertake studies and suggest an action plan for energy conservation and more efficient use of energy. Energy audits have been adopted and are being carried out. There has been some improvement over the years in the efficiency of the use of commercial energy in several sectors of the economy. The energy savings potential for some sectors in comparison with the international consumption levels is given in Table 3.

Table 3
Energy Savings Potential in Selected Industries/Sectors

| | India | World |
|----------------------|--|-------|
| Industry | GCal/Tonne | |
| Aluminium | 14.55 | 12.35 |
| Steel | 8 to 9.55 | 4.0 |
| Cement | 1.0 | 0.8 |
| Transport | 80% per tonne km. If freight moved from road to rail | |
| (Saving %) | | |
| Urban Transport | For every 1 tonne of petrol saved, 0.33 tonne of HSD is required (savings 67%) | |
| Agriculture | 30% | |
| Pump Sets | | |
| Domestic | | |
| CFL Vs Filament lamp | 76% | |

(Source: Ninth Plan Document)

VII. Energy and Environment

25. The use of energy may sometimes, be accompanied by an adverse impact on environment and ultimately on the human health. Combustion of fossil fuels generates gases and contributes to atmospheric pollution. The major source of such pollution is fuel combustion in power plants and industry as well as in motor vehicles, resulting in the deterioration of the air quality. Therefore, the future

energy strategy should try to meet the requirement of energy, without having an adverse impact on the environment and in a cost-effective manner.

§7. ENERGY SECTOR REFORMS

26. A series of policy changes and reforms in the Energy Sector were initiated in the year 1991 through the Industrial Policy Resolution. The policy to promote private participation in the energy sector is guided by the need for attracting additional investment and the introduction of better technology and competitiveness. Environmental management and protection and conservation of natural resources have also emerged as key priority areas in the reform process. In the Electricity Sector reforms included, functional reforms in the form of investment promotion; structural reforms in the form of unbundling the existing vertically integrated monopoly and separate generation, transmission and distribution activities for rationalizing their management; setting up of Central and State level Electricity Regulatory Commissions etc. Various tax incentives and a certain assured rate of return have been granted to the investors. Liberalized tariff reforms for hydroelectric projects have also been notified. The coal sector reforms include: permitting the private sector in commercial coal mining by the required legislative amendments; offering coal blocks both for exploration and mining on competitive bidding basis; the deregulation of coal prices, the setting up of a regulatory authority; re-structuring the coal sector by giving full autonomy to the various coal producing companies of Coal India Limited (CIL) and doing away with the concept of holding companies; accelerating the efforts for exploration of coal deposits etc.

Reforms in the petrol and gas sector have concentrated on opening up this sector to private participation in upstream and downstream activities and restructuring Public Sector oil companies through disinvestment of Government holdings. A package has been formulated for the upstream sector and announced in the form of a New Exploration Licensing Policy (NELP) to attract private investment in the exploration of petrol and gas which includes attractive fiscal concessions. The NELP provides a level playing field and makes exploration and production competitive by discontinuance of allotting exploration acreage to National Oil Companies on a nomination basis. Further, in the down stream oil sector, refining and marketing operations have been opened to the private sector. The structural reform is being considered in the form of providing a regulatory mechanism so that the functions of regulator and controller can be separated. Further, a co-ordinated and integrated approach is being developed at the national level so that a comprehensive view may be taken.

§8. NON-CONVENTIONAL SOURCES OF ENERGY

27. India has abundant non-conventional sources of energy which include biogas, solar and solar thermal, wind power, small hydropower, etc. The present assessment of the potential of these sources and their status of exploitation are as given in Table 4.

Table 4
Renewable Energy Potential

| Source/Technology | Potential/Availability | Potential exploited Till August 2001 |
|-----------------------------|------------------------|---|
| Biogas Plants | 12 million | 3.22 million |
| Biomass-based Power | 19,500 MW | 38.4 MW |
| Efficient Wood Stoves | 120 million | 33.86 million |
| Solar Energy | 20 MW/sqkm | 1.74 MW/sqkm |
| Small hydro | 15,000 MW | 1,398 MW |
| Wind Energy | 45,000 MW | 1,367 MW |
| Ocean Thermal | 50,000 MW | |
| Sea Wave Power | 20,000 MW | |
| Tidal Power | 9,000 MW | |
| Energy Recovery from wastes | 1,700 MW | 16.2 MW |

(Source: Tenth Plan Document)

The major portion of the energy requirement of India is met from conventional energy sources like coal and petroleum but the vast majority of the rural population still depends upon the locally available non-commercial sources of energy like animal dung, crop waste and fuelwood. In order to ensure the efficient use of these energy resources in an environmental friendly manner, the programmes of non-conventional energy sources under the Central Ministry of Non-Conventional Energy Sources (MNES) are being promoted in co-ordination with the governments of the States and the Union Territories. The major programs include power generation through wind, small hydro, biomass and solar energy, the socially oriented programs to meet the rural energy requirements such as the National Project on Biogas Development (NPBD), the Integrated Rural Energy Program (IREP), solar energy for lighting, solar water heaters, solar cookers and other rural applications and programs.

India still lacks a specific and comprehensive legislation with respect to renewable sources of energy. The framing of a policy including a legislation with a necessary regulatory mechanism in order to buy back the power generated from new and renewable sources and deliver the energy to end-users, is necessary. It is also necessary to bring down the cost of energy, especially from solar and other such renewable sources through suitable research and development and enhanced manufacturing facilities.

28. The Indian Renewable Energy Development Agency (IREDA) came into existence on 11 March 1987 with the objective of operating a Revolving Fund for development, promotion and commercialization of technologies relating to new and renewable sources of energy (NRSE) by providing soft term finances. IREDA has now assumed global dimensions with assistance received from the Government of the Netherlands, a Line of credit from the World Bank and with assistance from the Asian Development Bank. The Integrated Rural Energy Program (IREP) aims at

meeting the energy requirement in the selected blocks of all the States/Union Territories by providing a cost-effective and optimal mix of all the energy sources. The Central Sector outlays provided for IREP are utilized in creating capabilities for setting up planning cells in the States. These funds are utilized in meeting the expenditure on the staff component of the IREP as well as their training. The States are providing funds for actual implementation of the program by providing energy devices like Biogas plants, improved chulhas, solar cookers etc.

29. The National Policy for Renewable Energy formulated by MNES provides the following:

- (i) Around one tenth of the 120,000 MW expansion in energy generation capacity planned by the Central Electricity Authority (CEA) for the Eleventh Plan is expected to come from the renewable energy sector. Within the long term vision this Policy sets the major application areas and near term targets for the period up to the end of the Eleventh Five Year Plan in the year 2012. The major application areas are meeting the minimum rural energy needs; decentralized energy supply for agriculture, industry, commercial and household sector; grid quality power generation and supply. Special efforts are to be made for exploiting the large co-generation potential available in the country.
- (ii) In formulating the goals and strategies for these applications the major objectives are: to enhance the diversity and security of energy supplies; promote private sector participation; enhance the substitution of fossil fuels etc. The medium term goals up to the end of the Eleventh Five Year Plan include setting up of additional three (3) million family size biogas plants; deployment of five (5) million solar lanterns and two (2) million solar home lighting systems.

30. The provision of soft loans through financial agencies including the Indian Renewable Energy Development Agency (IREDA) and other concessions for provision of land, infrastructure for evacuating the power generated by the private entrepreneurs have to be ensured for implementing an effective power generation program through non-conventional energy sources. A major program may be initiated for the production of power through co-generation in industries, especially in sugar mills using bagasse as the fuel. Co-generation programs in industries have been given necessary thrust during the Ninth Plan as these programs can be implemented in a shorter duration and would also help the industries to meet their power demand and enable them to sell the surplus power to the utilities. The Energy Conservation Act of 2001 has been enacted to enforce energy conservation standards. A large section of the society particularly the rural poor in India are not in a position to meet their energy needs from sources like kerosene, LPG, etc., at an affordable price. As a result the dependence on fuelwood consumption is on the increase. The major source of energy for the domestic sector both in urban and rural areas continues to be fuelwood and the total requirement of fuelwood per year is estimated at 200 million tonnes of which 102 million tonnes are expected to be obtained from forest areas and the balance 98 million tonnes from the farm forestry. The availability of wood from forests in terms of fuelwood is increasing on average by 21 million tonnes per year. However, on a sustainable basis an additional 18

million tonnes per year are available. As a result 84 million tonnes to be met by excess removal from forest areas. This in turn brings pressure on the conservation of forest resources. While there is a notable achievement in the National Project on Biogas Development by the setting up of more than 9.6 lakh family size biogas plants during the Eighth Plan, the component relating to community/institutional biogas plants has not picked up. A dedicated involvement of the States concerned can help in promoting community-based plants as the promotion of such plants will be possible only by the strong involvement of local bodies like panchayats, rural co-operatives and other micro-level administrative set-up in the villages. Against this background, the Ninth Plan Document has recommended that this component of the biogas project should be transferred to the States with adequate budget provision under the State Plans.

31. The Integrated Rural Energy Program (IREP), a Centrally Sponsored Scheme, provides for Central Government grants to the States for developing capabilities in the States and Union Territories (UT) for preparing and implementing the Integrated Rural Energy Program and projects. It also provides for the expenditure on staff salaries and their training. The State Sector component is utilized for actual implementation of the program. While the progress achieved so far indicates that the program covers around 660 blocks in the entire country, the actual efficacy of this program is yet to be assessed fully. Although some evaluation studies have been conducted, they have taken a very limited sample of around 12 blocks. The role played by the State Governments in this program during the past had been very marginal. There were both institutional and financial constraints on the part of the States. This program, being a Centrally Sponsored Scheme, is under consideration for transfer to the States.

32. The wind power program has attained a commercial stage, so it needs support in terms of fiscal incentives to encourage increased participation of the private entrepreneurs to set up wind farms. A suitable regulatory mechanism is also required to decide on the buy-back of the power generated by wind farm operators at an attractive and economic price and also to provide for wheeling, banking and third party sales facilities. New demonstration programs could be limited, as the existing wind farms can provide the needed demonstration experience. However, as far as wind resource assessment and surveys are concerned, it is necessary to identify the potential sites for development of wind farms. The Small Hydro Power program could not pick up due to the absence of identified sites well in advance for taking up the programs, the reluctance on the part of the State Governments to actively involve, the long gestation combined with time and cost overruns of small hydro projects etc. During the Ninth Plan, the structure of the small hydro program needs to be suitably modified and being a Centrally Sponsored Scheme, this is also being considered for transfer to the States.

33. The biomass power program comprises the biomass combustion program, biomass gasifies and co-generation programs. A beginning was made during the Eighth Plan for experimental biomass production and the utilization and development of gasifies for different mechanical and electrical applications. More than 20

MW equivalent capacity projects have been installed against the Eighth Plan target of 2 MW. However, the co-generation program, especially in sugar mills using bagasse as fuel, is yet to pick up in a major way. The main constraint for this was the lack of suitable promotional incentives and the absence of demonstration programs. The promotional incentives modified recently are likely to result during the Ninth Plan in private owners of sugar mills coming forward to replace their existing low pressure steam boilers by high pressure ones and also carrying out other modifications so as to make them suitable for power generation. In addition, a regulatory mechanism is needed in respect of the buy-back of co-generated power by State Utilities (SEBs).

34. The generation of electricity from solar energy, although technically feasible, has not reached the stage of commercial viability in India. At the prevailing cost of solar cells, the cost of installations as well as the cost of production of electricity from solar energy is very high compared to the cost of electricity produced from other conventional sources. Thus, there is need to upgrade the existing technology and to reduce the cost of production of solar cells. As such, there are no large solar power plants operating in the country. Under the Solar Energy Program, standalone systems are installed for applications like the solar thermal water heaters, solar cookers, solar dryers, solar desalination systems and solar photo voltaic street lights, solar photo voltaic domestic lights, solar lanterns etc. In addition, hybrid systems using small aero generators and water-pumping windmills are also installed. The Solar Energy Centre, functioning under the administrative control of the Ministry of Non-Conventional Energy Sources, is carrying out the activities of testing the solar thermal and photovoltaic devices. The Centre is engaged in research and development activities to develop indigenous components for solar power generation, development of materials suited to the requirement of solar thermal applications etc.

There are no large-scale plants to utilize urban waste for production of electricity in the country, although several technological options are available to produce electricity from different sources like waste from industrial effluents, municipal/urban waste, tannery waste, vegetable/market yard waste, sewage, pulp and paper industry waste etc. The Ministry of Non-Conventional Energy Sources is at present implementing a program assisted by UNDP/GEF consisting of 16 sub-projects.

§9. ENERGY STRATEGY FOR THE FUTURE

35. The energy strategy for the future has to be based on the following basic components:

- Rationalizing the tariff structure of various energy products, particularly the prices charged by the State Electricity Boards (SEBs) from the various categories of consumers. This is an important component, if not a pre-requisite for the restructuring of the SEBs in order that they become bankable and creditworthy.
- The SEBs are being re-structured so as to permit them to operate on commercial lines.

- Dismantling the Administered Pricing Mechanism (APM) in a fairly short time frame.
- Strengthening the institutional reforms that have been initiated during the Eighth Five Year Plan, e.g. deregulation, etc.

Further, the energy challenges are to be tackled in a manner so that social, environmental, economic and security problems are not aggravated, as is typically the case with conventional energy strategies which either ignore these problems or do not deal with them adequately. Therefore, in the medium to long-term, it is necessary to take steps that will reduce the energy intensity of the economy, some of which are demand management through greater conservation of energy, optimum fuel mix, structural changes in the economy, an appropriate mix in the transport sector, i.e. greater dependence on rail than on road for the movement of goods and passengers and a shift away from private modes to public modes for passenger transport, greater reliance on co-generation, recycling, changes in the design of different products to reduce the material intensity of those products, etc. There is also a need to shift to less energy-intensive modes of transport. This includes measures to improve the transport infrastructure viz., roads, better design of vehicles, use of compressed natural gas (CNG) and synthetic fuel, etc. Similarly, better urban planning is also called for, which will reduce the demand for energy use in the transport sector. There is also a need to move away from depletable to inexhaustible resources viz. solar, wind, biomass energy, etc.

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Part I. Regulatory Framework Concerning Electricity

Chapter 1. General Introduction

§1. INTRODUCTION

43. It was in 1880, that the supply of electricity in India commenced for the first time with the commissioning of a 130 KW hydroelectric plant at Darjeeling, West Bengal. In 1897, a thermal power plant based on coal was set up at Calcutta followed by the commissioning of a hydel power station at Sivasamudram in Karnataka during 1902. Thereafter, for the next 50 years, that is, up to independence, the supply of electricity was confined mainly in and around urban centers, chiefly for lighting purposes and almost all the initial ventures were set up by private entrepreneurs. After independence, initially under the influence of socialism, there was emphasis on Government holding which culminated in to the formulation of the Industrial Policy Resolution of 1956, and the production of power was reserved for the public sector. It was only in 1991 that the entry of the private sector was again allowed through amendment in the Electricity Act of 1910 and the Electricity (Supply) Act of 1948. The detailed policy with respect to private participation was announced by the Government through a gazette notification (Gazette Notification, Extraordinary, Part I, Section 1, No. 237 dated 22 October 1991 Resolution No. 7/8/1/88, Thermal) culminating in to enactment of Electricity Act of 2003.

44. At present, the Government is actively encouraging the entry of the private sector and a substantial portion of the incremental capacity in the Ninth Five year Plan (1997-2002) was expected to come from the private sector. The main objective of this policy is to encourage private sector participation so as to mobilize additional resources for power generation, transmission and distribution. The policy initiative taken in 1991 facilitated the raising of capital from domestic and foreign markets and provided a more liberal, financial and legal environment and allowed the private investors to set up generation capacities or operate as licensee/distribution companies, which was till then a monopoly of the State Electricity Boards (SEBs) or public sector undertakings. However, the flow of foreign investment has not been to the desired level In the process of reform of the electricity sector, the enactment of the Electricity Regulatory Commission Act of 1998 was a major step forward. Now the Electricity Regulatory Commission Act of 1998 the Electricity Act of 1910 and the Electricity (Supply) Act of 1948 have been repealed through

the Electricity Act of 2003 (No. XXXVI of 2003) to bring them in tune with the ongoing policy of restructuring and privatization.

45. In 1947, at the time of independence, the electricity generation was only 4.1 billion units, it has increased to 515.3 billion units in 2001–2002. Despite this achievement, the electricity sector has been plagued by serious problems of supply shortages, financial crises of SEBs, transmission and distribution losses, low tariffs etc. The major reasons of ills of the electricity sector are the monopoly enjoyed by the SEBs, their organizational limitations and political considerations getting weightage in crucial decision making areas like the fixation of tariff. The problems of the power industry in India require the restructuring of the whole system by breaking up of monopolies of SEBs so that competition can be introduced and the bringing of changes in ownership patterns and establishment of an effective regulatory system in the States. The private players in the electricity sector will be interested only if consumer prices are realistic which can absorb the costs of finance and effective arrangements exist to hold such prices in place. The higher cost of privately financed projects will stand public scrutiny only if traditional approval processes are fast paced, trimmed to current needs and made transparent.

§2. THE REGULATORY MECHANISM

46. The regulatory mechanism for electricity exists both at the central as well as the state level. The authorities forming part of this structure, consist of the following:

- the Ministry of Power;
- the Central Electricity Authority;
- the State Transmission Utilities/the State Electricity Boards;
- the Central Electricity Regulatory Commission;
- the Electricity Regulatory Commissions of the State Advisory Bodies; and
- the Public Sector Electric Companies, as Generating Companies, Transmission Utilities and Licensee.

I. Ministry of Power

47. The Ministry of Power is primarily responsible for regulation and development of the electricity sector in the country. The Ministry is entrusted with perspective planning, policy formulation, the processing of projects, training and manpower development and the administration of power generation, transmission and distribution. The Ministry is responsible for administration of the Energy Conservation Act of 2001 and the Indian Electricity Act of 2003 and undertake such amendments to these Acts, as may be necessary from time to time, in conformity with the Government's policy objectives. There are six wings in the Ministry of Power as listed below:

1. Investment Promotion Cell;
2. Administration and Hydroelectric Power;
3. Planning, Co-ordination & Energy Management;
4. Thermal;
5. Systems and External Assistance; and
6. Finance.

48. The establishment and development of the generation and transmission projects in the central sector have been entrusted to the central sector power corporations, namely, the National Thermal Power Corporation (NTPC), the National Hydroelectric Power Corporation (NHPC), the North Eastern Electric Power Corporation (NEEPCO) and the Power Grid Corporation of India Ltd. (POWERGRID). The NHPC, incorporated in 1975 is instrumental in the planning, promotion and development of hydroelectric power in the country. The NTPC is the main thermal power public Sector Company with around 26 per cent of the total generation capacity. The Satlaj Jal Vidyut Nigam (JV) formerly known as Naptha Jhakri Hydro Power Corporation (NJHPC) and the Tehri Hydropower Complex are joint venture power corporations under the administrative control of the Ministry of Power. The Damodar Valley Corporation (DVC), constituted under the DVC Act of 1948 and the Bhakhra Beas Management Board (BBMB) constituted under the Punjab Re-organization Act of 1966, the Central Power Research Institute (CPRI), the National Power Training Institutes (NPTI) and the Energy Management Centre (EMC) also function under the administrative control of Ministry of Power. Programs of rural electrification are within the purview of Rural Electrification Corporation (REC). REC also provides assistance to SEB's in systems improvement projects.

