Cooperation between India and Gulf Cooperation Council (GCC) Countries in the Global Oil and Gas Regime

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The Thesis entitled "**Cooperation between India and Gulf Cooperation Council (GCC) Countries in the Global Oil and Gas Regime**" is a product of my own research. This thesis has not been submitted in part or full for the award of any degree to this or any other university. My indebtedness to other works, publications, has been acknowledged in relevant pages.

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.....Dedicated to
My Parents

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Notes, Definitions and Abbreviations

FSU - Former Soviet Union, comprising Russia, Georgia, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.

GCC - The Cooperation Council for the Arab States of the Gulf, known as the Gulf Cooperation Council, was founded in 1981 by Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates In 1982, it issued an agreement covering the freedom of movement of people and capital, the abolition of customs duties, technical cooperation, harmonization of banking regulations, and financial and monetary coordination. A common, minimum customs levy of between 4 percent and 20 percent was imposed in 1986 and in 1992. GCC ministers agreed to set up a common market by the year 2000 but, as of the time of writing, no united external tariff had been agreed upon.

IEA - The International Energy Agency, located in Paris, was founded in 1974 as an autonomous body within the OECD. It carries out an energy cooperation program among 24 of the 29 countries in the OECD. Its main aims are to reduce excessive dependence on oil; to provide information on the international oil market; to cooperate with oil producing and consuming countries in order to ensure stabile conditions on international energy markets; to prepare plans to help member states avoid the risks of major disruption of oil supplies; and to share supplies in the event of an emergency. Its members are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Union also takes part in the work of the IEA.

OECD -The Organization for Economic Cooperation and Development, located in Paris, was founded in 1960. Its aim is to promote economic growth, employment and financial stability in member states and to contribute to the development of the international trade and the world economy. Its members are Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Union also takes part in the work of the IEA.

OPEC - The Organization of Oil Producing Countries was formed in 1960 and is headquartered in Vienna. Since the 1970s, OPEC has had 13 members. The Middle Eastern members include Iran and seven Arab countries: Saudi Arabia, Iraq, Libya, Algeria, Kuwait, Qatar and the UAE (at first, before the establishment of the UAE in 1971, Abu Dhabi and Dubai had separate membership). There are also four non-Middle East members: Indonesia, Nigeria, and Venezuela. OPEC's basket price is a weighted average of the following crudes: Saharan Blend, Minas, Bonny Light, Arabian Light, Dubai, Tia Juana, and Isthmus.

OAPEC -The Organization of Arab Petroleum Exporting Countries was established in 1968 by Saudi Arabia, Kuwait and Libya. Members of OAPEC now include the Arab members of OPEC and Egypt, Syria, Bahrain, Oman, Tunisia and Morocco.

Transition Economies - Non-OECD Europe (excluding Poland), the FSU, Cyprus, Gibraltar and Malta.

Asia Pacific- Defined as East Asia, Southeast Asia and South Asia. In this study this has been interchangeably used as Asia or Asia Pacific.

ASEAN-The members of the Association of South East Asian Nations are Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.

Btoe: billion ton oil equivalent

b - Barrels

bcf - billion cubic feet

b/d - barrels a day
Mb/d-million barrels a day
bn - billion
bn b/d - billion barrels a day
GDP - Gross Domestic Product
Km - kilometers
Mb/d - million barrels a day
mn - million
Mtoe - million tons oil equivalent
Tcf - trillion cubic feet
Bcm-billion cubic metre
MMSCMD-million metric standard cubic metre per day
NASSCOM: National Association of Software and Services Companies
SOCAL: Standard Oil of California
NEDC: Near East Development Corporation
IPC: Iraq Petroleum Company
KOC: Kuwait Oil Company
SONJ: Standard Oil of New Jersey
TPC: Turkish Petroleum Company
Aramco: Arabian American Oil Company
NIOC: National Iranian Oil Company
IOP: Iran Oil Participants
BP: British Petroleum
NOC: national Oil Company
MoPNG: Ministry of Petroleum and natural Gas
GOI: Government of India
Unocal: Union Oil
ENI: Ente Nazionale Idrocarburi
LPG: Liquid Petroleum Gas
LNG-Liquefied Natural Gas
'000b/d: thousand barrels per day
GDP-Gross Domestic Product
GNP-Gross National Product
C.S.O.-Central Statistical Organization
R/P Ratio: reserve to production ration shows the longevity of reserves at the current rate of production.
ONGC: Oil and Natural Gas Commission
BOC: Burma Oil Co.
IOC: Indian Oil Corporation Ltd.
HBJ: Haldia-Bijapur-Jagdishpur
ISPP: Indo-Stanvac Petroleum Project
FICCI: Federation of Indian Chamber of Commerce and Industry
CII: Confederation of Indian Industry
ABC: Assam, Bombay and Cambay
MMT: million metric tons
NELP: New Exploration Licensing Policies
MTPA: million metric tons per annum
HSD: High Speed Diesel
GAIL: Gas Authority of India Ltd
MCMD: million cubic metres per day
TEESE: TERI Energy Economy Simulation and Evaluation.
GIDG: GDP indexed demand growth
PSUs: Public Sector Undertakings
VSA: valued stock account
fob: free on board
cif: cost, insurance, freight

APM: Administered Pricing Mechanism
OPA: Oil Pool Account
ETG: Expert Technical Group
ATF: Aviation Turbine Fuel
SKO: Superior Kerosene Oil
FDI: Foreign Direct Investment
mboe/d: million barrels of oil equivalent per day.
NGLs: non-gas liquefied
ADNOC: Abu Dhabi National Oil Co.
EIA: Energy Information Administration, US Department of Energy
MFN: Most Favored Nation
JBC: Joint Business Council
ASSOCHAM: Associated Chambers of Commerce and Industry
BATC: Bahrain Asian Trading Committee
MOU: Memorandum of Understanding
BBA: Bahrain Businessmen's Association
SAGIA: Saudi Arabia General Investment Authority
ICT: Information, Communication and Technology

ITES: Information Technology Enabled services

KISR: Kuwait Institute of Scientific Research

ICSIR: Indian Council for Scientific and Industrial Research

IKCC: India-Kuwait Chamber of Commerce
OCCI: Oman Chamber of Commerce and Industry
CES: Consultancy Engineering Services
BHEL: Bharat Heavy Electricals
PDO: Petroleum Development Oman
DTAA: Avoidance of Double Taxation Agreement
BIPA: Bilateral Investment Promotion and Protection
NSIC: National Small Industries Corporation
DGCIS: Directorate General of Foreign Commercial Intelligence and Statistics
SPA: Sales and Purchase Agreement
DBEC: Dakshin Bharat Energy Consortium
QAFCO: Qatar Fertilizer Company
QAPCO: Qatar Petrochemical Company
SPIC: Southern Petrochemicals Industries Corporation Limited
LDPE: low-density polyethylene
Q-Chem: Qatar Chemical Company
DME: dimethyl Ether
NODCO: National Oil Distribution Company (Qatar)
ACC: Associated Cement Companies Limited
IPCL: Indian Petrochemical Corporation Limited
QIMCO: Qatar Industrial Manufacturing Company
BEC: Bhilai Engineering Corporation
TISSCO: Teyseer Industrial Supplies and Services
JCM: Joint Commission for economic, trade, scientific, technical and cultural cooperation
BIPPA: Bilateral Investment Protection and Promotion Agreement
KACST: King Abdul Aziz City for Science and Technology
SASO: Saudi Arabian Standards Organization
PDEXCIL: Power loom Development and Export Promotion Council
SFD: Saudi Fund for Development
OCIPED: Omani Centre for Investment Promotion and Export Development
ESCWA: Economic and Social Commission for Western Asia
UNDP: United Nations Development Programme
AHDR: Arab Human Development Report

WSIS: World Summit on the Information Society
BPO: Business Process Outsourcing
CSCCI: Council of Saudi Chambers of Commerce and Industry
WTO: World Trade Organization
GATS: General Agreement on Trade in Services

Introduction

With the onset of globalization process, regional economic configurations are witnessing a qualitative change. Asia Pacific has gained new prominence primarily due to the performance of the two leading countries namely India and China, besides other countries like the Association of South East Asian Nations (ASEAN). In the global energy market regional shift is quite visible. The present study aims at analyzing the trends in the global energy market especially oil and gas with reference to regional shift and arguing a case for synergizing the policies of the GCC countries and the Asian countries. The focus will be on India and GCC from visible complementarities of both in the global oil and gas regime. The analysis highlights how a pattern of interdependence is emerging between India and the GCC countries due to their strategic positioning in the global oil and gas regime.

The global energy sector in general and oil and gas sector, in particular, has undergone several transformations. The commercial and economic fundamentals of the global oil business have radically changed over the years. The market realities in the short to the medium term have clearly gained precedence over the cold-war era oil fundamentals. The daily market trends, trade patterns, short-term price determinations set the present days global oil game as purely commercial. The past fifteen to twenty years oil market trends indicate cut down of production in the lowest cost producing areas on the one hand, and raising production to full capacity in the relatively high cost producing areas on the other hand. There has been a clear trend where the relatively high cost producers have become the main incremental suppliers of oil, thereby posing a fundamental threat to the lowest cost producers who were until recently, the main marginal suppliers (residual suppliers). It is argued that the proximate factors responsible for such inevitabilities are, first, the vast revenue needs of the lowest cost producers which has created a huge gap between 'the price level at which the national oil companies cover all their cost and the price level that balances their overall government budgets', and, second, the technological revolution that have driven down the production cost in the high cost producing areas. Thus these factors have made vulnerable the lowest cost producers and the traditional energy suppliers to the world, especially, the energy producing countries of the Gulf, in the sense that it led to their loss of market share and strengthen their inability further to meet their overall revenue needs.

The global oil and gas market, thus, no more resembles the late 60s or 70s when seller was the price setter, be oil companies or national government collectivity under the aegis of OPEC. A number of players have entered into the field since the late 70s, so much so that in the 90s and the oil price is no more set by the seller; it is a buyers market now. No more the supply-demand balances and trade patterns do conform to boundaries fashioned by the cold war mindset. The traditional rule of thumb of the 'OPEC versus non-OPEC' way of thinking about crude oil supplies, though persists, has lost relevance in understanding either current supply or future supply potentials. The conventional 'OECD versus non-OECD' consideration regarding the world oil demand has also become irrelevant. Instead, it has become conventional now to focus on the actual patterns of trade among key exporting and importing geographic regions and on the main centers of world economic growth, regardless of their allegiance and/or membership to/of any group or organization.

In such a global energy setting, changes can also be discerned in the location of the market. Asia, not the Atlantic has become the major destination of oil exports, particularly that from the Persian Gulf. In recent years, the Asian region in general and India and China, in particular, have raised worldwide interests due to their highly sustainable economic growth rate and consequent volume of energy consumption including that of oil and gas. The most notable is their explosive demand for every form of commercial energy and in particular that of oil and gas, which in fact is the highest in comparison to any other region in the world in recent years. The long term significance and potentials of this region has been well summarized by Richard S. Titelbaum (Fortune, 132, 9, 1995):

> *"Presently South Korea's annual per capita energy consumption is 16.9 barrels. In India and China, they use less than a barrel per head, though their usage is up 33% and 50% respectively, since 1985. Assuming that their per capita consumption rise to that of South Korea and their populations increase at currently projected rates, these two countries would alone need a total 119 million barrels of oil per day-that is almost double the world's entire demand today".*

The changes and transformations in the global oil and gas business have also reaffirmed the contours of the present day's energy security debate. The global oil and gas game of today is categorically different from the early oil eras when the producers/exporters used to influence the terms for the consumers/importers, who were the ultimate bearers of these cartel's business misadventures. This can be substantiated from the fact that the major oil importers-the OECD and other European developed countries-suffered heavily and which had in fact ripples flown across the globe, thereby led to recession in the world economy. But now days the consumers/importers are dictating every aspects of the global oil and gas business such as, pricing, trading, and financing major oil and gas projects either through their national energy companies or their multinational counterparts. Besides the suppliers/exporters have now become highly vulnerable to any eventual demand disruptions in the major consuming and importing countries either due to any economic crisis or other reasons, which analyst are referring to the 'reversal oil boom'. In addition, the major industrial countries who till recent years were the main importers and consumers of oil and gas have adopted advanced technologies to switch over to cleaner and viable energy options such as nuclear energy and others such as new hydrocarbon sources, etc. It is here worth mentioning that the Asian financial crisis in the year 1998 have taken its toll not only on the world oil and gas business but more importantly on the major oil producing and exporting countries of the Gulf region, as this region is presently the most energy consuming and importing region in the world and Gulf is the major energy supplier of this region. Thus in the present day global energy scenario, the oil and gas producers/suppliers and the oil and gas consumers/ importers are both vulnerable in the wake up of any possible demand as well as supply disruptions. In addition it can be contended that though the industrialized West have, somehow, leveraged from the energy security point of view, the newly developing countries of the East, especially, in Asia, like India are highly vulnerable. And in such transition, the oil and gas producers and exports, especially the Gulf countries have become vulnerable in the sense that their previous market share has shrunk and now dependent on some newly industrialized energy importing countries.

In such a global energy setting, a pattern is emerging in which India and the GCC countries have larger role to play. It can also be visualized that the countries of the GCC and India have convergence of interests from the perspective of the global oil and gas regime. Given the fact that India and GCC countries have traditional trading affinity, they will come closer to take pragmatic steps in order to mitigate the apprehensions regarding energy security. They will be tempted to extend their interdependence in the energy front to wider and diversified economic relations to absorb the periodical bottlenecks that may emerge in the global oil and gas regime. This can be witnessed from the initiatives taken by both India and GCC countries in the global regime to consolidate and assert them in order to survive.

Thus the present study intends to analyze the implications of the unfolding potentials and emerging opportunities of the Indian oil and gas sector in the liberalized phase and its implications for the oil and gas exporting countries of the GCC who are struggling to reposition themselves in global energy scene. The focus of analysis is on the emerging rationale of the relations between India and GCC countries in the present global oil and gas regime, which is to be strategically embedded in the framework of interdependence in order to augment mutually beneficial long term economic relations. The emerging deficits in the framework of a symmetry in the knowledge sector of the GCC countries and energy sector of India is the appropriate tool to garner efforts in order to result in an era of sustained multi-pronged economic interaction between the GCC countries and India.

The major objectives of the study are:

- To analyze the liberalization process in the oil and gas sectors as enabling regime to expand hydrocarbon exploration in India.
- To examine the implications and potentials of the emerging opportunities in the oil and gas sector in the liberalized oil and gas regime of India and the GCC countries.
- To evaluate the emerging complementarities between India and GCC countries in the framework of sectoral interdependence.
- To assess the mutual vulnerabilities arising out of the surging oil and gas demand growth in India and the shrinking Western market share of the GCC countries.
- To suggest a policy regime to extend the interdependence in the oil and gas sector as a catalyst to augment economic cooperation between India and GCC countries.

The present study is based on the following hypotheses:

- The high economic growth rate of India will enhance energy demand including demand for oil and gas in the foreseeable future. The inadequate domestic production of oil and gas will lead to increased imports of oil and gas.
- The shift in global oil and gas demand pattern and liberalization of the oil and gas sector in India creates objective conditions of interdependence between India and GCC countries.
- The new interdependence will hedge against the mutual vulnerabilities of the oil and gas markets of both India and GCC countries.
- Since GCC countries account for major proportion of India's oil imports, India will be susceptible to the developments in the oil and gas sectors of the GCC countries.
- Interdependence in the oil and gas sector will act as a catalyst to augment economic relation between India and GCC countries.

Methodology and Sources

The study is basically based on trend analysis. SWOT (Strength, Weakness, Opportunity and Threat) Analysis has been incorporated in this study to analyze the trends of the global oil and gas market from the perspective of energy fundamentals of India and GCC countries. Attempt has been made to use the framework of interdependence to analyze the interaction between India and GCC countries. The study is based on primary sources including government reports, reports and documents of various multilateral organizations like the UNDP, IMF, World Bank, etc. secondary sources comprise of books, articles and paper clippings. The unfolding events and situations in the global oil market scenario having relevance to the study have been incorporated through the perusal of newspapers, journals and various websites.

The present study is divided into five chapters excluding the introduction and conclusion parts. The first chapter delves into the historical moorings of the global oil and gas regime and the integration of the Middle East into global commercial arena. The focus is on the major players, their rotation in the power hierarchy, the power struggle to capture the larger pie and the institutional arrangements and their implications for the world oil and gas trade, etc. The phenomenon of world energy transition along with its different stages reflecting the share of oil and gas in the world primary energy mix has been highlighted.

Chapter-II focuses on the implications of these aspects of the present regime. It highlights how India is becoming the destination for the oil and gas exports of the Gulf Cooperation Council (GCC) countries.

Chapter-III attempts a "SWOT (strengths, weaknesses, opportunities and threats) Analysis" of the oil and gas fundamentals in India and GCC countries. This will reveal how an increasing pattern of interdependence based on these energy fundamentals is emerging in the present global regime. The first section deals with Indian oil and gas sector from the days of its evolution till the present phase of deregulation and restructuring. The second section focuses on the various emergent issues in the GCC oil and gas sector and their relevance to the stability and sustainability of GCC countries in the present regime. The last section attempts to delineate the emerging pattern of interdependence between India and GCC countries.

Chapter-IV explains the interdependence framework with its implications for energy security of both the oil and gas importing countries (India), and the oil and gas exporting countries of the GCC. Besides this chapter focuses on other aspects of interdependence between India and GCC, such as the opportunities in the liberalized economic regime in the ambit of globalization and the synergy between India and GCC countries.

Chapter-V attempts to analyze how the frame work of interdependence between India and GCC countries in the present oil and gas regime will act as a catalyst to augment broader and diverse economic relation between them, given the fact that India has traditional trading affinity with the countries of the GCC since decades.

In the concluding part, an attempt has been made to devise strategies for the foundation of an 'Energy Charter' comprising India, GCC and other Asian countries to safeguard their mutual interests in the regime.

Chapter 1

Changes in the Global Oil and Gas Regime: A Historical background

The global oil regime has undergone significant changes and transformations over the years. One significant aspect of the transition as witnessed in the present day global oil regime is the market forces determination of each and every aspect of world oil trade. The world oil market in recent years, though, may seem to have stabilised, yet, this is a somewhat new phenomenon. The post-war era saw a lengthy period of stability under the Seven Sisters, followed by a somewhat shorter, but much more exciting period of transition and turmoil in the 1970's, primarily due to the nationalisation of the local assets of foreign companies, and also in some cases through greater participation and/or regulation. Therefore, it can be argued that there was virtually no international oil market prior to the mid-70, as the great majority of crude oil and products trade remained within the systems of the Majors or went directly to third party customers such as Japanese Refiners. Moreover, the spot trading which in fact dominates today's world oil market was minimal in the 1960's and access to oil was primarily through the Majors who produced it. In the present oil regime, the market has undergone a revolutionary shift reflecting spectacular changes and transformations. These changes and transformations include an enormous increase in market freedom and revolutionary shift in the type of market actors leading to a complete reorganisation of these actors in terms of ownership and behaviour, thereby reshaping the global oil regime that is radically in contrast to the 60's and 70's.

The purpose of the present chapter is to examine the veracity of structural changes in the world oil industry as well as the regime transformations over the years. The various facets of the regime transformations will be succinctly discussed in this chapter.

Global Oil and Gas Regime: The Concept

The concept 'regime' in international political jargon[1] refers to 'the process or the procedure that is born of a treaty that the treaty signatories agree to follow'. The treaty usually sets up a goal, a time line and some kind of permanent organisational framework to monitor progress. In other words, regime refers to 'a particular process of interaction among groups within the framework of certain rules, norms and institutions thrive to achieve certain designed goals'. In this

[1]Regime theory developed by Oran Young holds that international cooperation depends on well-designed regimes. If a treaty promotes a well-designed regime, the chance of the treaty being implemented is much greater than if it designates a flawed regime. However, research continues as to what factors constitute a well-designed regime and what motivates states to implement treaties, see Duncan, W Raymond and others, *World Politics in the 21st Century,* (New York: Longman, 2002), p.22 and 606.

way, global oil and gas regime can be defined as 'the interaction among the major players in the international oil and gas industry within the framework of certain rules, norms and institutions (OPEC for oil exporters and IEA for oil and gas importers) to achieve certain designed goals (oil supply security for the oil & gas importing countries and oil & gas demand security for the oil and gas producing states)'. Thus, by global oil and gas regime[2], it is generally meant the whole processes making the world oil and gas market and its different aspects, which include:

- Interaction between the major players in the oil and gas industry–the multi-national companies and the national governments possessing vast reserves of oil and gas–and their struggle for control of the strategic economic commodity;
- The pattern of world oil and gas trade – the key producing and consuming countries, the pricing system, and production/quota, etc;
- The linkages of the Middle East oil industry with the world;
- The strategic interventions to 'control oil,' to achieve certain economic, political and other objectives, by the major players in the game and,
- The process of energy transition-'the shifting balance' from coal to oil to natural gas.

In order to analyse the changes and transformations in the global oil regime, it is prudent to distinguish four different periods in the history of world oil industry. *First*, was the era of early oil concessions during which the existing international oil companies made an early attempt to penetrate and expand into the underdeveloped economies of the Middle Eastern societies[3]. This was done by way of obtaining oil concessions, which means gaining exclusive property rights for exploration, development and production of crude oil in these areas. *Second*, was the period of transition from early concessions up to 1970 during which the global oil industry transformed into today's modern industry. *Third*, was the period in which the oil industry in the Middle East became a full-fledged capitalist entity, integrated in the world market. In this period, due to the internationalisation of all circuits of capital in the oil industry, market values, prices and oil rents were being determined within the international arena, as opposed to the regional markets[4]. *Finally*, the period of market domination due to liberalisation and globalisation after 1980, whereby, there is flagitious

[2] The Global oil and gas regime here can be referred to the various aspects of international oil trade, given the fact that natural gas is a new entrant and its trade though is different to the international trade in oil, yet to take a concrete shape of a regime.
[3] Mikdashi, Zuhayr, A *Financial Analysis of Middle East oil Concessions, 1901 – 65*, (New York: Praeger Publishers, 1966, p. 64).
[4] Cyrus, Bina, *The Economics of the Oil Crisis*, (New York: Merlin Press Ltd., 1985), p. 22.

increase in market freedom, periodical shift in the type of market actors and the reorganisation of the global oil regime[5]. More recently there are debates by bringing the issues in the world oil and gas market in the ambit of the World Trade Organisation (WTO) guidelines. There are issues and concerns regarding the linking up of 'energy services' under the General Agreement on Trade in Services (GATS) as per the WTO guidelines. It can be seen from the recent Mexico Energy debate:

> 'NAFTA failed to open up Mexico's state-owned oil company (PEMEX), but "energy services" negotiations under GATS is a strategic initiative by the Bush/Cheney White House to reduce dependence on oil from the Middle East by increasing access to and control over energy supplies via the break-up of state-owned oil and gas enterprises. Privatizations of PEMEX and electricity delivery services are highly controversial issues, and a global trade summit advancing the privatization of "energy services" could attract much attention. Connecting GATS to Mexico's energy debate and its key constituencies can raise the profile of the WTO Ministerial as well as elevate domestic voices on the global stage. Southern Mexico's rich petroleum resources are also at stake, as energy services liberalization would allow US companies to access more exploration and drilling opportunities in the region. There is currently no organized effort to monitor or influence WTO negotiations on Energy Services'[6].

The above periods can be historically identified as:

- the early period of 1901 - 1950,
- the transitional period of 1950 –1970,
- the period from 1970 up to 1980's and,
- the period since 1980, after the onset of privatisation and globalisation in the world economy.

The changes and transformations of the global oil regime in the first three phases can be attributed to the struggle between the players of the global oil game at two levels: between the foreign companies themselves in their struggles for concessions or Majors against Majors, and between the oil companies and the local rulers over shares in profits. The last phase reveals the vicissitudes of the changing commercials and fundamentals of world oil trade as a result of transformations and paradigm shifts in the global economic thinking.

Emergence of the Global Regime (First Regime)

The real start of the modern oil industry began when Colonel Edwin Drake discovered the first underground oil well of 70 feet deep near Titusville in

[5]For details see, Lynch, Micheal C., "Oil Market Structure and Oil Market Behaviour", *MEES*, 43:52, 25 Dec 2000/44: 1, 1 Jan 2001, p. $D_I - D_{II}$.

[6] http://www.ifg.org/analysis/wto/cancun/plan_cancun.htm.

Pennsylvania on 27 August 1859[7]. Although the main use for oil at that time was for lamp lighting, it did not take long to discover other machines and engines which opened the new opportunities for the use of oil and its products. The expansion of the market was quick and sudden, as oil became the fuel for railways, ships and electrical generators. Consequently the demand increased rapidly and oil companies were quickly formed and no effect spread to find new oil sources and produce more oil to meet the growing market.

The oil resources of the world are unevenly distributed over the earth's surface and the concentration of reserves is not geographically coincident with the concentration of consumption. It was inevitable therefore, that the industry would become internationally oriented and dominated by international trade, which would assume greater importance, as the uses of oil in manufacturing and transport expanded as industrial development spread throughout the world, especially in the Northern Hemisphere. Another facet of the internationalisation of the oil industry was the fact that the capital, technical and manpower resources required to discover and develop reserves were, at the dawn of the 'modern' age of oil industry in the middle of 19th century, also very unequally distributed among the countries of the world and again, were geographically unmatched with the distribution of potential oil reserves. Thus the physical development of world's oil resources required the international movement of capital and specialised skills[8].

Although South-East Asia and Southern Europe including Russia, were important oil producers in the later part of the 19th century, their resources were not only limited than those of the United States but had been developed with foreign capital, technology and manpower, partly, American. Of the countries with extensive oil reserves only the United States was substantially endowed with the requisite capital, technology and manpower to exploit them in the production of oil. With these advantages and a large domestic market United States soon became pre-eminent in the modern technology of drilling and refining and quickly became the world's largest exporter of oil products. Except for a brief period towards the end of the century, it remained so until the Second

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[7] Colonel Edward Drake was an adventurer who used to go on expedition in search for oil using the hand pump technology. For details see Adelman, M. A., *The Genie out of the bottle: world oil since 1970*, (London: MIT press, 1995).

[8] In fact the problem of oil production since the early days of the industry has always been the high sum of capital, technology and skilled manpower. For details, see Penrose, Edith T., *The Large International Firm in Developing Countries: The International Petroleum Industry*, (London: Allen and Unwin, 1968), Chapter-IV.

World War[9]. In fact, the Standard Oil Trust, established by Rockefeller in 1970 had monopoly in the crude sector and controlled 40,000 miles of pipeline in the United States. The Trust was divided into more than thirty companies, among them, the Standard oil Company of New Jersey, later became Exxon, Standard Oil of California (SOCAL), Standard Oil of New York later Mobil, Standard Oil of Indiana and Continental Oil Company[10]. The Standard Oil Trust dominated the petroleum market and the petroleum transportation facilities not only in the United States but also internationally which can be observed from the trends of the then world oil trade. Moreover, five of the seven companies, which are known, as the 'International Majors' are American oil Companies whose origins can be traced to that period of American oil history[11]. Thus United States was the World's most advanced country with respect to large business organisation and its large oil companies were capable of following up their success in export markets, not only with the successful acquisition of foreign crude oil resources to serve their foreign product market, but also with the construction of refineries, transport and distribution systems.

The emergence of Middle East in the world petroleum scene goes back to 1911, when the Turkish petroleum company was established with the purpose of exploring oil in Iraq by the Turkish National Bank owned by the British companies who were already in semi-monopolistic position in the Middle East, which immediately prompted the American 'majors' to penetrate. The American group led by Standard oil Company of New Jersey established a company named the Near East Development Corporation (NEDC)[12], which in fact sparked off the struggle for existence among the major players of the global oil regime in later years.

Most of the oil concessions concluded during the period, 1901 – 1950 in the Middle East had the following features as summarised by Bina Cyrus[13]:

- They all covered the entire or a substantial part of a country for significantly long period of time.
- The number of oil companies involved was fairly small.
- Concession terms were often uniform and simple.
- Royalty payment was the principal financial transaction.

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[9] Ferrier, R.W., and A.Fursenko, ed., *Oil in the World Economy*, (London/New York: Routledge, 1989), Chapter-I.

[10] For details see, Wilkins, Mira, *The Emergence of Multinational Enterprise: American Business Abroad from the Colonial Era To 1914*, (Cambridge Mass: Harvard University Press, 1970).

[11] See Annexure-I for the history of major oil companies in the Middle East.

[12] Shukri, Ghanem, *OPEC: The Rise and Fall of an Exclusive Club*, (London: KPI, 1988), p.7

[13] Bina Cyrus, op. cit., no. 3, pp. 23-24.

- The financial terms were extremely moderate.
- There was little change in the terms and conditions of the concessionary agreements during this period, thereby indicating minimal conflict between parties involved.

The uniformity of the terms associated with such concessionary contracts was the result of the monopolization and financial domination of a small number of oil companies in their successful attempt to impose a set of general terms on all territories. In addition, the royalty rates of the early period were exclusively geared to the extent of political clout of international oil companies and their governments with respect to a particular oil region, the Middle East. Since the economies of the Middle Eastern societies in general, and their realm of oil production in particular, were not yet integrated into the global economy, there was no objective mechanism for joint determination of oil prices and oil royalty rates at the international level during this period. In fact, the system of control of oil production in the Middle East was at the heart of the organisation of the international oil industry. This system was based on a network of consortia, linking all the international majors, which were present in them in a variety of combinations. There were originally four consortia in the Middle East, see table 1.1.

Table 1.1: The main Consortia in the Middle East, 1953-70 (ownership distribution of capital in percentages]

	IPC*	KOC	ARAMCO	IRANIAN
BP	23.75	50	_	40
Shell	23.75	_	_	14
Exxon	11.875	_	30	7
Texaco	_	_	30	7
Chevron	_	_	30	7
Mobil	11.875	_	10	7
Gulf	_	50	_	7
CFP	23.75	_	_	6
Others	5.0	_	_	5
Total	100	100	100	100

Note: * the same combination was found in MPC, BPC, ADPC, PDO and QPC.
Source: Luciani, Giacomo, "The oil companies and the Arab World", London: Croom Helm, 1984, p18.

The first Consortium and historically the most important in determining the shape of global oil regime was the Iraq Petroleum Company (IPC). It was formed in 1928, comprising five out of the 'Seven Sisters' of the 1950s and 1960s. The second type of Consortium was found in Kuwait, which was not included within the Red Line. Its territory was covered by a concession granted in 1934 to the

Kuwait Oil Company (KOC) in which Gulf and BP each held a 50 percent share[14]. The third pattern of Consortium was established in Saudi Arabia. It was started by Chevron (on the basis of an exclusive concession), Texaco, and later by the Aramco on the basis of Saudi Arabian concession. The fourth Consortium was the Iranian, which took control over the Iranian oil after the defeat of Mossadeq's government in 1953.

It has been argued[15] that, these consortiums served many things in the oil regime such as the integration of the world oil industry both horizontal and vertical, which gave birth to the vibrant industry of today's, somehow stability in terms of pegging supply of oil to the ever increasing demand, development of rational oil pricing system etc. Despite these contributions of the consortiums and their allied contributions in shaping the various oil regimes, they have also contributed equally to the oil power game in later years. The proximate factors for this inevitability were the terms of arrangements of the various Consortiums having multiple effects:

> "The Consortiums were not organised primarily as profit making institutions which would try to maximise profits and then distribute it among their shareholders, rather, they were conceived as agencies that would make crude oil available to the shareholders at cost in proportion to their respective shares. Therefore, the crucial point of decision making was only regarding the level of production and programmes of investment, as the basis of future level of production. Moreover, at any moment in time a company was allowed to lift more crude oil than the share to which it was entitled, but had to pay a premium above cost. Thus the most obvious effect of these arrangements was that they discouraged downstream competition, because a company that was successful in increasing its share of the market downstream would be faced by an obvious tendency of all others to restrict crude production and would probably have to accept a competitive disadvantage, which means pay crude at a higher price. Another effect was to slow down the development of the Middle East oil especially in the case of Iraq. However, this would not have been the case if the same Consortium had controlled all the oil supplies of the parent companies"[16].