49. The Power Finance Corporation incorporated in 1986, mobilizes capital from non budget resources for providing term finance for power projects. POWER-GRID, incorporated in 1989, is responsible for all transmission projects and for providing extra high voltage and an extra high voltage transmission network in the central sector and for development of the National Power Grid. It ensures an integrated grid operation and the delivery of power from central generating stations to the beneficiary states. Besides, it also floats bids and finalizes power purchase agreements. The Energy Management Center (EMC) established in 1989 under the Energy Conservation Cell in the Ministry of Power, designs and co-ordinates the implementation of energy management programs. The EMC has co-ordinated a large number of awareness campaigns, projects and studies, demonstration projects, established a data base on energy efficient processes and technologies and the implementation of multilateral and bilateral energy efficient projects etc. Set up in 1991, the Investment Promotion Cell (IPC) is the nodal agency under the Ministry of Power to provide information and assistance to entrepreneurs in the power sector. The IPC provides information on the policy regarding private sector participation and guides on the procedure and modalities of clearances and acts as single reference agency for resolution of issues related to private participation and investment in the power sector and works for speedy clearances.

II. Statutory Bodies

50. There are some statutory bodies created in pursuance of the provisions of the enactment, like Central and State Electricity Authorities, Licensee, Generating Companies, Utilities etc. A Licensee is one who holds a license, granted by the Appropriate Commission (Central Regulatory Commission, State Regulatory Commission or Joint Commission as the case may be), to supply electricity in a specified area, under Section 14 of the Electricity Act of 2003. A Generating Company is set up under Section 7 of the Electricity Act of 2003 and governed by the provisions of this Act. The Central Transmission Utility is set up under Section 38 of the Electricity Act of 2003. The main functions of the Central Transmission Utility are: to undertake the transmission of energy through an inter-State transmission system; and discharge all functions of planning and co-ordination relating to the inter-State transmission system with State Transmission Utilities, the Central Government, State Governments, Generating Companies etc. The Power Grid Corporation of India Limited is the Central Transmission Utility. The State Transmission Utility is set up under Section 39 of the Indian Electricity Act of 2003. The functions of the State Transmission Utility are: to undertake the transmission of electricity through an intra-State transmission system; and discharge all functions of planning and co-ordination relating to the intra-State transmission system with the Central Transmission Utility, State Governments, generating companies etc.

A. Central Electricity Authority (CEA)

51. The Central Electricity Authority (CEA) established earlier but continued under Section 70 of the Electricity Act of 2003, looks after planning and regulation aspects so as to develop a sound adequate and uniform national power policy on behalf of the Central Government. It advises the Ministry of Power on technical and economic matters so as to control and direct the utilization of national power resources. Since regulatory powers with respect to hydro generating station vest in the CEA so it regulates the entry of new hydro generating stations to all major projects (a threshold value is fixed by the Central Government). It sets safety standards and carry out over all technical regulation. The Authority is bound by written directions of the Central Government in the matter of policy involving public interest.

B. State Transmission Utility/State Electricity Boards

52. The State Electricity Boards (SEBs) were constituted by the State Governments in exercise of powers under the Electricity (Supply) Act of 1948. The SEBs have regulatory functions like the grant of a license, the fixing of terms and conditions, the revocation of licenses etc. SEBs also exercised powers in relation to control over generation and distribution operations. SEBs along with State Governments exercised recommendatory powers regarding the clearance for captive generating units that require the approval of the Central Electricity Board. The State

Electricity Board in co-ordination with Generating Company(s) arranged the supply, transmission and distribution to areas where there is deficient supply or no supply at all.

The SEBs were originally intended to operate as independent bodies, however, because of political and noncommercial considerations they could not take decisions independent of outside interference leading to the complete ruin and collapse of their finances. At present the restoration of the financial health of SEBs and their operational performance is a dominant and main concern of the power sector in India. Most SEBs are in financial crises brought about by artificially low tariffs, operating inefficiencies, loss due to theft and other non-commercial considerations.

As the Electricity (Supply) Act of 1948 has been repealed, so SEB's constituted under this Act have been deemed as the State Transmission Utility and licensee under Section 172 of the Electricity Act 2003. The undertaking of SEB shall, after the expiry of one year from the appointed date or after such additional period as decided by the Central and State Governments by mutual agreement, be transferred in accordance with Part XIII of the Act (Section 172(c)). As per transfer scheme any property, interest in property, rights and liabilities of the SEB shall vest in the State Government (Section 131(2)) which can be re-vested in a Government Company or in a company or companies. A transfer scheme, inter alia, may provide for the formation of subsidiaries, joint venture companies or other schemes of division, amalgamation, merger, reconstruction or arrangements which shall promote the profitability and viability of resulting entity, ensure economic efficiency, encourage competition and protect consumer interest (Section 132).

C. Central Electricity Regulatory Commission (Central Commission)

53. The Central Commission was originally constituted on 24 July 1998 under the Electricity Regulatory Commission Act of 1998, and has been allowed to continue under the Electricity Act of 2003, is a body corporate with perpetual succession (Section 76). The main functions of the Central Commission are: to regulate the tariff of generating companies owned or controlled by the Central Government; to regulate the tariff of generating companies other than those owned or controlled by the Central Government, if such generating companies enter into or otherwise have a composite scheme for generation and sale of electricity in more than one State; to regulate the inter-State transmission of electricity including the tariff of the transmission utilities; and to regulate inter-State trading of electricity and to aid and advise the Central Government in formulation of National Electricity Policy and Tariff Policy.

D. State Electricity Regulatory Commission (SERC)

54. The Electricity Regulatory Commission Act of 1998, empowered the State Governments to establish an Electricity Regulatory Commission of State as a body corporate with perpetual succession. These Commissions have been allowed to continue under Section 82 of the Electricity Act of 2003. The Regulatory Commis-

sions have been set up in twenty two (22) States including the States of Orissa and Haryana and it is expected that other States will follow suit. The main functions of the SERC are: to determine the tariff for electricity, wholesale, bulk, retail; to determine the tariff payable for use by the transmission facilities; to regulate the power purchase and procurement process of distribution licensees; to promote competition, efficiency and economy in the activities of the electricity industries and discharge such other functions assigned to the State Electricity Regulatory Commissions under the Electricity Act of 2003.

§3. STATUTORY STRUCTURE AND LEGAL REGIME

I. Constitution and Electricity

55. The electricity is in the Concurrent List of the Constitution (Entry 38, List III, 7th Schedule), therefore, both Center and States have the power to legislate and thereby regulate the electricity sector. However, the overall national policy and legislation is controlled and determined by the Central Government whereas the powers of State Governments remain restricted to their respective state territories. The Electricity Act of 1910, was the first legislative effort through which provisions to support and regulate this sector were put in place. Shortly after independence, a second legislation, the Electricity (Supply) Act of 1948 was promulgated, which paved the way for establishing Electricity Boards in the states of the Union. The above stated two Acts and the Regulatory Commissions Act of 1998 have been repealed and replaced by the Electricity Act of 2003. The enactments and other important basic documents dealing with electricity in India are as follows:

- the Energy Conservation Act of 2001;
- the Electricity Act of 2003;
- the National Electricity Policy, Plan and Tariff Policy;
- the Indian Electricity Rules of 1956;
- the Central Electricity Authority Rules of 1977;
- the Central Electricity Authority Regulations of 1979;
- the Electricity (Supply) Annual Accounts Rules of 1985; and
- the Electrical Wires, cables, Appliances and Accessories (Quality Control) Order of 1993, issued under the Essential Commodities Act of 1986.

II. The Salient Features of Electricity Laws

A. *The Energy Conservation Act of 2001*

56. This Act which came in to force in March 2002 provides for: institutionalizing and strengthening the delivery mechanism for energy efficiency services and brings about co-ordination amongst various entities. The Act consists of 62 sections divided in to ten chapters. Chapter 1 contains definitions. Chapter II establishes Bureau of Energy Efficiency. The Bureau replaces Energy Management Centre and

all its assets and liabilities have been transferred to the Bureau (Section 12). The Bureau recommends to the Central Government the norms for processes and energy consumption standards. required to be notified; prescribe guidelines for energy conservation building code; promote research and development in the field of energy conservation and energy efficient processes, equipment, devices and systems etc. It can levy fee for services provided for promoting efficient use of energy and its conservation (Section 13). The Act also gives power to Central and State Governments to facilitate and enforce efficient use of energy and its conservation (Chapters V and VI). An Appellate Tribunal has been created for energy conservation which hears appeals against the orders of adjudicating officer or the Central Government or the State Government (Section 30). The Central Government has power to supersede Bureau in case of grave emergency, persistent default in complying with its directions or in public interest (Section 47).

B. The Electricity Act of 2003 (Act No. XXXVI of 2003)

57. The Electricity Act of 1887 was the first enactment in India in the field of electricity followed by the Calcutta Lighting Act and the Howrah Bridge Lighting Act of 1902. This legislation was replaced by the Indian Electricity Act of 1903 which was amended and re-enacted as the Electricity Act of 1910. The Act of 1910 deals with the generation, supply and use of electrical energy and prescribes the rights and obligations of the licensee. The term ‘energy’ was defined as meaning ‘electrical energy’ (i) generated, transmitted or supplied for any purpose, or (ii) used for any purpose except for the transmission of a message. The Act of 1910 was amended in 1959 (the Amending Act XXXII of 1959), 1973 and subsequently in 1991 through the Electricity Laws (Amendment) Act of 1991 (No. 50 of 1991) to allow private sector participation. The Amending Act of 1991 widened the scope of private sector participation in the generation, supply and distribution of power. To achieve these objectives, the Electricity (Supply) Act of 1948 was also amended in 1991. After the passage of the Electricity Regulatory Commission Act of 1998, these Acts were again amended by the Electricity Laws (Amendment) Act of 1998 (No. 22 of 1998). The Electricity Act of 1910 has been repealed and replaced by the Electricity Act of 2003.

58. The Act of 2003 has eighteen parts with one schedule attached to it. Part I deals with preliminary aspects, Part II covers the national electricity policy and plan. Part III contains provisions with respect to generation of electricity. The provisions related to licensing have been provided in Part IV. There are provisions dealing with theft of electricity and prescribing penalties. The schedule contains enactment of the States which have been saved from repeal with certain qualifications. The Central Regulatory Commission has been empowered to constitute an advisory committee for any part of the territory to which the Act extends. Similarly, State Regulatory Commission can constitute an advisory committee for a whole State or any part thereof. Section 70 of the Act provides for the constitution of a Central Electricity Authority consisting of members nominated by the Central Government. The Central Government makes rules for the purpose of regulation of the

generation, transmission and use of energy and generally to carry out the purposes and objects of the Act. In discharge of their function, the Central Government as well as State Regulatory Commission shall be guided by the National Electricity Policy, National Electricity Plan and Tariff Policy published under Section 3 of the Act (Section 79(4) 86(4)). The Act also enjoins that the State Electricity Boards will function as State Transmission Utility.

The Act also provides that the Indian Electricity Rules of 1956 shall continue to be in force till the regulations under Section 53 of the Act are made (Section 185(1)(c)).

C. The Indian Electricity Rules of 1956

59. The Rules of 1956 have been framed by the Central Electricity Board under section 37 of the Indian Electricity Act of 1910 and repeal the Indian Electricity Rules of 1937. There are 11 chapters and 7 appendixes in the Rules. Chapter I prescribes qualifications of Inspectors and gives them power to enter and inspect any place, carrier or vessel containing any appliance or apparatus used in the generation, transmission, transformation, conversion etc. of energy and may carry out tests and examinations (Chapter II). Chapter X is applicable when electricity is used in a mine as defined in the Mines Act of 1952 (Rule 108). It is the duty of the owner, agent, engineer or manager of a mine or the manager or engineer of the company operating in the oilfield, or of the owner, engineer of one or more drilled wells situated in the oil field, to enforce the Rules contained in Chapter X and to conduct their work in accordance with the Rules (Rule 110). The notices are to be served with respect to the size and type of the apparatus being used, the keeping of plans, the keeping of safety lamps in the mines illuminated by electricity etc. The voltage limits, the switch gear for disconnecting the supply of electricity, the requirements to be complied with respect to cables, the precautions where gas exists and the earthing of points have also been dealt with in the Rules (Chapter X).

The State Government or where mines, oilfields or railways or works are executed for and on behalf of the Central Government, are affected, the Central Government may, by an order direct the relaxation of Rules, *inter alia*, contained in Chapter V to Chapter IX (Rule 133). The Rules provide for a penalty in the event of the non-reporting of an accident by a person (other than the inspector or any officer appointed to assist the inspector) who being responsible for the observance of these Rules, committed a breach.

D. The National Electricity Policy, Plan and Tariff Policy

60. The Central Government has framed this policy in compliance with Section 3 of the Electricity Act 2003 in consultation with the State Governments, the Central Electricity Authority, Central Electricity Regulatory Commission (CERC) and other stake holders (notified vide No. 23/40/2004-RZR (Vol. II) dated 12 February 2005, Part I, Section I, The Gazette of India – Extraordinary). The Central Government has the authority to review and revise this policy from time to time.

The Policy lays guidelines for accelerated development of the power sector, provision of electricity to all areas, protect the interest of the consumers, commercial viability etc. About 56 per cent of rural households have not yet been electrified. As per Policy the task of rural electrification is to be completed so that access to all the households of electricity could be secured and at the same time ensuring that electricity reaches to the poor and marginal sections of the society at a reasonable rates.

For providing availability of over one hundred units of per capita capacity by the year 2012, capacity addition of more than 100,000 MW would be required during the period 2002–2012. Adequate reserve capacity margin need to be created in order to fully meet both energy and peak demand by 2012. The overall availability installed capacity is to be enhanced to 85 per cent and a spinning reserve of at least 5 per cent is to be created so as to ensure grid security and quality and reliability of power supply.

61. The transmission capacity is very important keeping in view of the massive increase planned in generation. The Central Government will facilitate the development of National Grid for proper transmission of electricity from surplus regions to deficit regions. The Central Transmission Utility (CTU) and the State Transmission Utility (STU) are to carry out network planning and development as per National Electricity Plan. The Policy admits proper restructuring of distribution utilities. In the process of restructuring the transition financing support would be linked to attainment of predetermined efficiency improvements and reduction in cash losses. A governance structure is to be put in place which insulate the service providers from external interference. The State Electricity Boards liabilities are not to be passed on to successor distribution companies.

The problem of cross-subsidies is very acute and it adversely affect the recovery of cost of service. The State Governments have to make budget provision for the subsidy so that Utility insulated from the adverse affects of subsidies. Consumers below poverty line consuming below a specified level, say thirty (30) units per month may receive subsidy in tariff. But in any case tariff should be at least fifty (50) per cent of the average (overall) cost of the supply. The existing research and development base in the electricity sector would be further augmented and intensified in identified priority, areas. Large power companies should set aside a portion their profits for support to research and development. For promoting market development, a part of new generating capacity, say fifteen (15) per cent may be sold outside long term power purchase agreements (PPAs). In the coming years a significant portion of the installed capacity of new generating stations could participate in competitive power market. These measures in long run would lead to reduction in tariff. The National Electricity Policy also outlines the financing of power sector programmes and participation of private sector; bringing down the transmission and distribution losses which have been reported by a large number of States over forty (40) per cent; energy conservation; environmental issues; training and human resource development etc.

The National Electricity Plan is to be prepared once in five years by the Central Electricity Authority (CEA) as provided under Section 3(4) of the Electricity Act of 2003. The Plan is to be revised by CEA in accordance with National Electricity

Policy. The Plan prepared by CEA and approved by the Central Government can be used by prospective operating companies, transmission utilities and transmission/distribution licensees as reference document. The Plan would be for a short term framework of five years while giving a fifteen (15) year perspective. The Plan would *inter alia* include short term and long term demand forecast; locations/areas for capacity additions; development of national grid; fuel choices based on economy, energy security and environmental considerations.

Section 3 of the Electricity Act of 2003 empowers the Central Government to formulate, review or revise *inter-alia* the Tariff Policy. This Policy has been evolved in consultation with state governments and CEA. The overall objectives of the Policy are to: ensure financial viability and attract investment; protection of consumer interest; promotion of competition; consistency in regulatory approach etc.

E. The Central Electricity Authority Regulations of 1979

62. These Regulations have been framed by the Central Electricity Authority under Section 4C of the Electricity (Supply) Act of 1948 (No. 54 of 1948), as amended by the Electricity (Supply) Amendment Act of 1976 (No. 115 of 1976), and published in the Gazette of India (Extra), Part II, Section I, of 24 December 1979. These regulations set the procedure to be followed for organizing, conducting the meetings of the Authority and other related aspects. The rulings given by the chairman or the members presiding over the meeting on any point of the procedure shall be final and binding (Regulation 12). The decisions of the Authority are to be taken by the majority of the members including the chairman. In case of a tie, the chairman or the member presiding over the meeting shall have the casting vote (Regulation 14). Under Electricity Act of 2003 (Act of 2003), Section 177 contain the powers of the Authority to make regulations.

F. The Central Electricity Authority Rules of 1977

63. These Rules have been framed by the Central Government under Section 14 of the Electricity (Supply) Act of 1948. They contain the functions and duties of the Central Electricity Authority in addition to functions and duties prescribed under the Electricity (Supply) Act of 1948, e.g. the co-ordination of research and development in the power engineering field; the evaluation of the financial performance of the State Electricity Boards and conducting studies relating to economic and commercial aspects of the power industry as well as analyses of the tariff structure; the techno-economic appraisal of power projects; and the promotion of inter-state and joint sector power projects. Section 185(1)(b) of the Act of 2003 save these Rules until rules under Sections 67–69 of the said Act are made and notified.

G. The Electricity (Supply) Annual Accounts Rules of 1985

64. The Central Government has framed these Rules in consultation with the comptroller and Auditor General of India and the State Government under Section

69 of the Electricity (Supply) Act of 1948. The Rules provide for accounting the procedure to be followed by the Board. Every Board is required to compile annual accounts at the end of a financial year and submit it along with an auditors report to the Central Electricity Authority and to the concerned State Government (Rule 4). The form and content of the annual statement of accounts has also been prescribed (Rule 5). The basic accounting principles and policies have been laid down and provided for in Annexure III (Rule 7). The accounts submitted upon completion of the audit by the Comptroller and Auditor General of India or by any other person authorized by him and after incorporating any change, require to be finally adopted by the Board (Rule 40). These Rules shall continue to apply unless rescinded or modified (Section 185(1)(d) of the Act of 2003).

H. The Electrical Wires, Cables, Appliances and Accessories (Quality Control) Order of 1993

65. The Central Government acting under Section 3 of the Essential Commodities Act of 1955 (10 of 1955) has issued this order in the public interest so as to ensure quality control of electrical wire, appliances, accessories and other electrical goods.

§4. REFORMS IN ELECTRICITY SECTOR

I. Committee Constituted by the National Development Council

66. The reform and restructuring of the electricity industry is a world wide phenomenon and there has been a global movement to privatize, deregulate and re-regulate this industry. In India the reform process was initiated in 1991, through amendments in existing legislation. Subsequently, a committee was constituted by the National Development Council on Power to evaluate the working of the power sector. The Committee submitted its report to the then Prime Minister on 10 March 1995 recommending, *inter alia*, the restoration of autonomy and infusing professionalism in the State Power Utilities, the setting up of Tariff Boards at the national and regional level, the conversion of loans of the State Electricity Boards (SEBs) into equity with a debt equity ratio of 1:1.

II. Common Minimum Action Plan for Power (Minimum Action Plan)

67. Against this background, the Chief Ministers of States of India met on 16 October and 3 December 1996 to deliberate upon the issues pertaining to the power sector and made certain recommendations. To understand the present power scenario, it is important to look into some of the recommendations of the Minimum Action Plan. The creation of Regulatory Commissions was identified as a step in the direction of restructuring. There was consensus that the future expansion and improvement of the power sector cannot be fully achieved through public resources

alone and it is essential to encourage private sector participation through funding in generation, transmission and distribution. A consensus was also evolved for improving the performance of the power sector in a time bound manner. It was decided that the Government will finalize a National Energy Policy. Each State/ Union Territory shall set up an independent State Electricity Regulatory Commission (SERC). To start with, such SERCs will only undertake a tariff fixation. Licensing, planning and other related functions could also be delegated to SERCs as and when each State Government notifies it.

68. The Central Government was requested to make a comprehensive review of the role of the Central Electricity Authority (CEA). The role of the Foreign Investment Promotion Board (FIPB) should be minimized by putting as many projects on the automatic clearance route as feasible. The Government of India should issue transparent guidelines and delegate more powers to the States for the issue of forest clearances. The States will allow the State Electricity Boards the maximum autonomy. The State Electricity Boards will be restructured and corporatized and run on a commercial basis. State Electricity Boards should develop professionalism in their technical manpower and project management practices. The Government of India will carry out necessary amendments in the relevant Acts/Rules to allow private participation in transmission. The Plant Load Factor (PLF) of those thermal power stations, having less than 40 per cent PLF at present, should be increased by 3 per cent annually, by 2 per cent in case of those plants with a PLF between 40 and 60 per cent and by 1 per cent for those plants with a PLF of over 60 per cent. The overall PLF in the State sector in the country must come up to a minimum of 65 per cent and the national average to 70 per cent by the year 2002.

69. The recommendations also contained that the compulsory metering at substations and on all major feeders should be introduced and metering of all new electricity connections and connections to the agriculture sector exceeding 10 HP must be undertaken and completed in two years. All electric supplies should be metered by the year 2002. A compulsory annual energy audit of large consumers, i.e. 100 KVA and above, has to be undertaken and 'time of the day metering' is introduced for big power consumers for better load management. The Government should finalize the linkages of the allocation of liquid fuels for power plants in consultation with State Governments. The Development of mega power projects at mine pitheads, will be encouraged both in the public sector and the private sector, with transmission facilities for the evacuation of power to other areas. Coal India Limited and its subsidiaries should put up washeries at pitheads, wherever necessary so that coal is made available to power stations. In case CIL cannot set up the washeries, the private sector should be permitted to set up such washeries at pitheads.

III. Restructuring and Privatization

70. The restructuring and privatization process is in progress on the lines set by the Chief Ministers and it was also reflected in the Ninth Plan Document, according

to which the objective of the power sector reforms is to generate electricity at an economic cost, provide a reliable and high quality service to the consumers, and ensure that the sector is financially viable and also provide an attractive and conducive environment to bring in private investment. There was another conference of Chief Ministers and Power Minister on 3 March 2001 and these developments culminated in the form of the Electricity Act of 2003. Under the Act, trading of electricity has been recognized as independent and licensed activity. Unbundling the SEBs and separating generation, transmission and distribution into separate corporations makes it possible to judge efficiency levels in each activity.

71. The Ninth Plan Document envisaged that State Governments should undertake capital restructuring of the Electricity Boards converting loan into equity and subsequently moving towards a 1:1 debt equity ratio. After this restructuring, State Government equity in the Board should come down gradually from 51 per cent to 21 per cent. It had also recommended that boards should set up tariff commissions (or regulatory commissions) which may enable the State Governments to pursue a rational tariff structure. The Plan has also laid emphasis on tariff rationalization as the financial condition of the SEBs continues to deteriorate with reported losses touching Rs. 35,000 crore. The Separation of activities makes it easier to allow entry of private sector operators. Several states have initiated power sector reforms along these lines and regulatory commissions have been established by twenty four (24) states.

IV. Reform Process Initiated by States

A. *The State of Orissa*

72. Orissa was the first State to initiate a reform of the Power Sector wef 1 April 1996, through enforcing the Orissa State Electricity Reforms Act of 1995. The reform envisaged the setting up of separate generating as well as Transmission and Distribution (T&D) agencies. Accordingly, the monopoly of the State Board was broken by splitting it into three entities viz.: the Orissa Power Generation Corporation (OPGC – for thermal power), the Orissa Hydro Power Corporation (OHPC – for hydel power) and the Grid Corporation of Orissa (GRIDCO – for transmission and distribution network). A Regulatory Commission has been constituted as a statutory and autonomous institution to regulate and co-ordinate the activities of all these corporations, the tariff fixation and licensing. The World Bank has extended a loan of USD 350 million to assist the reform program.

B. *The State of Haryana*

73. In Haryana, the State Electricity Board was converted into two separate entities on 14 August 1998 by setting up corporations, namely, the Haryana Power Generation Corporation (HPGC) for generation and the Haryana Vidyut Prasaran Nigam (HVPNL) for the transmission of electricity. On the lines of the Orissa

model, the State has recently constituted a Regulatory Commission. There are plans to limit the distribution zones to two due to the wide variations in load across the state. A Consultant has also been appointed to advise the State Government on the privatization of the distribution of electricity.

C. The State of Andhra Pradesh

74. The distribution of electricity in Andhra Pradesh is proposed to be divided into 8 zones in which 51 per cent will be offered to the private sector. The State has enacted the Electricity Reform Act of 1998, constituted regulatory commission and the SEB has been unbundled.

D. The State of Rajasthan

75. Rajasthan was one of the first states, which proposed the privatization of power distribution by hiving off a majority stake to the private sector. Despite this, the actual process of privatization has been stalled due to various reasons. The plan is to hive off seven zones through the licensing route, whereby private operators and financial operations are governed by law and do not have to rely on a regulator for direction. The State Electricity Regulatory Commission has been constituted and it has issued tariff orders.

In fact a stage has come in the power sector of India when reforms and restructuring are no longer a matter of choice but a necessity and pre-condition for the health of the power sector. It remains to be seen that the process of restructuring and privatization will solve the problems faced by this sector or will create new problems.

Chapter 2. Production

§1. GAS PRODUCTION SCENARIO

151. During 2003–2004 the production of natural gas in India was in the order of 87.54 Million Standard Cubic Meters Per Day (MMSCMD). Out of this 17.79 MMSCMD was contributed by the joint venture and private sector. The total availability of gas after taking into account the internal consumption is 61 MMSCMD. Most of the production of gas comes from the western offshore area. Assam, Andhra Pradesh and Gujarat are other major producers of gas. Bombay High has contributed 55.72 per cent of the total gas during 2003–2004. Smaller quantities of gas are produced in Tripura, Tamil Nadu and Rajasthan. Sixty per cent of the natural gas is produced along with crude oil as associated gas; the rest is produced as free gas. The south bassein and the Tapti fields in the western offshore and the gas fields in Tripura and Andhra Pradesh (Krishna-Godavari Basin) are the main producers of free gas. GAIL has the maximum capacity for LPG recovery. LPG production during 2003–2004 was 7,223,000 tonnes. GAIL has seven LPG Plants, out of which two plants are at Bijapur in the State of Madhya Pradesh (MP) and another plant at Vaghodia in Gujrat State. The combined capacity of these plants is 500,000 TPA. GAIL is also has the following plants:

| <i>Plant Capacity in TPA</i> | |
|------------------------------|---------|
| Lakwa (Assam) | 85,000 |
| Usar (Maharashtra) | 139,500 |
| Auraiya (UP) | 258,000 |
| Gandhar (Gujrat) proposed | 270,000 |

Natural gas is currently the source of half of the LPG produced in the country. LPG is now being extracted from gas at Duliajan in Assam, Bijaipur in MP, Hazira and Vaghodia in Gujarat, Uran in Maharashtra and Nagapattanam in Tamil Nadu. The Government has also approved an LNG extraction plant at Auraiya in UP, which has been commissioned. One more plant has been set up at Gandhar. Natural gas containing C₂/C₃, which is feedstock for the Petrochemical industry, is currently being produced at Uran for the Maharashtra Gas Cracker Complex at Nagothane. GAIL has set up a 3 Lakh TPA of Ethylene gas based petrochemical complex at Auraiya.

§2. LEGAL REGIME FOR PRODUCTION

I. Mining Lease

152. A mining lease is required, before starting commercial production from a field, under the Oilfields (Regulation and Development) Act of 1948 (Act No. L.III of 1948) as amended by the Amendment Act of 1993 and 1998. This Act also provides for the regulation of oilfields and development of mineral oil resources. ‘Mineral Oil’ as defined includes both natural gas and petroleum. Therefore, this

Act is applicable to natural gas besides petroleum (Section 2C). A mining lease for production of gas is granted in accordance with the rules framed under Section 4 of the Act. The Central Government is authorized to make rules for the regulation of the grant of a mining lease (Section 5). Further, the rules with respect to technical aspects of the conservation and development of mineral oils can also be framed (Section 6).

II. Royalty

153. A lease holder is to pay royalty in respect of gas mined or collected. The rates of the royalty may be changed from time to time but such rate should not exceed 20 per cent of the sale price of the gas at the well head and enhancement in the rate shall be done only once in four years. The royalty is not payable in respect of natural gas which is unavoidably lost or is returned to the reservoir or is used for drilling or other operations relating to the production of petroleum or natural gas or both (Section 6A). The schedule appended to the Act contains the rate of royalties to be paid on natural gas produced from a well in terms of Section 6A of the Act.

III. Inspection

154. The authorized officer of the Central Government may enter and inspect any mine, order the production of documents/records and may examine any person having the control of, or is connected with any mine. Such an officer shall be deemed to be a public servant (Section 11). The Rules may also provide for the imposition of penalties (Section 9). The Central Government, in the public interest, may relax Rules framed under Sections 5 and 6 while authorising the grant of any mining lease or the working of a mine (Section 12).

IV. Application for a Lease

155. The Petroleum and Natural Gas Rules of 1959 (Rules) have been framed under Sections 5 and 6 of the Oilfields (Regulation and Development) Act of 1948 and in suppression of the Petroleum Concession Rules of 1949, for regulating the grant of exploration licenses and mining leases in respect of natural gas which belongs to the Government. 'Natural gas' has been defined in the Rules as gas obtained from boreholes and consisting primarily of hydrocarbons (Rule 3I). The definition of 'petroleum' contains natural gas as part of petroleum (Rule 3K). A gas well is a well from which the production is pre-dominantly natural gas or condensate, or both in quantity. The mining of natural gas is carried out under a lease granted by the Central Government for the production of minerals underlying the ocean within the territorial waters or continental shelf of India and vested in the Union and for onland by the State Government for land vested in a State Government. The lease documents contain terms and conditions prescribed under the rules or such additional terms as may be prescribed by the Government (Rules 4 and 5).

V. Rights and Duties of a Lessee

156. A lessee has the exclusive right to conduct mining operations for natural gas on the land demised by the lease and to carry out activities necessary for full enjoyment of the lease or for fulfilling obligations under the lease (Rule 7). The lessee is required to:

- (a) keep all apparatus, appliances and wells in good repair and condition;
- (b) execute operations in accordance with modern oil field practices and abide by directions of the Government relating to conservation and development; and
- (c) furnish a complete record of all data collected on expiry or early termination or relinquishment of the area under lease (Rule 19).

The area covered by lease is ordinarily 250 sqkm and the period of lease is 20 years (Rule 12). Before the grant of lease, the lessee is to deposit a security and a sum for meeting preliminary expenses. After the lease is granted, the lessee is to pay a dead rent or royalty which ever is higher and a surface rent for the area of land actually used. Such surface rent should not exceed the land revenue as specified by the State Government with the approval of the Central Government (Rules 12, 13 and 14). The lessee is to file monthly returns with respect to the quality and quantity of the natural gas extracted during the previous month. To ascertain the quantity the Government may conduct an inspection and make enquiries and take such remedial actions as deemed fit. The contents of any such enquiry is to be kept confidential (Rule 14).

157. The conditions of a lease may be suspended by the Government on the furnishing of sufficient reasons, for a period not on any occasion exceeding six months and on such conditions as it deems fit for the protection of petroleum deposits (Rule 20). A lease may be cancelled on contravention of the terms of that lease or if land under lease has not been used for mining or used for any other purpose. An opportunity to be heard is to be given to the lessee and if the cause is remediable, it is to be remedied within 60 days of notice from the Government otherwise the security deposit shall be forfeited and the lease shall stand cancelled. The above provision will not be applicable if failure arises from *force majeure* situations. The lease may also be cancelled on request of the lessee or if land under lease is required for some public purpose (Rule 21). Upon determination of the lease, the lessee is to deliver the land and wells if any to the Government and remove all equipment stores etc. within 6 months of such determination. In case of failure, these can be auctioned by the Government (Rule 25). In case of failure to pay a lease fee, royalty or dead rent by due dates, it will be increased by 10 per cent for each month or portion of a month during which it remains unpaid. If default continues and arrears are due for more than 3 months the lease may be cancelled (Rule 23).

158. The lessee is required to preserve all cores samples, water or petroleum discovered in any borehole for a period of 12 months and to furnish a report of all examinations made of such cores and samples. The lessee is to comply with the

directions of the Government so as to prevent waste (Rules 24 and 25). The Central Government may issue instructions for the spacing of gas wells, the quantity of gas to be produced, the regulation of operations when a petroleum deposit extends beyond the leased area and the control of the operations to prevent the escape of petroleum or access of water (Rules 25, 26, and 27). A lessee shall not suspend the operations or resume the suspended operations without serving a fortnight notice to the Government. The Central Government may order the shut down of a gas well, if it is being operated in contravention to the rules or to prevent waste, damage to property or to prevent pollution (Rules 30 and 31).

VI. Transfer and Assignment

159. A lease can be transferred or assigned with the written consent of the concerned Government (Rule 17). The Central Government has the right of pre-emption with respect to natural gas or products extracted from natural gas. The Government is required to pay the fair market price of gas or gas products against which the right of pre-emption has been exercised.

VII. Constitution of an Agency

160. Acting under Rule 30, the Central Government may constitute a suitable agency by Gazette notification for compliance of Rules 24 to 28 and 30 and to ensure whether the operations are being carried on in accordance with the rules or not. Such agency may also inspect and supervise gas wells and submit reports to the Central Government. Penalties in the form of imprisonment can be imposed for failure to furnish information or returns or in the event of contravention of sub-rule (2) of Rule 14, Rule 19 and Rule 24 (Rule 32A). The disputes between leaseholders and the Government is to be settled through arbitration (Rule 33). Schedule 1 of the Rules contains Performa for filing Monthly Return of the natural gas produced from a field.

§3. PRESENT LEASE HOLDERS

161. Barring some areas of Assam and Rajasthan where OIL is operating, ONGC is holding lease and operating in all other areas. Some contracts in respect of medium size fields have been signed for the development through joint ventures of ONGC/OIL with private parties. The private companies have also entered into contracts with the Government in respect of small and marginal discovered fields for development. National Oil Companies (NOC) are not party to the contract for small and marginal fields. The production of gas from some of these fields has started. Around 5.4 MMSCMD from Tapti and 1.2 MMSCMD from Panna-Mukta fields of the Western offshore are being supplied at Hazira. A consortium of ONGC, Reliance Industries Ltd., and British Gas (taken over from Enron) is operating these fields. Besides, around 0.7 MMSCMD of gas is being supplied from the Ravva

field of the Krishna-Godavari basin operated by a consortium of Oil and Natural Gas Corporation Limited, Videocon and Cairn Energy of UK.

§4. IMPORT OF GAS

I. Demand Supply Gap and Import

162. The production of natural gas in the country is growing with normal rate of 4.4 per cent per annum. The demand for gas in the year 2011–2012 will be 313 MMSCMD (Report on India Hydrocarbon Vision 2025). Projections of gas demand show a wide and growing gap between demand and supply. To meet this gap, steps have been taken for the import of natural gas from the Middle East. The Prospects of importing gas from Bangladesh and Myanmar to the eastern/southern parts of the country are also being explored. The feasibility of importing LNG from sources such as the Middle East, South East Asia, Australia etc. is being explored to meet the additional demand for gas. Since bringing gas through pipelines requires help and support from neighbouring countries which is always subject to uncertainties, the Government appears to have accorded priority to the import of LNG through tankers.

II. LNG Terminals

163. For developing import handling facilities like LNG terminals and storage tanks, Dahej in Gujrat, Cochin in Kerala, Ennore in Tamilnadu, Manglore in Karnatka and Hazira in Gujrat, have been identified.

A. Dahej and Cochi Terminals

164. Petronet LNG Limited has developed its first terminal at Dahej in Gujrat, with a capacity of 5 MMTPA and it has become operational and dedicated to the nation in February 2004. Besides, a terminal with a capacity of 2.5 MMTPA is being set up at Cochi in Kerala. Shell has also completed its LNG terminal at Hazira. The equity participation of the supplier of gas may be allowed up to a maximum of 26 per cent in the Dahej and Cochi Projects. The Erection Procurement and Construction Contract (EPC) for Regasification Terminals with associated marine facilities such as breakwater, Dredging, LNG unloading berth, Jetty etc. was outsourced. The scope of the contract included land survey, soil investigations, Marine and geotechnical investigations, sea bed engineering, and oceanographic investigations, enabling works, detailed engineering, supply, inspection, construction warehousing, fabrication and erection, quality-assurance, testing and commissioning, guarantee test runs including overall project management of terminals for receipt of imported LNG, cryogenic storage and regasification facilities including associated utilities/offsite facilities at terminal sites.