Competition among the Majors

The period during 1920's and 1930's witnessed an intense competition for the control of oil in Iraq among the major oil companies themselves-first between the British Anglo-Persian Oil Company and British Royal-Dutch Shell, and then between these two companies and the American Majors, principally Standard Oil

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[14] Luciani, Giacomo, *The Oil Companies and the Arab World*, (London: Croom Helm, 1984), p.19.
[15] Ibid, P. 21.
[16] See Adelman, M. A., Op cit No.6, pp. 25-36.

of New Jersey (SONJ)[17]. During the pre-First World War period, it had been widely believed that Iraq was rich in oil, especially in its northern province. A concession granted by the Ottoman Sultan led to the establishment of the Turkish Petroleum Company (TPC) in 1914, controlled by the British. The Anglo-Persian Oil Company held 50 percent of its shares, the Anglo-Saxon Petroleum Company (represented Shell) held 25 percent, and a German investor, the Deutsche Bank, acquired the remaining 25 percent[18]. The collapse of the Ottoman Empire in the First World War, the British conquest of Iraq and the consequent establishment of the British mandatory regime in Iraq strengthened the British government and companies' domination over Iraqi oil. The British government divulged the Deutsche Bank's holdings in TPC, which in 1920 were transferred to the French Government as part of the 'Sam Reno Peace Conference Agreement', and TPC thereby entirely came under British-French control[19].

These developments in the oil regime prompted the several American oil companies to expand their production capacity outside the United States and thus found Iraq's potential most attractive. It can be mentioned that, this period in particular and its aftermath witnessed key oil discoveries in the Middle East, see Table 1.2. These companies succeeded in conjuring up and then exploiting an atmosphere of supply threat in the U.S., managed to impress upon the administration and State Department to interfere and thereby help them achieving a share of Iraqi Oil[20]. After a series of drawn out negotiations, the British Government agreed upon to transfer 25 percent of TPC shares owned by Anglo – Persian to a group of five American oil companies organised as the Near East Development Corporation, dominated by SONJ and Socony–Vacuum. TPC changed its name to Iraq Petroleum Company (IPC) and became a production Joint Venture Company under the multi-ownership of British (47.5 percent), American (23.75 percent) and French (23.75 percent) firms. The remaining 5 percent was offered to an American geologist and businessman, Calouste

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[17] Blair, John, *The Control of Oil*, (New York: Pantheon Books, 1976), pp. 157.
[18] Gilbar, Gad G., *The Middle East Oil Decade and Beyond*, (Frank Cass, 1997), p.18.
[19] Kent, Marian, *Oil and Empire, British Policy and Mesopotamian Oil 1900 – 1920*, (London: Macmillan Press, 1976), pp. 103 – 12, 137 – 55.
[20] Randell, Stephen J., *United States Foreign Oil Policy, 1919 – 1948*, (Kingston and Montreal: McGill – Queen's University Press, 1976), pp. 10 – 14.

Gulbenkian (popularly know as, "Mr. Five Percent") for his service in the establishment of the Turkish – Iraqi Oil Company[21].

Table 1.2: Key Oil Discoveries in the Middle East

Country	Initial Oil Discovery Year	First Oil Field
Iran	1908	Masjid-I-Sulayman
Iraq	1927	Kirkuk
Bahrain	1932	Awali
Saudi Arabia	1936	Damman
Kuwait	1938	Burgan
Qatar	1939	Durkhan
UAE	1958	Murban
Oman	1962	Yibal

Source: Oil & Gas Journal (OGJ), July 9, 2001, p. 23.

Thus, until the early 1930s, most areas of production in the Middle East were in the hands of European Companies, especially, Anglo-Persian, which controlled oil production in Iraq exclusively and which together with Shell, held about half the shares of IPC. The American oil companies had obtained only a small share of Iraqi oil, along with control of the Bahrain Petroleum Company. However, a major thrust was given to the status of American involvement in the Middle East Oil Industry and thereby, initiating the struggle between the Majors and Majors in 1933; when the ruler of Saudi-Arabia, 'Abd al-Aziz Ibn Saud' awarded SOCAL, an American Company, a concession to produce oil in an area of 728,000 square kilometre in the country's eastern province[22]. SOCAL hurriedly divested the ownership of the Saudi concession with another American Company, Texaco, in order to actualise the vast potentials of oil. The two established a joint production company, Caltex in 1936 and in 1938, produced oil in commercial quantities. This joint venture later came to be known as Aramco (Arabian American Oil Company), in 1944.

The growing global oil demand after the Second World War, (see Table:1.3) and the immense production potential in Saudi Arabia tempted two other American Majors; SONJ and Mobil, to join Aramco, which increased total investment in Saudi oil industry and opened up new channels of marketing. The four Majors owned the company jointly, with SOCAL, Texaco and SONJ holding 30 percent of

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[21] In fact the State Department of U.S. insisted that British and French should apply the "Open Door Policy" – which envisages non-discrimination in economic activity within the mandated areas – to which they had committed themselves.

[22] Mikdashi, Zuhayr, *The Community of Oil Exporting Countries*, (Ithaca Press, New York: Cornell University Press, 1972), pp. 21-35.

shares each, and Mobil holding 10 percent. Within the next two decades, Aramco had become the biggest oil producing company in the World and Saudi Arabia, the largest oil exporter in the Middle East and the third largest oil exporting country in the world, together with the United States and the Soviet Union.

Table 1.3: Rates of growth of World oil consumption (%)

Year	World	WECC*	OECD
1950-60	8.2	7.6	7.4
1960-70	8.1	7.9	7.9
1970-73	6.9	6.5	6.6
1950-73	8.0	7.6	7.5
1960-73	7.8	7.2	7.6

*World excluding the communist countries (USSR, Eastern Europe and China).
Source: Noreng, Oystein, "Oil Politics in the 1980s", London: Tata-McGraw Hill, 1978, p.34.

It is here worth-mentioning that, Saudi oil came under American domination at a time when Britain enjoyed undisputed control in the Persian Gulf area and considerable influence among the rulers of Saudi Arabia and when European oil companies still controlled most of the concession area and thereby most of the production area. Significantly, while an intense and prolonged struggle had been waged over the control of the Iraqi oil concessions, the American companies did not have to exhaust themselves in order to win Saudi concessions. In contrast to TPC, Saudi Arabia dropped like a 'ripe plum'[23].

Struggle between Iran and Majors: Nationalisation of oil in Iran and Mexico

The aftermath of the long conflict between the Majors witnessed a new contest for control of oil between a domestic government and one of the Majors, although it indirectly involved all Majors operating in Middle East. In 1944, the Iranian Government approved a proposal by the Anglo-Iranian Oil Company to increase the company's royalty to the Government on the basis of the famous "fifty-fifty" agreements, adopted by the Governments' of Venezuela and Saudi Arabia[24]. And after a month of debate in the Mazlis, a special Mazlis Oil Commission appointed in 1950 and it decided to reject the oil agreement and recommended that the Anglo-Iranian Oil Company be nationalised. All installations of the Anglo-Iranian Oil Company were earmarked to be requisitioned by the newly founded National Iranian Oil Company (NIOC). The British Company did not recognise the nationalisation law as valid and a bitter dispute was carried on between the

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[23]Gilbar, Gad G, Op.cit, no. 14, p.21.
[24] Mikdashi, Zuhayr, Op.cit. no.2, pp. 135-45, 148-51.

Iranian Government on the one hand, and Anglo-Iranian, the British Government and other Majors on the other. This conflict lasted until the military coup of 1953, which derailed the nationalisation attempts of the Iranian Government, and as a consequence, production of Iranian oil retained under the control of foreign companies for many years.

The reason for the failure was that the NIOC could not market the oil it produced, which led to steep fall in foreign currency revenues and consequent deficits in the balance of payments. The inability of NIOC to export oil reflected the prevailing condition in the global oil market in the early 1950s. First, the oil short fall on the global market resulting from Iran's efforts at nationalisation was easily redressed by other sources. Some of the producing states having vast unexploited reserves of oil, far from demonstrating solidarity with the Iranian Government, took advantage of the situation. Secondly, the Majors backed the Anglo Iranian, being aware of the fact that the struggle of the British Company against the nationalisation was of their own. If Iran succeeded in its attempts, it would be repeated in all Middle Eastern oil producing states. Moreover, the Majors still controlled the most of the means of transporting and refining oil (the downstream operations in the 1950s), which enabled them to block the marketing of Iranian oil. They also threatened legal and economic actions in the form of an embargo against any purchaser of Iranian oil[25].

However, the formation of a consortium of foreign oil companies known as 'Iran Oil Participants (IOP)', which replaced the Anglo-Iranian Oil Company, essentially settled the oil dispute in Iran. The consortium consisted of Anglo-Iranian, later known as British Petroleum (BP) holding 40 percent shares; Shell with 14 percent, the American Majors with 7 percent each; the Compagnie Francaise des Petrole with 6 percent and a group of six American independents organised as Iricon Agency with 5 percent. The major consequence of the Iranian attempts to nationalise, then, was the loss of exclusive control by the Anglo Iranian Oil Company and the acquisition of a share in Iran's oil production by all the Majors, both European and American, as well as by a group of independents. Moreover, not a single oil state of the region attempted the process of nationalisation during the rest of 1950s and 1960s, thereby strengthened the position of Majors in the global oil regime.

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[25] Katouzian, Homa, *The Political Economy of Modern Iran*, (N Y, London: NY University Press, 1981), pp. 164-87, as cited in Gilbar, Gad G., op cit., p. 24.

Competition between the Majors and non-Majors or Independents

Changing market condition in the later part of the 1950s and 1960s and again in the early 1970s precipitated a phenomenon that became evident in the global oil regime. The sizeable increase in oil consumption in industrialised economies that lacked abundant energy resources, such as Italy and Japan, forced these countries to seek ways of reducing their dependency on the Majors, which were their chief oil suppliers and thereby reduce rising outlays in foreign currency on oil imports. This led to the formation of a public holding company, ENI, in Italy along with another exploration and Production Company called AGIP, which made vigorous attempts to win production concessions in the Middle East. However, its attempts to secure holding shares in the IOP consortium did not materialise. Moreover, the Majors, which had been pressurised by the US administration and congress to grant holding shares to the American independents, did not feel compelled to respond in a similar fashion to AGIP's pleas for a share in Iranian oil. This compelled the AGIP to acquire production rights in areas outside the concessions granted to Majors, through new agreements based on co-operation in control of production between the foreign company and the domestic Oil Company[26].

The outcome of the ENI agreements was the introduction of the principle of joint control, which became the cornerstone of all new accords between foreign and national oil production companies in the Middle East. These agreements conflicted with what the Majors regarded as the optimal format of the relationship between the foreign companies and domestic government. In fact, the signing of agreements as well as the expansion of operations by non-Majors – American, European and Japanese Oil Companies – in the joint venture framework presaged the end of the era of exclusive control by foreign companies over oil production. Moreover, these developments also undermined the status of Majors in their negotiations with the local governments over both old and new concessions. The emergence of joint venture framework thus contributed to the reversal that took place in the global oil regime to control oil production in the Middle East at the start of the 1970s.

[26]ENI's director, Enrico Mattei set himself the task of breaking the nearly absolute control by the Majors over Middle East oil; through new agreements.

Emergence of OPEC in the World Oil Regime

Towards the end of the 1950s, competition in product markets began to force down the prices of products especially in Europe, which led to the reduction of revenues of the integrated oil companies while the tax price of oil was maintained. The companies cut posted prices in 1959 and 1960, arguing that the reduction was necessary to bring the prices of oil in line with the lower product prices, see table 1.4. The consequent reduction in tax revenues was unacceptable to the oil producing states.

Table 1.4: posted price cuts in the late 1950s.

		1957	February 1959	August 1960
Iranian heavy	31°	1.80	1.62	------
Iraqi Basra	34°	1.98	1.80	1.68
Banias	34°	2.59	2.31	2.15
Kuwait	31°	1.85	1.67	1.59
Saudi Arabia light Ras Tanura	34°	2.08	1.90	1.80
VenezuelaBashaquero	16.5°	2.23	1.85	-----

Source: Economist, 1960, p.1017, as cited in Shukri, Ghanem, p.19.

These new developments witnessed during the 1950s eventually led to the formation of the Organisation of Petroleum Exporting Countries (OPEC), which took control of the global oil regime afterwards. The nationalisation of the Mexican oil industry in 1948, followed by the Iranian oil nationalisation of 1951 provided the impetus to other oil states in the Middle East to act in the same direction, which in fact reflected the serious concern for political and economic sovereignty which could be found in most of the oil producing countries. At the same time, the production of oil gained tremendous momentum, thereby shaping the growth of a modern oil industry in the region. Moreover, as the oil industry developed further, the conditions for the surrender of oil property rights – the fundamental basis of oil exploration – became much more complex. And also the usage of "posted price"[27] came into circulation in the global oil regime.

As a result, OPEC was founded in order to organise the efforts of the principal oil exporting countries to challenge the oil companies in a collective manner. During this period, due to the discovery of large oil fields in the Middle East, the centre of gravity of proven world oil reserves has sharply shifted to the Middle East (See

[27]Posted Price is the price that is "devised for long term oil transactions and contracts and, that is connected with the determination of oil royalties". It is usually a "measure primarily used by oil companies to value crude oil as it was transferred from one subsidiary to another within their own international framework.

Table 1.5). Another important development was the emergence of spot markets,[28] which arguably altered the set up of global oil regime in the decades to follow.

Table 1.5: Crude Oil Discoveries, 1944-1974, (billions of barrels)

Year	World total	OPEC	Middle East	Centrally planned Economies	Capitalist Countries	Others
1974 –	115	75	64	18	14	8
1973 – 1969	51	28	22	11	9	3
1968 – 1964	38	24	17	8	4	2
1963 – 1959	19	13	9	2	3	1
1958 – 1954	34	25	21	4	4	1
1953 – 1949	16	11	10	1	4	-
1948 – 1944	7	5	4	-	2	-
			As Percentages			
1974 –	100	65.2	55.6	15.6	12.2	7.0
1973 – 1969	100	54.9	43.1	21.6	17.6	5.9
1968 – 1964	100	63.1	44.7	21.0	10.5	5.4
1963 – 1959	100	68.4	47.4	10.5	15.8	5.2
1958 – 1954	100	73.5	61.8	11.8	11.8	2.9
1953 – 1949	100	68.7	62.5	6.2	25.0	-
1948 – 1944	100	71.4	57.1	-	28.6	-

Source: Cyrus, Bina, "*The Economics of the Oil Crisis*," New York: Merlin Press Ltd, 1985, Table No-4, p.29.

The formation of the oil cartel marked the erosion of integration witnessed in the global oil regime. During the 1960s some financial concessions were obtained from the companies as OPEC organised itself and formulated its demands.[29] Although the companies were fully aware of the radical movements in the Middle East, they apparently did not realise fully the extent to which the post war spirit of 'resource nationalism' and resentment of 'neo-imperialism' had spread even to the conservative countries of the Middle East, such as Saudi Arabia and Kuwait, whose governments were traditionally friendly towards the West, but who could not ignore the popular sentiments of the Arab world in general. Consequently the companies did not fully understand the effectiveness of OPEC in achieving their objectives.

In 1968 OPEC issued a declaratory statement of petroleum policy in which its objectives were clearly stated[30]. These included the demand that governments should participate in the equity of the oil producing companies and be able to operate directly in exploration and production, and that they should control posted prices. The assumption of ownership and/or control of their crude oil

[28]The spot market is evolved in one time transaction in crude oil, as opposed to the usual long-term contracts between OPEC and the oil companies. In fact, there was no spot market prior to 1970. As a result, the spot market prices themselves have had an impact on the terms of the long term contracts since the time of their development.

[29]For details see, Shurki, Ghanem, op cit.no. 9, part II.

[30]Ibid.

operations by the governments of the oil producing states thus broke a major link in the integration that had characterised the operations of the international companies. This in itself however was not a shock to the international oil economy or for the companies and in fact, the companies continued to lift most of the crude oil produced by their old operating companies[31].

In addition, during 1971-79, the Majors lost control of oil production in areas where they had enjoyed exclusive rights since the 1920s and 1930s, with control of production passing to domestic national companies. In the early 1970s, both Libya and Iraq unilaterally nationalised production concession and rights that had been granted to foreign companies. The other oil producing states in the Middle East avoided unilateral nationalisation of foreign companies, bringing production in their areas under their complete control through an exhaustive sequence of negotiations that lasted throughout most of the 1970s and was called the "participation process"[32] under the auspices of OPEC. The Majors accepted the proposal and the bargaining power of the local governments in the process got enhanced. The main thrust to the bargaining power of local governments was given in October 1973, when OPEC began fixing the posted price of oil in the world oil market without prior negotiations with the Majors. And consequently the control of every aspects of global oil regime shifted in favour of oil producing states.

It can be argued that the success of oil states in the 1970s, where the Iranian Government had failed two decades earlier was the outcome of a change in the basic structure of the world oil industry[33]. *First,* a situation of excess demand prevailed in the world oil market during most of the 1970's, which implied that the capacity for unexploited production in the short and medium term was reduced. Had there been a fall in production and exports form any of the countries as a result of confrontation with the local governments, the foreign oil companies could not have delivered the supply shortages from alternative sources. The fact that disruptions in production, which did, in fact occur in the

[31]Penrose, op. Cit., pp. 122-4

[32]The 'participation process' involved the producer governments buying a share in their concessionaire companies, and getting a direct say in such matters as the relinquishment of concession acreage, the employment of nationals, production rates, and investment in new capacity. For details see, Field, Micheal, *A Hundred Million Dollars a Day*, (London: Sidgwick and Jackson, 1975).

[33] For details see Al-Chalabi, F.J., *OPEC and the International Oil Industry: A Changing Structure*, Chapter-2, (Oxford: OUP, 1980).

winter of 1973[34] could cause tremors in strategy of the local governments with the foreign oil companies. *Secondly*, the oil industry was incomparably more complex and multi-faceted in the 1970s than it had been in the early 1950s. As OPEC was beginning to ascertain control in the late 1960s, the majors' small world of oil had already begun to unravel. Not only had national oil companies (e.g. AGIP/ENI, Total) and American independents (ARCO, Amoco) encroached upon their traditional turf (e.g. Iran), but Japanese 'trading houses' had asked for their share of exploration rights (getting the Neutral zone's offshore) and international traders (among others, Marc Rich, Marimpex and Phibro) had entered the oil fray. Thus by the early 1970s, the majors' resilient structure, which had dominated and managed the world of oil for half a century, was in the process of failing apart. The rule of the industry by a handful of select global companies was coming to an end. The transition from the 'old system' to the 'new system' was bound to be explosive. In the mean time, the industry was in a crisis, because the 'old' was not dead and the 'new' had yet to be born[35]. The Majors lost their oligopolistic status, as; a number of new companies entered this industry. Their share in refining apart from the United States and the Communist bloc fell from 73 percent in 1953 to 49 percent in 1972, and their share in marketing distillates decreased from 72 percent to 54 percent in the same period[36]. As a result, the Majors no longer had the power to prevent a local government that had resolved to nationalise the foreign companies operating in its territory from marketing the oil the company produced. The third factor that had not existed in the 1950s, which affected the power balance in favour of the oil producing countries, was the 'participation principle', under the auspices of OPEC.

Moreover, decisions by individual members of the organisation to nationalise oil production in their territory were backed by the rest of the members- a markedly different policy from that in the 1950s, when the oil producing countries exploited Iran's aborted marketing to increase their market share in the world market. Thus, the local government had not only acquired total oil production revenues, but also, their control of oil production, which provided them with a

[34]In October 1973, there was a double jump in the posted prices, which culminated in the four fold increase by Arab and non-Arab members of OPEC; thereby led to a major oil crisis in the global oil scenario.
[35] Levy, Walter J, *Oil Strategy and Politics, 1941-1981*, (West View Press, 1982), pp.181.
[36] Mikdashi, Zuhayr, Op.cit, No.19, p.37.

weapon of enormous political and economic power at the regional as well as global level.

The OPEC Era and the Second Regime

The brief period since the late summer of 1970, 'Tripoli', 'Carcass', 'Teheran', and then 'Tripoli'[37]again, had witnessed unprecedented demands upon the international oil industry by major oil producing countries, dramatic confrontations with threat to withhold essential oil supplies and far reaching 'settlements'[38]. As a result, the economic terms of oil trade had been radically altered. The balance among oil producing and oil exporting countries, and among oil consuming and importing countries, and oil companies themselves appeared to have shifted decisively in favour of the oil producing countries. The winds of change that had been stirring the oil industry throughout the decade since 1950s rose to hurricane proportions. The aim of the major oil producing countries in this vortex was to maximise their governments' 'take out' of the value of their oil production and to obtain substantial control over oil production. The countries thus organised effectively under OPEC to wield the economic and political power of an oil monopoly.

For their part, consuming countries were faced with appreciably higher prices for their oil imports, which for most countries constitute by far the major part of their total energy supplies and energy costs. Foreign exchange outlays were thus mounting rapidly. And the traumatic experience of confrontation between the industry and producing governments against interruptions, clearly, a very real challenge to the historical structure and operation of the internationally integrated oil industry emerged at a time when demand for oil was increasing swiftly. The relevant figures reveal dramatic upheaval in the global oil regime. Oil consumption in the non-communist world increased form 10 million barrels daily (mb/d) in 1950 to 39 mb/d in 1970 and 67 mb/d in 1980; U.S. oil consumption increased from 7 mb/d in 1950 to 15 mb/d in 1970 and 21 mb/d in 1980; Europe's consumption shot up from only 1.2 mb/d in 1950 to 12 mb/d in 1970, close to that of United States, and in 1980 it was expected to reach around 23 mb/d exceeding that of US; while Japan's consumption zoomed from

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[37]Tripoli, Teheran and Carcass are the venues of negotiations between the oil companies and national governments, under the auspices of OPEC. For details see Ahrari, Mohd. E., *OPEC: The Falling Giant*, (The University Press of Kentucky, 1986), p.130.

[38] Bakhtiari, A.M.Samsam, "The price of oil", *OPEC Review*, Vol.xxiii. no.1, March, 1999, p.5.

100,000 b/d in 1950 to 3.7 million b/d in 1970 and was expected to reach 10 mb/d in 1980[39].

As for the supply of oil, world production paralleled consumption. Western Hemisphere production doubled, from 8 mb/d in 1950 to 18 mb/d in 1970, whereas Eastern Hemisphere production increased about tenfold, from 2.1 mb/d in 1970. The output of OPEC members was 22 mb/d in 1970 and their oil exports accounted for nearly 90 percent of total free world oil trade. Despite discoveries in the North Sea, Far East and elsewhere, it was clear that the world would continue to depend heavily on OPEC to meet mounting oil requirements. Thus the economic terms of global oil regime radically shifted in favour of oil producing states and the occasion had also; been marked by an equally dramatic shift in the institutional and political positions of the industry and of producing and consuming countries.

The second oil regime witnessed an unprecedented increase in the price of crude oil in the scenario of burgeoning world oil demand, thus contributing to the first oil crisis which had ripples flown across the world economy. It was in the late 1960s[40] that forecasts of an imbalance between supply and demand for oil in the 1980s, assuming no radical change in prices, began to influence policy formulation in the developed industrialised countries. By the early 1970s a spectacular increase in American demand for imported oil had created a seller's market. But calculations about the future were upset by the unilateral action of the Arab oil producing countries in October 1973 when, with the outbreak of the war of Yom Kippur, they announced an immediate cut in their production and an increase in the prices of crude oil. The quantitative restrictions on oil supplies were firmly tied to political objectives. Countries 'friendly' towards Israel, chiefly the United States and the Netherlands were formally boycotted while those 'friendly' to the Arab cause were promised preferential treatment. The rest of the world was to receive reduced supplies, which were to be tightened every month until a settlement with Israel- on Arab condition—was reached[41]. The period witnessed almost 70percent increase in the posted prices of crude oil, with special premia for oil of low sulphur content. On 16th December 1973, the new price was doubled again, thus, at the beginning of 1974, the importing countries

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[39] Levy, Walter J, Op. Cit, pp.183-88.

[40] It was in the United States, in the late 1960s that the nature of the impending 'energy crisis' was generally first appreciated. For details see, Rybczynski, T.M., *The Economics of the oil crisis*, (London: Macmillan, 1976).

[41] Rybczynski, ibid, p.2.

were faced with crude oil prices that were three and half to four times what they had been three months earlier. The strength of the OPEC countries waxed even greater over the ensuing year, when they became able to increase the posted prices as well as royalties and greater participation. This raised considerably the income of the OPEC countries, since it means that the original concessionaire's equity, now belonging to the producing government has to be bought back at a price significantly higher than the equity price[42].

Apart from the role of oil as a political weapon which precipitated the energy crisis of 1973, there are two other important contributing factors, such as, first was the determination of the oil producing countries to appropriate control over the extraction and disposition of their major natural resources rather than delegate that power to others. The formation of OPEC as a result of the wave of 'resource nationalism' in the aftermath of Second World War substantiates the above assertions. Secondly, towards the end of the 1960s there was a shift in the balance between supply and demand, largely as a result of the US becoming the largest importer and the Japanese market growing out of all recognition.

However, in the Second Oil Regime, the demand supply vortex altered the regime configuration and in fact had a stronger impact than it did in the first oil regime. From 1974 to 1977 the real price of oil fell about 20 percent. Much of this decline was due to demand slackness and the fact that the spot market for oil showed lower prices than the OPEC price. With the partial elimination of vertical integration through the nationalisation of oil production in the Middle East, a large number of mutually interdependent buyers, sellers and intermediaries came to the field, which created the competition tensed and hence, stronger price fluctuations. In this phase, the spot market and short-term transactions covered a greater proportion of international oil trade than the previous phase. As OPEC countries diversified into downstream operations, such as refining, transportation and even marketing, stronger competition emerged and this moved the prices of production and even crude oil downwards. It should be noted that this might have been caused by OPEC apprehensions about the market, but concern over the long run health of the OECD economies could also have played a role. However, since 1974, till date there has been a greater

[42]For example the participation of the producing country's government increased to 60% in Kuwait and Abu Dhabi, to 55% in Nigeria and to 51% in Libya.

diversification of oil prices according to quality, with particularly low sulphur oil getting a high price[43].

The years 1979 and 1980 witnessed two consecutive rounds of price increases, which pushed the price from $12.00 to $36.00 per barrel. First, a strike by oil workers at the fall of 1978 reduced the Iranian supply and by December Iranian exports had completely stopped as production failed below domestic needs[44]. As percentage of the world output, this reduction in production was nearly twice as large as the worldwide shortfall due to the embargo and cutbacks of 1973 at their worst scenario. However, spot prices rose only moderately because other producers made up all but 1.5 mb/d of the loss. By spring 1979 Iranian production had resumed, but prices reached a high of $38 later that year. As in 1973, during this crisis also OPEC's actions lagged behind the market requirements. At the December 1978 meeting OPEC decided to increase the market price by only10%. By June, while spot price had risen to $38, OPEC announced a ceiling of $23.50 for the official price. Saudi Arabia kept its price even lower at $18. However as the crisis worsened, several countries increased their prices without consulting the agreements, charging up to $38. Successive OPEC meetings aiming at unification of the price structure could not materialise until October 1981.

The first supply disruption was quickly followed by another in the aftermath of the Iran- Iraq war in September 1980. The aggregate cut in supply due to the war was to the tune of 9mbd in 1980 compared to 1978. Prices that had declined during the early part of 1980 to about $36 jumped back to $38. OPEC set its price at $36, while Saudi Arabia sold its oil for $32 per barrel.

Whereas OPEC output remained constant for two years after the 1973 price increase, after 1979 it declined continuously, and never regained its all time high of 32mb/d in the mid-1979. In this period also, production shares changed drastically. Virtually all the decrease in the shares of Iran and Iraq was picked up by Saudi Arabia, who produced less than 30% of OPEC output in 1978 and more than 47% in mid-1981 and its output reached a record 10.6mb/d in the last quarter of the year 1980 after Iraq and Iran had ceased to export[45]. The proximate cause for the expansive Saudi oil production was lower Saudi oil prices than its competitors. It is remarkable that, except for Iraq, all other major

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[43]For details see Adelman, M.A., Op. cit. no. 5.

[44] Cremer, Jacques and Djavad Salehi-Isfahani, ed., *Models of the oil market*, (Switzerland: Harwood publishers, 1991), p.13.

[45] Cremer, Jacques, op. cit., p.15.

OPEC members reduced production, choosing a strategy opposite to that of Saudi Arabia.

The 1980s have been marked by a continuous decline in demand for OPEC oil, a decline in the oil production in Saudi Arabia both in volume and as share of OPEC, the introduction of output rationing by OPEC, and by a drastic fall in the real prices of oil. This development has been attributed to the repercussions of the oil crisis. This period also witnessed the importance of natural gas in the global energy scene[46]. In fact the share of natural gas in the world's primary energy consumption recorded impressive growth in this period. It has been argued that the environment movements of the 1970s and the1980s pioneered by non-government organisations (NGOs) highlighted the importance of natural gas as a fuel compared with coal and oil products when levels of pollution emissions is considered[47]. These developments in fact changed the determinants of global energy consumption in the succeeding years. This has been aptly described through two imperatives[48] such as the self-sufficiency imperative (conservation, domestic energy production, and diversification), and the environmental imperative.

Thus, so long as the oil industry experienced conditions of excess demand and was a sellers' market, the ability to determine the volume of oil produced, influence prices, fix marketing destinations and dictate terms of supply; all imparted political power to the oil state governments. But this political leverage became greatly attenuated when over supply conditions - a buyers' market - began to prevail, from 1983 until the end of the decade, as can be reflected in the succeeding analysis. In these circumstances the producer governments no longer had the freedom of manoeuvre to fix supply destinations and conditions of sale. 'All buyers are welcome' became the axiom in the oil market after 1983[49]

Before analysing the changed scenario after the 1980s, it may be worth mentioning that the Majors played a pivotal role in sustaining oil prices during 1970s and stabilised the global oil market to a great extent. Although the majors lost their economic, political and strategic power in the Middle East, they found ways of sustaining the high level of profits from their operations in the oil

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[46] This aspect will be explained descriptively in chapter-II.

[47] Clegg, Michael W., in ECSSR (ed.), *The Future of Natural Gas in the World Energy Market*, (UAE, Abu Dhabi: ECSSR, 2001), p.1.

[48]Dowling, Edward T. and F.G.Hilton, "The Changing Determinants of Global Energy Consumption", in Shojai, Siamack (ed.), *The new Global Oil Market: Understanding Energy Issues in the World Economy'*, (London: Praeger, 1995), Chapter-3, pp.27-40.

[49] Al-Chalabi, F.J., Op. cit.

industry. The attitude of the industrialised countries towards these companies also changed. After a long period in which policy makers, economists and large sectors of the public censured the concentration of such enormous economic power in the hands of a small group of private enterprises, a revisionist view emerged in 1980's which held that these companies had acted as a stabilising factor for a period of decades in a highly complex system. According to this view, low and stable oil prices until the 1970's had constituted one of the major contributing factors towards the creation of affluent society in the west following the Second World War[50].

Market Forces Domination in the Global Oil Regime (the Third Regime)

This phase of the regime witnessed the development of the international oil industry and trade in a geopolitical environment in which the governments of major oil-importing and consuming countries, and of many oil producers (including Russia since 1993) have generally reduced their attempts to manage economic affairs, including trade and prices across a wide range of subjects, besides energy. Information and communication technology has facilitated instant communication of pricing information and contact offers and acceptances across the world's trading screens. The expertise of other commodity markets, including financial and exchange markets, has been brought to the oil trade. It has been argued that the open international commodity market for oil was not driven by the developments in the importing countries only. It would not have advanced so rapidly if many OPEC governments had not destroyed the trading channels, which previously existed between and within a few major international integrated companies[51]. This can be substantiated from the fact that most of the OPEC countries nationalised or took over by participation the upstream operations of integrated international private sector companies in their territories during the 1970s. And then during the second oil shock they destroyed the 'long term contacts' which maintained special relationships with those companies. Moreover, as a result of two developments such as marketisation and deregulation in much of the world, and de-integration of most OPEC oil exports from the international chain, the world oil market is the central feature of the relationship between producers and

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[50]For details see, Gilbar, Gad G., op. Cit., p.30.