B. Ennore and Mangalore

165. In order to handle the import of LNG at Ennore on the eastern coast and Mangalore on the western coast of India with an initial capacity of 2.5 MMTPA each to be expanded to 5 MMTPA each with dedicated power plants of 2,000–2,500 MW at each location as well as at other suitable locations, a joint venture of petroleum companies has been formed. The Siemens Limited consortium which include CMS Energy, Woolside, Grasim and Unocal begged the contract for a two million tonnes LNG import terminal and a regasified LNG based 1,800 MW power plant at Ennore from promoters of the project, i.e. the Tamil Nadu Industrial Development Corporation (TIDCO). The consortium has tied with Rasgas for LNG supply. The cost of the power plant works to Rs. 2.3 crore per MW. This project still to take off.

C. Kakinada Terminal – Hardy and Nagarjuna

166. Nagarjuna Chemicals and Fertilizers Ltd. in collaboration with British energy company Hardy Oil Ltd. is reported to form a joint venture for setting up a one million metric tonne liquefied natural gas (LNG) terminal and regasification facility at Kakinada in the State of Andhra Pradesh. The project will have a total equity of Rs. 554 crore. The Nagarjuna group will have a 30 per cent stake. The total cost of the venture is estimated at Rs. 1,660 crore. The joint venture will import and regassify LNG at its proposed terminal and the output will be partly for captive use for feeding the fertilizer plants of the Nagarjuna group and the rest will be sold to potential users in the power and fertilizer sectors (Business Standard, 25 September 1998). The location of the proposed LNG terminal at Kakinada is such that, besides Nagarjuna's own units, LNG based power plants coming up in the area can be developed as potential buyers of the spare gas. The project is yet to take off.

D. Pipavav Terminal – British Gas

167. A joint venture led by British Gas (BG) is developing a terminal at Pipavav, which is barely 35 km away from Petronet's Dahej facility. This joint venture is the main challenger of Petronet LNG. A foundation stone was laid on 4 July 1998 at the targeted initial 2.5 MMT/Y LNG terminals to be operated by joint venture called Gujrat Pipavav LNG in which British Gas, NTPC and Sea King Engineers Ltd. have interest. M/s BG has signed an LOI with Yaman LNG for the supply of gas. The gas is to be supplied to Bombay for which M/s GAIL and the Government of Maharashtra are the joint venture partners.

E. Total-Tata Terminal – Trombay Project

168. The m/s Total and Tata joint venture is expected to supply three million tonnes of liquefied natural gas to customers in and around Trombay in Mumbai,

Maharashtra. It will supply LNG to corporate buyers who have chalked out a major expansion of their units around Trombay.

F. Terminal for Dhabol Part II

169. M/s Enron signed a sale and purchase agreement (SPA) to lift 1.7 million tonnes of LNG from Oman Energy. This was the first SPA so far as India is concerned. The 20 year contract, *inter alia*, includes a take or pay (TOP) clause as well. M/s Enron will sign an agreement with the supplier to invest in the LNG carrier. The LNG terminal was to be established at a total cost of USD 1.8 billion. This will include the power plant and re-gasification terminal as also the construction of a harbour and a 2.3 km long break water. This group and project is entangled in legal dispute.

§5. THE TENTH FIVE YEAR PLAN SCENARIO

170. Owing to the lower domestic production of crude oil, the gas production was also lower than the Ninth Plan targets. Moreover, there was a shortfall in the production of free gas on account of delays in the development of gas fields. Against the Ninth Plan target of 144.53 billion cubic metres (BCM), the actual gas production was 140.92 billion cubic metres and short of target by two (2) per cent. However, the overall management of the domestic gas sector has improved during the Ninth Plan period with better utilization of the produced gas and minimization of flaring by reinjection of gas to underground reservoir. The estimated production during the Tenth Plan period would be 177.48 billion cubic metres of gas. The projection for gas production during the remaining period of the Tenth Plan is as given in Table 9.

Table 9
The Projection for Gas Production during the Remaining Period
of the Tenth Plan

| Organization | 2003–2004 (MMSCMD) | 2004–2005 (MMSCMD) | 2005–2006 (MMSCMD) | 2006–2007 (MMSCMD) | Total Gas Production During the Ninth Plan (BCM) |
|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|--|
| (i) ONGC | 63.37 | 62.22 | 58.83 | 57.03 | 112.1 |
| (ii) OIL | 4.1 | 6.61 | 7.69 | 7.8 | 12.61 |
| (iii) JVC PROD. | 20.76 | 35.01 | 35.47 | 38.25 | 52.77 |
| Total | 88.23 | 103.84 | 101.99 | 103.08 | 177.48 |

(Source: Tenth Plan Document)

It is evident that joint ventures (JV's) will outstrip Oil India Limited in oil production and will come close to its level of gas production in the Ninth Five Year Plan period. The gas production by JV's over the plan period would be 52.77 BCM against Oil India's 12.61 BCM. It shows that the private sector is gaining strength and will emerge as a big player in the gas business in due course of time.

Chapter 3. Exploitation

§1. HYDROCARBON RESERVES

256. India has known reserves of 732 million tonnes of crude oil and 927 billion cubic metres of natural gas. The estimate of total in place oil as on 1 April 2004 was 7.89 billion tonnes and recoverable reserves stood at 2.94 billion tonnes. Out of this in place oil, the ONG Corporation had 4,419.50 MMT, OIL had 639.95 MMT and the share of Private Parties/Joint Ventures stood at 507.88 MMT. With respect to recoverable reserves, the share of ONGC was 1,245.06 MMT, OIL had 195.61 MMT and Private Parties/Joint Ventures had a share of 126.50 MMT (India 2003–2004 The Directorate General of Hydrocarbon). The oil reserves are being depleted faster than being replenished. Against a total accretion target of about 865 MTOE of hydrocarbons during the Ninth Plan period, the accretion to recoverable reserves of oil and gas was 780 MTOE. Exploration results after the Bombay High find have been characterized by the discovery of predominantly smaller size fields. In order to intensify exploration, two major programmes were launched in addition to the exploration programmes being implemented by the NOCs. Starting from September 1991 blocks in on-land and offshore areas have been offered to private parties from time to time for exploration. Further, in view of the low reserve accretion an Accelerated Exploration Programme was also taken up in 1994.

257. ONGC and OIL have together added 123.32 million tonnes of oil equivalent in-place hydrocarbon reserves during the year 2003–2004. These efforts are supplemented by addition of 225 O+ OEG(MMT) in the exploration blocks awarded to the private parties. An accretion of up to 200 million tonnes of oil and oil equivalent of gas (O+OEG) is envisaged in deep-water areas where a breakthrough has recently been made by private players. The estimated recoverable reserves to be added from this count will be in the range of 245.84 to 342.72 million tonnes of oil equivalent. The average recovery factor in India is only about 28 per cent of the initial oil in-place reserve. This is low by international standards. Improvement in the recovery factor can yield additional oil and gas without any corresponding addition in the reserve accretion.

§2. LICENSING REGIME

I. Petroleum Exploration License (PEL)

258. For carrying on prospecting operations for oil in any area, a license is required under the Oilfields (Regulations and Development) Act of 1948 (the Act) and the Petroleum and Natural Gas Rules of 1956 (the Rules). The definition of ‘mining lease’ as given in the Act includes an exploration or prospecting licence (Section 2d). The mineral oils include both natural gas and petroleum (Section 2C). The Central Government has the authority to make rules with respect to the grant of a prospecting license (Section 5) and the technical aspects of the conservation and development of mineral oils (Section 6). The Petroleum and Natural Gas Rules of

1959 framed under Sections 5 and 6 of the Oilfields (Regulation and Development) Act of 1948 regulate the grant of exploration or prospecting licenses. The Central Government grants a prospecting license or a letter of authority for the exploitation of minerals vested in the Union and underlying the ocean within the territorial waters or continental shelf of India. The concerned State Government grants the license for the onshore area where land is vested in the State Government. The license contains terms and conditions prescribed under the Rules and such additional terms as prescribed by the Government (Rules 4 and 5). Before the formal grant of a license, the applicant is to deposit an amount as security, the quantum of which is determined on the basis of the area and subject to a minimum amount. In addition, the licensee is also required to pay a licence fee, which is calculated at a specified rate per sqkm for each year and paid in advance. The rate increases from the first year to the fourth year and is the highest for renewals after the fourth year.

II. Role of the Government

259. The Central Government may delegate its powers by notification in the official gazette to such officers or authority as may be specified. The rules made under any provision of the Act are to be laid before the House of the People (Sections 9 and 10). The Act is binding on the Government. An authorized officer of the Central Government may enter and inspect any mine, order the production of documents, and records and may examine any person in control of, or connected with any mine. Such an officer shall be deemed to be a public servant within the meaning of Section 21 of the Indian Penal Code (Section 11). The Rules may also provide for the imposition of penalties including imprisonment (Section 9). In the public interest, the Central Government may relax rules framed under Sections 5 and 6 while authorizing the grant of any prospecting license (Section 12).

III. Rights and Obligations of a Licensee

260. A licensee has the exclusive right to carry out, in addition to geological and geophysical surveys, information drilling and test drilling operations for petroleum in the area covered by the license and also the exclusive right to lease over such part of the area covered by the license as such licensee may desire (Rule 7). The area under license is specified in the license. A license is granted for a primary term of 4 years, which may be extended for two further periods of one-year each (Rule 10). A licensee is required to keep all apparatus, appliances and wells in good repair and condition. The operations are carried on in accordance with modern oil field practices in the light of directions of the Government pertaining to conservation and development of petroleum resources.

261. A complete record of all data collected by the licensee is to be furnished to the Government on expiry or early termination or relinquishment of the area under license (Rule 19). The licensee has to preserve all core samples; water or petroleum discovered in any borehole for a period of 12 months and furnish a

report of all examinations made of such cores and samples (Rule 24). The licensee shall not suspend operations or resume the suspended operations without serving a fortnight notice to the Government (Rule 30). Penalties can be imposed in the form of imprisonment for failure to furnish the information or returns or contravention of sub-rule (2) of Rules 14, 19 and Rule 24 (Rule 32A). The licensee is at liberty to determine the license or relinquish any part of the license area by serving a notice on the Government. Failure to pay a license fee or any other amount which has become due under the Rules by due date, will entail a penalty of 10 per cent for each month or portion of a month during which it remains unpaid. If arrears remain due for more than three (3) months the Government may cancel the license (Rule 23).

IV. Assignment, Pre-emption and Cancellation of a License

262. The licensee can transfer or assign a license with the written consent of the concerned Government (Rule 17). The conditions of a license may be suspended on written request of the licensee by the Government on the furnishing of sufficient reasons. The period of such suspension on any one occasion shall not exceed six months. The suspension shall be on such conditions as deemed fit by the Government for the protection of petroleum deposits (Rule 20). A license may be cancelled on contravention of its terms or if land under lease has not been used for mining or used for any purpose other than mining. An opportunity to be heard is given and if cause is remediable, it is to be remedied within 60 days of a notice from the Government otherwise the security deposit is liable to be forfeited and the license shall stand cancelled. This provision will not be applicable if failure is caused and arise directly out of *force majeure* situations. A license may also be cancelled on the request of the licensee or by the Government on its own volition, if the land under license is required for some public purpose (Rule 21).

V. Relinquishment

263. Upon determination of the license, the lessee is to deliver the land and wells, if any, to the Government and is required to remove all equipment, stores etc., within 6 months of such determination. In case of failure, the material on the site and in the leased area can be auctioned by the Government (Rule 25). The Production Sharing Contract contains relinquishment provisions which require the contractor to relinquish a particular percentage of the block area after an exploration phase. After the last phase of the exploration, the contractor can retain only the discovery area and development area and has to relinquish all other areas.

§3. THRUST AREAS FOR EXPLORATION AND DEVELOPMENT

264. For the development of the fields, as well as for monitoring enhanced oil recovery (EOR) processes, 3D technology has been identified as a major seismic input. A new thrust is being given to deep-water exploration and other frontier

areas. Even after introduction of the NELP, a certain minimum level of exploration by the National Oil Companies may still be necessary in areas not attractive to private players so that hydrocarbon resources may be upgraded and private investments are attracted in this area. Against the revised 2D departmental survey target of 130,370 Seismic Line Kilometre (SLK), the actual achievements were 145,604 SLK during the Eighth Plan, i.e. an achievement of 127.9 per cent. For the geological survey, the target was 22,973 Ground Line Kilometre (GLK) and the achievement was 21,286 GLK, i.e. about 98 per cent of the target. For 3D seismic surveys against the survey target of 4,281 Seismic Square Kilometre (SSK), the achievement was 4,788 SSK, i.e. an achievement of 124.6 per cent for onshore areas. For offshore areas against the 2D survey target of 126,023 SLK, the actual achievement was 109,682 SLK, i.e. an achievement of 93 per cent and for 3D surveys against the target of 77,093 LK, the achievement was 79,846 SSK, giving an achievement of 104 per cent (Ninth Plan Document).

265. As against the target of 3,042 thousand metres of exploratory drilling for both the onshore and offshore areas during the Eighth Plan period, the achievement was 2,883 thousand metres, i.e. an achievement of 95 per cent. This was mainly due to the lower drilling achievements in the Upper Assam Basin, because of a delay in land acquisition and other environmental problems. The achievement of development drilling during the Eighth Plan was 2,718 thousand metres against a target of 3,809 thousand metres, i.e. an achievement of 71 per cent. The lower achievement in the development drilling target was due to the fact that some of the fields which were proposed to be developed by ONGC at the time of the formulation of the Eighth Plan were offered for development to joint venture companies (JVCs) and contract finalization took some time (Ninth Plan Document).

§4. CONTRACTUAL ASPECTS OF EXPLORATION

I. Bidding Rounds

266. The widening gap between demand and indigenous supply of petrol, the need for introduction of new technology and the adverse foreign exchange balance position forced the Government to open up the upstream petroleum sector for private participation. Starting from 1985 till the present NELP round, there has been various rounds of bidding for small and medium size fields and exploration blocks. For exploration blocks, eight rounds of bidding have taken place and one round of bidding known as the Joint Venture Round took place on the basis of committed participation by National Oil Companies (NOCs). In the Joint Venture Round NOCs have been assigned a participating interest within a range of 25 to 49 per cent.

II. Award of Blocks

267. After invitation of bid, an award of the block is made and parties are asked to negotiate a Production Sharing Contract (PSC). The Government has prepared a Model Production Sharing Contract, which is used as the base document for negotia-

tion. After negotiation, the Government executes a PSC with the party(ies) to whom the award has been made. In case the award has been made in favour of more than one party, such parties, excluding the Government, enter in to a Joint Operating Agreement, which must not be inconsistent with the provisions of the PSC. In the contracts for medium size fields and exploration round blocks, NOCs are party to a PSC. But in small fields, the PSC is between the Government and private parties and NOCs are not party to a it. In medium size fields, NOCs have a forty (40) per cent participating interest from the beginning and the rest is distributed amongst private parties. In exploration round contracts, NOCs have the option to take up a 10 per cent participating interest at the beginning and a further option to take up a 30 per cent interest after declaration of a commercial discovery which is known as a carried interest because no exploration cost is borne by the NOCs.

III. Production Sharing Contract Regime

268. The regime followed in India is a mixture of a licensing regime and sharing in profits after cost recovery. The government take consists of a license fee, royalty/dead rent and other taxes like the corporate tax. In addition to this, the Government also shares in profits on the basis of the investment multiples achieved. The contractor is responsible at its cost to carry out all petroleum operations. The costs are recovered from the gross revenue of sale proceeds of petroleum produced. A number of Production Sharing Contracts entered into with Indian and foreign parties are in operation.

IV. New Exploration Licensing Policy (NELP)

269. The Government offered 48 blocks in 1999 under the NELP for bidding by the domestic and foreign companies. Thereafter a large number of blocks have been offered under various rounds of bidding. The Production Sharing Contracts have been signed for 90 blocks and 19 discoveries have been made. The NELP round of bidding has the following salient features:

- (i) There is no mandatory state participation in blocks offered under the NELP through ONGC/OIL nor will there be any carried interest of the State. ONGC and OIL have to compete for obtaining the blocks on a competitive basis instead of the system of granting them PELs on nomination basis. At the same time, ONGC and OIL are entitled to the same fiscal and contract terms as available to private companies.
- (ii) Open availability of exploration acreage will be assured to provide a continuous window of opportunities to oil companies. The acreage will be demarcated on a grid system and pending the preparation of the grid, blocks have been offered for bidding. The Contractors will have the freedom of marketing crude oil and gas in the domestic market.
- (iii) Royalty payments have been fixed at a rate of 12.5 per cent for inland areas, 10 per cent for offshore areas and 5 per cent for deep water. Half of the royalty from the offshore areas will be credited to a hydrocarbon development

fund to promote and fund exploration related activities, such as the acquisition of geological data on poorly explored basins, promotion of investment opportunities in the upstream sector, institution-building etc. To encourage exploration in deep water and frontier areas royalty will be charged at half the prevailing rate for normal offshore areas with regard to deep water areas beyond 400 m bathymetry for the first 7 years after commencement of commercial production.

- (iv) Cess, which was earlier levied on crude oil production has been abolished for blocks offered under the NELP. Companies will be exempted from payments of import duty on the goods imported for petroleum operations. There is no up front payment like signature, discovery and production bonuses. A seven-year tax holiday from the date of commencement of commercial production has been made available for the north-east region.
- (v) There is a possibility of a seismic option in the first phase of the exploration period. There will be a work commitment in a phase but no expenditure commitment.
- (vi) There is the option to amortize the exploration and drilling expenditure over a period of ten years from the first commercial production. The cost recovery up to 100 per cent is a biddable item.
- (vii) The contractor will be provided fiscal stability during the entire period of contract. A provision to this effect exists in the Model Production Sharing Contract.
- (viii) The exploration and production sector has been given an infrastructure status under the Income Tax Act. This, *inter alia*, provides for a seven-year tax holiday from the commencement of the production. Further, the payment of dividend is tax-free.

270. The above regime will apply only against contracts signed under the NELP and not to the contracts signed earlier or to the acreage already under exploration with public sector oil companies given on nomination basis. In view of the New Exploration Licensing Policy and for restructuring of the oil sector, the Government has amended the Oilfields (Regulation and Development) Act of 1948, and a proposal for amending the Petroleum and Natural Gas Rules of 1959 is in the offing. The Government has also issued a Notification in November 1998, exempting discoveries made in Blocks awarded under the NELP from the application of cess (Gazette Notification, Extraordinary, Part II, Section 3, sub-section (ii) No. 726, dated 9 November 1998 SO 958(E)). To bring about a total de-regulation, the Government has proposed to set up two regulatory bodies through the enactment of the Petroleum Regulatory Board Bill 2002 which will deal with midstream and downstream sector and a similar law for upstream activities.

V. Differences Between the Model Production Sharing Contract (MPSC) for Exploration Rounds and the NELP Round of Bidding

271. The main differences between the the MPSC earlier used by the Government for exploration blocks, and the one circulated along with bid documents of the NELP offer, are as follows:

- (i) In the earlier MPSC, NOCs are licensee as well as lessee whereas in the PSC for the NELP, the contractor comprising of all the parties to the PSC, shall be the lessee as well as licensee. It implies that the parties will pay statutory levies with respect to license and lease, which were hitherto being paid by NOCs (*see* Article 16 of the earlier PSC). The representative of the NOC was the chairman of the Management Committee, now the Government has this position.
- (ii) The NOCs as nominee of the Government, were entitled to take up 10 per cent participating interest in the beginning and 30 per cent carried interest after a commercial discovery which was in the nature of carried interest and the NOCs were required to pay expenses incurred only after exercising the option for carried interest (Refer Article 13 of the earlier PSC). Under the NELP this has been dispensed with and the NOCs take participating interest as per their bid.
- (iii) the NOCs had the option to take up the operator ship after 10 years of commercial production or when the net cash income of the field for the first time equals twice the exploration cost plus development cost recoverable from the petroleum produced from that field, whichever is earlier (Article 6 of earlier PSC). This option is not available under the NELP.
- (iv) The ownership of the data vested in NOCs in the capacity of a lessee or licensee under the earlier PSC. Now it will vest in the Government. Further, a licensee had the right to require the vesting of the full title and ownership in the assets purchased by the contractor for use in the petroleum operations, free of charge and encumbrances. The licensee was entitled to exercise this option either on recovery of the cost of the assets or upon expiry or earlier termination of the PSC. This right has also been given to the Government under the NELP.
- (v) The Government take of profit oil was based on the investment multiples or Post Tax Rate of Return (PTRR) and these were biddable items. In the PSC for NELP, only one method has been kept, i.e. the investment multiple and it is a biddable item.

§5. THE SALIENT FEATURES OF MODEL PRODUCTION SHARING CONTRACT FOR NELP BLOCKS

272. The Model PSC for medium discovered fields is different from the pre-NELP MPSC document and the NELP, PSC model, as it contains provisions relating to an existing discovery, which are not found in the PSC for exploration blocks. So far as the PSCs of earlier rounds of exploration blocks bidding and the PSC 1999 for the NELP are concerned, except the differences as described above, all other provisions are generally the same. Some of the salient features of the PSC for the NELP are as follows:

I. License, Exploration Period and Relinquishment

273. The duration of the exploration period consisting of three phases is seven years. For deep water and frontier areas the exploration period may be for eight

years. The exploration phase should not exceed three contract years, however, in case of deep-water areas and frontier areas the exploration phase may be of eight years duration (Article 3). The 'frontier area' has been defined as 'any area identified, demarcated and so notified by the Government or its authorized agency(ies) for the purposes of exploration and exploitation of oil and gas, which is logistically and technically difficult and lacks infrastructure and/or marketing facilities, etc.' (Article 1.4(a)). The deep-water area has been defined as 'an offshore area beyond 400 Mts. isobar' (Article 1.29). The contractor has a walk out option after completion of an exploration phase. In case the exploration the period expires before completion of the appraisal programme, the exploration period may be extended by thirty months. If the contractor has not entered into the next exploration phase or no commercial discovery has been made in the contract area by the end of the exploration period, the PSC shall terminate (Article 3).

274. In the second exploration phase the contractor can retain 75 per cent of the original contract area including any discovery area and development area in not more than three areas of simple geometrical shapes and relinquish the balance of the contract area. In case the development area and discovery area exceed 75 per cent of the original contract area, the contractor can retain to the extent of the development area and discovery area. In the third exploration phase the contractor can retain 50 per cent of the original contract area in three simple geometrical shapes and has to relinquish the rest. Further, similar to the first exploration phase the contractor can retain to the extent of the development area and discovery area if these exceed 50 per cent of the original contract area. At the end of the third exploration phase the contractor can retain only development areas and discovery areas.

The liability of the contractor is limited to claims arising out of or in relation to acts of commission and omission while carrying out petroleum operation during the period between the effective date and the date of relinquishment or termination or expiry of the contract except for site restoration and abandonment obligations (Articles 4.6, 4.7 and 14.9).

II. Work Programme, Management Committee and Operating Agreement

275. The Work Programme is a biddable item and is based on the bid submitted by the company(ies) and accepted by the Government. The contractor is under obligation to complete the minimum work programme as given in the bid and incorporated in the PSC with an option to walk out after completion of the work programme of an exploration phase. In case the contractor fails to fulfil the committed work programme of a particular phase, each company constituting the contractor has to pay in proportion to its participating interest, to the Government an amount which is equal to the amount which will be required to complete the unfinished minimum work programme. (In pre-NELP, PSC this amount was payable to the Licensee which were NOCs.) The contractor is required to submit to the Management Committee (MC) the work programme and budgets within 90 days before

commencement of each following contract year. The contractor is required to drill a substitute well in case the depth/geological objective of the well is not achieved for any reasons.

276. The PSC provides for establishment of a Management Committee consisting of 2 members representing the Government and one member each representing the company(ies) constituting the contractor. The Government representative will be the chairman as well as deputy chairman of MC. The representative of the operator shall act as a Secretary. The operator on behalf of the contractor with the approval of the Operating Committee (to be constituted under the Joint Operating Agreement) shall submit matters for review and advise of the MC. With respect to development and production operations, the operator on behalf of the contractor with the approval of the Operating Committee, shall submit matters for the approval of the MC. It may be seen that any matter can not be submitted to the MC either for review or approval before first getting the approval of the Operating Committee. The matters requiring the approval of the MC shall be approved by a unanimous vote of the members in the MC present as well as votes received by some other mode of communications. In case unanimity is not achieved within a reasonable period, the decision may be taken by the majority participating interest of 70 per cent or more provided that the Government has voted in favour of the decision. The quorum of the MC shall consist of at least one of the members of each of the parties to the contract. A member can vote through proxy or by telex, cable, facsimile or any other mode of transmission by sending it to the chairman. There can also be a submission to the MC through telex or messages transmission *in lieu* of meetings.

277. The operator is to perform the functions of the contractor required under the PSC, however, subject to and in accordance with the terms and conditions of the PSC. In case more than one company constitutes the contractor, they are required to execute an operating agreement within 15 days of the effective date of the PSC. This agreement should be consistent with the provisions of the PSC and must provide for the appointment, resignation etc. of the operator; constitution and function of the operating committee; contribution to cost, sole risk, assignment etc. The Operator is to furnish to the Government an executed operating agreement within 30 days of the effective date of the PSC or such longer period as may be agreed by the Government. As per tender documents for the NELP 1999, in case of a joint bid, bidders are required to furnish a copy of the joint operating agreement, which the bidders intend to execute in case the award of block goes in their favour. Besides, they are also to submit the executed bid group agreement which they have entered into for making the joint bid.

III. General Rights and Obligations of the Parties

278. The contractor has the exclusive right to carry out the petroleum operations and to recover cost and expenses. The petroleum produced in the contract area

can be used for conducting petroleum operations free of charge. The contractor can lay pipelines, build roads, construct bridges and carry on all those activities as necessary for the conduct of petroleum operations. The contractor will have the right to use all available technical data of the contract area as available on the effective date and the same shall be made available within 120 days of the effective date in the office of the Directorate General of Hydrocarbons at New Delhi. The right to prospect has been limited to petroleum and the Government has reserved the right to grant to others, the right to prospect for minerals like coal bed methane and lignite in the contract area. The contractor is required to conduct all petroleum operations at its sole risk, costs and expenses and provide all funds necessary for the conduct of petroleum operations. The operations shall be carried out diligently, expeditiously, efficiently and in a safe and workmen like manner. While conducting the operations the contractor is to follow good international petroleum industry practices with such degree of diligence and prudence, reasonably and ordinarily exercised by experienced parties engaged in a similar activity under similar circumstances and conditions. For obtaining goods and services he has to follow procedure appended to the PSC (Appendix F). This procedure may be modified or changed with the approval of the Management Committee (Article 8).

IV. Discovery, Development and Production

279. In case of a discovery of oil, the contractor shall inform the Management Committee and Government of such discovery and if the discovery is of potential commercial interest, the contractor shall submit an appraisal programme.

After conducting an appraisal of the discovery, the contractor shall advise the MC whether such discovery should be declared a commercial discovery or not. It may be pointed out that the declaration of a commercial discovery is in the review functions of the MC under the PSC for NELP whereas in the earlier PSC it was in the approval functions of the MC. After declaration of commercial discovery the contractor is to submit to the MC a plan which shall:

- (a) relate to the discovery area and contain the reservoir or part thereof and boundaries of the proposed development area;
- (b) be designed to ensure the most efficient, beneficial and timely use of the petroleum resources discovered; and
- (c) be compiled in accordance with sound engineering, economic, safety and environmental principles recognized generally in the industry.

The development plan is required to be submitted to the MC for approval, if it is not approved within 120 days after submission or 120 days from the date of receipt of additional information asked by the MC, the contractor can submit the same to the Government for its approval. Once the development plan is approved, it commits the contractor to carry out such development plan in accordance with the provisions of the PSC (Article 10).

V. Mining Lease

280. For the offshore area, simultaneously with the submission of the development plan, the contractor may submit an application to the Government for the grant of a lease with respect to the proposed development area. The Government shall grant a lease provided that the Development Plan has been approved, there is compliance with the terms and conditions of the license and the PSC and contractor is not in breach of any of the terms of the PSC, or the provisions of any law. The lease is granted for an initial period of 20 years from the date of the grant and it may be extended by mutual agreement between the parties to the PSC for 5 years and in case of production of non associated natural gas (NANG) for a period of 10 years or for such other period as may be agreed taking into account the balance recoverable reserves and balance economic life of the field/development area.

281. In case of onshore areas the application for a lease is to be submitted to the relevant State Government. The Central Government will assist the contractor to obtain the mining lease from the State Government. In other respects the provisions are the same as in case of offshore areas (Article 11).

VI. Unit Development

282. If a reservoir is situated partly within the contract area and partly outside the contract area, then the Government may require a unit development of the whole area in which the reservoir is extending. For this purpose a joint development plan may be formulated with the consent of the parties (Article 12).

VII. Protection of Environment

283. The contractor is required to carry out two environmental impact studies in the contract area. The first study can be carried out in two parts namely, a preliminary part to be concluded before commencement of any field work, and a final part relating to drilling in the exploration area which shall be approved by the Government before the commencement of such drilling operations. The second study should be completed before the commencement of development operations and the execution of a development plan. The contractor is to ensure that petroleum operations are being conducted in an environmentally acceptable and safe manner. The environmental impact studies must be made available to the employees and subcontractors. On expiry or termination of the contract, the contractor is to remove all equipment and installations in a manner agreed with the Government pursuant to an abandonment plan and to perform all necessary site restoration activities. The Government has brought out a Site Restoration Fund Scheme 1999. The costs incurred by the contractor for protection of the environment are recoverable costs under the PSC. The liability of the contractor for the environment is limited to damage to the environment which occurs after the effective date of the PSC and results from the acts and omissions of the contractor (Article 14).

VIII. Fiscal Regime under the PSC

284. The contractor is entitled to recover contract costs out of the percentage of the total value of the petroleum produced and saved from the contract area. The percentage of cost recovery is a biddable item. The petroleum left after the cost recovery shall be shared with the Government on the basis of the investment multiple actually achieved by the contractor at the end of a receiving year. The investment multiple ratio earned by the contractor as at the end of any year is to be calculated by dividing the aggregate value of the addition of each of the annual net cash income (accumulated, without interest up to and including that year starting from the year in which production costs were first incurred or production first arose) by the aggregate value of the addition of each of the annual investments (accumulated without interest up to and including that year starting from the year in which exploration and development costs were first incurred). The profit petroleum from the contract area in any year shall be shared between the Government and contractor in accordance with the value of the investment multiple earned by the contractor as at the end of the previous year. The quantum of the investment multiple is related to the percentage take of the Government and the contractor. The percentage off take on achieving a particular investment multiple is also a biddable item.

285. With respect to taxes, royalty, rental, duties etc. the Government has come up with a Petroleum Tax Guide which is a compilation of taxes imposed under various laws on petroleum operations or production of petroleum. However, a provision is also contained in PSC dealing with taxes, royalties, etc. The fiscal stability has also been provided. The provision dealing with fiscal stability is to the effect that 'If any change in or to any Indian law, rule or regulation dealing with income tax or other corporate tax, export/import tax, excise, customs duty or any other levies, duties or taxes imposed on Petroleum or dependent upon the value of Petroleum results in a material change to the expected economic benefits accruing to any of the Parties after the date of execution of the Contract, the Parties shall consult promptly in good faith to make necessary revisions and adjustments to the Contract in order to maintain such expected economic benefits to each of the parties, provided, however, that the expected economic benefits to the Parties shall not be reduced as a result of the operation of this Article' (Article 17).

286. The aspects of sale, disposal and valuation have been taken care of and provided for in the PSC. Until such time, the total availability to the Government of crude oil and condensate from all petroleum operation activities does not meet the total national demand, the contractor shall sell all the production in the domestic market. The selling price of the crude is determined on the basis of prices prevailing in the international market (Article 19).

287. With respect to currency and exchange control provisions it has been laid down that a foreign company has the right to:

- (a) repatriate abroad, in United States Dollars or in any other freely convertible currency acceptable to the Government and the foreign company, the net proceeds of sale of petroleum in India;

- (b) receive, retain and use abroad the proceeds of any export sales of Petroleum under the PSC;
- (c) open, maintain and operate bank accounts with reputable banks both inside and outside India, for the purpose of PSC;
- (d) freely import, through normal banking channels, funds necessary for carrying out the petroleum operations;
- (e) convert into foreign exchange and repatriate sums imported pursuant to d) above in excess (if any) of its requirements; and
- (f) make payments outside of India for purchases, services and loans obtained abroad without the requirement that funds used in making such payments must come from or originate in India.

Provided, however, that repatriation pursuant to subparagraphs a) and e) and payments pursuant to subparagraph f) shall be subject to the provisions of any treaties and bilateral arrangements between the Government and any country with respect to payments to or from that country (Article 20).

IX. Employment and Procurement Policy

288. The contractor shall employ to the extent possible Indian nationals and also give them the opportunity for on-the-job training and technical experience. At the request of the Government, foreign companies shall separately endeavour to negotiate, technical assistance agreements setting the terms by which each foreign company may render technical assistance and make available commercially proven technical information of a propriety nature for use in India by the Government or a company nominated by the Government for this purpose (Article 22).

289. The contractor is required to give preference to local Indian goods provided that such goods are available on terms equal to or better than the imported goods and also to employ Indian sub-contractors subject to competitive quality and prices. The contractor shall see that the provisions to implement the above, are contained in contracts between operator and subcontractor (Article 23).

X. Insurance and Indemnities

290. The contractor is required to maintain and obtain insurance *inter alia* towards environmental pollution, injuries and damages to a third party person or property. The policies shall include the Government as additional insured and shall waive subrogation against the Government. The contractor is required to indemnify, defend and hold the Government and the State Government harmless against all claims, losses, and damages of any nature whatsoever (Article 24).

XI. Assignment of Interest

291. Subject to approval of the Government, a party may assign or transfer part or all of its participating interest subject to the fulfilment of certain basic requirements.

In case of change in the status of the company or its shareholding or the relationship with any guarantor, the company shall seek the consent of the Government. Through assignment or transfer, the participating interest should not be reduced below 10 per cent. For the performance of obligation under the contract a party may mortgage, pledge, charge or otherwise encumber at its own risk and cost, all or part of its participating interest.

A charge created on petroleum assets for financing requires registration under the Registration Act. If a foreign company creates a security interest on assets situated in India, approval of RBI is required under Section 31 of the Foreign Exchange Regulation Act of 1973. Further, a company registered under the Indian Companies Act of 1956 is required to register a charge, it wants to create for raising the finance as per Section 125 of the Companies Act of 1956 (Article 28).

XII. Guarantees

292. A company constituting the contractor is required to furnish to the Government, an irrevocable and unconditional bank guarantee for an amount equal to 35 per cent of its share of the total estimated expenditure during a contract year. In case the contract is being executed by a subsidiary then such subsidiary is required to provide a performance guarantee from a parent company of good financial standing. Public Sector Enterprises and companies having a net worth of USD 1 billion or more as per the latest audited accounts have been exempted to furnish a bank guarantee. The companies are also required to furnish a legal opinion from their legal advisors to the effect that the guarantees have been duly signed and delivered (Article 29).

XIII. Term and Termination of the Contract, *Force Majeure*

293. The term of the contract is the period of the license and lease if any granted, unless terminated earlier. The contractor as well as the Government have the right to terminate the contract in certain specified circumstances (Article 30).

294. The *force majeure* situation absolves the parties from taking action and mutual obligations are suspended during the continuance of *force majeure*. The scope of the clause is very wide as it includes all situations beyond the control of the parties. The affected party is to give notice of the start and end of *force majeure*. The burden of proof is on the party asserting and claiming *force majeure*.

XIV. Applicable Law and Dispute Resolution

295. The contract is governed and interpreted in accordance with the laws of India. A dispute may be referred to a sole expert or to a conciliator or to arbitrators for settlement. The decision of the sole expert on matters referred to him shall be final and binding on the parties and can not be subjected to arbitration. A disputed

matter may be submitted for conciliation by mutual agreement. No arbitration proceedings shall be instituted while conciliation proceedings are pending. If the dispute is not resolved by conciliation within 21 days of the date of agreement by the parties to submit such dispute to conciliation, the matter may be referred to arbitration. The arbitration clause provides for 3 arbitrators, the parties appointing one each and the arbitrators so appointed by the parties appointing the third arbitrator. The venue of arbitration is to be in India and the arbitration agreement is governed by the Arbitration and Conciliation Act of 1996 (Arbitration Act). The arbitration proceedings are to be conducted in accordance with the rules of arbitration provided in the Arbitration Act of 1996. The United Nations Commission on International Trade Law (UNCITRAL) Rules shall be applicable to the extent where corresponding rules are not provided in the Act (Articles 32 and 33).

XV. Accounting Procedure

296. The accounting procedure along with the MC forms part of the control mechanism provided in the PSC. The accounting procedure sets out the principles and procedure of accounting so as to monitor and control the financial aspects of the PSC. It classifies costs and expenditure and defines which costs and expenditure shall be allowable for cost recovery and profit sharing. It specifies the manner in which the contractor's accounts shall be maintained and the manner of their approval. It contains a provision with respect to the charging of interest and addresses many other related accounting matters (Appendix C).

Chapter 4. Transport of Coal

§1. MODES OF TRANSPORT

390. The main modes of transport of coal are: rail, road, captive systems like rail based merry go-round (MGR), conveyors, aerial runways and transportation by sea. Most of the coal mines in India are located in the eastern part of the country. The transport of coal to most of the country takes place by rail or road except to southern parts where transport mainly takes place by sea via the Bay of Bengal.