[51] Mitchell, John, et al, *The New Geopolitics of Energy*, (London: The Royal Institute of International Affairs, 1996), Chap-2, p. 8.

consumers in the new geopolitics. Idea of a producer-consumer dialogue at government level, or special favourable bilateral relationships between individual producer and consumer countries, are inevitably marginalised when on the consumer side, markets are open, the state has withdrawn and as a result competition prevails.

The primary change in the global oil regime after 1980 till today is the increased freedom of operations in a variety of ways due to market liberalization. Before the first oil price shock of 1973, nearly all oil moved in the channels of a handful of companies, with the Seven Sisters producing 22 mb/d of oil outside the US in 1972, which was 67 percent of the non-Communist total. Although there were a number of traders in the business, most dealt in regional product market. All the Majors used to sell to independent refiners and did not put oil into the open market. After the crisis of 1973, many oil products were subject to government price controls set by fiat or arcane regulations, even throughout the OECD countries- the major consuming countries. But, now a few of the major-consuming countries' government might attempt to influence product prices, in fact they are rarely doing so[52].

The crude pricing mechanism also has become highly flexible and the great majority of crude is no longer under any control. During the market upheaval of 1970s most OECD oil producers placed price controls on their own production, OPEC posted its official sales prices, which were typically changed twice a year; Soviet Union which was market responsive set its prices through a centrally marketing organization. Therefore, the outcome was that even on a monthly basis, prices were fairly stable when there was no major market disruption.

However, now-days, the above scenario of stable price regime has become a thing of the past. Now OPEC countries index their sales to the prices in the open market, the OECD countries have almost abolished price controls and the Russians like everyone else index their sales to spot markets. As a result, the lengthy periods of relatively stable oil prices of the mid-1970s and early 1980s have disappeared. In other words, before 1986, prices were set and the market cleared as OPEC nations allowed production to fluctuate, whereas since 1986, OPEC nations set production and allow prices to fluctuate to clear the market. Additionally, the movement of oil as an internationally traded commodity has changed considerably, partly reflecting the greater number of actors and partly reflecting dispersion of oil production due to a combination of the drop in FSU

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[52]The product price spikes in the later half of 1990s in the global oil market vindicate the above assertion.

production and the rise of a number of oil producers (though of moderate size) from Angola to Yemen[53]. The spot trade in crude oil and products has also expanded enormously in recent years. According to one estimate, world spot trade in crude oil had grown from 2.5 mb/d in 1978 to over 5 mb/d in the early 1990[54]. Another important change discernible in recent years is the emergence of 'futures market', which is technically a 'paper market', although delivery sometimes occurs.

Another change in the global oil regime earmarked in recent years is the growing importance of both smaller economies and their oil companies. In the 1960s, the Majors were challenged by the small independents but most of them were Americans. Today, not only the vortex of global oil consumption has shifted to the developing countries but also the number of companies operating in these countries has soared. In 1972, US alone accounted for 30 percent of world oil consumption and India 1 percent; now, the respective figures are 25% and nearly 4%[55]. It is a fact that, many developing countries reserved their markets for domestic companies was not a major concern three decades ago; but now those markets are not only large, they are the primary source of volume sales growth and much sought after in the global oil regime. Domestic companies- private or state owned – in developing countries are often avidly courted as partners. It has therefore been rightly remarked that, "Where Texaco was once bigger than the Indian market, now the situations are reversed"[56].

Simultaneously, these developments reflect a shift in the global oil production from the least cost producing areas to the high cost producing areas like, Malaysia, Brazil, etc., where national oil companies are either the operators or partners. Moreover, downstream operations in closed markets like Korea and India[57] has meant that domestic companies dominated there and as their demand has become important on a global scale, so too, the companies have come to have a greater presence in the global oil regime. Recently these companies have begun to invest overseas for the first time[58]. The possible reasons for this development are market oriented policies induced by reforms,

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[53]See *Petroleum Intelligence Weekly*, 18 Sep 2000, p.10.

[54]See *MEES*, 25 Dec. 2000, p. D2

[55]ibid.

[56] *The Economist*, London, 21 March 2000.

[57]India has the largest Grass-root State of the art oil refinery in the world- owned by Reliance Company at Jamnagar, Gujarat.

[58]Some of the initiatives by such companies are: Malaysian Petronas in Africa and Middle-East, Chinese CNPC in Iran and India's ONGC Videsh and IOC in Iran, Indonesia, Central Asia and Russia.

and technology and innovation leading to cost reduction and geographic diversion in oil production in areas hitherto inaccessible in number of countries, especially in the USA.

The other major transformation discernible in recent years is the reorganization of the oil sector, whereby, several largest companies are downsizing their operations and a number of others transforming on a wider scale. The underlying factors responsible for such transformations in the global oil industry are reform (privatization), globalization and consolidation/ mergers.

During 70s, it was widely held that national oil companies provided substantial benefits, including greater attention to social objectives including environment and workforce upgrading. Moreover, oil-importing countries thought having a NOC would ease relations with oil exporting NOCs and many countries, which did not have their own NOCs, established them. However, since the 1970s, a combination of theoretical change and growing experience has resulted in the assertion that NOCs do not deliver many of the expected benefits and that the resulting economic and operational inefficiencies are such that they outweigh any benefits. This led to privatization of NOCs in greater pace. In fact BP, the first national company was also the first to be privatized. Among the developing nations, Argentina's YPF is the most prominent to be privatized, and recently Indian oil industry is joining the ranks of private sector. Another approach prevalent in reforming is the phase of 'commercialization', whereby a Government owned company is ordered to behave as Private Sector Company without changing its ownership status[59].

Another important aspect of transformation is the impact of globalization, which has had one particular thrust in the global oil regime. Companies in the phase of globalizations have increasingly focusing on their strategic operational objectives: profitability, economic success and sustainability measured in terms of market share, size, and strategic investments, etc. and so on[60]. In response to this realization, companies became much more skeptical in their analysis of operations. Companies had no natural constituents for terminating an operation. Companies began to exit regions or sectors, selling of or closing assets

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[59]In fact BP was the first example having effectively become a commercial entity long before it was privatized. Other companies including, PDVSA, Pemex and KPC can be said to have moved at least partly down this path.

[60]For example in the early 1980s US companies were forced to rethink their approaches in response to intense Japanese competition, which compelled them to send executives to Japan to have a thorough look at the Japanese success story.

to both terminate poorly performing operations but also to help bring the sectors back to equilibrium. The best example is the refinery sector[61].

The other aspect of transformation is the biggest ever deals in the global oil industry through mergers and acquisitions (approximately 300 billion dollars). Table 1.6 shows the size of the private companies in 1998, which is aptly due to the process of mergers and acquisitions in the world oil industry.

Table 1.6: Size of Private Companies in 1998 and Impact of Mergers ('000 b/d)

Pre–Mergers			Post-Mergers		
Company	Liquid output	Refining capacity	Company	Liquid output	Refining capacity
Shell	2,354	4,007	Shell	2,354	4,007
Exxon	1,567	4,372	Exxon Mobil	2,502	6,549
BP	1,251	1,874	BP Amoco	2,707	3,377
Amoco	635	1,010	Chevron	1,107	1,585
Mobil	935	2,177	Texaco	930	1,506
Chevron	1,107	1,585	Total Fina Elf	1,503	2,430
Texaco	930	1,506	Repsol/Ypf	722	1,242
Total	564	891	ENI	653	859
Petro Fina	140	716	Conoco	348	807
Elf	799	823	Marathon	196	935
Ypf	518	370	Phillips	235	414
Repsol	204	872			
ENI	653	859			
Conoco	348	807			
Marathon	196	935			
Phillips	235	414			
Amereda Hess	206	495			
Petro-Canada	101	308			
Unocal	203	0			

Source: Petroleum Intelligence Weekly, 20 December 1999.

As the table shows, the merger moved Exxon Mobil up to be the biggest privately owned crude oil producer and refiner, BP closes behind. Moreover, it can be seen from the table that the super Majors remained a shadow of their former selves. Non-has even regained their former production levels and most are below half. Shell, in terms of crude oil production has done the best because its upstream operation were not as heavily concentrated in the Middle-Eastern countries, which nationalized their foreign operators, see table 1.7.

[61]For instance, Japanese companies have closed thousands of service stations. Moreover OPEC countries cut back their investment in export refineries whose profitability has been questionable; even now they are showing resistance to down stream investment overseas, where the returns did not appear attractive.

Table: 1.7: Crude Oil Production of Major Companies, 1950 – 2000 ('000 b/d)

Year	Shell	Exxon	Mobil	Chevron	Gulf	Texaco	BP	CFP	World
1950	459	1,015	129	205	403	190	877	40	9,666
1957	1,215	1,583	350	526	1,025	479	1,000	184	15,680
1966	2,093	2,831	854	1,110	1,710	1,154	2,612	718	27,543
1972	3,531	4,299	1,575	2,690	2,529	2,912	4,664	977	43,029
1986	-	1,715	649	948	Merged	1,047	-	-	44,383
1991	2,082	1,600	753	833	With	685	1,356	-	50,290
1995	2,254	1,622	767	822	Chevron	644	1,213	140	50,060
2000	2,400	2,600	-	1,150		930	2,800	1,500	52,660

Source: Platt's Oilgram News, on the site, http://www.platt.org.

Another aspect of the third regime is the integrated pattern of world energy system evidenced by the rising share of energy crossing borders before reaching final consumers. Energy trade slipped to 40 percent of primary energy use in 1985 {down from 50 percent in 1970} but rebounded after the collapse in oil prices in 1986. By the end of the 20th century this share was approaching 55 percent. The fast growing Asian economies contributed significantly to this increase. Their energy imports tripled between 1985 and 1997, reaching 13 percent of world energy imports. The share of OECD countries in global energy trade dropped 6 percentage points due to stepped up intraregional trade and increased domestic oil production (accounting for 13 percent of domestic oil production in 1990, up from 6 percent in 1985) and gas production (30 percent of domestic gas production in 1985). OECD countries in Europe cut their share of global imports from 25 percent in 1985 to 16 percent in 1997, while North America doubled its share to 8 percent over the same period. In fact the energy self-sufficiency rating[62] increased impressively in the OECD countries, though it declined in the early 1990s. It has been remarked that,

> "The two oil shocks traumatized the global economy and drove most nations to pursue greater energy self-sufficiency. Market forces and ambitious government policies forced entire nations to undertake unprecedented and sometimes painful measures to achieve greater energy self reliance. The 24 members of the Organization for Economic Cooperation and Development (OECD), the world's leading industrialized economies, made particularly strong efforts in this regard. Between 1973 and 1979, OECD's energy self-sufficiency rating increased modestly from 63.2% to 65.4%. Stimulated by the second oil crisis, the ratio jumped to 68.8 percent in 1980 and then increased steadily, to an all time high of 75.8 percent in 1985. Thus the self-sufficiency imperative evidently peaked in 1985"[63].

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[62] It is measured by the ratio of energy production to energy requirements.

[63] Shojai, Siamack, ed., *The New Global Oil Market: Understanding Energy Issues in the World Economy*, (London: Praeger, 1995), Chapter-3, pp.27-40.

Global energy trade remains dominated by crude oil and oil products. Despite steady growth in coal trade and accelerated penetration of natural gas in the 1990s, the share of crude oil and oil products in trade only fell from 90 percent in 1971 to 77 percent in 1997. While trade in coal, natural gas and even oil products expanded largely unaffected by world oil market prices, trade in crude oil definitely responds-though with lag-to market price changes. Thus crude oil remains the world's swing fuel, with Middle East as the swing supplier despite the fact that the Middle East has the lowest production cost.

Developing countries have almost doubled their share of crude oil and oil product imports since 1979. While other major importers such as Western Europe and Japan have reduced their share of global oil trade, the US thirst for oil has reached an all time high accounting for 25 percent of global oil trade in 1999 and declined to 23.61% in the year 2002. In 2002, some 46.27 percent of oil trade originated in the Middle East —up from 38 percent in 1985. This implies the region is back on track to regain market shares of well above 50 percent[64]. Its low production costs (on average, less than $5 a barrel) expose investments in oil production capacity elsewhere to above average risks. It appears in a sense that OPEC countries have regained their market share lost in 1986, and can control oil prices in either direction.

For oil importing countries, concerns about oil import dependence and supply security appear to have given way to market forces and high expectation that new exploration and development will bring new oil to the market at a rate commensurate with demand. Moreover, in the wake of globalisation and non-polarisation, quasi-open access to OPEC oil has accelerated the shift of oil from a strategic good to a commodity, further lowering supply security concerns.

Still the world oil market remained fragile in the recent years. In March 1999, OPEC countries cut production by 85 million tonnes a year, or 2.5 percent of world oil production. This was in addition to an earlier cut of 125 mts. As a result of strong world oil demand, mostly from the rebounding Asian economies and the surging US economy, market prices almost tripled within about a year[65].

Unlike oil, natural gas has yet to play a significant role in global market. Some 20 percent of global gas crosses borders before reaching final consumers. About 75 percent of that gas is traded through pipelines between essentially

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[64] United Nations, *World Energy Assessment: Energy and the Challenges of Sustainability*, UN, 2001, p.34, Ch.1, and *BP Statistical review of World Energy*, London: BP, June 2003, p.18.

[65] World market prices for API Gravity 2 oil were $ 9.39 per barrel in December 1998 and $ 27.55 a barrel in March 2000. For details see, *MEES*, 23 Jan 2001, p. D11.

neighbouring countries. Hence natural gas trade has developed primarily at the regional level or between adjacent trading regions. Pipeline transaction is highly capital intensive and allows little flexibility in the choice of buyers and sellers. However, pipeline gas is traded between production and consumption sites more than 4,000 kilometres apart. The three major regional gas trade markets which have emerged recently are: the almost fully integrated North American market characterised by accelerated growth of Canadian exports to the US market (from 26 mtoe in 1990 to 79 mtoe in 1999). There has also been minor exchange between Mexico and the US. The European market, with the following principal suppliers: the former Soviet Union (with a pipeline producing 108 mtoe in 1999), Norway (pipeline producing 38 mtoe), and the Netherlands (pipeline producing 33 mtoe), and Algeria with minor liquefied natural gas supplies from Libya (pipeline and LNG producing 74 mtoe)[66]. Overall, natural gas trade expanded by 2.7 percent a year in the period 1990-98. A gas market is also emerging to take stride in Latin America, with exports from Bolivia to Argentina and Argentina to Chile. The Asian gas market is dominated by LNG trade, which increased from 47 mtoe in 1990 to 77 mtoe in 1999. The main suppliers in Asia are Indonesia, Qatar, United Arab Emirates, Malaysia, Australia and Brunei. Japan, the Republic of Korea, China, India and Taiwan are the main consumers of natural gas in the region.

Thus, as evident from the above analysis, the domination of market forces led to an overall changed scenario in the global oil regime. The commercial and economic fundamentals of the global oil industry have undergone substantial changes and transformations over the years. The daily market trends, trade patterns and short-term price determination set the present day global oil game as purely commercial. No more the supply-demand balances do conform to the boundaries fashioned by the Cold-War mindset. The traditional rule of thumb of the 'OPEC vis-à-vis non-OPEC' way of thinking about crude oil supplies, though persists, has lost considerable relevance in understanding either current supply trends or future supply potentials. The conventional 'OECD vis-à-vis non-OECD' way of thinking about demand has also become irrelevant. It has now become fashionable to focus on the actual patterns of trade among key oil exporting and oil importing geographic regions and on the main economic growth centres of the world, regardless of their allegiance to or membership of the OPEC or OECD

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[66] For details see, IEA/OECD, *Natural Gas Information 2000*, (Paris: IEA/OECD, 2000).

camps. Thus the global oil market no more resembles the late 60s or early 70s, when the seller was the price setter, be oil companies or national government collectivity under the aegis of OPEC. A number of players have entered into the field and now the buyers set oil prices. It is a buyer's market and is likely to be so in the coming years. The location of market has also changed. Asia-Pacific[67], not the Atlantic has become the major destination of oil, particularly oil from the Gulf Co-operation Council countries.

From the supply side, the oil market trends in the last part of the 1980s and throughout the 1990s indicate cut down of production in the lowest cost producing areas on the one hand and rising production to full capacity in relatively high cost producing areas on the other hand. There has been a clear trend that the relatively high cost producers have become the main incremental supply of crude oil, thereby posing a fundamental challenge to the lowest cost producers, who were traditionally the residual suppliers. This can be attributed to factors such as, first, the vast revenue needs of the lowest cost producers, which have created a huge gap between the price level at which the national oil companies cover all their costs and the price level that balances the overall government budgets[68]; and second, the technological revolution that have driven down production costs in the high producing areas. These factors made vulnerable the lowest cost producers, especially those in the Gulf in the sense that it led to the much-publicized loss of market share and strengthened their inability further to meet overall revenue needs. However, the period after the OPEC decision of 1999 to cut production, particularly the year 2002 witnessed higher prices of oil in the world economy in a scenario of global recession and weakening oil demand. Moreover the production decline in the non-OPEC high-cost producing areas due to low oil prices and low investment in these areas made matters easy for the OPEC to cut down production and regain market share.

Characteristics of the Regimes

The first oil regime can be characterized by an integrated pattern of organization, based in the major consuming countries and a lower price of oil. These two characteristics have been explained in terms of the structure of the world oil industry itself. During the first oil regime, the centre of world oil production

[67]Defined as East Asia, Southeast Asia and South Asia.

[68] Steevens, Paul, "Middle East Oil", *MEED Special Report, MEED*, 16 January 1994, pp.3-8.

gradually shifted from North America to the Middle East. Decreasing exploitation costs and the political dominance of the major industrialized and the then oil producing countries through their oil companies in the fields of investment, technology, and skilled manpower made this shift possible. The industrial consuming countries became increasingly dependent on a limited number of developing countries for oil. Within the first oil regime the basis of the regime's existence was eventually eroded because power shifted to countries whose interests the regime did not serve. The combination of rapidly growing demand and rising exploitation costs (especially in the areas like Alaska and the North Sea) transformed the first oil regime because it led the way for a price increase and institutional change through OPEC control of oil production. This loss of the economic and political basis of the regime explains the abruptness of the transition, once the catalyst of the Middle East dispute set it off.

The first oil regime was thus a private oligopoly with close ties to the governments of the major consuming countries—mostly the industrialised western countries, the economic giants in the world at that point of time, about the year 1940. Oil at that time sold for about two dollars a barrel and the 'Seven Sisters' (seven large transnational companies) determined the amount of oil that would be produced. The price of oil depended on how much the large companies produced and on the demand in the rich countries where most of the oil was sold. Thus transnational companies set the rate of production and prices were determined by the conditions in the rich countries. The strongest powers in the international system in traditionally military terms occasionally intervened to keep the system going[69]. For instance, in 1953, when a nationalist movement tried to overthrow the Shah of Iran, Britain and the United States covertly intervened to return the Shah to his throne. The oil regime was in fact largely then unchanged.

The second oil regime witnessed major changes, after 1970s. The producing countries set the rate of production and therefore had a strong effect on price, rather than the price being determined solely by the market in the rich countries. There was an enormous shift of power and wealth from rich to relatively poor countries. A frequently offered explanation is that the oil producing countries banded together and formed the Organisation of Petroleum Exporting Countries (OPEC). However, it can be argued that OPEC was formed

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[69] Nye, Jr., Joseph S., *Understanding International Conflicts: An Introduction to Theory and History,* (New York: Longman, 2000, 3rd edition, p.189).

in 1960 and the dramatic changes did not occur until 1973[70]. Moreover oil prices fell despite OPEC, so there is much more than this explanation.

The second oil regime can be characterised by a fragmented pattern of organisation and a much higher price of oil. The centre of world oil production was the Middle East, but for physical and most importantly political reasons, supplies of oil did not match the growing demand and the result is the energy crisis affecting all aspects of the global economy. In the second oil regime efforts were made to diversify oil supply sources and to find oil elsewhere other than the Middle East. Also the need for developing alternate energy sources, such as, natural gas, nuclear energy, and hydropower, gathered momentum. The second oil regime like the first eroded the basis of its own existence through its inability---for physical and political reasons—to guarantee sufficient supplies of oil. The second oil regime also witnessed the major oil crises, because of the structural bottlenecks of the world oil market, apart from the political situation in the major producing areas. The definite sources of instability in the second oil regime are: the discrepancy between the technical horizon and the market horizon of alternative sources of energy increased because of the combination of the growing pressure on low cost oil and escalating costs of alternative energy; the discrepancy between the demand for oil from the oil producing countries having production expanding potential and their economic need to do so grew; the discrepancy between the economic requirements of the oil producing countries and their actual income became a real problem; and there was burden on the balance of payments position of the major oil importing countries because of the substantial volumes of oil imports and conversely the accumulation of large currency surpluses in some of the oil exporting countries which with rising oil prices fuelled the crisis.

The second oil regime also witnessed a pattern of interdependence between the consumers especially the industrialised OECD countries and the producers[71]. The pattern of interdependence can be witnessed at four different levels: There was mutual dependence based upon oil trade. The two sides, OPEC and OECD represented respectively more than 90 percent of oil exports and imports; there was mutual dependence based upon trade outside oil. The OECD countries were the major suppliers of food, consumer goods, capital goods, arms, technology,

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[70]Joseph S. Nye, Jr., op.cit., p.190.

[71]For details see Adelman M. A., *The Genie out of the bottle: World Oil since 1970*, (London: MIT Press, 1995).

etc. to the OPEC nations and thus the OPEC countries especially those in the Gulf, provided important export markets to the industrialised OECD. There was mutual financial dependence. The OECD countries were dependent on the recycling of OPEC financial surpluses, and several of the most important OPEC countries had increasing financial interests in the OECD region, implying that the economic health of the OECD area determining the returns on the OPEC financial investments. There was also mutual political dependence created by the geopolitical situation in the Middle East. This particularly concerned the US, which has leverage over Israel, and Saudi Arab, which has some leverage over the other Arab countries.

The changes as enunciated in the second oil regime can be explained in three ways through the dynamics of international political economy. The three mechanisms to explain the changes in the second oil regime are the overall balance of power, the balance of power in the oil issue, and international institutions.

One way of explaining is the realistic changes in the balance of power resting primarily on military force, particularly with regard to the Persian Gulf, the major oil exporting region of the world. Two factors affected the changes in the balance: the rise of nationalism and decolonisation witnessed in the world[72]. In 1960, half of the OPEC countries were colonies of Europe; by 1973, they were all independent. Along with the wake of nationalism, military intervention had become a costly affair. For example, when the British and the Americans had tried to keep the Shah of Iran in 1953, it was not very costly affair, but if the Americans had tried to keep the Shah in his throne in 1979, the costs would have been prohibitive. It is to be noted that the rich countries did not go in and colonise the oil producing countries in 1973 because of the staggering cost of using force against nationalistic awakened people. The change in British power and US also affected the balance of power in the Persian Gulf. Before and during the formation of OPEC, Britain was to a larger extent the policeman of the Persian Gulf. In 1961, it prevented an earlier Iraqi effort to annex Kuwait. But by the year 1971 Britain was insisting on lowering its international defence commitments due to domestic economic difficulties. In 1971, Britain ended what used to be called its role 'east of Suez' and at that time the US stepped in to in support of Greece and Turkey and formulated the 'Truman Doctrine'. But in

[72] Yergin, Daniel, *The Prize: The Epic Quest for Oil, Money and Power, (* New York: Simon & Schuster, 1991, pp. 588-632).

1971, the US was not well equipped to step in and replace the British in the hot seat as it did in 1947[73].

A second way of explaining the changes focuses solely on the distribution of power within the world oil industry. The US used to be the largest oil producer in the world, but American production peaked in 1971. American imports began to grow thereafter and the US no longer had any surplus oil. During the two Middle East wars of 1965 and 1967 the Arab countries relied to the principle of an 'oil embargo,' but to no avail, as the market was flooded with American oil to meet demands from Europe and elsewhere. Once the American production peaked in 1971 and the US began to import oil, the power to balance the world oil regime switched to countries like Saudi Arabia. The USA' role as the supplier of the last resort in the wake of any supply glut in the oil regime got diluted.

Another explanation for the changes in the global oil regime is the changes in the role of international institutions, particularly the multinational corporations vis-à-vis the OPEC. The 'seven sisters' gradually lost power over this period due to their obsolescing bargains with the host countries. At the early stages of the regime the multinational corporations had the monopoly on capital, technology and access to international markets, which fetched them lion's share in the negotiations with the host resource rich countries. But over time with the transfer of huge resources in the form of capital to the resource based countries, these countries made substantial development, which was out of normal business practices, not the proverbial 'international aid politics'. In the course of interaction the multinational corporations train the locals and as a result the locals such as the Saudis, Kuwaitis and others developed expertise in the field. These factors eventually led to the loss of the 'obsolescing bargaining' power of the multinationals with the host countries. Moreover over the course of the period from the 1960s to 1973, the multinationals inadvertently transferred technology and skills that developed the host countries capacity to undertake the oil operations by themselves. As mentioned earlier, further "little cousins" joined the 'seven sisters' who began negotiations with the host countries whenever the major multinationals failed to reach a negotiation. Thus when an oil producing country wanted to free itself from the clutches of the 'seven sisters',

[73]The US was deeply embroiled in the Vietnam and was not prepared enough to penetrate in to the Persian Gulf. The American strategy was relying on influencing the regional powers, by projecting Iran as the regional

it could strike a deal with smaller independent multinational. That again reduced the bargaining strength of the largest multinationals.

Institutionally, there was a modest increase in the effectiveness of OPEC as a cartel. Cartels restricting supply had long been typical in the oil regime, but in the past they had been private arrangements of the 'seven sisters'. Cartels generally have a problem because there was the tendency of cheating among the members, when there was surplus oil in the market. Usually cartel behaviour is used to be smooth in the scenario of scarce oil supply. However with time market forces eroded the significance of cartel in the global regime. OPEC represented an effort to shift from a private to government cartel of the oil producing countries. In its early years, OPEC had trouble exercising power because there was plenty of oil in the market. As long as oil was in surplus, the OPEC had incentives to cheat to get a larger share of the world oil market. OPEC was unable to enforce price discipline from the year it was founded, 1960, until the early 1970s. But after oil became short in supply, OPEC's role in coordinating the bargaining powers of the producing countries increased. The Middle East war of 1973 provided the impetus to OPEC to use the power it has wielded thereof. Though it is a fact that the Arab nations collectively withdrew oil supplies for obvious political reasons, yet the action itself reflects the situations where OPEC could become effective. Over the long term as discussed earlier, OPEC was not able to keep oil prices permanently up because of market forces, but there was stickiness on the downside that was an effect of the OPEC coalition.

A crucial factor was the role of the oil majors in 'smoothing the plain' at times of crises. At one point during the crisis, Henry Kissinger, the then US secretary of state had opined that 'if the US faced 'strangulation', force might have to be used. That was the period when there was cut in traded oil by almost 15 percent and the Arab embargo reduced oil exports to the US by almost 25 per cent. However the oil companies made sure that no one country should suffer much more than the other by redistributing the global supply trade. When the US supply was cut by 25 per cent due to the Arab embargo the companies pumped up more Venezuelan or Indonesian crude to the US market, thus reducing the US vulnerabilities. And it can therefore be argued that the oil majors averted the consolidation of a military conflict ignited by the economic conflict. It is to be noted that the multinationals acted in the interests of the rich nations neither on account of any political pressure nor charity, but on pragmatic commercial purposes of stabilising their market share in the longer term.

In short, changes in three dimensions—the overall balance of power, the issue structure of power and the institutions within the oil regime—explains the dramatic difference between the first global regime of the 1960s and the second global regime after 1973.

The third oil regime witnessed the reorganisation of the world oil industry. The international trade in oil became transparent. The past dominant position of either the importing nations or exporting nations got weakened by the emergence of market forces, which dictate all rules of the game. This regime also witnessed the paradigm of energy transformation, which gave space to natural gas as the preferred form of energy, though the share of oil in the world primary energy consumption remain stagnant.

This regime witnessed the emergence of a number of players in the oil game as the majors gradually lost their grip on the global oil industry. Remaining first and foremost, among the players in the game is the USA- the country that had pioneered in almost every aspect of the industry, dominated it for a whole century and was still able to produce no less than a quarter of global output as late as 1970: with an all time high of 11.3 mb/d. In 1999, the USA still dwarfed all other consumers, by using more than 25 per cent of planetary requirements and importing more than 8mb/d of crude oil. Therefore it has been said that since the days of 'Colonel' Drake, not only were the destinies of the oil industry and the USA closely interlinked, but, moreover, "the rise of oil coincided with the rise of the American Empire and with the attempts by the USA to establish hegemony over the rest of the world"[74]. The second player is the group of major international oil and gas companies, especially the Big Three, which still dominate the lot- as shown in table. Thirdly, there is OPEC heavily influenced by Saudi Arabia, which is incidentally the world's largest oil producer and exporter, the Saudis control a quarter of proven global oil reserves and at the end of 2001 produce 30 per cent of OPEC's output. Major non-OPEC producers (outside the USA) make up the fourth major group. Prominent among them are (in order of their output) Russia, Norway, Mexico, China, Great Britain and Canada. These six major non-OPEC producers accounted for no less than 21mb/d of world output in the year 2000. Fifthly, there are the governments and institutions of

[74]For the dominant position of the USA in the global oil regime over the years, see Shaffer, Ed, *The United States and the Control of World Oil*, (New York: St Martin's Press, 1983).

the major oil importing countries—Japan, Germany, France, Italy and the booming Asian Economies especially India. The sixth player is the amalgam of the multinational banks, financial institutions, and the international futures and forward exchanges. The next position is occupied by the oil and gas industry's 'independent grey cells'- that is, the global 'think tanks' (the Club of Rome), the specialised consultancies (Cambridge Energy Research Associates, Centre for Global Energy Studies, Tata Energy Research Institute, etc.), the various fora and institutes, the oil and gas press (Oil and Gas Journals, Middle East Economic Digest and Petroleum Intelligence Weekly, etc.), and independent market observers such as Dr Paul H. Frankel. Finally the last major player consists of the aggressive environmental organisations (led by Greenpeace) and the ecological non-governmental organisations, which put pressure on their respective governments and the major oil and gas companies through mobilising public opinion. Thus it is the intricacies of these players that shape today's global oil and gas game.

Summing Up

Thus the basic structure and transformations of the global oil and gas regime as described above can be visualised at three stages:

- **The Formative Phase**

This phase includes the origin and development of the modern world oil industry. In this phase the major oil companies completely monopolised the industry until the 1960; right from drilling, producing and refining the crude, distributing the products and finally retailing them to the consumer. As the oil potentialities of the Middle East became apparent, the companies formed a series of consortia to negotiate with the local governments and rules in order to arrange production deals. The Middle East states at that time had no complaints, but were crazy to increase their incomes.

- **The Dominant Phase**

This phase includes the emergence of OPEC and its impact on the whole regime. The event that led to the formation of OPEC was the reduction in price of marker OPEC crude (Arab Light) from US$ 2.08/b to US$ 1.80/b in less than two years by the majors. During the 1960s OPEC patiently formulated the principles of strategy that later enabled them to assume the role of leader of the world oil market. The consolidation and strengthening of OPEC by the end of the 1960s was held first by the extension of its membership from 5 in 1960 to 10 by the end of 1970 and secondly, by the phenomenal growth of world oil demand during that decade which inevitably resulted in increased world dependence on OPEC oil. The Algerian nationalisation of 51 percent of French oil interests in February 1971 followed by the measures taken by Libya against the operating companies including the British Petroleum in December 1971 and the full nationalisation of Iraq in June 1972 led to the liquidation of the majors' stronghold on the Middle East oil production. The pace of the changes was set by the Gulf members, who during 1971-72, succeeded in forcing the oil companies to accept, firstly, the principle that crude prices would no longer be set unilaterally by the companies without consulting the governments of producing countries and, secondly, the inflation and the fluctuation in the value of the US dollar were the factors which would be accommodated in the crude oil prices.