During the year 1997–1998, the inter modal split of coal movement was as follows:

| <i>Mode</i> | <i>Percentage</i> |
|-------------------------------------|-------------------|
| Rail | 51.3 |
| Road | 20.8 |
| MGR System | 24.1 |
| Other (Belt/Conveyer, Ropeway etc.) | 3.8 |

§2. REGULATIONS FOR TRANSPORT

391. There is no specific legislation with respect to the transport of coal; however, laws of general application with respect to carriage by road; rail and sea are also applicable to the transport of coal.

Inland Transport

- The Common carrier Act of 1865 (No. 3 of 1865);
- The Railway Act of 1890;
- The Inland Waterways Authority of India Act of 1985 (No. 82 of 1985);
- The National Waterways (Allahabad – Haldia Stretch of the Ganga of 1982 (No. 49 of 1982);
- National Waterways (Kollam-Kottapuram Stretch of the West Coast of 1992 (No. 25 of 1992).

Sea Transport

- The Indian Carriage of Goods by Sea Act of 1925 (No. 26 of 1925);
- The Merchant Shipping Act of 1958 (No. 44 of 1958) as amended by the Act of 1986 and 1987);
- The Indian Bill of lading Act of 1856;
- The Marine Insurance Act of 1963;
- The Multimodal Transportation of Goods Act of 1993 (No. 28 of 1993).

§3. INLAND TRANSPORT

I. Road and Inland Waterways

392. The carriage of coal by land may be either by road or rail or inland waterways. The Common Carriers Act of 1865, deals with the transport of goods

over land and inland waterways. The goods may be transported either by a common carrier or a private carrier. A common carrier as defined includes any individual, firm or company (other than the Government) transporting goods as a business for money without discrimination. On the other hand a private carrier is one which carries its own goods. The Common Carriers Act of 1865 determines and sets the liabilities of a common carrier. The position of a private carrier is of a bailee (Sections 151, 152 and 161 of the Indian Contract Act of 1872). A common carrier is duty bound to carry the goods without discrimination within time and at the stipulated place, with safety and without making any deviation. A common carrier can refuse to carry dangerous goods, has a lien over goods for outstanding dues and can claim damages in case any injury is suffered because of the dangerous nature of goods or loose packaging. The goods have been divided into two categories, namely scheduled and non scheduled, for the purpose of claiming damages from the carrier. The development of inland waterways requires consideration because the potential of this mode of the transport has not been tapped even in small measure. It can supplement rail and road transport capacities in a big way.

II. Railways

393. India has the largest railway system in Asia and the second largest in the world with a network of 62,486 km of track. The share of railways in the overall distribution of modes of transport was highest but has decreased over the years. As compared to 52 per cent annual increase in production of coal, the railway movement has increased only by 3.8 per cent. However, still about 75 per cent of the coal production is transported by railways. Forty-eight per cent of the total railway revenue earning freight comes from coal and out of this 68 per cent is from coal transported to the power sector. There has been an persistent increase in freight, which is resulting in increased landed costs to the consumer. If this trend is not arrested the domestic coal will be at a competitive disadvantage.

394. The transport of goods (including coal) by rail is governed by the Railways Act of 1890. Railways cannot discriminate in carrying goods and are responsible as bailee while goods are in transit. It has to use reasonable foresight and care in the carriage of goods. Subject to other rules of carriage of goods, the railway administration is responsible for damage or destruction except in a *force majeure* situation. The consignor of the goods is to execute a forwarding note in the prescribed form. The Railway Act also provides for rights, duties and liabilities of railways.

395. There is need for the augmentation of rail movement capacity by implementing the critical rail links in potential coal fields so as to avoid mismatches and materialization of coal demand. Against an anticipated movement of 181.33 Mt coal and products by rail from CIL and SCCL in 2001–2002 the projected coal movement by rail in 2006–2007 is 221.62 Mt. This means a wagon requirement of 25,789 four wheeler wagons against 21,099 four wheeler wagons against 21,099 four wheeler wagons in the Ninth Plan. The coal movement by MGR is projected at 101.05 Mt in the Tenth Plan against an anticipated movement of 77.76 Mt in the

Ninth Plan. Similarly the movement by road is estimated at 67.34 Mt against 53.6 Mt in the Ninth Plan. Coastal shipment including rail cum sea route is projected to be 17.37 Mt against 16.52 in the Ninth Plan. During Tenth Plan certain critical rail links are to be completed in order to facilitate smooth movement of coal. Some of these are: Talchar to Prasdip, Korba and Pendra road, Tori Shivpuri link. To overcome the constraints of rail movement and to create competition in coal supplies, it is desirable to create new coal based thermal generation capacity in coastal regions.

396. The movement facilities from coal fields to the trunk route are lagging behind. The Ministry of Coal (MOC) is considering the funding of these infrastructure rail links through collections from excise duty levied under the Coal Mines (Conservation and Development) Act of 1974, which is also meant for improvement of the transport infrastructure in the coal fields.

§4. SEA TRANSPORT

I. Coal Handling Facilities

397. As a whole, sea borne movement accounts for about 6 per cent of the total domestic coal transport. The Ministry of Surface Transport has estimated, the dedicated capacity for coal handling in Indian ports, at the beginning of the Eighth Plan as 7 Mt only, out of which Haldia accounted for 5 Mt and Tuticorin 2 Mt. There are two coal berths at Haldia and one at Tuticorin. The cargo berths at Vishakhapatnam, Pradip and Madras on the East coast, also handle coal. During the Eighth Plan, one coal jetty with a handling capacity of 2.5 Mt was added at Tuticorin with an interim capacity of about 1 Mt. Therefore, the aggregate coal handling capacity of major ports by the end of the Eighth Plan was 8.5 Mt only which has increased to 44 Mt in the terminal year of Ninth Plan. Due to capacity constraints of port handling facilities, the option of import to meet demand cannot be exercised and the possibility of large scale import of coal is not eminent in the near future. About 11 Mt/year coal is carried by rail over short distances to the eastern ports for onward coastal shipping to southern India. About 10–11 Mt coal is shipped out from Haldia, Pradip and Vishakhapatnam each year, destined mainly for the southern ports of Chennai and Tuticorin. Cooking coal imports are also received in these ports. The Government has allowed private sector participation in the development of port facilities. The power generators, steel manufacturers and cements producers who are large users, are being encouraged to develop their own port handling facilities. In view of the port handling capacity constraints, the Committee on Integrated Coal Policy (CICP) has suggested that coast-based power stations may import power grade coals.

398. As per future projections of coal demand there will be a shortage of coal by the terminal year of the 10th five-year plan and some coal may be required to be imported. This will definitely require expansion of existing port handling facilities particularly on the southern and western coast. Major coal handling ports are Haldia, Pradip and Vishakhapatnam, which are all on the eastern coast. Madras handles only

a small quantity of imports. Coking coal imports in the year 2002–2003 was in the order of 12.95 Mt was about 9 Mt. There was also a gap between the estimated demand and domestic availability of coal for the power sector in the year 2002–2003, which necessitated import of a large quantity of non coking coal. The total import of coal in the year 2002–2003 was in the order of 25.5 Mt. Against this background the matching coal handling facilities were not adequate. The Ninth Plan envisaged developing mechanized facilities at Ennore near Madras and at Pradip for handling thermal coal. After completion of these facilities, the expected additional coal handling facility is in the order of 35.5 Mt, increasing the total capacity to 100 Mt in 2001–2002 against the total capacity of 8.5 Mt in 1996–1997 at the end of the Eighth Plan.

II. Carriage under the Carriage of Goods by Sea Act

399. The carriage of goods by sea from one port in India to any other port within or outside India is regulated and governed by the Carriage of Goods by Sea Act, 1925. This Act imposes duties and fixes liabilities of a carrier of goods by sea. A carrier is required to exercise due diligence with respect to seaworthiness of the ship and must carefully handle the goods. The carrier has to issue a bill of lading on demand of the shipper. An agreement relieving the carrier from liability to pay compensation for loss or damage is void and inoperative. A carrier may enhance or limit its liability by incorporating it in the bill of lading. The limitation period for bringing court action is one year from the date of the delivery of goods or the date when goods should have been delivered.

III. Safety of Life and Cargo at Sea

400. The Merchant Shipping Act of 1958 prescribes measures for the safety of life and cargo at sea. In view of the International Convention for Safety of Life at Sea signed in London in June 1960, this Act was amended in 1966 to incorporate the provision of the Convention.

Part V. Interaction Between Energy Law and Environmental Law

Chapter 1. Introduction

408. Since ages, the people of India attach significance and have a special reverence for rivers, mountains, trees etc. which reflects the general concern for the preservation of nature and the understanding of its importance. However, this enlightened attitude did not develop in a modern movement for the protection of the environment barring a few exceptions because being a developing country after independence, India had no choice but to exploit her natural resources so that the basic necessities of the people were met. In this process, problems of pollution were bound to arise. Therefore, the policy of India up to the 1980s gave priority to development over environment. It was only after the Bhopal Gas Tragedy in 1984 that a flurry of activity in the matter of policy and law reforms in the field of environment started and people took the problem seriously.

The legislative and judicial activism triggered thereby, have brought greater public awareness and resulted in the evolution of non-governmental organizations (NGOS) which continuously take up the cause of the environment on various forums including courts. Environmental concerns are now on the top of the World agenda and the impact of pollution emanating from different energy sources has emerged as major and significant issues and concerns for the coming millennium. These concerns are highlighted by and evident from the ongoing debate about effects of pollution on health, environmental damage due to destruction and/or acidification of forests and lakes as a result of setting up hydro power stations; concern about the safety of nuclear power plants; radioactive waste management; and the potential risk of global climate change induced by the increasing atmospheric concentration of carbon dioxide and other greenhouse gases being produced by vehicular and other modes of transport.

409. The use of energy like coal and petrol is bound to be accompanied by an adverse impact on the environment. The production of electrical power by using coal as a source of energy gives rise to pollutants like fly ash and harmful gases. Environmental impacts and polluting affects of the energy sector are classified broadly as, local and general and those emanating from production and consumption cycles. In the global context, a comparison of the CO₂ budget for India *vis-à-vis* the global budget, indicates that the total Indian contribution from various sources is about 2.2 per cent of global emissions. The current gross emissions per capita in India are 0.2 teragrams per year (Tg/year) against the world average of 1.2 Tg/year. Unfortunately, it is very difficult to quantify and aggregate the environmental impacts of the energy chain except for atmospheric pollutants (the Ninth Plan Document).

Chapter 2. Regulatory Framework

§1. MINISTRY OF ENVIRONMENT AND FOREST

410. The regulatory framework for pollution control and environmental management started taking shape around 1972 when the National Committee on Environmental planning and Co-ordination was set up in the context of the Stockholm Conference. Acting on the recommendations of the Tiwari Committee Report, a Department of Environment was created in 1980. The functions being performed by the Ministry of Science and Technology were transferred to this newly created department. In 1985, the subjects of forests and wildlife were also brought under the Ministry of Environment and a separate ministry, i.e. the Ministry of Environment and Forests (MOEF) was created. MOEF is the apex body and nodal agency and regulation and environmental protection is ensured in the country through carrying out environment appraisals of development projects. It has administrative responsibilities for pollution monitoring, regulation and control. The Ministry has four wings:

1. Environmental Division;
2. Forests and Wildlife;
3. National River Conservation Directorate;
4. National Afforestation and Eco-development Board.

§2. POLLUTION CONTROL BOARDS AND OTHER ORGANIZATIONS

411. The Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCB) have been constituted to regulate and promote environmental protection and prevent pollution under the Air, Water, and Environment Acts. There are various other organizations, which support the MOEF, e.g. the Botanical Survey of India, Zoological Survey of India and the Forest Research Institutes. These organizations help the Ministry in implementation of the Environment Protection Act of 1986, and conduct primary research in areas and matters related to environmental conservation and protection. A National Committee of Environmental Planning is attached to the Ministry in an advisory role. The Planning Commission also has a unit dealing with the issues of environment and forestry. The National Environmental Engineering Research Institutes also functions under the Ministry of Science and Technology.

412. All the States have established State Pollution Control Boards and Departments with regional offices, which undertake pollution control and monitor the environmental protection programs. The Central Pollution Control Board (CPCB) has the power to take over the functions of a State Pollution Control Board (SPCB) in specific cases, e.g. in the event of inaction despite specific directions. The CPCB, being the authority for implementing policies formulated by the MOEF, also has the power to frame implementation strategies for pollution control, the most important being the development of the minimal national standards.

Chapter 5. Hydrocarbon Sector and Environment

§1. PETROLEUM OPERATIONS

433. In India, there are three types of situations in the upstream sector with respect to protection of the environment and pollution control. The areas where national oil companies are carrying on exploration work will continue to be governed by PEL or ML as the case may be and relevant legislation on the subject. The blocks which are under a Production Sharing Contract regime and blocks awarded after the NELP rounds will be governed by the provisions of the Model PSC for the pre-NELP or post NELP, as the case may be, as well as relevant legislation.

§2. CLAUSE IN THE PSC OF 1999 RELATING TO THE ENVIRONMENT

434. The clause dealing with the protection of the environment given in PSC for the NELP Round of bidding (Article 14) is given hereunder:

- ‘14.1 The Government and the Contractor recognize that Petroleum Operations will cause some impact on the environment in the Contract Area. Accordingly, in performance of the Contract, the Contractor shall conduct its Petroleum Operations with due regard to concerns with respect to protection of the environment and conservation of natural resources and shall in particular; a) Employ GPIP and standards including advanced techniques, practices and methods of operation for the prevention of Environmental Damage in conducting its Petroleum Operations; b) take necessary and adequate steps to:
- (i) prevent Environmental Damage and, where some adverse impact on the environment is unavoidable, to minimize such damage and the consequential effects thereof on property and people;
 - (ii) ensure adequate compensation for injury to persons or damage to property caused by the effect of Petroleum Operations; c) comply with the requirements of applicable laws and the reasonable requirements of the Government from time to time.
- 14.2 If the Contractor fails to comply with the provisions of paragraph (b)(i) of Article 14.1 or contravenes any relevant law, and such failure or contravention results in any Environmental Damage, the contractor shall forthwith take all necessary and reasonable measures to remedy the failure and the effects thereof.
- 14.3 If the Government in accordance with the laws has good reason to believe that any works or installations erected by the Contractor or any operations conducted by the Contractor are endangering or may endanger persons or property of any person, or are causing or may cause pollution, or are harming or may harm fauna or flora or the environment to a degree which the Government deems unacceptable, the Government may require the Contractor to take remedial measures within such reasonable period as may be determined by the Government and to repair any damage to the environment. If the Government deems it

necessary, it may also require the Contractor to discontinue Petroleum Operations in whole or in part until the Contractor has taken such remedial measures or has repaired any damage caused.

- 14.4 The measures and methods to be used by the Contractor for the purpose of complying with the terms of paragraph (b)(i) of Article 14.1 shall be determined in timely consultation with the Government upon the commencement of Petroleum Operations or whenever there is a significant change in scope or method of conducting Petroleum Operations and shall take into account the international standards applicable in similar circumstances and the relevant environment impact study carried out in accordance with Article 14.5 below.

The Contractor shall notify the Government, in writing, of the measures and methods finally determined by the Contractor and shall cause such measures and methods to be reviewed from time to time in the light of prevailing circumstances.

- 14.5 The Contractor shall cause a person or persons with special knowledge on environmental matters, to carry out two environmental impact studies in order:

(a) to determine at the time of studies the prevailing situation relating to the environment, human beings and local communities, the flora and fauna in the Contract Area and in the adjoining or neighboring areas; and

(b) to establish the likely effect on the environment, human beings and local communities, the flora and fauna in the Contract Area and in the adjoining or neighboring areas in consequence of the relevant phase of Petroleum Operations to be conducted under this Contract, and to submit, for consideration by the Parties, methods and measures contemplated in Article 14.4 for minimizing Environmental Damage and carrying out Site Restoration activities.

- 14.5.1 The first of the aforesaid studies shall be carried out in two parts, namely, a preliminary part which must be concluded before commencement of any field work relating to a seismic or other survey, and a final part relating to drilling in the Exploration Period. The part of the study relating to drilling operations in the Exploration Period shall be approved by the Government before the commencement of such drilling operations, it being understood that such approval shall not be unreasonably withheld.

- 14.5.2 The second of the aforementioned studies shall be completed before commencement of Development Operations and shall be submitted by the Contractor as part of the Development Plan, with specific approval of Government being obtained before commencement of Development Operations, it being understood that such approval shall not be unreasonably withheld.

- 14.5.3 The studies mentioned in Article 14.5 above shall contain proposed environmental guidelines to be followed in order to

minimize Environmental Damage and shall include, but not be limited to, the following, to the extent appropriate to the respective study taking into account the phase of operations to which the study relates.

- (a) proposed access cutting;
- (b) clearing and timber salvage;
- (c) wildlife and habitat protection;
- (d) fuel storage and handling;
- (e) use of explosives;
- (f) camps and staging;
- (g) liquid and solid waste disposal;
- (h) cultural and archaeological sites;
- (i) selection of drilling sites;
- (j) terrain stabilization;
- (k) protection of freshwater horizons;
- (l) blowout prevention plan;
- (m) flaring during completion and testing of Gas and Oil Wells;
- (n) abandonment of Wells;
- (o) rig dismantling and site completion;
- (p) reclamation of abandonment;
- (q) noise control;
- (r) debris disposal; and
- (s) protection of natural drainage and water flow.

14.5.4 Government shall convey its decision regarding any proposal for environmental clearances submitted by the Contractor pursuant to the provisions of this Article or Contract or required under any laws of India within one hundred and twenty (120) days from the date of submission of application by the Contractor seeking such clearance. Any clarification/additional information required by the Government shall be asked by it within sixty (60) days from the date of submission of the application by the Contractor. The final decision by the Government shall be conveyed within sixty (60) days from the receipt of such clarification/additional information from the Contractor. In case Government fails to convey any decision to the contractor, such application for the clearance by the Contractor shall be deemed to have been approved by the Government.

- 14.6 The Contractor shall ensure that:
- (a) petroleum Operations are conducted in an environmentally acceptable and safe manner consistent with Good International Petroleum Industry Practices and that such Petroleum Operations are properly monitored;
 - (b) the pertinent completed environment impact studies are made available to its employees and to its Contractors and Subcontractors to develop adequate and proper awareness of the measures and methods of environmental protection to be used in carrying out the Petroleum Operations; and

- (c) the contracts entered into between the Contractor and its Contractors and Subcontractors relating to its Petroleum Operations shall include the provisions stipulated herein and any established measures and methods for the implementation of the Contractor's obligations in relation to the environment under this Contract.
- 14.7. The Contractor shall, prior to conducting any drilling activities, prepare and submit for review by the Government a contingency plan for dealing with oil spills, fires, accidents and emergencies, designed to achieve a rapid and effective emergency response. The plans referred to above shall be discussed with the Government and concerns expressed shall be taken into account.
- 14.7.1 In the event of an emergency, accident, oil spill or fire arising from a Petroleum Operation affecting the environment, the Contractor shall forthwith notify the Government and shall promptly implement the relevant contingency plan and perform such Site Restoration as may be necessary in accordance with Good International Petroleum Industry Practices.
- 14.7.2 In the event of any other emergency or accident arising from the Petroleum Operations affecting the environment, the Contractor shall take such action as may be prudent and necessary in accordance with Good International Petroleum Industry Practices in such circumstances.
- 14.8 In the event that the Contractor fails to comply with any of the terms contained in Article 14.7 within a period specified by the Government, the Government, after giving the Contractor reasonable notice in the circumstances, may take any action which may be necessary to ensure compliance with such terms and to recover from the Contractor, immediately after having taken such action, all costs and expenditures incurred in connection with such action together with such interest as may be determined in accordance with Section 1.7 of Appendix C of this Contract.
- 14.9 On expiry or termination of this Contract or relinquishment of part of the Contract Area, the Contractor shall:
- (a) subject to Article 27, remove all equipment and installations from the relinquished area or former Contract Area in a manner agreed with the Government pursuant to an abandonment plan; and
 - (b) perform all necessary Site Restoration in accordance with Good International Petroleum Industry Practice and take all other action necessary to prevent hazards to human life or to the property of others or the environment.
- 14.10 The Contractor shall prepare a proposal for the restoration of the site including the abandonment plan and requirement of funds for this and any annual contribution in accordance with the scheme framed by Government to the site restoration fund. This will be submitted along with the annual budget for the consideration and approval of the Management Committee.

- 14.11 Subject to Section 3.2 of the Accounting Procedure, any site restoration fund scheme formulated by Government and subject to provisions of this Contract, any and all costs incurred by the Contractor pursuant to this Article shall be cost recoverable including but not limited to sinking funds established for abandonment and restoration of the Contract Area.
- 14.12 In this article, reference to Government includes the State Government.
- 14.13 Where the Contract Area is partly located on areas forming part of certain national parks, sanctuaries, mangroves, wetlands of national importance, biosphere reserves and other biological sensitive areas, passage through these areas shall generally not be permitted. However, if there is no passage, other than through these areas to reach a particular point beyond these areas, permission of the appropriate authorities shall be obtained.
- 14.14 The obligations and liability of the Contractor for the environment hereunder shall be limited to damage to the environment which:
- (a) occurs after the Effective Date; and
 - (b) results from an act or omission of the Contractor.’

435. The meaning of some of the terms used in the above quoted provision and as defined in the PSC are being given for a clear understanding and better appreciation.

Article 1.51 of the PSC defines GIPIP as follows:

“Good International Petroleum Industry Practices” (GIPIP) means those practices, methods, standards, and procedures generally accepted and followed internationally by prudent, diligent, skilled and experienced operators in petroleum exploration, development and production operations and which, at a particular time in question, in the exercise of reasonable judgement and in the light of facts then known at the time a decision was made, would be expected to accomplish the desired results and goals established in respect of which the practices, methods, standards, procedures and safety regulations, as the case may be, were followed; provided, however, that “Good International Petroleum Industry Practices” is not intended to be limited to the optimum practices or method to the exclusion of all others, but rather to be a spectrum of reasonable and prudent practices, methods, standards, procedures and safety regulations. What constitutes the GIPIP in a particular circumstances shall be agreed to by the Management Committee and failing which the same shall be agreed to by the Directorate General of Hydrocarbons or its assigns or successor and its decision shall be binding.’

‘Site Restoration’ as defined in Article 1.83 of the PSC ‘mean all activities required to return a site to its state as of the Effective Date pursuant to the Contractors environmental impact study and approved by the Government or to render a site compatible with its intended after-use (to the extent reasonable) after cessation of Petroleum Operations in relation thereto and shall include, where appropriate, proper abandonment of Wells or other facilities, removal of equipment, structures and

debris, establishment of compatible contours and drainage, replacement of top soil, re-vegetation, slope stabilization, in filling of excavations or any other appropriate actions in the circumstances’.

The term ‘Environmental Damage’ as defined in Article 1.39 ‘means soil erosion, removal of vegetation, destruction of wildlife, pollution of groundwater or surface water, land contamination, air pollution, noise pollution, bush fire, disruption to water supplies, to natural drainage or natural flow of rivers or streams, damage to archaeological, palaeontological and cultural sites and shall include any damage or injury to, or destruction of, soil or water in their physical aspects together with vegetation associated therewith, aquatic or terrestrial mammals, fish, avi-fauna or any plant or animal life whether in the sea or in any other water or on, in or under land’.

§3. PRODUCTION OPERATIONS AND POLLUTION

436. During development and production operations, the principal wastes arise from drilling and sometimes accidental spills of oil and blowout. The former includes the drilling mud, additives, cements, well-treating fluids, and flow enhancers for stimulating production. Another main waste from production is the brine associated with the oil/gas in the crude-bearing formation or reservoir. It is mostly water with dissolved mineral salts, which also contains dissolved petroleum in small concentrations. Oil in the reservoir contains various proportions of associated or dissolved gas, which is used primarily as a feedstock for the fertilizer industry, and also as fuel for power generation. The rest of the gas is let off at the tail-end and flared. The flaring of natural gas has adverse impacts in terms of air pollution in the form of emissions of oxides of sulfur and nitrogen; and carbon dioxide, which is an important greenhouse gas. Rule 25 of the Petroleum and Natural Gas Rules of 1959, authorizes the Government to issue directions to a lessee with respect to the use of petroleum or natural gas which leads to the creation of unnecessary fire hazards, or permits gas produced from a gas well to escape into open air (Rules 25 and 3-r).

§4. THE SITE RESTORATION FUND SCHEME OF 1999

437. The Government has formulated a site Restoration Fund Scheme under sub-section (1) of Section 33ABA of the Income Tax Act of 1961. But this scheme is more concerned with the monetary aspect of restoration rather than the environmental aspect, which it could have well covered. The Scheme made effective from 1 April 1999, applies to the acreage for which the Government of India has entered into Production Sharing Contracts (PSC). The assessee is required to make a deposit out of profits derived from the business consisting of prospecting for, or extraction or production of, petroleum or natural gas or both (para. 3(3)) in a designated branch of the State Bank of India (para. 4). The interest accrued on the deposit can be withdrawn only for the purpose of utilization in site restoration and not otherwise (para. 6(3)). The withdrawal of a deposit and interest accrued on it

can be made to the extent necessary to meet any expenditure to be incurred on the expiry or termination of the agreement or relinquishment of part of the contract area towards removal of all equipment and installation, in a manner agreed with by the Central Government pursuant to an abandonment plan or towards all necessary site restoration in accordance with good international petroleum industry practices. In addition, withdrawal may be for meeting all expenses necessary to prevent hazards to life, property or environment consequent on expiry, termination or relinquishment under the PSC.

§5. REFINING AND POLLUTION

438. The pollutants given out in the refining process are sulfur oxides, nitrogen oxides, carbon oxides, hydrocarbons, etc. A refinery, by itself will not significantly affect air quality. However, a refinery located in an already polluted area will have major environmental impact. Also, discharge of refinery effluents has an adverse impact on the receiving water body. After the enactment of the Environment Protection Act in 1986, statutory requirements have become stricter, and accordingly, the refining sector has geared itself towards the up-gradation of existing treatment systems/control techniques and monitoring facilities. In locations like the Mathura Refinery, which is close to the Taj Mahal, SO₂ concentration levels are continuously monitored in four stations covering a distance of 38 km from the refinery.

§6. STORAGE TANKS

439. Storage facilities are the most significant sources of hydrocarbon emissions. Vapors are emitted when storage tanks breathe as also when vapors are displaced during filling, and when liquids evaporate. Floating roof tanks are provided for the storage of high vapor-pressure hydrocarbons to minimize the evaporation loss from the liquid surface. This can bring about a reduction in emissions of nearly 95 per cent.

§7. TRANSPORTATION AND MARINE POLLUTION

440. While transporting crude by truck, rail, barge, tanker or pipeline there is a buildup of bottom sediment waste (BSW), which is to be discharged. There is also the serious and catastrophic probability of oceanic spills from ocean tankers. The threat to the marine ecosystem from these is such that sometimes large colonies of fish, and even coral reefs are wiped out. In view of marine pollution from oil, Parts X B and Part XI A were added in the Merchant Shipping Act of 1958 through the Merchant Shipping (Amendment) Act of 1970 and 1983 that deal with marine pollution and civil liability for oil pollution and damages.

Part XB of the Merchant Shipping Act makes the owner of an Indian or foreign ship within the jurisdiction of India as per law, liable for any pollution damage caused as a result of the discharge of oil from the ship except in *force-majeure*

situations (Clause 352). Except in case of pollution damage as a result of an actual fault of the owner, liability in respect of any incident is limited to an aggregate amount of:

- (a) two thousand francs for each ton of ship's tonnage; or
- (b) two hundred and ten million francs, whichever is lower.

To meet the above liability, the owner may apply to the High Court for the constitution of a limitation fund (Section 352K). Besides, the owner of every Indian ship which carries 2,000 tons or more oil in bulk, has to maintain an insurance or other financial security of the amount specified in Section 352N, and the Director General shall issue a certificate that such security exists. The Indian ship is to possess this certificate for leaving or entering an Indian port. Similarly a foreign ship must have a certificate issued in India or outside relating to maintenance of the insurance or other financial security under the International Convention on Civil Liability for Oil Pollution Damage signed at Brussels on 19 November 1969.

441. Part XI A of the Merchant Shipping Act deals with the prevention of the containment of pollution of the sea by oil through tankers of one hundred fifty tons or more or other ships of five hundred tons gross or more; and offshore installations (Section 356A). It prohibits the discharge of oil and oily mixture by tanker, ship or offshore installation except in certain circumstances (Sections 356C and D). With respect to oil reception facilities on ports, the Government has been authorized to specify such ports by notification (Section 356(4)). The Central Government has the power to serve notice to the owner of a polluting ship (Section 356J) and to take measures for preventing or containing oil pollution (Section 356K). The Central Government may give directions to certain ships in case of pollution, to render specified services (Section 356L). The Government has also been given power to levy cess for the purpose of providing oil reception facilities, combating pollution etc. (Section 356M).

§8. POLLUTION FROM VEHICLES USING PETROL OR DIESEL

442. The Central Motor Vehicle Rules of 1989 provide for emission standards for both petrol and diesel vehicles. The Rules require that the vehicle must meet the smoke and CO₂ emission standards. The mass emission norms which were introduced from 1 April 1996 under the Central Motor Vehicle Rules by the Ministry of Surface Transport contain emission standards for type, approval and conformity of production tests for a vehicle in the manufacturing stage. To reduce the environmental pollution caused by the increasing number of diesel vehicles, Government has issued orders to supply HSD with sulfur content of 0.5 wt per cent and below in the four metropolitan cities of Delhi, Mumbai, Calcutta and Chennai wef 1 April 1996. In addition the supply of low lead Motor Spirit (0.15 GMS/lit.) has been introduced from January 1997. Supply of unleaded Motor Spirit for cars fitted with catalytic converters introduced in four metropolitan cities, has been extended to the entire country from April 2000.

Part VI. Interaction Between Energy Law and Tax Laws

Chapter 1. Introduction

458. India has a well developed taxation regime, consisting of taxes of general application, applicable beside others to the energy sector as well and specific taxes applicable to the energy sector only. However, there is growing awareness that a taxation provision concerning a particular industry may be gathered and compiled so that investors can understand and appreciate the risk and reward scenario. The Petroleum Tax Guide of 1998, compiled by the Ministry of Petroleum and Natural Gas, is an effort in this direction. In addition to domestic law on taxation, there are international conventions and treaties signed by India with various countries for avoidance of double taxation. These treaties provide an alternative mode for taxing business profits, *in lieu* of the domestic tax law. The treaties also deal with the mode of taxability of incomes in the nature of dividends, interest, royalty and fees for technical services.

The corporate structure of a company in India is determined and regulated by the Companies Act of 1956 (Companies Act). The Registrar of Companies and the Company Law Board administer the provisions of this Act. The promoters of a company are required to submit a Memorandum of Association and Articles of Association for incorporation to the Registrar of the Companies. After incorporation, a certificate of incorporation is issued and the company assumes legal personality with perpetual succession. The companies incorporated under the Act can be either a public or private company, with limited or unlimited liability. The limited liability structure can be achieved through limitation by shares, or by guarantee. An unlimited company can also be incorporated under the Companies Act, which like a partnership exposes promoters to unlimited liability. The finance may be raised either by means of equity or debt. Ordinary or equity shares are the basic element of ownership of a company and carry voting rights, and therefore, are the ultimate means of exercising control on a company, as well as rights to dividends and return of capital upon winding up. The normal value of equity shares is Rs. 10 per share. Existing companies may issue shares at par, at premium or at a discount. A recently introduced provision permits companies to issue non voting equity shares, up to a maximum of 25 per cent of the total equity capital. Preference shares issued by a company must be redeemed within 10 years of its issue. Funds can also be raised through the issue of debentures, bonds and any other securities of a company.

However, the issue of debentures carrying voting rights is not allowed. Another source of raising finance is through the acceptance of deposits. The Companies Act provides the manner and sources from which deposits can be invited and accepted.

An integrated network of financial institutions caters to the long and medium term financing needs of industrial projects, by way of project loans, underwriting, deferred payment, guarantees, leasing, venture capital, and a variety of other financial modes and methods. Moreover, debt funding from overseas can be obtained through external commercial borrowings, after prior permission from the Ministry of Finance/ Reserve Bank of India.

Chapter 6. The Petrol and Gas Sector

466. The upstream petrol and gas sector, for the purpose of taxation may be broadly discussed under the pre-NELP scenario and post-NELP scenario. In the post NELP situation the taxation is governed by the relevant provisions contained in the Model Production Sharing Contract of 1999 (MPSC 1999) and Petroleum Tax Guide of 1998, compiled by the Ministry of Petroleum and Natural Gas containing provisions of the law relating to income tax, custom duty, central excise, cess, royalties and license/lease fees applicable to the activities connected with the prospecting for or extraction or production of petroleum under contracts (PSC) entered into on or after 1 January 1999 in terms of the New Exploration Licensing Policy of India (NELP).

§1. PETROLEUM TAX GUIDE

The provisions in the Petroleum Tax Guide have been taken from the existing enactment, rules and notifications. The list of enactments mentioned in the Guide is as follows:

- (a) the Territorial waters, continental shelf, Exclusive Economic Zone and Other Maritime Zones Act of 1976 (Act No. 80 of 1976);
- (b) the Income Tax Act of 1961 (Act No. 43 of 1961);
- (c) the Income Tax Rules of 1962;
- (d) the Central Excise Act of 1944 (Act No. 1 of 1944);
- (e) the Central Excise Tariff Act of 1985 (Act No. 5 of 1985);
- (f) the Oil Industry (Development) Act of 1974 (Act No. 47 of 1974);
- (g) the Customs Act of 1962 (Act No. 52 of 1962);
- (h) the Customs Tariff Act of 1975 (Act No. 51 of 1975);
- (i) the Oil field (Regulation & Development) Act of 1948 (Act No. 53 of 1958);
and
- (j) the Petroleum & Natural Gas Rules of 1959.

467. The purpose of compilation as brought out in the Guide is to bring the relevant taxation provisions relating to the exploration and exploitation of petroleum at one place. However in the event of any inconsistency between the Guide and any enactment, rule or notification the relevant act, rule or notification, as the case may be, shall prevail (para. 2 (2)). In view of this position, it is not clear that to what extent the tax authorities will follow it so far as the assessment procedure is concerned. However, this Guide may give comfort to an intending investor in his process of assessment of likely incidence of taxation. Further, para. 12 states that the Guide does not take into account:

- (i) charges payable by specified industries or in connection with Petroleum Operations under any other legislation;
- (ii) payments for the purchase, lease or rental of land or land rights in connection with Petroleum Operations;

- (iii) taxes, fees or charges for specific services rendered on request or to the public generally;
- (iv) Sales Tax; and
- (v) stamp duties, registration fees, license fees, taxes on property or assets (not calculated by reference to income or otherwise exempted) or other levies, fees or charges of a non discriminatory nature and generally applicable in India or in the State where petroleum operations are being conducted.

468. The Guide makes a general statement with respect to the applicability of all fiscal legislation unless exempted by law or as per Production Sharing Contract (PSC) or in terms of double taxation avoidance agreements (para. 4). The parties to the PSC shall be assessed in the status which the PSC has accorded to them and not as an association of persons or body of individuals (para. 5(1)). For parties, the Guide uses the term PSC Participant and defines it in para. 3(13) as meaning a person with whom the Government of India has entered into a contract on or after 1 January 1999 and where more than one person is a party to such contract, the term 'PSC Participant' shall mean all such persons collectively, including their respective successors and permitted assigns.

469. Paragraphs 5(2 and 3) lays down that the profits and gains of a PSC Participant for the purpose of levying income tax shall be computed on the basis of the value determined and revenue realized from the sale of Petroleum in accordance with the PSC of a party's participating interest share of petroleum produced and saved and sold or otherwise disposed of, from the contract area and any other gains or receipts from petroleum operations reduced by deductions of all expenditure incurred in respect of exploration operations and drilling operations. With respect to deductions, the Guide makes a significant statement that profits and gains of business will be reduced by deductions as specified in the Guide and except as provided in the Guide, all the provisions of the Income Tax Act of 1961, shall apply. Further, deduction of the expenditure provided in the Guide is *in lieu* of and not in addition to corresponding allowances provided for under the heading 'Profits and Gains of Business or Profession' in the Income Tax Act of 1961.

The deduction of expenditure will be allowed subject to fulfilment of the following conditions:

1. Expenditure must be solely incurred on Petroleum Operations.
2. Expenditure must not be excessive or unreasonable.
3. Expenditure, for which payment of a sum exceeding 20,000 has been made in cash, 20 per cent of such expenditure may not be allowed as deductions.
4. Payment made for gratuity or provident fund to an employee in the absence of an approved scheme for gratuity or provident fund.
5. For a non-resident PSC Participant, the deduction of head office expenditure shall be limited to lower of 5 per cent of the adjusted total income, or so much of the expenditure in the nature of head office expenditure incurred by him as is attributable to the business carried on in India.

The ‘adjusted total income’ is the total income computed in accordance with the Income Tax Act of 1961, as modified herein, but before any deduction for carried forward unabsorbed depreciation, carried forward family planning expenses, any losses carried forward under Section 72(1), or Section 73(2) or Section 74(1) or Section 74(3) or Section 74A(3) or deduction under Section 80IA of the Income Tax Act of 1961.