The next important event was the Iranian nationalisation attempts in 1951 followed by the Western boycott of Iranian oil and the Suez Crisis of 1956 which resulted in Arab oil embargo imposed on the West. Although total world oil supply was hardly affected because production increased elsewhere, irreparable damage was caused to the relationship between the companies and the host governments, and it became evident that the producers could act together. Another event that led to the end of majors' monopoly was the decision of the six Gulf members on 16th October 1973, regarding the determination of crude prices as the exclusive right of the oil producing states. Three months later the same six members decided to set the governments' royalty on Arab Light at US$ 7/b with effect from the beginning of 1974, thereby raising the posted price of the marker crude to US$ 11.65/b. This action was soon identified as OPEC policy action and by 1974 OPEC began to act as a unified authority in settling the level of world crude prices. Both in absolute and relative terms, the price assessment of 1974 and 1975 were modest. At the end of 1978 and amid sign of an imminent short term supply disruption, OPEC worked to put an elaborate quarterly price assessment, resulting in an average price increase of 10 percent in 1979 in relation to 1978. The carefully prepared scheme of price escalation was reduced to shambles by the widespread chaos that prevailed in the world oil market during the first week of 1979. The chaos of 1979 was unprecedented and OPEC efforts to cope with the deteriorating situation proved futile, not because there was an actual supply shortage but because that served primarily the interests of oil companies and the major oil consuming and importing countries. In fact in 1979, OPEC export of crude and products was nearly 1mb/d higher than 1978 and the total world production was up by nearly 2.5 mb/d. With the production of OPEC countries at maximum capacity, they neither increased production nor were willing to acquire oil prices two to three times higher. By the end of 1979, OPEC had not only lost its control over world oil regime, but also, the cohesion within its organisation.

This phase witnessed the consolidation of the major oil importing and consuming countries to confront the oil producing and exporting countries in a concerted manner in order to cope with the short-term repercussions of supply disruptions. The importing countries became conscious that they should consolidate themselves through an international multilateral agency to deal with supply disruptions. The major companies through established markets managed the oil sharing that took place during the embargo. As a consequence, in December 1973, US Secretary Kissinger proposed that the US, Japan and the nations of Western Europe should form an international organisation of consumer countries in order to promote united actions in energy problems. This resulted in the formation of the International Energy Agency (IEA) on November 1974 as an autonomous agency within the Organisation for Economic Cooperation and Development (OECD).

- **The Transformation Phase**

This phase witnessed declining importance of OPEC as an influencing factor in the world oil trade to some extent. This accompanied by the built-in rigidities of the industry itself and the paradigm shift of global economic thinking led to various structural changes in the global regime. It was not until October 1981 that OPEC managed to restore its cohesion to uniform its pricing structure on the basis of a price of US$ 34/b for the marker crude. The achievement was too late to correct the imbalance in the market. The oil companies and the consuming countries had accumulated very substantial oil inventories, the market had been fragmented, and the role of speculators and mediators had increased. The most important factor was the impetus provided by higher oil prices to the conservation efforts on the one hand and the development of other energy sources, especially non-OPEC oil on the other. Thus the organisation was faced with the classical dilemma of declining world oil demand and increased non-OPEC supplies, which left the OPEC members, particularly the Gulf members with two options: to reduce its over all production in order to confirm its official price structure or to reduce prices in order to discourage the development of high cost non-OPEC crude. This implied a drastic reduction of total OPEC oil revenues. In March 1982, OPEC decided to reduce its total production to 18 mb/d. One year later it decided to reduce prices by US$ 5/b. But with world oil consumption remaining virtually unchanged, the price reduction could not arrest the declining trend of OPEC's share in world oil production. In fact by 1985, OPEC's share had dropped to as low as 40 per cent. Even though OPEC had reduced its over all production ceiling to 16mb/d at the beginning of November 1984 in an attempt to cause destabilising impact on the North Sea production. The member countries found it difficult to market their reduced production quota at official prices. Consequently a variety of marketing practices which involved direct or indirect discount on official prices, were offered. At this point of time there was general impression in the market that OPEC had given up its policy of defending prices and bent upon initiating a price war on out side producers. As a result, prices continued to drift downward and by July 1985 the price was below US$ 10/b, a level that, in nominal terms were lower than that of 1974. These factors culminated in what is known as 'reverse oil shock'. As noted by El-Beblawi[75]:

> "On January 24, 1983, almost a decade after the first oil shock, Ahmad Zaki Yamani, the Saudi oil superstar declared at the end of a Geneva OPEC meeting, "There has been a complete failure", "I do not see a bright future". On March 14, 1983, OPEC could finally agree on quota production and a new marker price for the Arabian Light, cutting it from $34 to $29-the first such cut in OPEC history. The 'oil glut' took over from 'energy and oil crisis' as catchwords in headlines and news media. From a seller market with all sorts of premiums, oil is becoming a buyer market also asserted with all kinds of discounts. OPEC production declined from its peak of about 31 mb/d in 1979 to less than 17 mb/d in 1983, thus reducing its share in oil trade from about two thirds in mid-seventies to less than 45 percent in early eighties. All this sounds new and strange; the "New Oil Order" seems to be threatened with a different oil shock, a 'reverse oil shock' this time".

However, though stability ensured in 1987, yet OPEC members pledged to defend fixed prices.

On the demand side of the global oil and gas regime, the Eastern Countries or the developing world, especially the Asian countries took centre stage on the consumption front, replacing the industrialised west. Though the USA is still World's largest oil consumer in the world till today, yet the newly industrialising and mature economies of the Asian region such as India, China, and Korea, etc, are becoming prominent on the energy consumption front due to their economic performance and future potentials. The important aspect of the transition is that

[75] El-Beblawi, Hazem, *The oil Decade: An Appraisal in Perspective*, (The IBK Papers, Series No.10, Kuwait: The Industrial Bank of Kuwait K.S.C., September 1983, p.42).

these new consuming and importing countries are poised to replace the industrialised countries such as North America and Europe as the only market for the World's only Producing and exporting region-the Gulf region. And somehow the contours of the present regime have made the Gulf region to be dependent on these emerging consuming and importing regions for a secure stable outlet for their energy exports.

Thus, the global oil regime has undergone substantial changes and transformations over the years. The dynamos of the changes and transformations as evident from the above broad analysis not only transformed the demand as well as supply side of the global oil game, but also radically altered the players in the game. In the initial phase the Majors were dominant and the period also witnessed the confrontation among the majors to secure the dominating position. The next phase witnessed the confrontation between the Majors and the possessors of the black gold and consequent formation of oil Cartel (OPEC) weighing massive economic as well as political prowess. The next phase saw gigantic transformations in the commercials and fundamentals of the global oil regime, where market forces of demand and supply determine each and every aspect of the game.

Chapter II

Changing Pattern of the Global Energy Trade: India, a Destination for the GCC Countries Oil and Gas

As discussed in chapter I, the most significant aspects of the present global oil and gas regime are: the pattern of energy transformation, whereby natural gas's share in the world's primary energy mix is increasing and that of oil is somehow stagnant; the increasing importance of the major Asian economies in the global oil and gas consumption on account of their burgeoning economies; and the penetration of a number of non-OPEC oil and gas producers to the global oil and gas market, which in fact has posed severe threats to the OPEC producers, especially those in the Gulf. This chapter will focus on the implications of these aspects of the present regime. It will highlight how India is becoming the destination for the oil and gas exports of the Gulf Cooperation Council (GCC) countries[76].

With a lapse of three decades after the oil crisis, the world's energy mix/energy map has changed drastically. In 1972, immediately before the first oil crisis, the world's primary energy mix was composed of oil (47.3%), natural gas (18.0%), coal (32.5%), hydro (2.0%) and nuclear (0.2%). In 2002, or 30 years later, it was made up of oil (37.5%), natural gas (24.2%), coal (25.5%), hydro (6.5%), nuclear (6.3%), thus showing the share of oil and coal shrinking, while that of natural gas and nuclear rising. North America/Europe accounted for 52.2% of the world's primary energy consumption in 1972, but its share shrank to 43.4% by 2002. Over the same period the share held by the Asia Pacific region swelled from 16.4% to 28.9%. The world's primary energy consumption increased at an average of 1.8% a year during the past three decades. A closer examination unveils that, aside from the two oil crises, a crucial point of changing energy scenario was the sharp economic plunge resulting from the demise of socialism in the FSU/East Europe in 1990[77]. With 1990 taken as a peak, primary energy consumption of the FSU/East Europe has slumped to about two-thirds. This region had accounted for 22.2% of the world's primary energy consumption in 1990, which contracted to 12.3% by 2002.

World Energy Supply, Demand, Consumption and Trade Pattern
Supply and Demand of Oil
Oil Production

The world's oil output grew at an annual pace of 1 on average during the period 1972-2002 (see Table 2.1). The North American oil production, accounting

[76] Gulf Cooperation Council (GCC) Countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE.
[77] Fujime, Kazuya, 'How the world's energy supply-demand/trade structure haves changed during 30 years since the oil crisis?' The Institute of Energy Economics (IEE), Japan: IEE, October 2003.

23.6% of the world's output in 1972, had its share falling to 20.0% in 1982, 16.0% in 1992 and further to 13.7% by the year 2002. The rate of decline averaged 0.8% in 30 years. During 1972-1982, as a reaction to the price hikes during the oil crises, oil production in the Middle East plunged by about 30% over the ten years, and its share in the world's oil production shrank from 34.1% to 23.4% as well. With 1982 as a border, as a result of lower prices, the Middle Eastern oil production increased by 1/6th fold by the year 2002 and its share increased to 28.5%. Likewise, the African oil production, down by about 20% in ten years with the share shrinking from 10.7% to 8.2%, rebounded 1.7 times by 2002. It is Latin America, West Europe and Asia Pacific (this region alone marked a slower growth in the 1990s) that have been on the constant rise in the 30 years. Their shares in the world's total production, 6.0%, 0.8% and 5.1% respectively, expanded to 8.4%, 14.5% and 10.7% each 30 years later. East Europe/FSU on their part showed characteristic moves due to economic crisis. In 1972-1982, their oil production grew 1.9 times and the share went up from 15.9% to 22.9% of the world's total. But, after the crisis, production plunged by about 40% by the year 2002 within 20 years. The share slumped to 13.7% as well.

Table 2.1: The Trends of Oil Production (shares) by area in the World

Area	1972	%	1982	%	1992	%	2002	%
North America	621.0	23.6	559.6	20.0	510.0	16.0	486.0	13.7
Latin America	255.6	9.7	329.9	11.8	400.2	12.6	514.1	14.5
Western Europe	22.3	0.8	147.5	5.3	213.6	6.7	296.8	8.3
Eastern Europe, FSU	419.7	15.9	639.6	22.9	482.0	15.1	487.4	13.7
Middle East	898.6	34.1	653.1	23.4	914.0	28.7	1,014.6	28.5
Africa	282.1	10.7	228.9	8.2	332.4	10.4	376.4	10.6
Asia Pacific	134.5	5.1	235.9	8.4	334.7	10.5	381.4	10.7
World Total	2,633.8	100.0	2,974.5	100.0	3,186.8	100.0	3,556.8	100.0

Source: BP Statistical Review of World Energy, London: Pauffley for BP, Various issues on the site, http://www.bpamoco.com/worldenergy/

Oil Consumption

The world's oil consumption also grew at an identical pace, up 1% a year on average during 1972-2002. The two oil crises during the 1970s had the gravest impacts on the advanced industrialized countries, such as; oil consumption in North America dropped by about 10% in ten years of 1972-1982 and that in West Europe down by 15% or so, with their shares in the world shrinking from 33.3% and 27.1% each to 27.9% and 21.6% respectively. Japan's oil consumption dropped by about 20%. On the other hand, during 1972-1982, Latin America, the Middle East, Africa and developing areas in the Asia Pacific had not been oil-dependent so much as severely hit by the oil crises. In the 30 years of 1972-2002, these regions all had their shares swelling from 6.0%, 2.2%, 1.7% and 15.8% (a total of 25.7%) to 8.4%, 5.9%, 3.4% and 28.2% (a total of 45.9%). East Europe/FSU consumed about 40% more oil than before during 1972-82 (with their world share up from 14.3% to 18.4%), which, however, conversely shrank by about 40% during the period 1992-2002 (with the world share down just half to 9.2%). The trends can be seen from Table 2.2.

Table 2.2: The Trends of Oil Production (shares) by Area in the World

Area	1972	%	1982	%	1992	%	2002	%
North America	855.1	33.0	778.4	27.9	859.0	27.1	984.0	27.9
Latin America	154.5	6.0	214.7	7.7	246.9	7.8	295.7	8.4
Western Europe	701.8	27.1	601.6	21.6	650.5	20.5	599.8	17.0
Eastern Europe, FSU	370.1	14.3	512.2	18.4	412.0	13.0	325.4	9.2
Middle East	56.9	2.2	122.5	4.4	173.7	5.5	207.4	5.9
Africa	44.7	1.7	77.9	2.8	97.0	3.1	118.6	3.4
Asia Pacific	409.3	15.8	480.6	17.2	731.3	23.1	991.6	28.2
World total	2,592.4	100.0	2,787.9	100.0	3,170.4	100.0	3,522.5	100.0

Source: BP Statistical Review of World Energy, London: Pauffley for BP, Various issues on the site, http://www.bpamoco.com/worldenergy/

Supply and Demand of Natural Gas

Natural Gas Production

The world's natural gas production grew at an annual average of 2.6 during the period 1972-2002, thus, growing at nearly threefold faster than the world's oil production growth. However, just like oil production, the North American natural gas production entered the resource depletion period and its world share kept falling from 59.2% in 1972 to 39.6% a decade later, 31.4% two decades later, and 28.9% three decades later. It is the share of the developing countries of Latin America, the Middle East, Africa and Asia Pacific, that have been on the constant increase during 1972-2002, with their shares up from 6.0%, 2.2%, 1.7% and 15.8% (a total of 25.7%) to 8.4%, 5.9%, 3.4% and 28.2% (a total of 45.9%), respectively. The share of West Europe has remained virtually flat at around 10% throughout the 30 years. The share of East Europe/FSU surged from 22.5% in 1972 to 34% in 1982 and further to 37.6% in 1992, which, however, slumped to 28.4% in 2002. Because natural gas is produced nearer to consuming areas (i.e. lesser trade) than oil, natural gas production trends are akin to its consumption moves. The trends can be seen from Table 2.3.

Table 2.3: The Trends of Natural Gas Production (shares) by Area in the World

Area	1972	%	1982	%	1992	%	2002	%
North America	626.4	59.2	522.9	39.6	578.1	31.4	658.1	28.9
Latin America	37.3	3.5	60.6	4.6	78.4	4.3	124.0	5.5
Western Europe	102.7	9.7	148.8	11.3	165.2	9.0	242.5	10.7
Eastern Europe, FSU	237.9	22.5	452.2	34.2	691.3	37.6	646.8	28.4
Middle East	24.2	2.3	36.7	2.8	102.7	5.6	212.0	9.3
Africa	5.8	0.5	30.8	2.3	67.7	3.7	119.9	5.3
Asia Pacific	23.4	2.2	68.6	5.2	157.1	8.5	271.4	11.9
World total	1,057.7	100.0	1,320.6	100.0	1,840.5	100.0	2,274.7	100.0

Source: BP Statistical Review of World Energy, London: Pauffley for BP, Various issues on the site, http://www.bpamoco.com/worldenergy/

Natural Gas Consumption

The share of North America in the world's natural gas consumption, which was 60% in 1972, fell below 30% in 2002, or registered a decline of half of the 1972 level. On the other hand, in reflection to advancing oil-to-gas shifts, etc., West Europe boosted its share in the world's natural gas consumption from 10.9% in 1972 to 16.0% by 2002. Developing countries of Latin America, the Middle East, Africa and Asia Pacific which held 3.5%, 2.0%, 0.2% and 2.0% (a total of 7.7%) shares in 1972, respectively expanded to 5.5%, 8.1%, 2.7% and 13.0% (a total of 29.3%) by 2002. East Europe/FSU, responsible for 21.4% of the world's consumption in 1972, expanded its share to about one-thirds of the world during 1982-1992, which subsequently recoiled to one-fourths as a result of the breakup of the socialist system. By the way, comparing oil and natural gas consumption in equivalent heat quantity terms, the latter, having remained at one-fourths of the former in 1972, approached two-thirds of the former in 2002. The trends can be seen from Table 2.4.

Table 2.4: The Trends of Natural Gas Consumption (shares) by area in the World

Area	1972	%	1982	%	1992	%	2002	%
North America	626.7	60.0	511.5	38.9	589.7	32.1	673.3	29.5
Latin America	36.4	3.5	61.6	4.6	80.8	4.4	126.1	5.5
Western Europe	113.5	10.9	181.1	13.8	253.6	13.8	365.1	16.0
Eastern Europe, FSU	224.0	21.4	441.6	33.6	615.0	33.5	574.4	25.2
Middle	21.0	2.0	31.7	2.4	99.6	5.4	185.1	8.1

East								
Africa	2.4	0.2	22.8	1.7	36.2	2.0	60.7	2.7
Asia Pacific	21.0	2.0	65.9	5.0	161.3	8.8	297.3	13.0
World total	1,045.0	100.0	1,315.7	100.0	1,836.2	100.0	2,282.0	100.0

Source: BP Statistical Review of World Energy (Various issues), London: Pauffley for BP.

Energy Trade

Among primary energy sources, those subject to cross-border transactions (trade) include oil, natural gas and coal. Energy trade no doubt occupies a considerable portion of traded goods both in value and in volume. Particularly, oil is traded in huge quantities because its producing centers are located far from consuming areas.

Oil Trade

About 60% of oil output is exported. In other words, about 60% of oil consumption is covered with imports. Of oil imports/exports, crude oil accounts for 76.7% and petroleum products the remaining 23.3% (2002). It is America and the rest of consuming areas, largely consisting of such developing countries as China and India, that recorded growing oil imports in terms of both volume and world share. The American oil imports increased by an average 3.0% per year in 30 years of 1972-2002, with its world share rising from 15.8% in 1972 to 26.0% in 2002. Oil imports by the rest of consuming areas increased by an average 2.9%per year during 1972-2002, and its share went up from 21.6% to 35.1% over the same period. Oil imports by these two areas kept swelling even during 1972-1982, the period of the two oil crises. Oil imports by Europe and Japan declined by 30.9% and 13.2% respectively during 1972-1982. On top of economic stagnation, energy conservation and oil substitution, the sharp decline in Europe's oil imports reflected rising self-sufficiency thanks to the start of full-scale crude oil production in the North Sea. The world shares held by the two (Europe &Japan) alike contracted from 46.7% and 15.9% respectively in 1972 to 27.3% in 1982 and to 11.6% in 2002. With these imports-growing and imports-falling areas combined, the world's oil imports dropped 13.8% during 1972-1982. But, having boosted later, the growth averaged 1.2% per year throughout the period 1972-2002. These trends are shown in Table 2.5.

Table 2.5: The Trends of Oil Imports (shares) by Area in the World

Area	1972	%	1982	%	1992	%	2002	%
USA	4,740.0	15.8	5,040.0	19.4	7,888.0	23.6	11,357.0	26.0
Europe	14,060.0	46.7	9,717.0	37.5	10,319.0	30.9	11,895.0	27.3
Japan	4,785.0	15.9	4,155.0	16.0	5,306.0	15.9	5,070.0	11.6
Others	6,510.0	21.6	7,020.0	27.1	9,884.0	29.6	15,306.0	35.1
World total	30,095.0	100.0	25,932.0	100.0	33,397.0	100.0	43,628.0	100.0

Source: BP Statistical Review of World Energy, London: Pauffley for BP.

Analysing oil trade from the oil-exporting side, the world's total oil imports equal the world's total oil exports, in statistical terms. As a result of consuming countries' responses to the oil crises, combined with the policy of production curtailments taken by the OPEC, the Middle East and African oil producing countries, especially the Gulf OPEC countries, came to hold lesser weight in the world's oil exports than before. Exports from the former Soviet Union temporarily declined due to the economic collapse. But, reflecting subsequent developments, like shrinking domestic consumption and stronger wills to earn hard currency by boosting exports, exports from this area have been on the sharp rise in recent years.

Exports from the Middle East plunged by 31.2% during the period 1972-1982, but later rebounded to 59.5% during 1982-2002. Its world share slumped from 56.3% in 1972 to 41.3% by 2002. Shipments from Africa slumped sharply by 32.4% during 1972-1982, and then picked up as much as 57.9% during 1982-2002. Its world share fell from 17.9% in 1972 to 13.2% in 2002. Exports from the former Soviet Union slightly more than doubled during 1972-1982, then, despite a 12.1% fall registered during 1982-1992-attributable to shattered socialism-rebounded by more than 2.3 times during 1992-2002. Its world share rose from 4.2% in 1972 to 12.2% by 2002 (see Table 2.6).

Table 2.6: The Trends of Oil Exports (shares) by Area in the World

Area	1972	%	1982	%	1992	%	2002	%
North America	1,310.0	4.4	1,300.0	5.0	2,019.0	6.0	2,863.0	6.6
Latin America	3,720.0	12.4	4,135.0	15.9	3,843.0	11.5	4,931.0	11.3
Western Europe	325.0	1.1	0.0	0.0	435.0	1.3	2,234.0	5.1
Eastern Europe, FSU	1,260.0	4.2	2,612.0	10.0	2,298.0	6.9	5,370.0	12.3
Middle East	16,950.0	56.3	11,660.0	45.0	15,453.0	46.3	18,062.0	41.3
Africa	5,390.0	17.9	3,645.0	14.1	5,093.0	15.2	5,754.0	13.2
Asia Pacific	1,090.0	3.6	1550.0	6.0	2,414.0	7.1	2,863.0	6.6
Others	50.0	0.2	1030.0	4.0	1,842.0	5.5	1,551.0	3.6
World total	30,095.0	100.0	25,932.0	100.0	33,397	100.0	43,628.0	100.0

Source: BP Statistical Review of World Energy, London: Pauffley for BP.

Natural Gas Trade

Natural gas is traded in two ways, that is, through pipelines and by LNG tanker after liquefication. As of 2002, pipeline-based trade accounts for three-fourths of total, and LNG tanker-based the remaining one-fourth. Of natural gas produced in 2002, about 20% were exported. During the period, 1989-2002, natural gas trade[78] (exports/imports) expanded by 5~6% per year on average. Imports expanded particularly at a faster pace in America and Asia Pacific, where imports surged by an average 8.7% and 7.0% per year respectively during 1989-2002. Their world shares increased from 13.4% and 16.2% each in 1989 to 17.3% and 17.6% in 1992 and further to 19.8% and 19.2% in 2002. Natural gas imports by West Europe grew 5.3% per year on an average during the last 13 years, with its world share falling mildly from 49.9% in 1989 to 49.2% in 1992 and to 47.0% in 2002. The moderate fall can be attributed to increasing self-sufficiency of the North Sea natural gas production. Natural gas imports by East Europe from the former Soviet Union dropped due to rising prices, etc. after the FSU breakup. Later, the import level was restored but remained flat as an underlying trend. Table 2.7 depicts the above trends.

Table 2.7: Trends of Natural Gas Imports (shares) by Area in the World

	1989	%	1992	%	2002	%
USA	39.2	13.4	59.6	17.3	115.4	19.8
Canada	0.7	0.2	2.7	0.8	6.0	1.0
Latin America	2.3	0.8	5.0	1.5	17.9	3.1
Western Europe	143.0	49.9	169.5	49.2	273.0	47.0
Eastern Europe	50.0	17.5	36.4	10.6	50.9	8.8
Middle East	3.6	1.3	0.0	0.0	4.9	0.8
Africa	1.2	0.4	0.7	0.2	1.5	0.3
Asia Pacific	46.3	16.2	60.6	17.6	111.8	19.2
Total World	286.3	100.0	344.5	100.0	581.3	100.0

Source: BP Statistical Review of World Energy, London: Pauffley for BP.

The world's total natural gas imports have expanded at the same rate as the world's total natural gas exports. Natural gas exports from Canada grew by 8.9% per year on an average during 1989-2002. It was in a reverse direction in relation to the soaring natural gas imports by America. Canada's share in the world's total exports jumped from 13.2% in 1989 to 18.7% in 2002. Natural gas exports from Asia Pacific swelled 5.4% per year on average during 1989-2002. Its world share expanded from 14.5% in 1989 to 16.7% in 1992, but reversed to the 14% mark, or 14.1% by 2002. Natural gas exports from West Europe increased by an average 6.5% per year during 1989-2002, but its world share leveled off at 22%. The growth of natural gas exports from the FSU remained at 2.2% per year on average during 1989-2002, with its world share declining from 34.9% in 1989 to 22.9% by 2002. When combined, developing countries of Latin America, the

[78] Natural gas trade statistics are available only from 1989 onward.

Middle East and Africa had their world shares rising from 13.9% in 1989 to 19.9% in 2002, see Table 2.8.

Table 2.8: Trends of Natural Gas Exports (shares) by Area in the World

	1989	%	1992	%	2002	%
USA	2.0	0.7	6.9	2.1	15.1	2.6
Canada	37.9	13.2	58.3	17.4	108.8	18.7
Latin America	2.3	0.8	2.2	0.7	15.2	2.6
Western Europe	64.9	22.7	71.8	21.5	126.6	21.8
Eastern Europe	100.0	34.9	99.1	29.6	133.1	22.9
Middle East	6.7	2.3	3.4	1.0	34.1	5.9
Africa	30.9	10.8	37.0	11.1	66.2	11.4
Asia Pacific	41.6	14.5	55.8	16.7	82.2	14.1
Total World	286.3	100.0	334.5	100.0	581.3	100.0

Source: BP Statistical Review of World Energy, London: Pauffley for BP.

Thus in almost all the countries of the world, oil is consumed. Until 1990, the degree of concentration in demand and supply were indeed quite similar. The top five consumers and producers account for more than half of each world total, and the top ten of each for around two thirds of world consumption and production. These patterns of demand and supply overlap, mainly because the US and the FSU were until 1990 the world's largest oil consumer and producer. More than half the world's oil is consumed by the twenty-four member countries of the organization for economic cooperation and development (OECD), the rich countries club of the post-war generation, which account for only about 15 per cent of the world population. In 1990, oil represented about 43 per cent of these countries total energy consumption. By the end of the year 2002, it was around 39 per cent. The interesting fact is that these countries have leveled off their oil consumption throughout the 90s and increased the use of other energy sources, especially the use of natural gas. Natural gas accounts for more than 24.3% of their total energy consumption. These countries also account for nearly 62.9% and 54.6% of the world oil and natural gas consumption respectively (at the end of 2001). Comparably the FSU was consuming only 13% of world oil and 0.33% of gas. China with four times more population was using only 3% of oil at that time. And at that time, India with population that next to China was using negligible percentage of world oil and gas. Soviet oil consumption leveled off during the 1980s, with its command economy pushing through a determined switch to natural gas. Indeed the whole communist bloc managed to stabilize oil consumption. But none of the countries then leveled as 'centrally planned economies' has achieved nearly as much energy conservation as most of the OECD members. With far lower per-capita national income, these countries used energy much less efficiently. These countries, comprising 75% of the world population consumed only 24% of the world's commercial energy in the year 1990. Their per-capita energy consumption varying from only about 125 kgs to 1 ton of oil equivalent annually, was tiny compared with over 5 ton per head in the OECD countries. But these poor countries energy consumption went on growing rapidly during a decade and half of sharply increased and then unstable oil prices, while the OECD's leveled off in the early 1980s, fell and has recovered only slowly.

Thus as discussed above, oil and to some extent gas has remained the form of energy that nearly all developing countries have mainly relied to achieve and maintain high rates of economic growth. These countries generally use so little per head that they can hardly achieve any energy saving. Also, economic growth is their main priority, well above the world environment that the richer countries urge upon them. So most of the continuing growth in world energy, particularly oil and gas demand during the 90s occurred in these economies.

Moreover, the dynamics of world energy consumption as discussed reveals that from 1990 onwards, OECD is not where the growth of oil consumption took place. What have begun to become more important are the patterns of oil demand outside OECD- in the developing countries, especially in the Asia-Pacific region, the center of the world economy. Besides, much of oil's contribution to world energy supply now-a –days is as a family of specialized transport fuels outside the general fuel market where it competes with other forms of primary energy such as, natural gas. From the last two decades, it looks as if this specialized market sector might be the main element of continuing growth[79]. This primarily constituted substantial proportion of global oil demand during the 1990s and thereby accounted for the world oil demand trend in this period. This period therefore witnessed sharp increase in gas consumption in the OECD. It is to be mentioned that, though the nations of the industrialized world continue to consume more of the world's petroleum products than the developing world, yet the gap is projected to narrow considerably by the year 2020[80], see Table 2.9. In 2001, oil consumption in developing nations was 58% of the amount used in the industrialized world, but by the year 2020 this is expected to increase to 90%.

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[79] This trend can be witnessed in the world energy consumption patterns. As per estimates, for every thing except transport, oil demand in the world's richest countries (OECD) is nearly down by 30 in the 1990s in comparison to the previous decade.

[80] As projected by the Energy Information Administration (EIA), Deptt. Of Energy (DOE), USA; see, *MEES*, 1 April 2002, p. A9.

The increase in oil use in the industrialized world is expected to occur in the transportation sector, where there are presently few economically competitive alternatives to oil. In the developing world, oil demand is projected to grow in all end use sectors. As the energy infrastructures of these emerging economies improve, people are turning from traditional fuels like wood burning to electricity and additional petrochemical feedstock are being used for industry. Moreover natural gas is expected to take the greatest share of incremental energy consumption in the industrialized world. In the developing world increments in gas use are expected to supply both power generation and industrial uses. As per the projections natural gas will experience robust growth in the developing world, averaging 5.3% per year between 2000 and 2020, reflecting the popularity of the fuel, as well as the expectation that the relatively immature gas markets of emerging countries will develop quickly over the coming years[81]. Moreover as per the projections the developing regions will account for 29 mb/d of the 45 mb/d increase in global oil demand between 2002 and 2030. The developing Asia will take the largest share. Oil demand in China and India will register highest growth. Other East Asian countries oil demand will double, to 9.4 mb/d. Oil consumption in OECD North America will rise strongly too, from 22 mb/d to almost 31 mb/d in that period. Demand in other OECD regions will increase only modestly. North America remains by far the largest single market for oil.

Regarding gas, its share in the primary fuel mix is expected to increase in every region, but in volume terms the greatest increases will be in OECD North America and OECD Europe. But the fastest rates of growth will occur in China and India, where gas consumption is currently low. World primary consumption of gas is projected to grow at an average annual 2.7% from 1997 to 2020, as shown in Table 2.10. Demand is strongest in the non-OECD regions, growing by 3.5%, while OECD consumption increases by 1.9%. The non-OECD region's share of total world gas demand is projected to reach 56% by 2020, as against 48% in 1997. Demand growth is particularly strong in non-OECD Asia, although its share of global demand remains below that of Europe and North America in the year 2020. Gas use in the transition economies expands more slowly than in any other region except North America, but these countries remain the second largest consuming and the largest outside the OECD in 2020, see Table 2.10.

[81] Ibid.

Table 2.9: World Oil Demand Outlook in the Reference Case (mb/d)

Year/Region	2000	2005	2010	2015	2020
North America	24.1	25.0	26.1	27.2	28.2
Western Europe	15.1	15.6	16.3	16.8	17.1
OECD Pacific	8.7	8.9	9.2	9.4	9.6
Total OECD	47.9	49.4	51.6	53.4	55.0
Developing Countries					
Oil Importers					
S E Asia	3.0	3.4	4.1	4.9	5.8
South Asia	2.6	3.2	4.1	5.1	6.3
Africa and Middle East	1.5	1.7	2.0	2.3	2.6
Latin America	3.2	3.8	4.7	5.7	6.9
Total Oil Importing DCs	10.4	12.1	15.0	18.0	21.6
Oil Exporters					
OPEC	5.6	6.2	7.1	8.1	9.1
Other Exporting DCs	2.6	2.9	3.4	3.8	4.3
OPEC + Other Exporting DCs	8.3	9.2	10.5	11.9	13.4
DCs excl OPEC	13.0	15.1	18.3	21.8	26.0
Dcs incl OPEC	18.7	21.3	25.5	29.9	35.0
Former Soviet Union	3.8	4.2	4.7	5.1	5.6
China	4.7	5.5	6.7	8.2	9.8
Other Europe	0.8	0.8	1.0	1.0	1.2
Total World	75.7	81.3	89.4	97.6	106.5

Source: MEES, 45:29, 22 July 2002, p. D3.