The ‘head office expenditure’ has been defined as ‘executive and general administration expenditure incurred by the PSC Participant outside India, including expenditure incurred in respect of rent, rates, taxes, repairs or insurance of any premises outside India used for the purpose of business, salary, wages, annuity pension, fees, bonus, commission gratuity, perquisites or profits *in lieu* of or in addition to salary, whether paid or allowed to any employee or other person employed in, or managing the affairs of, any office outside India; travelling by any employee or other person employed in, or managing the affairs of, any office outside India; and such other matters connected with executive and general administration as the Government of India may prescribe for the purpose of Section 44C of the Income Tax Act of 1961’.

470. The PSC Participants have the option to set off any loss on account of the allowable expenses in the year such expenses are incurred, against profits from any other source of income in accordance with and subject to Sections 70 and 71 of the Income Tax Act of 1961 (para. 5(4) Proviso). For income tax purposes, all unsuccessful exploration costs incurred in areas other than a producing area, can be deducted from the aggregate value of petroleum allocable to the assessee, PSC Participant, from the producing areas. These costs can also be set off against profits from any other source (para. 5(5)). The amount deposited in the site restoration fund scheme or spent over and above realized from such scheme, shall also be an allowable deduction while computing profits and gains of business of a PSC Participant (para. 5, sub-paras. 6 and 7). A provision has been made which takes care of the difference in the proceeds of transfer and expenditure incurred by the transferor. The interest on moneys borrowed under a loan agreement or debt incurred in purchase of raw materials or moneys borrowed in relation to industrial development in India, is exempt from income tax (Section 10(15) Income Tax Act). This exemption is subject to the condition that the financial institution must be in a foreign country, debt must be incurred in a foreign country or monies borrowed should be in a foreign currency from a source outside India (para. 5, sub-para. 14 of the Guide).

471. In case of non-resident service providers and suppliers, 10 per cent of the amount paid or payable or the amount received or deemed to have been received on account of the provision of services and facilities shall be deemed to be the profits and gains and shall be taxed at normal rate applicable to the business income of non-residents. Further liability of a non-resident providing service or supply shall be either in accordance with the Income Tax Act or the double taxation avoidance agreement (Section 90 of the Income Tax Act), whichever is more beneficial to the non-resident.

472. Custom duty shall not be levied on the import of machinery, plant, equipment, materials and supplies listed in Annexure I of the Guide by the PSC Participant or any of its sub-contractors on production of certificate from the Directorate General of Hydrocarbon (DGH). In case of imports by a foreign company no foreign exchange remittance should have been made for the purpose of the import of such goods. The Government has the right to inspect goods and records so that it may be ensured that goods are being used for the purpose for which the exemption has been granted (para. 7). No excise duty or cess shall be levied on the production of Petroleum under Production Sharing Contracts (para. 8).

473. After the award of a block under the NELP, the contractor is to take a prospecting license. The applicant for a license is to deposit in advance Rs. 50,000 as security and a license fee of Rs. 8 per sqkm for the first year, Rs. 40 per sqkm for the second year, Rs. 300 for the third year, Rs. 400 per sqkm for the fourth year and Rs. 600 per sqkm for the first and second years of renewal. For taking a lease, an amount of Rs. 100,000 is to be deposited as security and Rs. 10,000 for meeting the preliminary expenses along with the application. On the grant of a lease, the lessee is required to pay either yearly dead rent or royalty whichever is higher. The yearly fixed dead rent is 12.50 per hectare or part thereof for the first 100 sqkm and Rs. 25 per hectare or part thereof for an area exceeding the first 100 sqkm. Royalty at the rate of 10 per cent for crude oil and natural gas is levied for offshore areas. For onshore areas, the rate of royalty is 12.5 per cent for crude oil, the same as applicable to offshore areas for natural gas, i.e. 10 per cent. In deep water areas beyond 400 m bathymetry the rate of royalty is 5 per cent for the first 7 years starting from the commencement of commercial production. In addition to royalty or dead rent, as the case may be, the licensee is to pay surface rent for the surface area of land actually used at such rate not exceeding the land revenue and cess as assessed or assessable on the land as may be specified by the State Government with the approval of the Central Government. If an employer bears the tax on remuneration then such tax, subject to satisfying the conditions prescribed in the Income Tax Act of 1961 shall not be included in the taxable income of the employees (para. 11).

§2. PROVISION IN PRODUCTION SHARING CONTRACT

474. The PSC of 1999 also contains provisions dealing with the taxation aspect of acreage awarded to a party after following the bidding process. The public sector oil companies (PSUs) are also entitled to get the same tax benefits which are now available to any other party which enters into a Production Sharing Contract with the Government. The provisions which were in favour of or discriminatory to the National Oil Companies (NOCs) or PSUs have been dispensed with. For example under Exploration Rounds of Bidding the PEL fees, royalty/dead rent and cess were borne by the NOCs as licensee, as per terms of the bid. However, under the NELP, the consortium will be the licensee so all these charges have to be borne by the parties constituting the consortium to the extent of their respective participating interest. The PSC 1999 contains Article 17 dealing with taxes, royalties, rentals,

duties etc. and Article 20 which contains provisions regarding currency and exchange control. Both these articles are important and are being reproduced hereunder:

- 17.1 Companies, their employees, persons providing any materials, supplies, services or facilities or supplying any ship, aircraft, machinery, equipment or plant (whether by way or sale or hire) to the Companies for Petroleum Operations or for any other purpose and the employees of such persons shall be subject to all fiscal legislation in India except where, pursuant to any authority granted under any applicable law, they are exempted wholly or partly from the application of the provisions of a particular law or as otherwise provided herein.
- 17.2 Pursuant to the provisions of Section 42 of the Income Tax Act of 1961, the allowances specified herein shall apply in computing income tax payable by a Company on its profits and gains from the business of Petroleum Operations *in lieu* of (any not in addition to) corresponding allowances provided for under the heading 'Profits and Gains of Business or Profession' in the Income-Tax Act of 1961. Any other allowance, which are not specified herein, shall be treated in accordance with the provision of the Income Tax Act of 1961.
- 17.2.1 Subject to the provisions herein below, deductions at the rate of one hundred per cent (100%) per annum shall be allowed for all expenditures, both capital and revenue expenditures, incurred in respect of Exploration Operations and drilling operations. The expenditure incurred in respect of Development Operations, other than drilling operations, and Production Operations will be allowable as per the provisions of the Income Tax Act of 1961. The expenses so incurred are subject to the following:
- (a) where any expenditure is not solely incurred on Petroleum Operations or is incurred as part of or in conjunction with any other business, only that proportion of the total expenditure which can be proved to the assessing officer to represent a fair proportionate part thereof, having regard to all relevant facts and circumstances, shall be allowed;
 - (b) Sections 40A and 44C of the Income Tax Act of 1961 shall apply.
- 17.2.2 A Company shall be entitled, for Income Tax purposes only, to deduct all its unsuccessful Exploration Costs in contract areas covered by other contracts from the aggregate value of petroleum allocable to the Company from any Fields(s) in the Contract Area in the manner as follows:
- (a) Unsuccessful Exploration Costs incurred in contract areas other than the Contract Area where a Commercial Discovery has been made up to the date of commencement of Commercial Production shall be aggregated and the Company shall be entitled to deduct such costs at the rate of one hundred per cent per annum;
 - (b) Unsuccessful Exploration Costs incurred in contract areas other than the Contract Area where a Commercial Discovery has been

- made, after the commencement of Commercial Production, shall be deductible at the rate of one hundred per cent per annum of such costs beginning from the Year such costs are incurred.
- 17.2.3 All allowable expenditure incurred in the Year in which Commercial Production commence shall be aggregated and the assessed loss for the Year as well as the assessed loss, if any, incurred in the assessment year relevant to the Year in which Commercial Production commences, or in any subsequent assessment year, shall be carried to succeeding assessment years and set off as provided in the Income Tax Act of 1961.
- 17.2.4 For any or all accumulated expenditure incurred in respect of Exploration Operations and drilling operations prior to the date of commercial production, Company(ies) shall have the option to amortize such expenditures over a period of ten (10) years from the date of first commercial production.
- 17.2.5 The profits and gains of the business of the Parties comprising Contractor consisting of Petroleum Operations shall, for the purpose of the levy of income tax under the Income-Tax Act of 1961, be computed on the basis of the value, determined in accordance with Article 19, of its Participating Interest share of Crude Oil produced and saved and sold, or otherwise disposed of, from the Contract Area and from any revenue realized on the sale of Associated or Non Associated Natural Gas referred to in Article 21 as well as any other gains or receipts from Petroleum Operations as reduced by the deductions as specified herein, and, except as herein provided, all the provisions of the Income-Tax Act of 1961, shall apply.
- 17.2.6 Company(ies) shall be eligible for benefits available under Section 80IA of the Income Tax Act of, 1961 as applicable from time to time.
- 17.3 For the purpose of Article 17.2 and Section 42 of the Income-Tax Act of 1961;
- 17.3.1 The following terms used in Section 42 of the Income Tax Act of 1961 shall have the meanings corresponding to the terms used in this Contract and defined in Article 1 as follows; a) 'agreement' means this Contract as defined in Article 1; b) 'commercial production' shall have the meaning assigned in Article 1.
- 17.3.2 The terms 'assessing officer', 'assessed loss', and 'assessment year' shall have the meaning as defined in the Income-Tax Act of 1961.
- 17.4 Companies (Lessee) shall be required to pay royalty to the Government (Lessor) for offshore areas at the rate of ten per cent of the wellhead value of crude oil and natural gas. In case of any onshore area, Companies shall be required to pay to the State Government(s) (Lessor) at the rate of twelve point five zero per cent of the well-head value of crude oil and ten per cent (10%) of the well-head of natural gas. In case of an offshore area falling beyond four hundred (400) metre isobath, the rate of royalty payable by Companies (Lessee) to the Government (Lessor) shall be at the rate of five per cent of the well-head value of crude oil and natural gas for the first seven

years from the date of commencement of Commercial Production in the Field. The valuation of crude oil and natural gas shall be as per Article 19 and Article 21 respectively. The royalty amount due to Government/State Government(s) shall be payable latest by the end of the month of the succeeding month.

- 17.5 Machinery, plant, equipment, materials and supplies imported by the Contractor and its Sub-Contractors solely and exclusively for use in Petroleum Operations under this contract or similar contracts with Government where customs duty has been exempted by the Government shall be exempt from customs duties, export duties or other charges on re-exportation of the said items in accordance with applicable legislation.
- 17.6 The Government shall have the right to inspect the records and documents of the physical items or items for which an exemption has been provided pursuant to Article 17.5 to determine that such item or items are being or have been imported solely and exclusively for the purpose for which the exemption was granted. The Government shall also be entitled to inspect such physical items wherever located to ensure that such items are being used for the purpose herein specified and any item not being so used shall immediately become liable to payment of the applicable customs duties.
- 17.7 Subject to Article 27.1, the Contractor and its Sub-Contractors may sell or otherwise transfer in India all imported items which are no longer required for Petroleum Operations, subject to applicable laws including rules, regulations, procedures, notification etc. governing customs duties and sale or disposal of such items.
- 17.8 Any sales tax or tax of similar nature payable on the sale(s) of Petroleum under this Contract shall be borne/reimbursed by the buyer(s).
- 17.9 Subject to the provisions herein above provided, the Contractor shall be liable for payment of:
 - (a) annual license charges and rental fees and other charges under the Rules;
 - (b) charges payable by specified industries or in connection with Petroleum Operations under applicable legislation;
 - (c) payments for purchase, lease or rental of land or land rights in connection with Petroleum Operations;
 - (d) taxes, fees or charges for specific services rendered on request or to the public generally;
 - (e) customs duties, except for those items subject to exemption as provided in Article 17, applicable at the rates specified from time to time;
 - (f) stamp duties, registration fees, license fees, taxes such as taxes on property or assets (not calculated by reference to income or otherwise exempted) or other levies, fees or charges of a non-discriminatory nature and generally applicable in India or in the State where Petroleum Operations are being conducted.
- 17.10 If any change in or to any Indian law, rule or regulation dealing with income tax or other corporate tax, export/import tax, excise, customs duty or any other levies, duties or taxes imposed on Petroleum or dependent upon the value of Petroleum results in a material change to the expected economic benefits accruing to any of the parties after the date of execution of the Contract, the

parties shall consult promptly in good faith to make necessary revisions and adjustments to the Contract in order to maintain such expected economic benefits to each of the parties, provided, however, that the expected economic benefits to the Parties shall not be reduced as a result of the operation of this article.

Here it is necessary to mention and spell out the meaning of certain expressions used in the above quoted article and defined in the PSC for a proper understanding of this provision.

The term 'Petroleum Operations' has been defined in Article 1.7.3 of the PSC to mean, 'as the context may require, Exploration Operations, Development Operations or Production Operations or any combination of two or more of such operations, including construction, operation and maintenance of all necessary facilities, plugging and abandonment of wells, safety, environment protection, transportation, storage, sale or disposition of Petroleum to the Delivery Point, Site restoration and any or all other incidental operations or activities as may be necessary.'

The term 'Company' has been defined in Article 1.20 of the PSC as a company which is party to the PSC and where more than one company is a party to the contract, the term Companies shall mean all such Companies collectively, including their respective successors and permitted assigns.

Commercial Discovery means a discovery of petroleum reserves, which have been declared as a Commercial Discovery by following the procedure given in PSC.

The term 'agreement' has been defined in Article 17.3.1(a) with reference to Article 1 of the PSC. Article 1.22 of the PSC is to the effect that 'Contract' means this agreement and the appendices mentioned herein and attached hereto and made an integral part and any amendments made thereto.

The term 'commercial production' has been defined in Article 1.19 as meaning production of crude oil or condensate or natural gas or any combination of these from the contract area (excluding production for testing purposes) and delivery of the same at the relevant Delivery Point under a programme of regular production and sale. Article 27.1, referred in Article 17.7 provides that the Government is the sole owner of Petroleum underlying the Contract Area and shall remain the sole owner of Petroleum produced pursuant to the provisions of this Contract except as regards that part of Crude oil, Condensate or Gas, the title whereof has passed to the Contractor or any other person in accordance with the provisions of this Contract.

§3. CURRENCY AND EXCHANGE CONTROL

475. The other important provision given in the PSC is Article 20 which deals with currency and exchange control matters. It opens with a statement that, subject to the compliance with the laws of general application governing currency and foreign exchange and related administrative instructions and procedure issued on a non-discriminatory basis, a foreign company shall have the following rights:

- ‘(a) Repatriate abroad, in United States Dollars or any other freely convertible currency acceptable to the Government and the Foreign Company, the net proceeds of sales of Petroleum in India;
- (b) Receive, retain and use abroad the proceeds of any export sales of Petroleum under the Contract;
- (c) Open, maintain and operate bank accounts with reputable banks, both inside and outside India, for the purpose of this Contract;
- (d) Freely import, through normal banking channels, funds necessary for carrying out the Petroleum Operations;
- (e) Convert into foreign exchange and repatriate sums imported pursuant to (d) above in excess (if any) of its requirements; and
- (f) Make payments outside of India for purchases, services and loans obtained abroad without the requirement that funds used in making such payments must come from or originate in India.’

Provided, however, that repatriation pursuant to sub-paragraphs (a) and (e) and payments pursuant to sub-paragraph (f) shall be subject to the provisions of any treaties and bilateral arrangements between the Government and any country with respect to payments to or from that country.

476. Relevant provisions of taxation law and provisions contained in the Production Sharing Contract govern the pre-NELP period. The provisions of law are generally the same as referred to in Article 17 of the PSC of 1999 like Sections 35E, 42, 44BB and 293A of the Income Tax Act.

As per Section 35E, the expenditure incurred by a resident tax payer engaged in prospecting for or extraction or production of petroleum during the 5 years period ending with the year commercial production has been allowed to be deducted in equal instalments for 10 years. Section 42 is applicable to residents as well as nonresidents. As per this section, in computing the profits or gains of any business consisting of prospecting for or extraction or production of petroleum, the following shall be allowed as a deduction:

- (a) expenditure by way of infructuous or abortive exploration expenses in respect of any area surrendered to the Government prior to the beginning of commercial production by the tax payer;
- (b) expenditure incurred by the tax payer, whether before or after the commencement of the commercial production, in respect of drilling or exploration activities, or in respect of physical assets used in that connection; and
- (c) allowance for depletion of oil reserves in the oil exploration area.

The above deductions of the expenditure incurred can be allowed if the following conditions are fulfilled.

- (i) There exist an agreement between the Central Government and any other person,
- (ii) The business should be such which either the Central Government or any other person authorized by it is a party,

- (iii) The agreement has been placed before each house of Parliament, and the agreement provides for the deductions and allowances as mentioned in this section.

The provisions of the Income Tax Act shall be deemed to be modified to the extent necessary to give effect to the terms of the agreement.

Section 44BB, is applicable only to non-residents and provides for presumptive taxation. Section 293A is applicable to PSC participants and those who provide facilities or supply plant and machines. This section confers wide powers on the Government to exempt from tax or reduce or modify the tax leviable in respect of a class of persons through a gazette notification.

477. In the PSC, for pre-NELP rounds of bidding of the blocks, the issues of tax, royalty and rentals have been dealt with in Article 18 and there is a separate article dealing with custom duties. The PSC provisions which have been executed or to be executed with respect to pre-NELP rounds of bidding along with relevant provisions of the taxation laws will remain applicable for those blocks for which PSC has been executed or will be executed in the future, unless the Government decides and provides otherwise. In a pre-NELP PSC, Article 16 deals with taxes, royalties, rentals etc. Article 17 contains provisions with respect to custom duties and Article 20 deals with currency and exchange control matters. The article dealing with custom duties provides as follows:

- 17.1 Machinery, plant, equipment, materials and supplies imported by a foreign company or its subcontractor solely and exclusively for use in petroleum Operations shall be exempted from customs duties subject to compliance with procedures and conditions as may be determined pursuant to applicable customs duty legislation, Article 23 and the terms herein specified.
- 17.2 Contractor shall submit to the Government a list of subcontractors who are engaged by it for the purpose of obtaining the various categories of items specified herein pursuant to the conduct of Petroleum Operations and who may claim exemptions hereunder.
- 17.3 In order to qualify for the exemption from customs duties as provided for in Article 17.1, all imported items for which duty exemption is being claimed shall be certified by a responsible representative of the Contractor to be imported in terms of this contract solely and exclusively for use in carrying out Petroleum Operations and shall be approved by a representative of the Government to be eligible for such exemption pursuant to the terms of the Contract.
- 17.4 The Government shall have the right to inspect the records and documents of the physical item or items are being or have been imported solely and exclusively for the purpose for which the exemption was granted. The Government shall also be entitled to inspect such physical items wherever located to ensure that such items are being used for the purpose herein specified and any item not being so used shall immediately become liable to payment of the applicable customs duties.

- 17.5 Subject to Article 27, the Contractor and its Sub-contractor may sell or otherwise transfer in India all imported items which are no longer required for Petroleum Operations, subject to applicable laws governing customs duties and sale or disposal of such items.

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