Table 2.10: Total World Primary Supply of Gas (mtoe)

	1997	2010	2020	1997-2020*
OECD	999	1349	1549	1.9
North America	579	721	778	1.3
Europe	344	522	650	2.8
Pacific	77	107	121	2.0
Non-OECD	912	1376	2002	3.5
Transition Economies	484	572	714	1.7
Africa	41	73	108	4.3
China	21	56	111	7.5
East Asia	88	176	286	5.2
South Asia	37	87	163	6.6
Latin America	108	205	313	4.7
Middle East	132	207	307	3.8
World	1911.3	2724.4	3551.0	2.7

*Average annual growth rate in percent.
Source: IEA/OECD, *Natural Gas Information 2002*, (Paris: IEA/OECD, 2003).

Asian Economic Growth Miracle and Energy Demand Pattern

The phenomenon of Asian economic boom can be analyzed in the light of two schools of economic thought. A broadly neoclassical economic view sees it as the result of getting markets right, with governments interventions normally not only unhelpful, but also adverse, as they leave open the possibility of policy failure and structural rigidities. The second school of thought advocates a more positive function for state intervention and provision of incentives, beyond the conscious policy of improving market performance, and hence a longer-term historical context of mercantilism within a country[82]. This school of thought also refers to what the World Bank designates as the 'market friendly view'[83], which explain growth as the result of a set of central policy prescriptions; macroeconomic stability, trade and capital market openness, an emphasis on education and training, and a policy encouraging private sector development and capital growth. The *dramatis personae* of development success in Asia have been ever expanding. After the takeoff of the Japanese economy in the 1950s and 1960s came the success of the 'four little dragons or four tigers', namely Singapore, Taiwan, Hong Kong, and Korea. In the last two decades, the focus was shifted to the newly industrialized countries of Malaysia and Thailand. More recently, in terms of absolute GDP increments more significantly, the giant economies of China and India have shown their economic potential.

Economic growth has been maintained at high rates in the majority of the Asian countries throughout the 1980s and into the 1990s. Its key feature is, despite widespread growth most Asian countries are still low-income economies, with considerable disparities in economic performance across the continent. It is to be noted that, only some economies in the Asian region had a GNP per capita in 2001 of above $1000[84]. These countries contain less than 7% of the population of Asia, with the remaining 2.9 billion living in low-income economies, 2.1 billion in China and India alone. This implies that for Asia as a whole the development process is still in an early stage, with most of the potential for economic growth still unrealized. Moreover among the lower income economies, starting later from a lower base means that many years of very strong growth need to be sustained to even reach a position comparable to the current level of development of the 'Tigers'.

Economic growth provides the backdrop to and often the motivating force behind the growth of energy demand. The structural change and market development as a result of the sustained growth rate has tremendous implications for the energy sector in the Asian countries. The implications of economic growth for energy demand is reinforced by growth induced structural changes that have important

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[82] See Sanjaya Lall, *Learning from the Asian Tigers, Studies in Technology and industrial Policy*, (Macmillan Press: Basingstoke, and Laos, 1996).
[83] See World Bank, *The East Asian Miracle: Economic Growth and Public Policy*, (Oxford University Press (OUP), Oxford, 1993). This view has also been described in World Bank (1991), World Development Report 1991, OUP, Oxford.
[84] Asian Development Bank, 2002.

resources implications[85], such as; first, there is the move towards urbanization manifest in the rapid expansion of the Asian mega cities, with their implications for power and transport infrastructure and demand; second, there is the changing balance between the economic importance of internal and external markets with the growth in the former leading to further implications for the transport sector; third, there is the change in private aspirations backed by increasing purchasing power, leading to realization of pent-up demands for private transport and the use of commercial rather than traditional non-commercial energy in the domestic sector; and finally, particularly for countries at an early stages of development, such as India and China, there is the sectoral balance shift towards energy intensive manufacturing and heavy industries.

Asian Primary Energy Demand Pattern

An important feature of the pattern of primary energy consumption in Asia is the generally low level of energy use in the region compared to developed countries. Table 2.11 shows the pattern of primary commercial energy demand across fuels in Asia and primary energy consumption per capita.

Table 2.11: Primary Energy Demand in Asia and share by energy source, (million tons, and kilograms of oil equivalent), 2002.

		Energy Per capita Kgoe	Shares of Total Primary Energy				
Total Energy Use mtoe			Oil	Natural Gas	Coal	Nuclear	Hydro-electric
Bangladesh	9.2	76	25.0	71.7	2.2	0.0	1.1
China	833.1	682	18.9	1.9	76.9	0.4	1.9
India	227.3	244	31.9	7.5	56.4	0.9	3.3
Indonesia	69.9	361	55.2	37.6	6.0	0.0	1.1
Japan	490.2	3915	54.5	11.2	17.5	15.2	1.6
Malaysia	35.1	1746	57.3	37.3	4.0	0.0	1.4
Pakistan	31.6	243	48.4	38.3	7.0	0.3	6.0
Philippines	18.8	275	89.4	0.0	8.0	0.0	2,7
Singapore	16.1	5384	91.9	8.1	0.0	0.0	0.0
South Korea	149	3326	63.6	6.2	18.3	11.6	0.3
Taiwan	66.1	3103	53.6	5.9	25.7	13.8	1.2
Thailand	49.2	817	67.7	16.9	14.2	0.0	1.2
Asia	2081.3	667	38.6	8.2	46.0	5.1	2.0

Source: BP Statistical Review of World Energy, London, June 2003.

Besides the pattern of overall energy use, the potential for energy efficiency merits some considerations. As evident from Table 2.11, primary energy use is very limited in China and India in per capita terms. However when this is

[85] Paul Horsnell, *Oil in Asia: Markets, Trading, Refining, and Deregulation*, (OUP for Oxford Institute for Energy Studies, Oxford, 1997), p.16.

analyzed in GDP units, a radically different trend emerges. While China and India use very little energy given their size of population, they use a lot given the size of their economies. Table 2.12 shows the total primary energy used expressed in kilograms of oil equivalent, per thousand dollars of GDP, for selected Asian countries together with the UK and USA for comparison[86].

Table 2.12: Energy Efficiency in different countries

Country	Kgoe/$ 1000 GDP	Index (Taking World as 1)
India	631	2.2
China	807	2.8
Malaysia	544	1.9
Japan	128	0.4
UK	142	0.5
USA	220	0.8
World	292	1.0

Source: Chaturvedi, B.K., 'Domestic Resourcing of Energy, Gulf and Future of Global Energy, Paper Presented at the *National Seminar on India's energy security*, New Delhi: GSP, JNU, February 19-20, 2004.

As shown in Table 2.12, China and India are shown to have extremely high levels of energy use per unit of GDP, especially when compared to the extremely energy efficient Japanese economy. However it is to be mentioned that India and China are still at an early sage of development where peasant agriculture is far more important than in most other Asian countries.

Asian Demand for Oil and Gas

During the 1990s, the Asian countries took the center stage in the world economy due to their impressive economic growth ignited by the policies of liberalization and privatization. Indeed the Asian economies expanded faster than the OECD economies. The impressive economic growth in these economies led to a drastic change in their pattern of primary commercial energy demand. The direct impact of economic growth led to soaring Asian oil and gas demand. The factors responsible for the enormous growth of Asian oil and gas demand are; the relatively low real oil prices in the 1990s in comparison to the two previous decades, reinforced in some countries by currency appreciations against the dollar; the relatively low share of commercial energy in the total energy supply in many countries[87], and the government policies of using cleaner

[86] This measure is affected by a number of factors such as; balance between energy intensive and traditional sectors; technology of energy use; the relative price of labour to capital; and a set of other economic, social factors.

[87] In fact the share of commercial energy in the total energy supply in Asia, is still low in comparison to other regions, i.e., oil, natural gas and coal, respectively, account for 38.6, 8.2 and 46.0 (%) of the total energy supply in Asia, whereas non- commercial energy such as bio-mass constitute an important

energy sources such as oil and natural gas in place of more polluting source such as coal.

By 2002, oil demand in Asia accounted for just over a quarter of the global total. At the margin it represented the majority of the global growth. As shown in Table 2.13, during the period1990-95, its level increased by about 4.1 mb/d. Over the same period, this compares to a 4.1 mb/d decrease in the FSU, and a 2.3 mb/d increase in the rest of the world. Growth in oil demand in Asia over that period was 5.6 per annum. Excluding the mature and dominant in absolute size, Japanese economy, the rate of oil demand increase was 8.6 per annum (p.a.) in the rest of Asia. In 1985, Japan accounted for 45% of total Asian demand, by 1995, this had fallen by 34%. Of the increase between 1990 and 1995, around one-half of the total Asian oil demand was accounted by South Korea, China and India alone. Indeed oil demand growth has been strongest in the Asian region during the past ten years. In fact the sharp growth of Asia-Pacific's oil demand offset the sagging oil demand in the rest of the world during the 1990s, and the Asia-Pacific growth was responsible for the whole of the world's oil demand growth over this period. Though the Asian economic crisis in 1998 brought a sudden reversal to this trend, the two emerging Asian economies-India and China-, being partially open and somehow insulated, continued to maintain their strong oil demand. The Asian oil demand grew at an average of 5.2% during the period 1995-2000, but the most important was the oil demand growth rate of China and India, which was 15.2% and 7.4% respectively. Besides, bulk of the growth in Asian gas demand growth took place in three major economies of Japan, China and India (consumption was 77.4, 30.1 and 28.2 bcm respectively and the growth rates were 4.26%, 8.7% and 10.4% respectively) over the period 1990-2002.

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proportion. For details see, Paul Horsnell, *Oil in Asia: Markets, Trading, Refining and Deregulation*, (Oxford University Press (OUP) for the Oxford Institute for Energy Studies, Oxford, NY, 1997).

Table 2.13: Oil Demand in Asia (volume in 000'b/d and growth rates in % p.a).

Year/ Country	1985	1990	1995	2000	2002	Growth Rate			
						85-90	90-95	95-00	00-02
China	1810	2255	3310	4110	5362	6.2	8.0	12.3	15.2
India	885	1200	1510	1820	2090	5.5	4.7	7.6	7.4
South Korea	535	1040	2010	2355	2288	14.2	14.1	2.7	-1.4
Indonesia	460	645	810	965	1072	5.8	4.7	6.4	5.5
Japan	4435	5305	5780	5785	5337	2.7	1.7	-1.3	-3.8
Malaysia	195	270	430	430	489	8.2	9.8	2.74	6.8
Pakistan	155	220	305	350	359	7.0	6.8	3.5	1.2
Singapore	225	370	510	560	699	8.5	6.6	7.4	12.4
Bangladesh	35	45	50	67	71	3.6	2.1	8.4	2.9
Thailand	235	410	690	785	746	11.4	11.0	1.6	-2.4
Taiwan	355	550	725	816	817	7.4	5.7	2.5	0.06
Others	205	215	310	432	434	4.2	7.6	8.0	0.23
Asia-Pacific	9780	12,900	16,965	20939	21399	5.7	5.6	5.2	1.09

Source: Calculated from various issues of BP Amoco Statistical review of World Energy.

Besides the stages of economic growth have an asymmetric effect on the demand for oil products. In the domestic sector, growth first leads to a substitution away from traditional fuels towards oil products, and in particular towards LPG (Liquid Petroleum Gases), and most particularly butane. Later stages of development normally lead to the development of energy infrastructure enabling further switch to occur towards natural gas or electricity in heating and cooking. This transition as shown in Table 2.14 for China, Japan and other Asia outside Japan, has been associated with a very rapid expansion of LPG demand.

Table 2.14: Oil Demand by Product, Japan, China, Other Asia and total Asia, (mb/d, growth p.a.)

Japan	1975	1980	1985	1990	1995	Growth 75-85	% p.a. 85-95
LPG	0.40	0.47	0.57	0.60	0.62	3.6	0.9
Naphtha	0.57	0.49	0.42	0.54	0.70	-3.1	5.8
Gasoline	0.74	0.59	0.63	0.76	0.86	-1.6	3.5
Aviation Fuel	0.10	0.05	0.06	0.07	0.09	-4.8	4.1
Kerosene	0.39	0.43	0.47	0.54	0.56	1.8	2.0
Gasoil/Disel	0.73	0.75	0.80	1.11	1.25	1.0	5.1
Residual Fuel Oil	2.23	1.64	0.95	0.91	0.89	-8.2	-0.7
Other	0.62	0.54	0.54	0.77	0.72	-1.3	3.2
Total	5.79	4.97	4.43	5.29	5.69	-2.6	2.8
China							
LPG	0.02	0.04	0.05	0.08	0.15	10.3	13.0
Naphtha	0.01	0.05	0.12	0.21	0.31	25.6	11.2
Gasoline	0.19	0.23	0.33	0.44	0.63	5.8	7.5
Aviation Fuel	--	0.01	0.01	0.02	0.04	n.a.	14.3
Kerosene	0.06	0.07	0.07	0.06	0.05	1.3	-3.0

Gasoil/Disel	0.29	0.34	0.39	0.55	0.75	3.3	7.3
Residual Fuel Oil	0.40	0.58	0.56	0.66	0.74	3.4	3.2
Other	0.35	0.43	0.33	0.30	0.39	-0.7	1.8
Total	1.32	1.75	1.86	2.32	3.06	3.3	5.3
Other Asia							
LPG	0.04	0.07	0.17	0.31	0.46	14.0	12.2
Naphtha	0.08	0.16	0.24	0.33	0.60	11.2	10.6
Gasoline	0.25	0.32	0.38	0.62	0.86	4.0	9.5
Aviation Fuel	0.13	0.15	0.18	0.28	0.35	3.5	7.6
Kerosene	0.21	0.31	0.33	0.45	0.55	4.4	5.8
Gasoil/Diesel	0.54	0.85	1.08	1.61	2.20	7.1	8.3
Residual Fuel Oil	0.88	1.29	1.14	1.68	2.14	2.6	7.3
Other	0.09	0.11	0.13	0.21	0.24	3.6	7.3
Total	2.23	3.26	3.63	5.51	7.39	4.8	8.0
Total Asia							
LPG	0.46	0.58	0.79	0.99	1.24	5.4	5.2
Naphtha	0.67	0.70	0.78	1.08	1.61	1.6	8.3
Gasoline	1.18	1.15	1.34	1.82	2.34	1.2	6.4
Aviation Fuel	0.23	0.21	0.25	0.38	0.48	1.0	7.3
Kerosene	0.67	0.81	0.87	1.05	1.16	2.7	3.3
Gasoil/Disel	1.55	1.94	2.27	3.27	4.19	3.9	7.1
Residual Fuel Oil	3.51	3.51	2.65	3.26	3.77	-2.8	4.0
Other	1.06	1.08	1.00	1.29	1.35	-0.6	3.4
Total	9.34	9.98	9.93	13.12	16.14	0.6	5.5

Note: Figures for all fuels for the year 20002 are not available.
Source: Calculated from BP Statistical Review of World Energy.

The next stage in the phase of development as shown in the Table 2.14 in China and other Asia outside Japan has been associated with rapid expansion of LPG demand. Over the 1985-1995 period, LPG demand increased by 13% per annum in China and 12% in other Asia. As development proceeds, the expansion of LPG demand begins to slow, given that it is primarily driven by wholesale once and for all fuel switching. Further at higher stages of development, the switching away from LPG towards gas and electricity would be expected to occur. This is vindicated by the modest 0.9% per annum growth since 1985 in Japan. A second major structural change occurs when petrochemical industries are expanded in response to both domestic sector demand, and also petroleum input demand from the industrial sector. Petroleum development leads to increased demand for naphtha as a feedstock.

The main structural change as growth progress lies in the transport sector. Incremental Asian demand has been, and will remain, heavily skewed towards transport fuels, particularly as these are the areas in which the scope for fuel substitution is limited. Of the total 6.8 mb/d total increase in oil demand between 1975 and 1995 shown in the Table 2.14, gasoline, aviation fuel and diesel have contributed 4.1mb/d. The earlier stages of development involve the expansion of the relative importance of diesel, due to the development of internal domestic market and associated industrial demand for transportation of goods. Most Asian countries are still moving through this stage, resulting in fast demand growth for diesel and expansion of its share within the demand barrel. This has been reinforced in several countries, most notably in India and Thailand, by the tendency, through tax/subsidy system, to keep the price of gasoline relative to diesel well above world market levels. Over the time this has encouraged the development of a vehicle fleet heavily biased towards diesel powered engines. Later stages of development tend, dependent on government tax and automobile production and importation policies, to see a switch towards faster gasoline and demand growth. In fact, the growth of transportation fuels skews the demand barrel towards the lighter products and in Asia particularly towards middle distillates[88]. This tendency has been reinforced by the changes in the pattern of residual fuel oil demand. In Asia as a whole, fuel oil accounted for 38 per cent of the demand barrel in 1975, but just 23 per cent in 1995. The primary market for fuel oil has been power generation, where the scope for substitution by other fuels is at its greatest.

The consumption of natural gas is not so impressive in the Asian region, as most of the countries of the region are at the early stage of energy transition which implies that these countries are either overwhelmingly dependent on oil products or coal. This is why the final consumption of natural gas should be examined in the context of other energy fuels used, namely oil products, coal and electricity. From the trends of primary energy consumption pattern, it appears that as if natural gas has not been a very important fuel in satisfying energy needs in the non- transporting sector in Asia[89]. Table 2.15 shows trends of natural gas consumption in selected Asian countries from 1985 to 2002.

[88] Fereidun Fesharaki, and Yamaguchi Nancy, "Energy Supply and Demand Outlook in the Asia-Pacific Region", *Link*, 34 (50), 26 July 1992, pp.28-33.
[89] Robert N McRae, "The Development of Natural Gas Market in Asia: The Importance of Economic Growth", in ECSSR, ed., *The Future of Natural Gas in the World Energy Market*, (Abu Dhabi, UAE: ECSSR, 2001), chapter-4, p.63.

Table 2.15: Trends of Natural Gas Consumption in selected Asian Countries from 1985-2000 (mtoe)

	1985	1990	1995	2000	2002
Bangladesh	2.6	4.3	6.6	7.0	10.1
China	11.5	13.2	15.8	17.4	27.0
India	3.5	11.2	17.0	20.9	25.4
Indonesia	12.3	18.0	26.3	28.7	31.3
Japan	35.9	46.1	55.0	62.5	69.7
Malaysia	2.4	6.8	13.1	18.4	24.3
Pakistan	7.3	10.4	12.1	14.2	18.8
Philippines	---	---	0.1	--	1.6
Singapore	---	--	1.4	1.4	1.6
South Korea	---	3.0	9.2	14.1	23.6
Taiwan	1.0	1.7	3.9	5.7	7.7
Thailand	2.8	4.9	8.3	14.1	23.3
Asia*	82.0	122.0	172.7	233.0	297.3

Note: * denotes that the trends include that of whole Asia.
Source: BP Statistical Review of World Energy.

The important feature of natural gas consumption pattern in Asia is that the share of natural gas consumption is more in countries like Bangladesh, Indonesia, India and Pakistan, where there are reserves; and in the industrialized countries such as Japan, Malaysia due to the advance phase of energy transition in these countries. As shown in Table 2.15, Japan's use of natural gas makes it the largest consumer in the region, but the rapid development of domestic gas use in Thailand, Malaysia and Indonesia can be witnessed. Overall, gas use in Asia has grown strongly up from 82 mtoe in 1985 to173 mtoe in 1995 to 233 mtoe in 2000 and 297.3 mtoe in 2002.

The Asian natural gas market is basically based upon LNG (Liquefied Natural Gas) trade and pipeline trade, since there is inadequate regional supply in the region. Due to a lack of inadequate supply of local natural gas, Asia boasts the largest level of imports of LNG by tankers and pipelines[90]. LNG is currently imported into Japan, Taiwan and Korea from a series of LNG production trains in Indonesia, Malaysia, Abu Dhabi, Australia, Brunei and Alaska; with further two trains in Qatar coming on stream. There has also been significant growth in the use of pipelined gas, primarily in the member countries of ASEAN,[91] among whom Indonesia, Brunei, Malaysia, Thailand and Vietnam have significant gas reserves.

[90] For details regarding Asian LNG trade refer International Energy Agency (IEA), *Asia Gas Stud*, IEA, Paris, 1996.

[91] The members of the Association of South East Asian Nations are Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.

Oil Demand Projections

As predicted by various analysts[92], there are clear indications about sustained growth of Asian oil and gas consumption. As per the IEA, World Energy Outlook 2002, the Asian regional oil demand is projected to increase from 19.2 mb/d in the year 2000 to 37.1 mb/d by the year 2030. This implies that the share of Asia-pacific oil demand in total world demand is expected to rise from 25.6% to 30.9% over the same period, see Table 2.16.

Table 2.16: Outlook for Oil Demand up to 2030 in Asian Countries

	2000		2030		2000-30
	Mb/d	%	Mb/d	%	% /year
China	4.9	6.5	12	10	3.0
East Asia	4.3	5.7	9.4	7.8	2.6
South Asia	2.6	3.5	7.4	6.2	3.5
India	2.1	2.8	5.6	4.7	3.3
Total Asian Developing Countries	11.8	15.7	28.8	24.0	3.0
Korea	2.1	2.8	3.4	2.8	1.6
Japan	5.3	7.1	4.9	4.1	-0.3
Total Asian Countries	19.2	25.6	37.1	30.9	2.2
World total	75	100.0	120	100	1.6

Source: IEA, World Energy Outlook, Paris: IEA, 2002.

The various forecasts as summarized by Paul Horsenell[93] suggest a range of expected demand increment by the year 2000 of 4.1 mb/d to 6.1 mb/d. This then implies an average annual increment of between about 600 thousand b/d and 900 thousand b/d. For 2010, the range for the total increment from 1993 is between 9.4 mb/d and 14.7 mb/d (these two extremes being the low and high case from the same forecast), implying average annual increments between 2000 and 2010 within the range of 500 thousand b/d and 900 thousand b/d. The IEA, as reported in forecast (c), in addition predicts the global totals in 2010 of about 92 mb/d and 97 mb/d for its two cases, implying that over 40% of increment world oil demand will come from the Asian region.

On the basis of the above forecasts, three main features are evident. The first is the assumption of a declining growth rate of oil demand (the forecasts tend to have near constancy in the average absolute growth in demand). The second feature is that growth in China is forecast to be the highest in the region, with

[92]Various studies by independent researchers and institutes on the Asian oil demand projection include Ken Koyama, "Outlook for Oil Supply and Demand in Asia-Pacific Region and Role to be Played by Japan's Oil Industry," *Energy in Japan*, March 1995, no.132, Fereidun Fesharaki, Allen Clark and Duangjai Intarapravich, "Pacific Energy Outlook: Strategies and Policy Imperatives to 2010," 1995, East-West Centre, Honolulu, Hawaii, International Energy Agency, "World Energy Outlook", 1996 & 2002,IEA, Paris.

[93] Paul Horsnell, Op. cit, p.28.

Chinese oil demand in absolute terms reaching about 4 mb/d in 2000, and surpassing 6 mb/d in 2010. The strong forecast rate of growth in India represents the third feature (from 1.3 mb/d in 2000 to nearly 3mb/d in 2010). Thus all forecasts give a central role to China and India. In oil products market that role is in fact even more central, as oil refining surpluses of other countries will look to China and India to take the role of a 'demand sink'[94]. In the Asian region, India is one of the largest oil and gas consuming country, see Table 2.17.

Table 2.17: Principal Asian Oil and Gas Consumers

Country	Oil('000 b/d)			Gas(bcm)		
	1990	2001	2002	1990	2001	2002
Japan	5305	5785	5337	51.2	69.5	77.4
China	2255	4110	5362	14.7	19.3	30.1
South Korea	1040	2355	2288	3.4	15.6	26.2
India	1210	1820	2090	12.5	23.2	28.2
Indonesia	620	965	1072	20.1	31.9	34.7
Thailand	410	785	746	5.5	15.7	25.9
Singapore	390	560	699	-	1.5	1.8
Malaysia	270	430	489	7.6	20.4	27.0
Philippines	235	380	333	#	#	0.1
Pakistan	220	350	359	11.2	15.8	20.9
Total Asia-Pacific	13705	19615	21399	158.2	259.0	330.3

Notes: # denotes less than 0.05.
-- denotes not available.
Source: BP Amoco Statistical Review of World Energy, 2002.

Economic Growth and Energy Consumption Pattern in India

India has become an important element in Asian and indeed world energy markets over the last decade. Its high rate of economic growth has swiftly made it one of the prominent energy consumers in the region as well as in the world. India accounted for nearly 12% of total primary energy consumption in the Asia-Pacific region and 3.5% of world primary energy consumption in the year 2002[95]. The Indian economic boom is the by product of the reform policies adopted in the year 1991, as a reactionary policy prescription to counteract the crisis ridden economy as per the IMF and World Bank guidelines. The structural changes in Indian economy resulted in higher growth rates over the last decade that had implications percolating to all the sectors including the oil and gas sector. A summary of the growth performance is given in Table 2.18.

[94] Ibid.
[95] *BP Amoco Statistical Review of World Energy*, 2002.

Table 2.18: Summary Economic Statistics for India, annual average growth rates

Year	Gross National Product at factor cost		Net National Product at factor cost		Per capita Net National product	
	At current prices	At 1993-94 prices	At current prices	At 1993-94 prices	At current prices	At 1993-94 prices
First Plan (1951-56)	1.8	3.7	1.5	3.6	-0.3	1.8
Second Plan (1956-61)	9.5	4.2	9.4	4.1	7.3	2.0
Third Plan (1961-66)	9.6	2.8	9.5	2.5	7.1	0.2
Three Annual Plans (1966-69)	12.3	3.9	12.2	3.8	9.8	1.5
Fourth Plan (1969-74)	11.1	3.4	11.0	3.3	8.5	1.0
Fifth Plan (1974-79)	10.7	5.0	10.4	5.0	7.9	2.7
Annual Plan (1979-80)	9.4	-5.0	8.3	-6.0	5.7	-8.3
Sixth Plan (1980-85)	15.2	5.5	15.1	5.4	12.7	3.2
Seventh Plan (1985-90)	14.4	5.8	14.2	5.8	11.8	3.6
Two Annual plans (1990-92)	15.8	3.3	15.5	3.0	13.2	0.9
Eighth Plan (1992-97)	16.3	6.8	16.3	6.7	14.0	4.6

Source: Ministry of Finance, *Economic Survey*, GOI, p. s-4, 2001-02.

The growth and structure of the economy, population growth, the pace of urbanization have influenced the pace and pattern of energy demand growth in India. The transition of the Indian economy from the mixed economy pattern in the Nehruvian model to the market friendly pattern in the Rao-Manmohan model has contributed to this state of things[96]. The Indian economy has historically been developed as a mixed economy dominated by the public sector. As such, the structure and growth of the economy have been influenced significantly by the allocation of plan budgets across various sectors. The initial planning periods focused on industrial growth in a conscious attempt to improve the infrastructure base of the economy, with scant attention being paid to the agricultural sector. By the early sixties, however, it was apparent that India was heading for a food crisis, and the focus of planning shifted from industry to agriculture. In the Sixth Plan Period (1980-85), a major redistributive change in the allocation of resources was apparent again, oriented towards achieving a high growth rate for the economy.

The new path embarked upon in 1991 marked a major-if gradual and phased policy shift, toward market oriented reform, constrained earlier by residual tension and structural rigidities. India's economic reforms, initiated in 1991,

[96] For details regarding the transition of the Indian economy see, Datt, Ruddar and K.P.M. Sundaram, *Indian Economy*, (New Delhi: S. Chand & Company, 2001).

resulted in a higher rate of economic growth during the Eighth Plan (1992-97) compared to the Seventh Plan period. The average annual growth of gross domestic product (GDP) during the Eighth Five-Year Plan was 6.8%, as against the 6% during the Seventh Plan period. The GDP growth rate averaged 7.5% per annum during 1994-97. During the Ninth Five-Year Plan, the average GDP growth rate has been pegged at 7%. However during this period the actual growth in the GDP has not realized the pegged growth rate due to some internal and external economic disturbances. Despite the domestic and external constraints, growth in real GDP is expected to be 5.4% as estimated by the Central statistical organization (C.S.O). This growth rate marks some recovery and it will be one of the highest growth rates in the world. The average annual growth rate during the Ninth Plan period (1997-2002) is now estimated at 5.4%, which is lower than the plan target of 6.5 per cent. The overall growth of 5.4 per cent in the year 2001-02 is supported by a growth rate of 5.7 per cent in agriculture and allied sectors, 3.3 per cent industry, and 6.5 per cent in services. Although this raises new challenges for reinvigorating growth in the Tenth Plan, the Indian growth record is one of the highest among the major economies in the world in recent years. The Indian economy has been resilient in the face of several external shocks during this period such as the East Asian crisis of 1997-98, the oil price increase of 2000-01, and the world economic recession during 2001-2003.

Apart from the rapid increase in economic activity, two other factors that drive energy demand are population and the proportion of urban population. India's population structure shows that during the period 1951-91, population grew at an annual rate of 2.15 per cent, and this trend for the period 1991-2001 is 1.93 per cent. India accounts for 2.4 per cent of the world surface area and 16.7 per cent of the world population. As per the provisional estimates of the Census of India 2001, India is the second most populated country in the world and it is also expected to overtake China by the year 2050[97]. Further the migration from rural to urban area continues unabated, because of the marginal increase of gross sown area and lack of employment opportunities in the rural area. The share of urban population in the total population increased from 17.3 per cent in 1951 to 25.7% in 1991 and to 27.7 per cent in 2001. With the increased work related mobility of both the urban and rural population, on an average, the per

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[97] United Nations, *World Population Prospects: The 1998 Revision,* (Paris: UN, 1999).

capita income went up from Rs 1127 to Rs 2608 in the period 1950-1996 and to Rs 2800 in 1998-99. Over the years, Indian economy has undergone structural changes, see Table 2.19. The share of agriculture in GDP declined from 35.9 per cent in 1982 to 30.9% in 1992 to 25.0% in 2001 and to 22.7% in 2002, while the share of industry has been increased marginally from 25.8% in 1982 to 26.6% in 2002. The services sector's share has increased considerably from 38.3% in 1982 to 50.7% in 2002.

Table 2.19: Structural Change in the Indian Economy, 1982-2002.

(% of GDP)	1982	1992	2001	2002
Agriculture	35.9	30.9	25.0	22.7
Industry	25.8	26.7	25.7	26.6
Manufacturing	16.2	16.2	15.3	15.6
Services	38.3	42.3	49.4	50.7
Private consumption	69.9	65.8	69.5	65.0
General government consumption	10.7	11.2	12.9	12.5
Imports of goods and services	8.4	9.8	14.1	15.6
Average annual growth rate				
	1982-92	1992-2002	2001	2002
Agriculture	3.1	2.5	6.5	-5.2
Industry	6.7	6.2	3.4	6.4
Manufacturing	6.5	6.6	3.6	6.2
Services	6.8	8.2	6.8	7.1
Private consumption	5.3	5.0	6.2	-0.8
General government consumption	6.1	7.1	3.0	3.1
Imports of goods and services	5.7	12.0	4.0	8.1
Gross Domestic Investment	5.7	7.2	1.6	9.5

Source: Compiled from various issues of Economic Survey, Ministry of Finance, GOI.

Status of Present Energy Mix and Demand in India

Economic development results in both qualitative and quantitative increases in the use of energy. The growth of energy consumption is, therefore, a function of the growth in the economy and changes in the lifestyle of households as a result of changes in the income levels enjoyed by them. In India, energy consumption however reflects the energy demand to the extent it is constrained by supply shortages. Economic growth, based on rapid structural change and increased urbanization, is an important factor, which contributed to the increase in energy consumption in India. During the period 1980-95, the commercial energy used increased at an annual average growth rate of 6.5 per cent. In India, energy consumption reflects the energy demand pattern to the extent it is constrained by supply shortages. Although past experience shows that availability consideration rather than price levels are important determinants of energy demands, the energy-GDP elasticity is often used as an indicator for mapping energy consumption response[98]. The declining trend of energy-GDP elasticity during the period 1953-95 is partly due to the structural changes in the economy, the changing pattern of demand, and also the penetration of efficient technology. This elasticity is, however, very high when compared to developed countries (see Table 2.12), reflecting the fact that India's per capita commercial energy consumption levels are still very low, and the use of traditional fuels is still being substituted by commercial energy forms.

The significant structural changes in the economy and population growth led to large increases in the consumption of commercial energy. However, the rural population in the country, despite various interventionist policies, continues to depend on traditional fuels (biomass fuels). Even today, these fuels are estimated to account for around 40 per cent of the total energy consumption in rural areas[99] and nearly 30 per cent of total energy supply in India. However the role of commercial fuels have increased over the years as they are substituting traditional fuels in the energy mix, due to the stage of energy transition, which is determined by the level of economic development in the country. Figure 2.1 depicts the trend in growth of commercial energy. As shown in the figure 2.1 the non-commercial energy consumption is being replaced with various commercial sources of energy. Use of increasing quantities of LPG, and Kerosene for fuel and lighting in rural areas is reflective of the above trend.

Currently, coal constitutes about 50 per cent in the energy mix in India and oil and gas account for about 47%. The balance of about 3% is shared by the nuclear, hydro and other sources. The relative consumption of coal, oil &gas, hydro, nuclear and renewable sources are briefly shown in table 2.20.

Table 2.20: Share of Future Energy Supply in India (%)

Year	Coal	Oil&Gas	Hydel	Nuclear
1997-98	55	42	2	1
2001-02	50	47	2	1
2006-07	50	47	2	1
2010-11	53	44	2	1
2024-25	50	45	2	3

Source: Up to 2011 from Technical Note on Energy, Planning Commission, GOI, 1998-99. Beyond this period the figures have been extrapolated.

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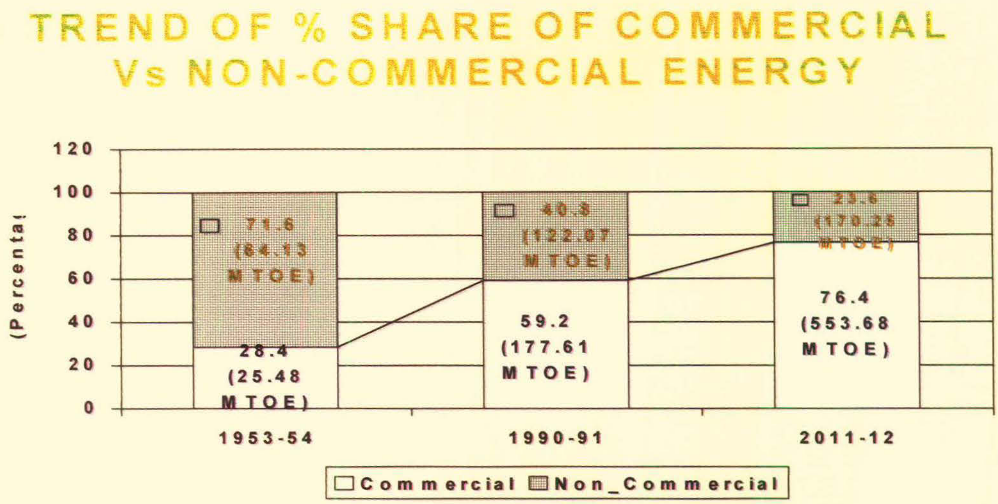
98 Ibid.

99 Tata Energy Research Institute (TERI), *TERI Energy Data and Directory Year Book*, (New Delhi: TERI, 2001-02).

Figure 2.1: Trend in Growth of Commercial Energy in India



Total Energy :1953-54=89.61 MTOE; 1990-91=299.68 MTOE; 2011-12=723.93 MTOE

Source : Ninth & Tenth Plan Documents

India ranks sixth in the world in terms of energy demand, accounting nearly 3.5% of world commercial primary energy demand in 2002. Although, the commercial energy consumption has grown rapidly over the last two decades, a large part of India's population does not have access to these sources. At 317 kg of oil equivalent (kgoe), the per capita energy consumption is also low even compared to some of the developing countries. Figure 2.2 &2.3 depict that China's energy consumption is three times as compared to India and the world's per capita consumption is more than twice that of India.

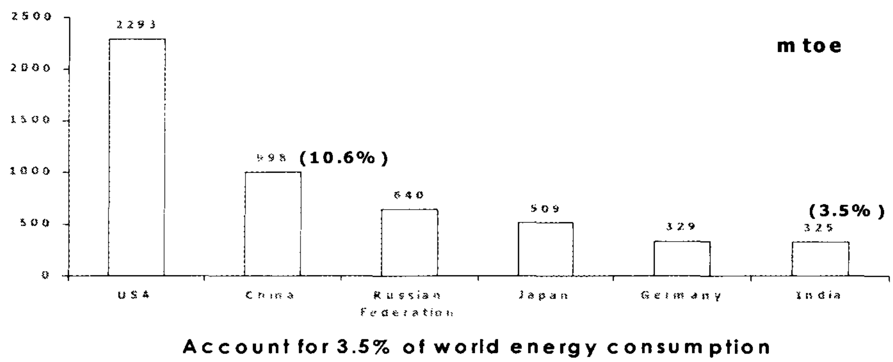
Primary commercial energy demand in India has grown almost three-fold at an annual rate of 6 between 1971 and 2001, to reach 314.7 mtoe with corresponding energy elasticity as against GDP of 1.12. Table 2.21 shows the historical trend in energy consumption growth rates in India.

Table 2.21: Historical Energy consumption Growth Rates in India

	Primary Commercial Energy	GDP Growth Rate
Decadal Growth (%)		
1970-71to1980-81	4.89 (1.55)	3.15
1980-81to1990-91	6.36 (1.13)	5.61
1990-91to2001-02	5.33 (0.96)	5.53
Rolling Growth		
1970-71 to 1990-91	5.63 (1.28)	4.38
1970-71 to 2001-02	5.35 (1.12)	4.76

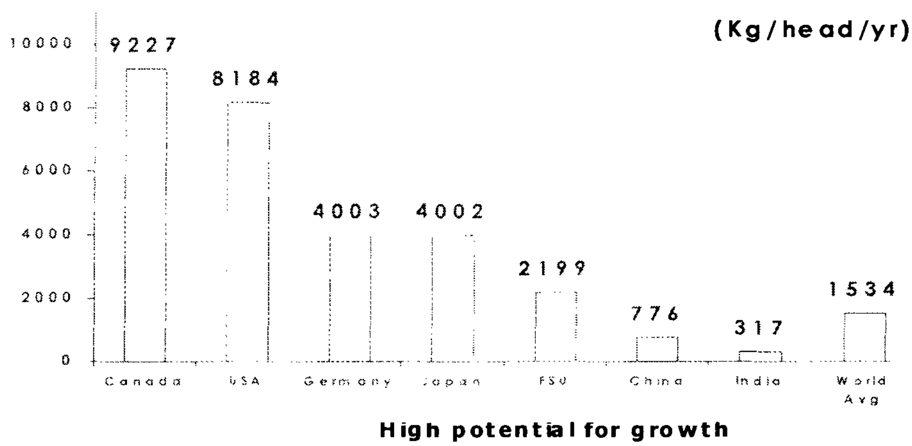
Note: Figures in brackets are the actual elasticity of energy consumption.
Source: Chaturvedi, B.K., 'Domestic Resourcing of Energy, Gulf and Future of Global Energy II, paper presented at the *National seminar on India's energy Security*, JNU, New Delhi, Feb.19-20, 2004.

Figure 2.2: Top Primary Energy Consuming Countries, 2002



Source: BP Statistical Review of World Energy, June 2003

Figure 2.3: Per Capita Energy Consumption



Source: EIA/BP;

The sectoral pattern of commercial energy consumption (i.e. coal including lignite, oil and gas and electric power) is given in Table 2.22. The industrial sector is the largest consumer of commercial energy in India followed by the transport sector. Together they now account for two-third of the commercial energy consumed in the country. However there has been a marginal fall in their share of the total commercial energy consumption. As shown in Table 2.22, their share was as high as 84 per cent in 1953-54; it declined to 64 per cent in 1996-97. Agricultural sector has, however, registered sharp increase in the consumption of commercial energy, i.e., from 3 per cent in 1970-71 to 9% in 1996-97. During the same period, the share of the household sector in commercial energy consumption has risen to 12 percent.

Table 2.22: Sectoral Trends in Commercial Energy Consumption (in %)

Sector	1953-54	1970-71	1990-91	1996-97
Household Sector	10	12	12	12
Agriculture	1	3	8	9
Industries	40	50	45	42
Transport	44	28	22	22
Others	5	7	13	15
Total	100	100	100	100

Source: Ninth Five-Year Plan, vol. II, Ch. 6.

It may be observed that the share of coal in total commercial energy consumption has declined steadily over the years; and the share of oil and gas and electricity has steadily increased.

The indigenous production of commercial energy in India increased from 53 mtoe in 1972-73 to about 183 mtoe in 1996-97, registering an average growth rate of about 5.8 per cent per annum. Given the large resources of coal, it is obvious that coal dominates the supply profile. However, coal accounted for as much as 72 per cent of domestically produced energy in 1972-73, its share declined to 65 per cent in 1996-97. In direct contrast to this, the share of oil and gas increased from 16.3 per cent to 27 per cent in the same period. Table 2.23 gives the trend in the availability of various primary energy forms.

Table 2.23: Availability of Primary Sources of Energy (mtoe)

Coal	1972-73	1975-76	1980-81	1985-86	1990-91	1996-97
Production	41.60	53.70	53.90	75.60	103.70	126.40
Net Imports	0.25	0.23	0.68	0.89	2.40	4.0
Crude Oil						
Production	7.30	8.40	10.5	30.20	33.00	32.20
Net Imports	12.10	13.60	16.20	14.60	20.70	27.40
Natural Gas						
Production	1.30	2.0	2.00	6.90	15.40	16.60
Net Imports	----	---	---	---	--	---
Hydro Power						
Production	2.30	2.80	3.90	4.30	6.00	7.00
Net Imports	---	---	--	--	--	--
Nuclear power						
Production	0.09	0.22	0.25	0.42	0.52	0.48
Net Imports	---	---	--	---	---	---
Total						
Production	52.59	67.12	72.55	117.42	158.62	182.68
Net Imports	12.35	13.83	16.88	15.49	23.10	31.40

Source: Teddy, TERI, 1997-98.

Despite large coal reserves, it is the share of oil and gas in total primary energy consumption that is increasing. The reasons for this are manifold; the most obvious being that the persistent shortages of coal and power supplies in the past decades has resulted in a switch to petroleum product consumption[100]. This switch took place not as a result of the large supply of petroleum products available domestically, but of the relative ease in importing ease in importing them. This energy transition is also consonant with universal energy pattern of transition witnessed in the industrial countries, as the economy tries to improve the production base on advanced technology to augment growth and instill efficiency in the production. As mentioned in the previous section of this chapter, this energy transition pattern can be witnessed from the trends of the pattern of petroleum product consumption in India as shown in table 2.24.

Table 2.24: Average Annual Compound Growth Rates of Consumption of Petroleum Products,(%)

	1980-85	1985-90	1992-97	1996-97	1997-98	1998-99*
Products	VI Plan	VII Plan	VIII Plan	Annual	Annual	Annual
LPG	18.4	18.9	9.2	8.7	9.5	9.7
MS	6.9	10.9	6.4	5.9	4.6	6.3
NAPHTHA	5.3	1.4	2.2	9.4	17.5	32.3
OTHERS	1.2	14.2	23.6	16.2	2.7	-41.9
LIGHT DISTILLATES	7.2	8.3	6.9	9.4	9.4	11.2
ATF	3.2	5.8	6.2	3.7	-2.3	-0.5
SKO	9.0	6.7	2.6	3.5	2.4	7.1
HSD	6.9	8.6	8.6	8.6	3.0	2.3
LDO	-1.1	4.4	-4.1	-6.7	1.0	2.0
OTHERS	0.2	3.0	9.1	0.6	-14.9	36.3
MIDDLE DISTILLATES	6.6	7.7	6.7	6.8	2.4	3.4
LUBES	3.2	6.9	0.1	-0.8	18.4	11.3
FO/LSHS	2.3	2.1	2.7	1.5	1.2	0.3
BITUMEN	-2.6	12.6	7.2	13.4	-4.2	2.8
OTHERS	5.5	8.5	-3.3	-8.2	-16.6	20.1
HEAVY ENDS	2.0	4.0	2.5	2.7	0.6	1.9
TOTAL CONSUMPTION	5.4	6.9	5.9	6.5	3.4	4.7

Notes: * means provisional. Growth rates are based on PSUs consumption i.e. excluding private parties' imports.
Source: Ministry of Petroleum and natural Gas (MPNG), "Basic Statistics on Indian Petroleum and Natural gas", MPNG, GOI, August 2000.

It is also expected that India will continue its present trend[101] in the consumption of oil and natural gas in the near future. The most important factor regarding the Indian oil and gas trends is that India will continue heavily on imports, as neither its domestic reserve/production, nor, the regional reserve/production (Asian) can really be adequate to meet the ever burgeoning

[100] Srivastava, Leena, and R. Goswami, "The Indian Oil Experience: A Case Study", in, ECSSR ed., *Privatisation and Deregulation in the Gulf Energy Industry*, (UAE: ECSSR, 1999), pp.55-68.
[101] The trends of India's oil and consumption will be discussed fully in chapter III.

demand for oil and gas. The deteriorating profile of the Asian countries with reference to their oil and gas reserves is given in table 2.25.

Table 2.25: Trends in Regional Oil and Gas Reserves in Asia-Pacific, 1982-2002.

Country	1982 '000mb	1992 '000mb	2001 '000mb	At the end 2002 '000mb	'000mt	Share of total (%)	R/P ratio
			Oil				
Australia	1.6	1.8	3.5	3.5	0.4	0.3	14.1
Brunei	1.2	1.4	1.4	1.4	0.2	0.1	18.0
China	19.5	24.0	24.0	18.3	2.5	1.7	14.9
India	3.4	6.0	4.8	5.4	0.7	0.5	19.4
Indonesia	9.6	5.8	5.0	5.0	0.7	0.5	11.1
Malaysia	3.3	3.7	3.0	3.0	0.4	0.3	10.6
Papua New Guinea	-	0.3	0.2	0.2	+	*	14.3
Thailand	0.1	0.2	0.5	0.6	0.1	0.1	9.6
Vietnam	-	0.5	0.6	0.6	0.1	0.1	4.7
Other Asia-Pacific	0.5	0.8	0.7	0.8	0.1	0.1	14.7
Total Asia-Pacific	39.2	44.6	43.8	38.7	5.2	3.7	13.6
Total World	697.6	1006.7	1050.3	1047.7	142.7	100.0	40.7
			Natural Gas Reserves				
Country	1982 trillion cubic meters	1992 trillion cubic meters	2001 trillion cubic meters	At the end 2002 trillion cubic meters	trillion cubic feet	Share of total (%)	R/P ratio
Australia	0.50	0.40	2.55	2.55	90.0	1.6%	73.9
Bangladesh	0.20	0.72	0.30	0.30	10.6	0.2%	26.8
Brunei	0.20	1.40	0.39	0.39	13.8	0.3%	34.1
China	0.19	0.73	1.37	1.51	53.3	1.0%	46.3
India	0.84	1.82	0.65	0.76	26.9	0.5%	26.9
Indonesia	0.96	1.92	2.62	2.62	92.5	1.7%	37.1
Malaysia	0.52	0.88	2.12	2.12	75.0	1.4%	42.2
Pakistan	0.52	0.88	0.71	0.75	26.4	0.5%	35.8
Papua New Guinea	--	0.40	0.35	0.35	12.2	0.2%	---
Thailand	0.31	0.24	0.36	0.38	13.3	0.2%	20.0
Vietnam	--	0.01		0.19	6.8	0.1%	80.2
Other Asia-Pacific	0.20	0.61	0.66	0.69	24.5	0.4%	34.1
Total Asia-Pacific	4.99	9.66	12.27	12.61	445.3	8.1%	41.8
Total World	85.90	138.34	155.64	155.78	5501.5	100.0%	60.7

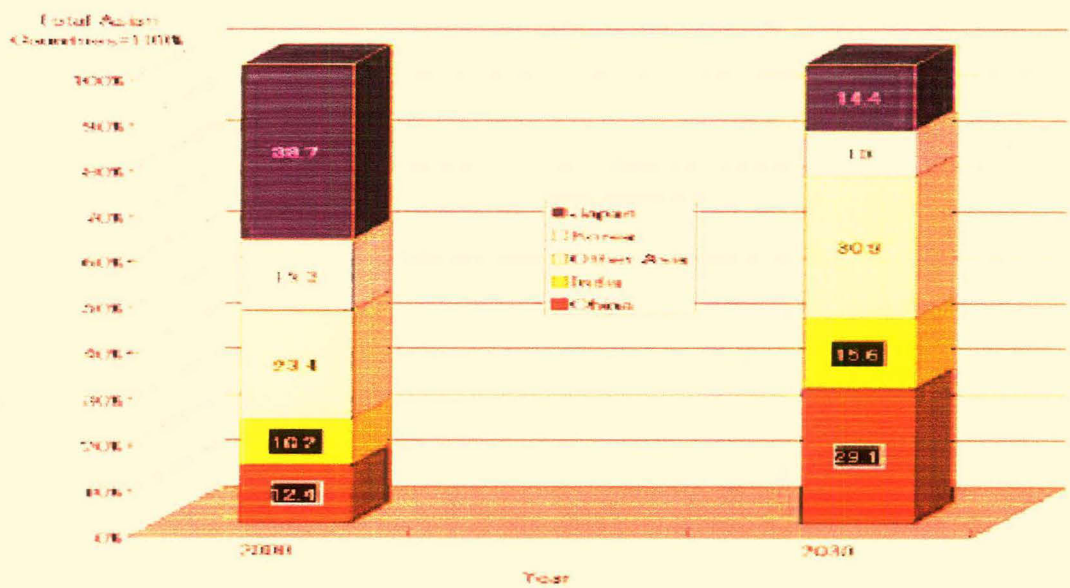
Source: BP Statistical Review of World Energy, London, 2003.

It shows that while the global reserves have gone up from 697.6 thousand million barrels in 1982 to 1006.7 in 1992 and 1050.3 by the end of 2001, the Asian reserves show a decline from 44.6million barrels in 1992 to 38.7 in 2001. For example at the end of 2002, proven oil reserves in Asia was 38.7 billion barrels and the reserve to production ratio for oil was 13.1, based on average oil production of 6.48 mb/d in 2001. This implies that the same amount of oil production in Asia could meet only 40 per cent of oil demand in Asia. It is to be noted that even if the gas reserves in the Asian region shows an increase over the same period, yet they are not adequate to meet the burgeoning demand in the coming years.

Thus oil and gas demand in reflection to the rapid economic growth in India and other Asia is poised to experience sizable growth rates in the foreseeable future. Because increase in economic activity and income brought about by economic growth can expand energy requirements in various ways, as discussed above. India with a large population and impressive growth rate will require huge energy to fuel and augment the growth engine. However, both India and its neighbors have limited domestic and regional oil and gas supplies to meet this rising demand. This is because of the factors such as limited resource base, high costs of new energy infrastructure investments, energy transportation bottlenecks and growing concern about environmental problems. These imbalances in oil-gas demand-supply in India and whole of Asia will bring out heavier dependence on imported energy from out side the Asian region.

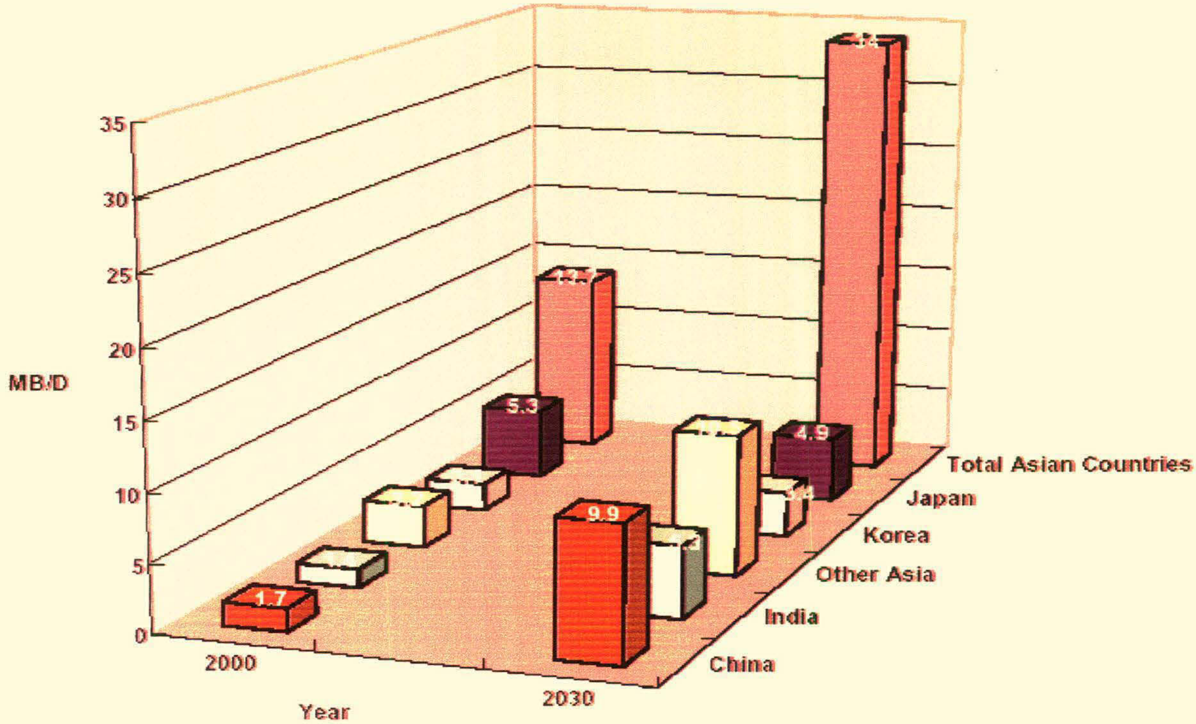
Moreover, it is significant to note that the share of countries in the total imports of the region is likely to undergo a radical change. Japan importing 38.7% of the total Asian imports in 2000 is likely to be having import share of only 14.4% in 2030, Korea too shows a decline in import share from 15.35% to 10% for the same period, but China shows a rise of 17.4% to 20.1%, followed by India from 10.2% to 15.6%. See figure 2.4 &2.5.

Figure 2.4: % of oil Imports in main Asian Countries in the Total Asian Countries



Source: IEEJ, March 2003.

Figure 2.5: Outlook for Oil imports up to 2030 in Asian Countries

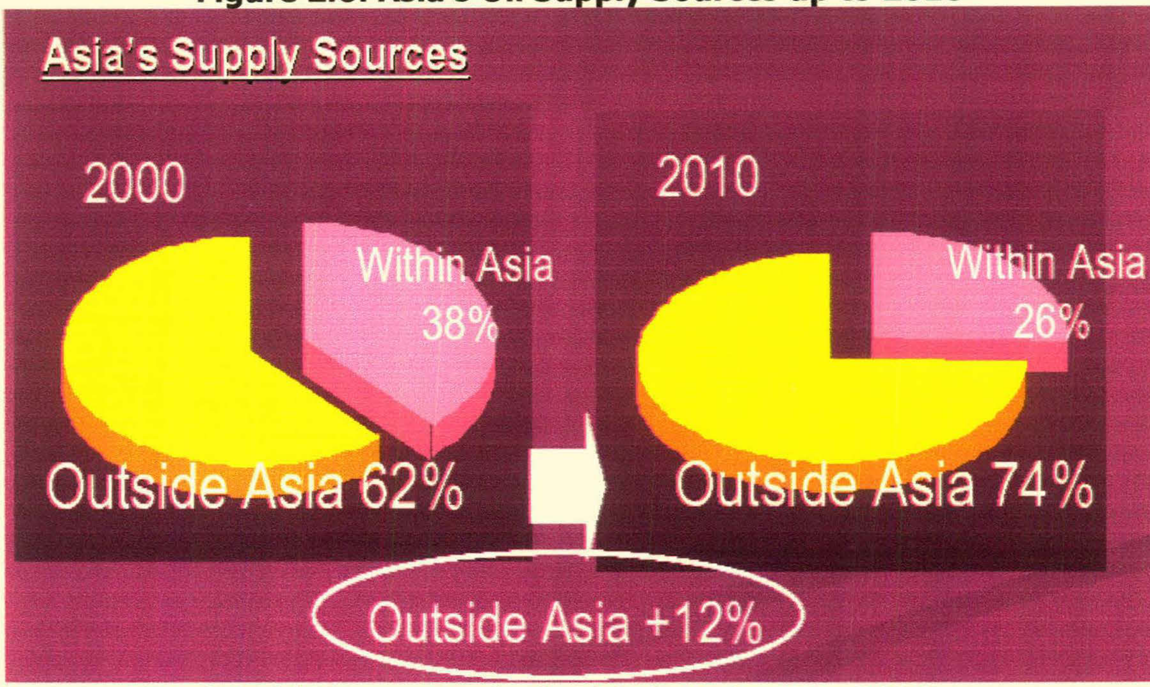


Source: IEEJ, March 2003.

Asia in general and India in particular are depending and will depend on oil imports from outside the Asian region to meet their burgeoning demand in the future (see figure 2.6). Asian countries' dependence on oil imports from outside the region, particularly the Middle East, which stood a little above 70% in 2000, can outrun 90% by 2030. If so, energy security, especially how to secure constant supplies, could become an even more important issue than today[102]. Given the fact that the Gulf being the only immediate and the only oil exporting region will be the target of India and other burgeoning Asian markets, which have also implications for the oil and gas exporters in the Gulf region. In the preceding section it will be analyzed why these oil and gas fundamentals of the Asia in general and India in particular is important for the GCC oil and gas exporters.

[102] Fujime, Kazuya, "Asia need to construct a framework of energy cooperation and joint research", (Japan: IEE, March 2003).

Figure 2.6: Asia's Oil Supply Sources up to 2010



Source: IEA, 'World Energy Outlook 2000', Paris: IEA, 2000.

Fluctuation in Gulf Cooperation Council Oil Exporters' Global Clout

The most important aspect of the present global oil and gas regime is the fluctuating clout of the OPEC in general and the Gulf[103] in particular. The phenomenon of fluctuation in OPEC's/Gulf's international clout can be aptly described by looking at the phenomenon from the demand side and the supply side, as well as a quick historical review[104]and in the light of domestic economic constraints.

Supply Side Factors

First from the supply side, it can be noted that, after the 1970s new oil was discovered in several parts of the world. In addition, non-OPEC countries helped push global supply level to the point where prices started to drop. For instance, oil production in Mexico, China, Egypt, Malaysia, Britain, Norway, India and other countries all helped increase in global supply. Today even more oil is expected to be pumped from wells in the Caspian Sea and other locations around the world including Eastern Siberia, the Gulf of Mexico, Canada's tar sands deposits, and Venezuela's Orinco Belt[105]. Second, by the 1990s, most

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[103] Since the major oil-exporting members of the Gulf Cooperation Council (Saudi Arabia, Kuwait, and UAE, Qatar) are also the members of OPEC, the analysis for OPEC also reflects the situation in these countries.

[104] This aspect has been descriptively discussed in chapter I.

[105] Robert W. Fisher, "The Future of Energy," *The Futurist*, September/October, 1997, pp.43-46.

OPEC members were pumping out more oil than they were supposed to, thus increasing world supply. This occurred in part because of the world's oil-rich countries were struggling economically.

The economies of the GCC/OPEC countries relied—and continue to rely—almost exclusively on oil; for many, oil accounts for 75 per cent of their national incomes. In the case of Kuwait, over 90 percent of its revenues were coming from oil. Even Saudi Arabia, the leading oil supplier and producer in the world and the political leader of OPEC, faced debt problems and economic recession. In 1997, for instance, Saudi Arabia earned about $45 billion from oil exports. In 1998 it earned only about $ 30 billion. This led to a budget deficit of nearly $13 billion[106]. As a result of the economic difficulties in the major oil producing countries, each individual OPEC member had an inclination to sell more oil in the market. This resulted in more supply and hence a drop in the price of oil as per the market dynamics. This is exactly what has been happening in the 1980s and particularly in the 1990s. This action is referred to as the 'free rider problem'[107] which refer to the phenomenon that a OPEC member state cheating on the cartel's agreement to keep world supplies low and prices high or by passing the 'quota principle' and pumping more oil through covert bilateral negotiation with importing countries to earn the much needed revenue to maintain political as well as economic status quo.

Demand Side Factors

The demand side factors responsible for GCC/OPEC members' declining international clout are: world recession, Iran-Iraq war and the Asian financial crisis of the late 1990s, increased fuel (oil) substitution, augmented energy conservation programmes, and disagreements among OPEC members. The worldwide recession that followed the two oil shocks of the 1970s dampened the global oil demand, which further exacerbated by the Asian financial crisis of 1997, as Asia was the second largest oil-consuming region in the world next to the North America. Secondly, since the 1970s the massive inter fuel substitution in the industrialized countries in particular, in which oil is being substituted by natural gas, coal and nuclear power has subscribed to dampen the world oil demand. This has become possible due to the sophisticated technology in these

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[106]"The Suffering Gulf," *The Economist*, October 24, 1998, p.41.

[107]'Free Rider Problem' is a form of cheating, like an individual riding a bus for free, associated with countries benefiting from membership in an international organization without having to any of the political, military, or economic costs. See W. Raymond Duncan, and others, *World Politics in the 21st Century*, (New York: Longman, 2002),p.524.

countries, which had increased the energy efficiency indicator of these economies. For example, as per one estimate[108], between 1973 and 1982, Western countries became 31.1 per cent more efficient in their energy use. This also throws light on the Western countries energy conservation programmes that have in fact been witnessed in these countries declining reliance on oil as a source of energy. Lastly, the internal strife, which is the culmination of differences among members within the OPEC, has also contributed in this regard. Since the OPEC heydays of the 1970s, the members have never completely controlled global oil prices due to their differences over the output targets.

Overview of Economic Developments and Policies

Since the substantial increase in international oil prices during the 1970s, economic developments and policies in the GCC countries can be broadly divided into four periods:

- *In the early part of the period 1981-85, historically high--albeit declining--oil prices increased export receipts, allowing the GCC countries to record large external current account surpluses and to build up foreign reserves.*

The policy objectives of improving the social and physical infrastructure, diversifying the economic base, and containing inflationary pressures were addressed through a two-pronged strategy. First, with a view to insulating their economies from foreign inflation, the GCC authorities abandoned the link between their currencies and a depreciating SDR, and established a de facto peg with the U.S. dollar, which led to a significant real effective appreciation of all GCC currencies. Second, expenditures on development projects increased, and some countries actively pursued policies to promote basic industries based on their vast hydrocarbon resources.

The sizable budget surpluses started to diminish from 1982 as expenditures continued to increase in some countries while revenues declined due to the steep slide in oil prices. While some countries had large budgetary deficits in 1984-95, the region as a whole recorded an annual average deficit of only 1 percent of GDP and an external current account surplus equivalent to 7 percent of GDP during 1981-85. Foreign reserves positions were very comfortable and inflation decelerated to an average rate of less than 1 percent per annum, but real output contracted.

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[108] Joan E. Sepro and Jeffry A. Hart, *The Politics of International Relations*, (New York: St. Martin's Press, 5th edition, 1997), p.290.

- *With the continued erosion of oil prices during 1986-89, economic conditions weakened further and large internal and external financial imbalances emerged.*

In response, the authorities implemented adjustment policies involving primarily cuts in expenditure, particularly capital outlays which declined from an average of 21 percent of GDP during 1981-85 to 13 percent of GDP during 1986-89. Adjustment was further facilitated by the significant real effective depreciation of GCC currencies.

Despite the expenditure cuts, and given the severity of the decline in oil revenue, the aggregate budget deficit increased to 4 percent of GDP during 1986-89, while the external current account position shifted to a deficit of 1 percent of GDP during the same period. External borrowing by some GCC countries limited the drawdown in foreign reserves.

- *The adjustment process was interrupted by the regional crisis of 1990-91.*

Notwithstanding the sharp jump in oil prices in the initial phases of the conflict and the higher oil production in some countries, crisis-related expenditures and transfers created significant pressures on the budgets and external current account positions of the GCC countries.

Those countries directly involved in the conflict suffered the worst: the budget deficit in Kuwait exceeded an estimated 100 percent of GDP in 1990-91; that of Saudi Arabia increased to 17 percent of GDP in 1991; and the combined external account deficits of the two countries amounted to US$54 billion in 1991 alone. Excluding Kuwait, the aggregate external current account deficit of the GCC countries increased to 7 percent of GDP, and their combined official foreign reserves declined further.

- *The GCC countries emerged from the Gulf crisis in a weaker economic and financial position at a time when the resumption of the adjustment process was further complicated by the continued downward slide in oil prices and a slowdown in global economic activity.*

Economic growth in the GCC moderated to an average of 2 percent per annum in 1992-94, real per capita GDP declined, and the lingering expenditures and transfers related to the conflict prevented significant reductions in the internal and external imbalances. For the region as whole, the average budget deficit in 1992-94 (10 percent of GDP) was higher than that of the pre-crisis period (4 percent of GDP), despite the much lower levels of capital expenditure. Similarly, at 6 percent of GDP, the aggregate external current account deficit was higher than the average during the 1986-89 period (1 percent of GDP) and foreign reserves positions eroded further. By 1994, although the stock of external debt stabilized at about 12 percent of GDP, debt service payments had increased sharply.

From 1995 most GCC countries intensified their adjustment efforts in response, inter alia, to an unfavorable oil market outlook. In particular, Kuwait, Oman, and Saudi Arabia introduced medium-term plans incorporating balanced budgets by the year 2000, as well as measures to promote private sector growth and human resource development. In other countries, similar policies are under consideration or are being formulated.

While the recent initiatives have significantly strengthened the adjustment process that began in the mid-1980s, the nature and extent of emerging challenges are also different in at least two important areas:

- *The fiscal deficits have become more structural in nature.*

In earlier periods, fiscal retrenchment was carried out through cuts in development expenditure without seriously affecting the growth prospects. In the meantime, the maintenance costs have increased, and there is a need to replenish the aging capital stock. In addition, the investment income, which in some GCC countries comprised a large share of government revenue, has declined while debt servicing has increased. Expenditure on social sectors has increased in line with a growing population, and outlays on defense and security have remained high. Pressures on expenditure also come from a large and growing government wage bill.

- *The GCC countries are undergoing major demographic changes characterized by a rapidly growing and young population, with important implications for the labor market.*

Traditionally, the government sector has absorbed a large number of new entrants to the labor force, reflecting the policy of guaranteed employment, higher wages, and the social status and other benefits associated with government employment. Fiscal constraints limit this possibility at a time of increasing number of entrants into the labor market. The policy challenge in the period ahead therefore is to meet the dual objectives of maintaining high levels of employment while reducing the role of the public sector in favor of the private sector.

Thus over the past three decades the member countries of the Cooperation Council of the Arab States of the Gulf (GCC)—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates—have witnessed an unprecedented economic and social transformation. Oil proceeds have been used to modernize infrastructure, create employment, and improve social indicators, while the countries have been able to accumulate official reserves, maintain relatively low external debt, and remain important donors to poor countries. Life expectancy in the GCC area increased by almost 10 years to 74 years during 1980–2000, and literacy rates increased by 20 percentage points to about 80 percent over the same period. Average per capita income in the GCC countries was estimated at about $12,000 in 2002, with their combined nominal GDP reaching close to $340 billion (more than half the GDP of all Middle Eastern countries. With very low inflation, overall real economic growth has averaged 4 percent a year during the past three decades, while the importance of non-oil economic activities has grown steadily, reflecting GCC countries' efforts at economic diversification. Moreover, central bank international reserves alone in some GCC countries are equivalent to about 10 months of imports. This progress has been achieved with an open exchange and trade system and liberal capital flows, as well as open borders for foreign labor. The GCC area has become an important center for regional economic growth.

The economies of the Gulf Cooperation Council (GCC) countries are wholly dependent on revenues generated from oil and gas as well as related petrochemical and refining industries. Table 2.26 showing the revenue sources of GCC economies, emphasizes the fact that, even after the OPEC hey days of 1970s during which oil revenues accrued the major proportion of the GCC countries' affluence and consequent economic diversification attempts to increase the proportion of non-oil revenues in the overall government revenues; oil still account for almost 75% of total government revenues in these economies (also see figure 2.7). Table 2.27 shows the data of GCC countries' total oil exports and oil revenue as percentage of GDP.

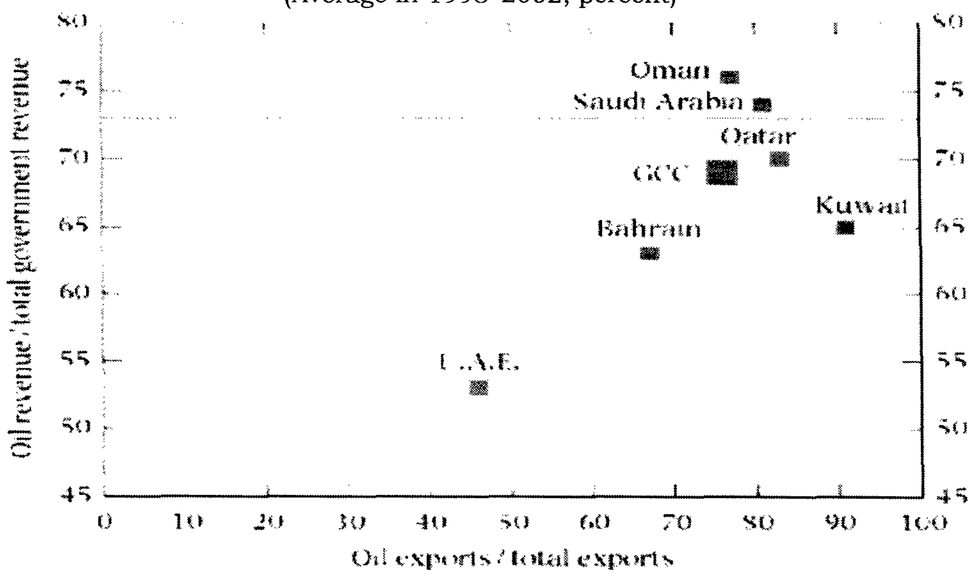
Table 2.26: Revenue Sources in GCC Countries, 1988-1996 (%)

	1988	1989	1990	1991	1992	1994	1996
Oil Revenue	54.0	63.7	76.2	78.7	75.7	73.9	77.4
Tax Revenue	28.3	25.4	17.1	17.6	18.2	18.6	18.8
Non-Tax Revenue	7.1	4.8	5.2	5.0	3.5	3.6	3.4
Investment Income	10.6	6.1	1.5	1.3	2.6	4.0	4.1

Notes: * actual preliminary data, ** preliminary estimates.
Source: Unified Arab Economic Report, 1995 and OAPEC Bulletin, April 1997.

Figure 2.7: GCC Countries: Oil Dependency[1]

(Average in 1998–2002; percent)



Sources: National authorities; and IMF staff estimates, as cited in Ugo Fasano and Zubair Iqbal, "GCC Countries: From Oil Dependence to Diversification", http://www.imf.org.

[1]Total government revenue includes investment income, and total exports include re exports

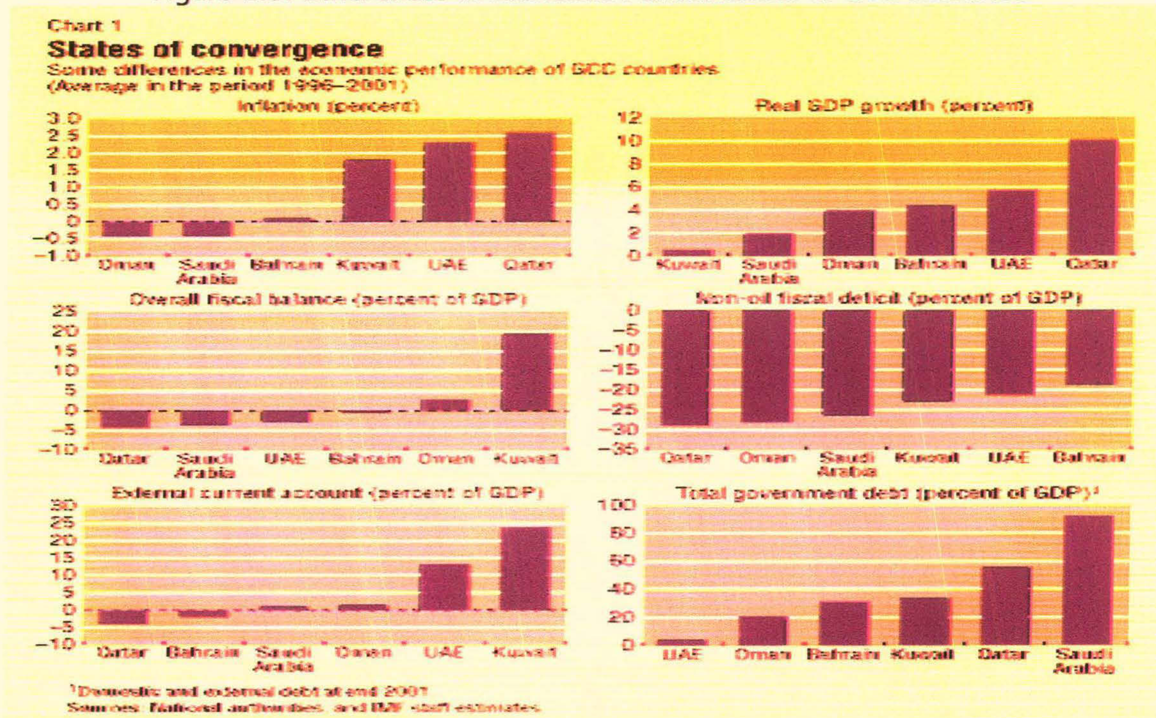
Table 2.27: GCC Oil Exports Statistics for 2001.

Country	Total Oil Exports (mn/d)	GDP ($Bn)	Oil Revenue (% of GDP)
Bahrain	0.02	99.0	30
Kuwait	1.8	33.4	50
Oman	0.9	17.7	40
Qatar	0.8	12.4	30
Saudi Arabia	7.4	185.0	40
UAE	2.1	58.0	33

Source: MEES, 45:34, 26 August 2002, p. A11.

Moreover, the GCC countries exhibit differences in economic performance and policy preferences during the 1990s, particularly in the second half (see figure2.8).

Figure 2.8: Differences in Economic Performances of GCC countries



Source: http://www.imf.org/external/pubs/ft/fandd/2002/12/fasano.htm

Various economic indicators reflecting the economic performances of GCC countries for the year 2002 are shown in Table 2.28. Since the 1970s, changes have been rapid; GDP, per capita GDP and export revenues have increased significantly, especially during the 1970s. Moreover, economic growth has been accompanied by a dramatic improvement in the welfare of the general population in these countries. Under normal circumstances, such rapid economic and social change would have to be accompanied by broad based economic growth, a thriving private sector, and growing exports, most likely in high income and price-elastic manufactured goods, except oil. In the GCC countries, however this has never happened. In fact the growth rates of GDP at times have declined to reach the levels of what is called as depression in the OECD standards. To illustrate, Saudi Arabia's real per capita income fell from $11,843 in 1980 to $7001 in 1985. During 1980-96, average annual GDP per capita growths were negative in Bahrain (-2.2%), Qatar (-3.7%), Saudi Arabia (-3.7%) and the UAE (-3.5%). The share of revenue generated from the sale of oil and natural gas represents the largest component of their combined GDP. While the Arabian Gulf nations share common features of oil abundance and oil dependency, their economic growth rates have differed sharply from one country to another[109]. In Bahrain, with a per capita income of $9000 in 1998, its average GDP growth rate in 1994-1998 was approximately 2.5%. With a per capita income of $15000 in 1997, Kuwait had witnessed a substantial growth in its GDP of 8.4% in 1994 because of its reconstruction spending after the Gulf War. However the average figure for following four years, declined to a low of 1% per annum. Kuwait's GDP growth in 1999 was not expected to differ sharply from the previous four years. With its per capita income of $7000, Oman performed better than either Bahrain or Kuwait as far as economic growth is concerned; yet it is a country facing problems in the present century as a result of having the highest birth rate among the six countries. Its GDP growth rate was in excess of 3% annually in the three year period, 1995-1998, but a preliminary estimate for 1999 indicated it to be around 4%. Qatar's per capita GDP is twice that of Oman, but the country experienced negative growth rate of -1.2% in 1995 to more than 11% in 1997. With its investments in natural gas projects, its GDP growth rates for 1999 are estimated to be around 6%. Saudi Arabia's per capita GDP has dropped from previous year to $7000 in 1998. Its average GDP growth rate was less than 1% per annum during the period 1995-1998. The highest per capita GDP among the six GCC members was $17000, experienced in the United Arab Emirates (UAE). However its GDP growth rates have been erratic, ranging from as high as 10% in 1995 to less than half of 1% in 1998. Table 2.29 shows the GDP in current market prices of the GCC countries.

[109] The figures reflecting various economic indicators have been adapted from the various issues of *MEES*.

Table 2.28: Economic Indicators of GCC countries, 2002 ($ Million, unless otherwise stated)

	GDP	Population (million)	GDP per capita ($)	GDP Growth (%)	Forecast GDP Growth2003 (%)	Forecast GDP Growth2004 (%)	Imports	Exports	Trade balance
Bahrain	8,328	0.7	11,210	5.5	5.7	5.9	5,542	6,773	1,231
Kuwait	35,900	2.4	14,958	2.3	8.5	3.5	7,091	15,366	8,275
Oman	20,180	2.5	8,029	1.9	1.1	1.5	5,867	11,205	5,338
Qatar	17,466	0.7	26,871	2.0	4.6	8.5	4,325	11,030	6,705
Saudi Arabia	188,240	22.1	8,518	2.1	4.9	1.0	32,267	71,583	39,316
UAE	71,021	3.6	19,728	1.2	4.0	2.5	35,000	47,900	12,900

	Budget Surplus /Deficit	Budget Surplus /Deficit as % of GDP	External Debt (end 2002)	External Debt as % of GDP	Foreign Currency Reserves (July2003)
Bahrain	-481	-5.8	3,588	45.4	1,736
Kuwait	4,860	13.5	0	0.0	8,860
Oman	-843	-4.2	5,700	28.2	3,257
Qatar	500	2.0	16,000	91.6	1,720
Saudi Arabia	-5,730	-3.0	0	0.0	23,106
UAE	-6,300	-8.9	0	0.0	14,897

Source: Middle East Economic Digest (MEED) 16-22 January 2004, p. 39.

Table 2.29: GDP in current market prices of GCC countries 1990-2000 ($/million).

	1990	1995	1996	1997	1998	1999	2000*
Bahrain	4,529	5,849	6,102	6,349	6,184	6,620	7,971
Kuwait	18,293	26,554	31,068	29,865	25,401	29,816	37,780
Oman	11,685	13,803	15,278	15,837	14,086	15,605	19 773
Qatar	7,360	8,138	9,059	11,298	10,255	12,197	16,454
Saudi Arabia	104,671	127,811	141,322	146,446	128,492	142,864	175,287
UAE	33,653	42,807	47,974	51,189	48,500	54,961	66,117

Notes: * preliminary estimates.

Source: Unified Arab Economic Report 2001, OAPEC Monthly Bulletin, November 2002, p.30.

These developments can be attributed to several factors. The region's governments have pursued policies to rapidly benefit the average citizen-transforming an almost primitive infrastructure into that of a modern industrial state; enhancing basic social services; developing a national defense; and financing sustained development of their economies. Although a great deal of success has been achieved in certain areas, especially in infrastructure development and in the delivery of social services; structural reforms and policies to promote sustainable development of their economies have not put in place. The public sector is still dominant. The heavy dependence on oil as their sources of revenue still continues. The declining oil prices and consequent declining oil revenues in the 1990s have exacerbated these adverse developments.

The total proven oil reserves of the six member countries of the GCC accounted for 44.2% of total world oil reserves, while natural gas reserves accounted for 15.5% by the end of 2000. It can be observed from the trends of reserves of both oil and natural gas of the GCC countries that these have increased in both absolute and relative terms over the course of the last two decades. Their combined reserves of crude oil increased from 276.1 billion barrels at the end of 1978 to 465 billion barrels by the end of 1998. The compound rate of increase is approximately equal to 2.6 per annum. During the corresponding period, the world figure was 1.90% as the total proven reserves of crude oil worldwide increased from 648.3 billion barrels to 1,052.9 billion barrels. With regard to natural gas, the compound rate of increase of the GCC countries' combined proven reserves is 7% per annum in comparison to the world figure of 3.8% per annum, over the course of twenty years from the end of 1978 to the end of 1998. It may also be observed that while the proven reserves of natural gas in those six countries are substantial, given the small size of their populations, they are not significant in relation to worldwide reserves. Yet, their proven reserves of oil are important for the world in the sense that there are clear indications of world's continuing dependence on oil from this region, like the experiences of past decades. It is noteworthy that proven oil reserves by the end of 1998 in comparison to those of 1978 increased by 39% in the case of Kuwait, 35% in Saudi Arabia and 21.1% in the United Arab Emirates.

Against such a background and given the trends as reflected in the global oil industry, it may be pointed out that these countries are suffering to sustain themselves.

As discussed in chapter I that the world oil and gas market has changed radically in the present regime in the phase of globalization sweeping across the nook and corner of the world, it is interesting to look at the role of oil producing governments, especially the GCC states and the impacts of these changes on their economies. The relationship between the oil and gas sector and the national economy in most of the developing oil producing countries, especially in the GCC has changed in a fundamental way over the past two decades. The oil and gas sector is no longer an exogenous sector immune from the broader economic and financial realities and pressures. More than ever before, the economic constraints have become binding at all levels. Perhaps the most significant consequence for the global oil and gas regime is the fact that the hydrocarbon sector in the GCC countries was pushed into 'the politics of the budget'[110], to carry on social charity in order to restrain the emerging public consciousness.

Very few GCC countries still have the financial resources that they had few years ago. Not only their real oil revenues come down drastically in past ten years or so, but also most GCC states have exhausted the vast financial surpluses accumulated during the golden days of the 1970s and early 1980s. Instead these countries have accumulated huge foreign debt on account of successive deficit budgets and surmounting public expenditure. This evinced from the fact that, the net assets[111] of OPEC member states crashed from just under $160 billion in 1980 to almost *negative* $ 60 billion in 1995. However, the depletion of assets and successive accumulation of huge foreign debt, in and of itself, is not the problem. The real problem facing these economies and these governments is the fact that the windfall revenues from oil exports was never disposed off rationally. This is vindictive of the fact that none of the oil exporting GCC states has managed to develop productive non-oil sector that can grow and create wealth independent of government spending and subsidies. This is peculiar phenomenon of a depleting-resource-based economy. Thus, at a time of declining global market share and dire need of huge investments in the oil and gas sector in order to meet the challenges of global environment of emerging potential markets (Asia in general and India and China in particular) and the sustained penetration of new players (non-OPEC oil and gas producing countries, Russia, etc.) in the global oil regime, the political pressures on the governments to spend on either current or military items has, more often than not, deprived the oil and gas sectors of the strategic necessary investment funds. This is why the budgets of national oil companies, which in the GCC economies do not represent important political constituencies, were the first to be cut.

Incidentally, just when the demands on declining revenue base started to take their toll on the governments' freedom of flexibility in formulating domestic policy, their capacity to influence the world oil market is virtually being eroding. The mounting domestic economic pressures implies that most governments could not afford the short term revenue consequences of an exercise/campaign

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[110]Vahan Zanoyan, "A Relevant Framework for Understanding the Global Crude Oil Market", in ECSSR, ed., *Gulf Energy and the World: Challenges and Threats*, (UAE, Abu Dhabi: ECSSR, 1999), Chap. 2, p.38.

[111] Net assets refer to total foreign assets less total foreign debt. The trends are sourced from, IMF Financial Statistics, January 1997.

to raise their market share; nor could they afford to neglect a host of regional and global political repercussions while considering short term oil price targets. Most GCC countries that depend on the West for security are generally constrained not only by the political imperative to spend on Western military and civilian imports, but also by the necessity to take western economic interests into considerations while formulating oil policy. The former reduces their freedom to cut spending; the latter reduces their chances to raise oil revenues. Moreover, the domestic constraints are intimately related to the fact that most oil exporting GCC countries have failed to come to terms with the new post-oil boom socio-economic realities in their respective countries. This tendency or popular psyche of 'care free attitude' has been strengthened by chronic deficit spending by the GCC governments and in fact created the illusion that the free period of the 1970s and early 1980s could be indefinitely prolonged. In addition the cost- cutting measures if adopted with iron intent cannot become successful because of the inherent fundamental structural and institutional bottlenecks.

The external policy options for the GCC countries have changed radically in recent years. Perhaps the most damning aspect of that change for oil exporting GCC countries is the extremely stubborn and widespread 'supply complacency' that has overwhelmed the oil consuming world for almost a decade. The fact that the three members of OPEC are under US trade embargo {i.e. Iraq, Libya and Iran} is indicative of the degree of supply complacency. The resilience of the supply complacency becomes more remarkable when one considers the fact that it has survived major political and military upheavals, including two major wars in the Gulf, along with substantial reductions in excess production capacity in the world in the past few years. Part of the reason for the supply complacency stems from the fact that the OECD countries in the aegis of IEA have accumulated substantial strategic petroleum reserves after the first oil shock, which in fact provided a level of comfort for the industrialized world and the global regime. Another part is the emergence and consolidation of paper markets[112] and hedging practices in the present regime, which have somehow instilled transparency and stability in the global oil and gas market. Another part is the rapid increase in production capacity in countries outside of the Gulf. The most important feature is that the capacity addition in the non- OPEC countries have been undertaken by international companies, while the

[112] In fact, the volume of trade in the paper markets and hedging practices is ten times higher than the overall physical oil trade in recent years.

operations in this regard in the GCC countries have been undertaken by the national oil companies with stringent budgets and government constraints.

The GCC countries are facing daunting challenges to sustain themselves. The challenges facing the GCC countries are well analyzed by some analysts[113]. Over the past twenty years, real economic growth in the GCC had not exceeded 2.5% annually, or half the average annual growth rate recorded in other developing countries. The per capita income in the GCC countries had declined over the past twenty years, whereas in other developing countries it had increased by some 60%. The GCC countries are confronting five major challenges to sustain themselves such as follows; population growth and labor productivity due to high birth rate, growth in budgets and public debt, dominance of public sector, restricting the development of a vibrant private sector, failure to tap enough foreign investment due to the unattractiveness of the domestic rigid institutions. The independent analysis of each of the above factors will reflect the extent of GCC countries' vulnerability to augment economic growth.

Challenges Facing the GCC Countries

Population Growth and Labour Productivity

Rapid population growth rate in comparison to labour productivity in the GCC countries is the most important problem. The growth rate in population-nationals and non-nationals-is one of the highest in the world, having averaged 5% between 1970 and 1995. The GCC countries are witnessing high birth rates coupled with low but declining death rates, as health conditions and sanitation improve over time. A summary of population statistics is given in Table 2.30. This rapid growth has in turn led to a surge in demand for jobs, with the labour market now roughly accounting for one-third of the population, of which foreigners account for roughly for two-thirds. The number of new entrants to the labor market-local and foreign- increases annually by an average of 3.7%. The national labor force is estimated to increase by 6% as a result of increased fertility rates and consequently some 7 million nationals are expected to enter the labor market during the current decade. In each of these six countries, the dependency on oil prices as the main source of government revenues make it difficult to devise long term economic policies, given oil price fluctuations and ever changing trends. Assuming stable government revenues against a high population growth rate, the per capita income will shrink and the standard of living will worsen over time.

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[113] For details see *MEES*, 45:18, 6 May 2002, p. B4, and Ibrahim M. Oweiss, *The Arab Gulf Economies*, (UAE: ECSSR, 2000).

Table 2.30: Population Statistics for GCC Countries (actual figures in thousands for 1990 and projections for the year 2005)

Country	1990	2005	Birth Rate (annual)	Death Rate (annual)
Bahrain	503	704	2.41	0.05
Kuwait	2,143	2,081	2.45	0.03
Oman	1,524	2,759	4.30	0.04
Qatar	486	646	2.00	0.04
Saudi Arabia	15,803	25,812	3.64	0.05
UAE	1,589	2,159	2.18	0.04

Source: World Bank Population Conference, Washington DC, April 1999.

The population of the six GCC countries is expected to increase by 55 percent in a fifteen-year interval. In the absence of evidence that oil prices will increase by the same ratio, the per capita income is bound to decline and budget deficits will increase. While examining the rate of population growth against sources of economic growth it has been found that labor productivity contributed only 9-11% of their overall economic growth rate. This is in sharp contrast to industrialized nations where the contribution of labor to growth is in the neighborhood of 75%. Given that the source of growth in these economies is natural resources, the growth accounting against such rapid population growth and lower labor productivity indicates that the per capita income will decrease. Another worrying trend is that in UAE, Qatar and Kuwait the foreign labor force accounts to 80% of the total population.

Heavy Budgets and Surmounting Public Debt

With the exception of Kuwait and Qatar, the internal and external debt of the GCC countries has reached critical levels. The deterioration in the financial position of these countries has been caused by fluctuations in the oil market, especially in the late 1980s and early 1990s when oil prices reached low teens and declining market share of these oil-exporting countries due to the penetration of other oil producers to the international oil market. Another actor is the increasing level of current expenditure in these countries[114].

Public Sector Dominance

As per the latest statistics (2000), the public sector dominates the GCC economies, ranging from 35% in UAE, to 54% in Saudi Arabia and 61% in Oman. The growth of public sector in these economies can be attributed to the fact that the governments in these countries accumulated massive wealth from oil revenue at a time when the private sector was virtually absent. This prompted the state to take initiatives and provide all the basic public services. At the same

[114] Barnett, Steven, and Rolando Ossowski, "Operational Aspects of Fiscal Policy in Oil-Producing Countries," *IMF Working Paper 02/177* (Washington: International Monetary Fund, 2002).

- *With the continued erosion of oil prices during 1986-89, economic conditions weakened further and large internal and external financial imbalances emerged.*

In response, the authorities implemented adjustment policies involving primarily cuts in expenditure, particularly capital outlays which declined from an average of 21 percent of GDP during 1981-85 to 13 percent of GDP during 1986-89. Adjustment was further facilitated by the significant real effective depreciation of GCC currencies.

Despite the expenditure cuts, and given the severity of the decline in oil revenue, the aggregate budget deficit increased to 4 percent of GDP during 1986-89, while the external current account position shifted to a deficit of 1 percent of GDP during the same period. External borrowing by some GCC countries limited the drawdown in foreign reserves.

- *The adjustment process was interrupted by the regional crisis of 1990-91.*

Notwithstanding the sharp jump in oil prices in the initial phases of the conflict and the higher oil production in some countries, crisis-related expenditures and transfers created significant pressures on the budgets and external current account positions of the GCC countries.

Those countries directly involved in the conflict suffered the worst: the budget deficit in Kuwait exceeded an estimated 100 percent of GDP in 1990-91; that of Saudi Arabia increased to 17 percent of GDP in 1991; and the combined external account deficits of the two countries amounted to US$54 billion in 1991 alone. Excluding Kuwait, the aggregate external current account deficit of the GCC countries increased to 7 percent of GDP, and their combined official foreign reserves declined further.

- *The GCC countries emerged from the Gulf crisis in a weaker economic and financial position at a time when the resumption of the adjustment process was further complicated by the continued downward slide in oil prices and a slowdown in global economic activity.*

Economic growth in the GCC moderated to an average of 2 percent per annum in 1992-94, real per capita GDP declined, and the lingering expenditures and transfers related to the conflict prevented significant reductions in the internal and external imbalances. For the region as whole, the average budget deficit in 1992-94 (10 percent of GDP) was higher than that of the pre-crisis period (4 percent of GDP), despite the much lower levels of capital expenditure. Similarly, at 6 percent of GDP, the aggregate external current account deficit was higher

> the basis of fruitful economic cooperations' has been dissipated in wasteful expenditures domestically and internationally"[116].

Thus as discussed above the GCC countries face important policy challenges and opportunities in view of an uncertain oil market outlook and the evolving trends in the regional and international economy. These are compounded by domestic developments, particularly the growing number of nationals entering the labor markets. Indeed, the GCC countries are at a crossroad. One path, built on insufficient policy response to less favorable external conditions, carries the risk of low rates of economic growth, rising unemployment, and growing financial imbalances and indebtedness. The second, stressing economic adjustment supported by structural reforms, promises financial stability, growing employment opportunities, and sustained economic growth.

Policy Challenges in the GCC countries

Policymakers in the GCC countries recognize the challenges facing their economies. This has been reflected in the renewed emphasis placed on broadening and intensifying the adjustment and reform efforts--efforts that were interrupted by the 1990-91 regional crisis triggered by Iraq's invasion of Kuwait. Having identified the economic and financial challenges and the appropriate policy response, the issue is now to implement the policy agenda in a decisive and sustained manner.

The economies of the GCC countries share many structural features, face similar constraints, and are influenced broadly by the same set of trends in the world economy. Over the years, the oil income has created a modern physical and social infrastructure and substantially raised the standard of living of the population. The countries have established a tradition of open and liberal trade and exchange policies, low inflation, and stable currencies. They also share a relatively narrow non-oil revenue base and large dependence on imports of goods and labor, increasing their vulnerability to adverse exogenous developments.

The major policy challenge in the period ahead is to exploit further the countries' economic and financial attributes by effectively addressing macroeconomic imbalances, correcting remaining structural rigidities, and reducing the vulnerability of the economies. While differences between the GCC countries with regard to resource endowment, foreign reserves cushion, and economic diversification are likely to influence the speed and the depth of the required policy effort.

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[116] El-Beblawi, Hazem, *The Oil Decade: An Appraisal in Perspective*, The IBK Papers, Series No.10, (Kuwait: The Industrial Bank of Kuwait K.S.C), p.43.

Thus as evident from the above discussion, the global oil and gas regime has undergone radical changes and transformations over the years. The market fundamentals have altered the global game in the favour of none. Both the producers and consumers are now overwhelmingly dependent on market solutions for their survival in the global oil and gas regime. The demand as well as the supply side of the regime has altered. The Asian countries have taken centre stage in the demand side of the global regime due to their surmounting consumption of imported energy ignited by their economic growth rate. In the Asian region, after China, India with its gigantic population is poised to be the largest energy consumer in the world. Given the fact that GCC countries are the traditional sources of India's energy provider this will open new opportunities for the GCC energy exporters to tap the booming energy situation in India as well as the whole of Asia. India's heavy reliance on imported energy especially from the Gulf region is looking inevitable in the near future. On other hand, from the global supply perspective, the GCC countries have lost their early leverage (1970s and early 1980s) to the out side players who have emerged in the regime due to the institutional, strategic, economic factors and due to the inherent instabilities in the world market. Nevertheless, these countries (GCC countries) are likely to play crucial role in the future, as most of the world's reserves lie in these countries and the cost of production is the lowest in this part of the world, if they consolidate themselves to the new realities of the times.

In this backdrop the emergence of India and the whole of Asia as a strategic force in the global energy consumption front, it is time for the GCC countries to take the appropriate policies and reap the benefits to ensure their survival in the new environment and to earn the much needed leverage in the global regime. And this seems evitable as one analyst has talked of the emergence of a 'global demand heartland' comprised of China, India and rest of Asia and a 'resource periphery' around the region from central Asia, Persian Gulf to Indonesia and south China[117].

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[117] Jasjit Singh, "Geopolitics of Energy and its Security", in Jasjit Singh, ed., *Oil and Gas in India's Security*, (New Delhi: Knowledge World and Institute for Defence Studies and Analysis,(IDSA), p.13.

Chapter III

India and GCC Countries: An Emerging Pattern of Interdependence in the Global Oil and Gas Regime

The analysis in chapter II reveals that the present global oil and gas regime is radically different from that of the past years. While on the one hand, the major players of the regime of the yester- years—the GCC countries are in the process of losing streak due to the penetration of other players; on the other hand, the industrialized West is being replaced by the newly industrializing countries of the East—the Asian economies in general and India in particular, in the world energy consumption map. Despite the GCC countries continuous failure to sustain their prominence in the regime, there are clear indications of GCC countries retain their position in the regime in view of growing dependence of Asia.

This chapter attempts a "SWOT (strengths, weaknesses, opportunities and threats) Analysis" of the oil and gas fundamentals in India and GCC countries. This will reveal how an increasing pattern of interdependence based on these energy fundamentals is emerging in the present global regime. The first section deals with Indian oil and gas sector from the days of its evolution till the present phase of deregulation and restructuring. The second section focuses on the various emergent issues in the GCC oil and gas sector and their relevance to the stability and sustainability of GCC countries in the present regime. The last section attempts to delineate the emerging pattern of interdependence between India and GCC countries.

Section I

Indian Oil and Gas Sector: A Brief Historical Account

The Indian petroleum industry is one of the oldest in the world, with oil being struck at Makum near Margherita in Assam in 1867[118], nine years after Col. Drake's sensational discovery in Titusville. Indian oil exercise started at a time when exciting technological innovations in the post-Industrial Revolution Period marked heavy and persistent World (especially the Western) dependence on a key resource like petroleum. H. B. Medicott of the Geological Survey of India first started oil exploration in India in 1865 in the Makum area. The most astounding Indian oil history was made on 26th March 1867 by striking oil at 118 feet. It was India's first oil well and Asia's first mechanically drilled well. Then came the discovery of oil at 178 ft., on 16th October 1889 in Digboi, which marked the birth of Indian petroleum industry in November 1890. A small oil refinery was

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[118] The efforts and findings worth mentioning in this respect are of Lt. R. Wilcox in Supkhong (1825), C.A.Bruce in upstream Makum (1828), W. Griffith in Kamrup Putar (1837), Lt. W. Bigge in Namrup (1837), Capt. Francis Jenkins in Borhat and Makum (1835), Capt. H. Vetch in Makum (1842), and a few unnamed explorers. The Indian exercises in this field have been well documented by S. N. Visvanath in his book, *A Hundred Years of Oil: A Narrative Account of the Search for Oil in India*, (New Delhi: Vikas Publishing House, 1990).

set up in Margherita in 1893 to process Digboi crude. However, the Assam Oil Company commissioned India's first oil refinery at Digboi in December 1901. Production from Digboi was initially 20,000 tons in 1934. Another area in upper Assam named Surma valley, was opened up for exploration in Badarpur prospect in 1915. A small oil deposit was discovered, which was later abandoned in 1933 after a total production of about 3, 20,000 tons.

The Formative stage

In terms of evolution, the period 1947-60 and more precisely the decade of 1950s could be designated as the formative stage of the growth of Indian oil sector. Independent India adopted centrally planned socialistic economic system with mixed economy articulations reflected in some areas of industrialization. The greatest Indian oilman, late Keshava Deva Malviya- the father of modern Indian Oil industry, very willfully and committedly took up the responsibility of transcending the Nehruvian vision into realities of a national oil industry. His efforts led to the discovery of two oil fields in Nahorkatiya in June 1953 and relatively smaller one in Moran in November 1956, which added considerable strength to the Indian energy economy. To give boost to the exploration activities an Oil and Natural Gas division was created within the Geological Survey of India in December 1955, which was upgraded to Oil and Natural Gas Commission (ONGC) on 14th August 1956. ONGC started exploration in the Sibsagar district in upper Assam and in the central part of Gujarat in the Cambay basin in 1956-57. The efforts were soon resulted in the form of two giant discoveries of oil fields in Lunej and the biggest onshore oil field at Ankleswar. In the downstream sector the second oil refinery owned by the Standard Vaccum Oil Company was commissioned in 1954. The third refinery in Mumbai owned by Burma-Shell Refineries Ltd. and the fourth refinery in Visakapatnam owned by the Caltex Oil Refinery (India) came on stream in 1955 and 1957 respectively. The Indian Refinery Limited was formed in 1958 and for marketing the petro-products, the Indian Oil Company came into being in 1959. On the other side, the Government of India (GOI) incorporated Oil India Private Limited on 18 February 1959 as a Rupee Company with two-third shares held by the AOC-BOC combine and one-third. This arrangement was further modified; equal share holding of this company between GOI and Burma Oil Co. (BOC) was effected from 27 July 1961.

The Developing Stage

This stage covers two decades 1960s and 1970s, when the efforts, growth and success of the Indian Petroleum industry in its upstream and downstream sectors were of significant proportions. Oil exploration was spread out to almost all the first and second grade petroliferous Indian basins. Success of discovering a good number of mega, macro, medium, moderate, mini and also micro size oil-gas fields, both in India onshore and offshore areas, irrevocably confirmed presence of oil and gas beyond Assam. The decade of 1960s is therefore designated as the 'saga of elephantine serendipities, exemplary sacrifices and determined struggle for discovering, developing and utilizing the petroleum resources of the country'[119].

Of the total oil-gas find achieved in this decade, the discoveries, mentioned in Table 3.1 are technically and economically most significant.

Table 3.1: Important Oil-Gas Discoveries of 1960s and 1970s in India

Discovery (Oil/Gas)	Basin	Date of Discovery		Field Size
		Month	Year	
Cambey (Lunej)	Cambay	November	1958	Mini
Ankleswar	Upper Assam	May	1960	Mega
Rudrasagar	Cambay	December	1960	Medium
Kalol	Upper Assam	June	1961	Macro
Lakwa-Lakhmani	Cambay	December	1962	Mega
North Kati	Upper Assam	April	1967	Medium
Geleki	Cambay	April	1968	Macro
Sonthal	Bombay Offshore	October	1971	Medium
Bombay High (oil&gas)	-do-	February	1974	Giant
Panna (oil)	-do-	March	1976	Macro
South Bassein (Gas)	-do-	April	1976	Mega
Heera	-do-	October	1977	Mega
South Tapti	-do-	February	1978	Medium

Source: B.K. Bose, *Oil Asia*, January-March, 1999, p.7.

In the refinery sector, the first public sector refinery at Guwahati (1961), World's first crude conditioning plant at Nahorkatiya (1963), Cochin Refinery (196 and Madras Refinery (1969) came on streams in the 1960s. A few pipelines were also commissioned. They were Nahorkatiya-Guwahati pipeline, the first long distance product pipeline in India from Guwahati Refinery to Siliguri (1964), 16" dia pipeline from Ankleswar to Koyali Refinery (1965). In the organizational front, Indian Refineries Ltd. and India Oil Company merged to form Indian Oil Corporation Ltd. (IOC) on 1st September 1964.

[119] B.K. Bose, Ibid, p. 5.

The period 1970s may be termed as the decade of exploration excellence. In this period the exploration concepts, efforts and also the expectations got progressively refined. The offshore exploration was started and the India's oil giant Bombay High and the gas-mega Bassein level discovered much to the rejoice of the nation. Bombay High was brought to commercial production in 1975 and gas supply from the field for power generation and fertilizer manufacturing started in 1978. But the biggest disappointment of the developing stage was the lack of exploration success in Bengal Basin, Ganga valley, Mahanadi Basin, Kutch-Saurashtra and the Andamans.

During this period, indigenous oil production increased significantly. At the time of Indian independence in 1947, oil production was a meagre 5,047 barrels per day, while in 1970 it became 142,000 b/d, an amazing increase of more than 28 times. The level of self-sufficiency of Indian economy in oil however was then only around 35 percent. In the refinery side, the fuel sector of Haldia Refinery came on stream in 1975. Next year, the Burma Shell Refineries was fully taken over and renamed Bharat Refineries Ltd., while Esso refinery through Government takeover was renamed as Hindustan Petroleum Corporation Ltd.

The Maturing Stage

This stage resulted in rapid increase in exploration activities and also inventories of non-economic and marginal fields. Despite a few impressive discoveries, almost 85 percent of the discoveries of the 1980s were of micro size. The situation characterizes the matured stage of exploration efforts in an area. Field production and development increased manifold in this stage. In fact, Indian domestic oil production reached the till then highest ever peak of oil production around 692,000 b/d in 1989-90. Also, Indian self-sufficiency in oil touched an all time high of 68 percent. The Krishna-Godabari and Cauvery basins both onshore and offshore came up on the Indian and global map with substantial discoveries, see table 3.2. Some of the discoveries in Bombay offshore and the Gandhar oil-gas field in Cambay had been the most rewarding assets of this period.

Table 3.2: Important Oil-Gas Discoveries of 1980s

Discovery (oil/gas)	Basin	Date of DiscoveryMonth and Year	Field size
Mukta (oil)	Bombay offshore	August 1981March 1984July 1985	Medium
Gandhar (oil-gas)	Cambay		mega
Narimanam (oil)	Cauvery onshore		Moderate
Pasrlapudi (gas)	Krishna-Godabari (k-G)onshore	January 1987 January 1987	Medium
Neelam (oil)	Bombay offshore	July 1987	Mega
Ravva (oil)	K-G offshore		Macro
Mandapeta (gas)	K-G onshore	September 1988	Medium
PY-3 (oil)	Cauvery offshore	September 1988	Mini

Source: Oil Asia Journal, January-March, 1999, table-3, p.8.

The other important development during this stage was the government's take over of Oil India Ltd., which became a fully 100% public sector company in 1981. During this period, the supply of natural gas also got intensified. Gas from Bombay High started getting up to HBJ (Haldia-Bijapur-Jagdishpur) pipeline from 1987-88. One LPG plant at Uran (near Mumbai) was commissioned by ONGC in 1985-86. This period witnessed the emergence of two jewels of the oil-gas sector, such as Indian Oil Corporation (IOC) and Oil and Natural Gas Commission (ONGC).

This decade however marked the induction of foreign players into the Indian oil regime, though slowly. It was realized that foreign technologies, expertise and above all capital will be essential to deal with the future challenges and commitments of Indian oil economy. The first step towards this end was the opening up of Indian exploration acreage to competitive global bidding. The first strategic initiative was taken in 1979-80 of offering 32 exploration blocks (17 offshore and 15 onshore) covering 8 basins for global bidding[120]. In fact the first strategic alliance in the Indian oil sector started in the year 1953-54 when Indo-Stanvac Petroleum Project (ISPP) was organized for oil exploration in West Bengal offshore and Kutch offshore were assigned to Carlsberg-Namota: and Reading & Bates respectively in 1975. However the options of phased liberalization of the Indian oil-gas sector started getting nationally debated and seriously considered since the end-1980s.

[120] Ministry of Petroleum and Natural Gas, *Annual Report*, (New Delhi: Govt. of India, 1990).

Global Regime in India

Before discussing the stage of Indian oil-gas sector in the 1990s, it would be interesting to focus on the implications of the global regime on Indian oil economy. It is to be noted that, when India achieved political independence in 1947, oil, more than any sector, was the weakest link in its economic structure. The powerful foreign oil monopolies, especially the British, with the full backing of the colonial administration, had seen to it that India remained backward and totally dependent on them in this vital front. They did not show interest in developing crude production or refining in India[121]. The imperialist interest in oil was to supply Indian market, on terms advantageous to them, from rich oil fields of the Middle East and Latin America, which the international monopolies operated. The activities of global oil cartels in India were confined to establishing sales network rather than making investments on building an integrated oil industry. Though the American monopolies, as part of their worldwide competitive requirements, sometimes evinced interest in oil exploration in India, particularly during the first two decades of the 20th century, the British due to its colonial political power restricted their moves[122].

However, after the World War I, with the balance of power shifting in favor of the Americans, the Americans penetrated into the Indian oil and gas sector. This period witnessed cutthroat competition between the British and the American monopolies in India, which was later, resolved by an agreement for the carving up of the Indian market in 1927. This was at about the same time as the top seven international oil companies entered into elaborate cartel arrangements for the world market as a whole. The British became more accommodative to share the Indian market with the Americans, though the major share of about 70 percent rested with them, till the 1950s. It is to be noted that the Americans lost interest in exploration in India and whatever desultory exploration was undertaken, was more to hide than to search for oil.

However after independence, when policy makers became restive about the vulnerable position in this vital sector the multinationals advanced the false theory that there was no oil in India[123]. The foreign companies propagated this myth even after oil had been struck in the first few years of exploration in the

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[121] Mehta, Balraj, *India and the World Oil Crisis*, (New Delhi: Sterling Publishers Private Ltd., Part II, 1974), p.31.

[122] When in 1902, the Standard Oil of the USA sought permission to prospect for oil in India, it was curtly refused on the specific ground that, 'it is not desired by the Govt. of India to introduce any American oil companies, or their subsidiary companies, into India', see Balraj Mehta, ibid.

[123] Mehta, Balraj, Op. cit, No.4.

public sector with Soviet assistance. The most decisive factor in this period has been the success of the efforts to develop the industry in the public sector during the late 1950s. Nevertheless, the foreign oil monopolies had always hedged their efforts of collaborations with many unacceptable conditions and terms and there had been no progress in this direction. Thus, there was virtually no oil industry in India at the time of independence. There was a small refinery in India and six marketing companies, all with their head offices out side India. Three of the marketing companies were subsidiaries of the international oil majors—the Burma-Shell, the Stanvac, later turned into ESSO and the Caltex. The three together controlled 90 percent of the sales of petroleum products to the Indian market. The Digboi refinery with less than half a million tonne capacity, also wholly owned by a subsidiary of the Burma Oil Co-a British concern which holds 50 percent partnership in Burma-Shell, covered only a small part of the consumption.

The growing demand for petroleum products had to be met by increasing imports through the companies, on which they made enormous profits. This openly colonial pattern in the Indian oil-gas sector continued till the early 1950s. Though the Government in its 1948 Industrial Policy took some bold steps to revamp the sector from the colonial pattern, it failed due to the transition phase in the aftermath of the Second World War. Meanwhile, the oil monopolies strategised new ways of consolidation in the Indian oil economy. The new plans took stage with the commissioning of three new coastal refineries between 1954 and 1957, since after the World War II, the oil monopolies had intended to locate the refineries in consumption centres rather than in the centres of crude oil production due to political, strategic and economic reasons. This also forestalled the implementation of GOI's 1948 Industrial Policy Resolutions. The oil monopolies not only succeeded in consolidating their hold over the Indian market, but also they won away special refinery arrangements from the GOI, which was arbitrary and irrational. It is to be noted that the GOI played into the hands of the oil monopolies at the formative stage of the Indian oil economy. This was exacerbated by the then prevailing situation in the global regime in which there was skepticism regarding cut off of future oil supplies to India, due to the nationalization of the British oil cartel in Iran and successive American and British threats.

The whole *raison de'tre* of the companies putting their refineries on the Indian coasts was simply to tie up the rapidly expanding Indian market with their own sources of crude supply, which automatically tied the Indian oil sector with their global operations. It was designed to strengthen and consolidate their hold on the Indian market rather than develop Indian oil industry. When in order to mitigate foreign exchange stringency, the Soviet Union offered to supply crude to India on rupee payment basis for refining, the companies bluntly refused to process it in their refineries and got away with it, by invoking the refining agreements. It was also equal significant that the product pattern of the refineries established in India did not cater to more crucial Indian demand pattern such as, kerosene, aviation jet fuel and lubricants which were of economic and strategic importance for the country. Thus the entire pattern of the companies' operations and organization in India was developed to achieve the objective of establishing a small link in the chain of their world operations.

Moreover, the operations of smaller independent companies were insignificant in comparison to the majors. Between 1928 and 1933, for instance, some independent distribution companies were floated in India but they had to face a fierce cutthroat competition and underselling by the giants and as a result, they collapsed or remain out of business. Even after independence, such attempts got foiled. An Indo-Iranian Oil company was set up during the Anglo-Iranian oil conflict in the early 1950s. It even concluded a contract with the National Iranian Oil Company (NIOC) to buy oil products for sale in India. But the power of the monopolies was so great that the company was liquidated before it could start business.

Thus, in the system of majors' operation in India, there was necessarily no place for exploration and production of crude, the primary source of their super-normal-profit. India was placed very low in the order of priority for exploratory efforts in the global operations of the international oil majors. Even in such cases where prospects for exploration were established to be good, the companies sought special rights and concessions, reimbursement of expenditure in event of failure and control over disposal of crude. Only the BOC agreed to participate in crude exploration and production in the Assam area, at especially favorable terms, because it already held profitable investments in the Digboi refinery and wanted to expand further. The result was the formation of the Oil India Ltd., in which the BOC first secured 70 percent share and subsequently agreed to 50:50 partnership with the government, and a guarantee of 9 to 13 percent profit to the BOC. During the first year of its working when the profits were not good, the return to the company was ensured through government subsidies to the tune of rupees sixty and more per ton of crude production.

By the mid-50s, it became clear to the government that there is no alternative to building national oil industry in the public sector. In this regard, the ONGC was set up in 1956 and was converted into a statutory body in 1959. After the first success in oil exploration by the ONGC, the government started to plunge into the refining sector and subsequently in the early 1965, the public sector refining company and the IOC were merged to form the Indian Oil Corporation (IOC). This set up in the public sector oil had to rival the power of the monopolies. The existence and growth of the public sector in oil for ten years between 1956 and 1965 was a source of great strength to the economic and security capability of the country.

The decision to develop national oil industry in the public sector had naturally met with hostilities from the international companies. This hostility expressed itself in various economic as well as political forms over a prolonged period of tussle for the public sector oil to establish itself. The setting up of public sector refineries especially met with stronger resistance since it threatened the interests of the companies immediately. In this regard, the attitude and position of the world bodies like the World Bank is noteworthy:

> "The World Bank in its two reports submitted in 1956 and 1958 went out of its way to specifically oppose the public sector oil programme in India. In the 1956 report it remarked, 'It would be a mistake to insist on such a measure of government participation in the exploitation and development of oil resources as to discourage foreign oil ventures'. Again in its report in 1958 it reported: 'The (India) government's insistence that refineries must be in the public sector and its reluctance to grant new exploratory concessions to oil companies inhibited the participation of foreign capital'. The Federation of Indian Chamber of Commerce and Industry (FICCI) also echoed the same line and demanded that foreign capital should be allowed in the oil sector" [124].

Meanwhile, favorable conditions had begun to operate in the global regime. While in the initial phases, Soviet and Rumanian assistance alone could be counted upon to develop the national oil industry; new developments in the world oil industry were also taking place at about the same time to reduce somewhat the monopoly grip of the cartels in this vital sector. The sweep of national liberation movements in the countries of Asia and Africa had important repercussions for the global oil regime. It gave birth to the drive of nationalization of oil industries in the oil-producing countries, earlier owned by

[124] Balraj Mehta, Op. cit., p. 49.

the multinationals. Most of these countries were able to release wholly the oil concessions from the cartels' control and establish national oil companies. This provided a new basis for international collaboration between India and countries in the West Asian region. The countries in west Asia were eager to penetrate in to the potentially vast oil market in India. Also India had developed technical expertise to some degree in various fields, which the west Asian could use viably and economically. The first instance of this cooperation was a deal with the Iranians, which included the setting up of a refinery at Madras and participation of India in oil exploration in the Iranian offshore areas. Similar prospects afterwards came up in relation to other oil producing countries, the most important being the deal with Iraq.

Another major development having bearing to the development of national oil industry in India was the growth of national oil companies in the consuming countries of Europe such as France and Italy as well as the emergence of independent oil companies in the West as a whole, including the USA. In their search of business opportunities as a measure of self-defence, these national oil companies and the independents were willing to accept terms of collaborations. This resulted in the refinery construction at Cochin with the American Company Philips accepting a minority holding. In the field of exploration also, India attracted foreign expertise and capital from independent sources such as from the ENI of Italy and the French governments[125]. The cartel remained completely out of any such venture. These developments made it possible for India to confront the international oil companies in India from a position of comparative strength and self-confidence. The result is the companies' retreat in the form of offer to terminate the special refinery agreements as a sop to the national sentiment and to operate under ordinary industrial licenses. However the offer was conditional in that the government had to allow the tie up of the companies' refineries with their own sources of crude supply. This implies that the companies wanted to maintain their international monopoly in India. Thus the sixties witnessed a significant decline in the operations of international oil cartels in India.

The energy sector in India was completely nationalized by the mid-1970s, and the government started using the sector as a vehicle to provide subsidies to its population as well as to provide employment. While on the one hand these sectors were straddled with employee numbers far beyond those required and

[125] Mehta, Balraj, ibid.

the accompanying labor problems, on the other hand there was never a position in these public sector enterprises to generate any substantial internal resources to augment the budgetary support provided to them by the govern ıent. Additionally the subsidized energy provision resulted in scant regard being paid to energy efficiency by the consumer. This resulted in a situation where de. .and growth outstripped supply growth, thereby leading to sub-optimal investment choices.

The Transforming stage

One of the significant aspects of the public sector development of the oil-gas sector in India is the grant of substantial budgetary support, which resulted in the present maturing stage of the industry. The 1990s witnessed a phase of transformation in the oil and gas sector in India as well as other sectors of the Indian economy. The oil-gas sector witnessed a transition from a state of complete protection to the phase of open competition. For several decades, India pursued protectionist 'import substitution' trade policies, which impaire l the flow of foreign capital into the country. Dictated by a balance of crisis, mainly due to sky-rocketing world oil prices in the event of the Gulf war (1990-91), ..dia began to open up to foreign investment and trade. Given the fact that the petroleum product consumption has increased substantially over the years and there is every likelihood of these trends to continue, an assessment the current and future scenario in the Indian Hydrocarbon sector became impo.tant. As a result, factors basic to promotion, progress and prosperity of oil-gas business in India have been altering since early 1990s. This is commensurate with the general economic reforms and restructuring going on in the Indian economy since the early 1990s.

Economic reforms in India have followed an approach. In the process, though these reforms have been undertaken slowly, it has been argued that the process has avoided many cataclysmic effects that have accompanies reforms in several other countries. The tackling of the reforms at macro level got succeeded by 'mesoeconomic reforms', i.e. reforms in the more critical sectors of the economy. There are certain reasons for prioritizing reforms in the hydrocarbon sector, such as[126]:

- The horrible experiences of the oil shocks of 1973-74, 1979-80 and the period during and after the Gulf war of 1990-91 made the policy makers to devise policies and prepare the Indian economy to absorb the shocks and uncertainties of any future oil market upheavals.

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[126] For details see Government of India (GOI), *Restructuring Group Report*, (New Delhi: GOI, 1996)..

- Given the growth in demand for petroleum products, the excessive dependence on oil imports needs to be curbed either through indigenous production or from equity oil that India may be able to establish in other oil producing and exporting countries. Even though export earnings in general have been buoyant in the 1990s, the cost of increased outflow of foreign exchange required to import petroleum products could become high and hence need to be guarded against.
- The oil and gas industry worldwide went through a period of reform, which had important lessons for India that became the guiding principles for restructuring and reorganizing the sector. While the decade of 1970s was a period of growth and emergence of national entities, the 1990s represented a period of reforms in the national oil companies and organizations in the industry. In fact the oil-gas industry today represents the cutting edge of economic reforms in many countries. The experiences thus served well for the reform in the oil and gas sector in India.

Thus a process of transition of the Indian oil-gas sector has started since mid-90s from its protective into a competitive future. The oil-gas sector is also gearing up to suitably transform into a competitively responsive industry. The causes and contents of the forces driving the need of transformation are arising from the ground realities of the various sub-sectors of the oil-gas sector such as the upstream and downstream sectors. A detailed analysis of the sectors will reveal the basic realities/ fundamentals of oil-gas sector in India. The organization of the Indian energy sector is depicted in Annexure 3.1. Annexure 3.2 depicts the growth of Indian Petroleum sector.

Upstream Sector

The total prognosticated hydrocarbon resources of India, inclusive of deep waters, are estimated at around 28 billion tonnes oil and oil-equivalent of gas, of which, as of 01.04.2003, initial in-place of 7.57 billion tonnes and recoverable reserves of 2.81 billion tonnes have been established. The resources estimated by Director General of Hydrocarbon (DGH) for its 'internal use', for the country, is 32 billion tonnes (O+OEG)[127] (see Annexure 3.3).

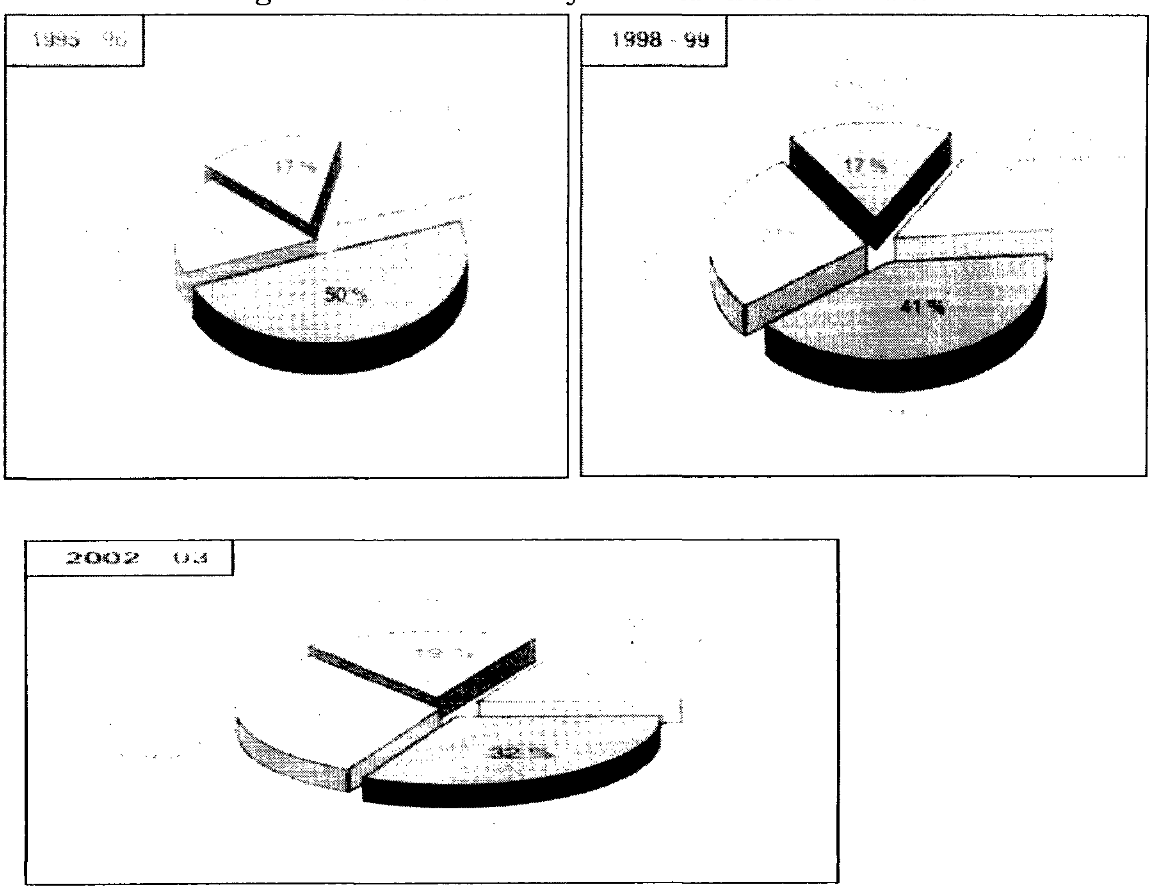
Exploration Activities

Geologically, 26 sedimentary basins cover India. But, on techno-economic risk-reward sensitivity ratings, a total of 42 basins can be identified. Exploration efforts have so far been made in 22 basins with varying degree of success. Commercially, the most rewarding basins have been the Assam, Bombay and Cambay (ABC). Grading of the qualitative images of the present exploration situation of the ABC basins suggest that their prospectivity is still best among all Indian basins so far explored. Exploratory drilling in Indian deep-water area has

[127] 'India - Petroleum Exploration and Production Activities - 2002 – 2003', http://www.dghindia.org/.

recently started and the initial results are not inspiring. Integrated overview of the trend in oil-gas reserve accretion and the accelerated growth in mini-micro finds and fields over the last two decades suggest that exploration efforts in the explored Indian basins, save deep-water and frontier areas have by and large attained first level of maturity[128]. The area expanse and the level of exploration intensity of the Indian basins summarily reflects that 16% has been moderately to well established, see figure 3.1. Of the total area of 3.45 million sq.km of Indian basin, 46% constitute land and 43% deep-water and the balance 11% offshore area up to 200-metre isobath. Starting from Goodenough's historical attempts till today a total of 340 strikes and finds have been made. Of it, about 70 has been developed into producing oil-gas fields. Important Indian producing fields are mostly in the ABC basins (see Figure 3.1 and Table 3.3).

Figure 3.1: Sedimentary Basinal Areas Of India



Total Sedimentary Area : 3.14 M. Sq. Km

[128] Ministry of Petroleum and Natural Gas (MoPNG), Annual Report, 2000-01.

Table 3.3: Status of Exploration in India

Level of Exploration	AREA (Million Sq.Km.)		
	1995-96	1998-99	2002-2003
Unexplored	1.557	1.276	1.019
Exploration Initiated	0.556	0.837	0.996
Poorly Explored	0.529	0.529	0.590
Moderate To Well Explored	0.498	0.498	0.535

Source: http://www.dghindia.org/.

Oil-Gas Production

The exploration and production of oil and gas has been primarily in the hands of two national oil companies: ONGC and OIL. Over the years, the domestic production of crude oil has not kept pace with demand. Self-reliance on crude oil has dropped dramatically in the last two years (1999-2001) with the spurt in refining capacity and presently (2001-2002), stands at a mere 30%. The trends of crude oil production and demand are shown in table 3.4.

Table 3.4: Trend of Crude oil Production and Demand in India 1990-91-2001-2002 (MT)

Year	Production		Domestic Total	Net Import	Total Demand	Import as % of Demand	Self Reliance (%)
	Onshore	Offshore					
1990-91	11.83	21.19	33.02	20.70	53.72	38.53	n. a.
1991-92	11.38	18.96	30.34	24.00	54.34	44.17	50
1992-93	11.20	15.75	26.95	29.25	56.20	52.05	43
1993-94	11.65	15.38	27.03	30.82	57.85	53.28	41
1994-95	12.01	20.23	32.24	27.35	59.59	45.90	45
1995-96	11.85	23.32	35.17*	27.34	62.51	44.73	44
1996-97	11.37	21.53	32.90*	33.91	66.36	50.76	39
1997-98	11.44	22.37	33.86*	34.50	68.36	50.47	37
1998-99	11.50	21.20	32.70*	39.80	72.50	54.90	41
1999-00	11.20	21.30	32.50*	53.50	86.00	62.21	41
2000-01	11.71	20.72	32.43*	74.09	103.44	71.62	40
2001-02	11.81	20.22	32.03*	78.70	107.27	72.77	45.6
2002-03	11.39	21.65	33.04*	81.98	112.56	72.83	42.5

Note: * includes oil production through Pvt./JV Companies.

Source: MoPNG, '*Basic Statistics on Indian Petroleum and Natural Gas*, GOI, Various issues.

The substantial drain on the country's reserves of foreign exchange caused by the heavy imports of crude necessitates increased domestic exploration. The investments required, estimated at about $60 billion, however, were considered beyond the scope of the national oil companies. Total current investments by the private sector in the upstream sector are estimated to be in excess of $2.36 billion (till September 2002). In 2002-03, total oil production was over 33.0 MMT and that of gas 31.4 BCM. The contribution of Pvt/ Joint Venture companies was about 14-15% of the total Oil & OEG Production, see table 3.5.

Table 3.5: Oil and Gas Production by NOCs (national oil companies) and Private and Joint venture Companies

	Oil (MMTS)			Gas (bcm)		
Year	NOCs	Pvt./JV	Total	NOCs	Pvt./JV	Total
1995-96	34.5	0.7	35.2	22.3	0.3	22.6
1996-97	31.6	1.3	32.9	22.7	0.5	23.3
1997-98	31.3	2.5	33.9	24.7	1.7	26.4
1998-99	29.7	3.0	32.7	24.6	2.9	27.4
1999-00	27.9	4.0	31.9	25.0	3.5	28.4
2000-01	28.4	4.0	32.4	25.9	3.5	29.4
2001-02	27.9	4.1	32.0	25.7	4.0	29.7
2002-03	-----	-----	33.04	--	--	31.4

Note: Pvt./JV-Private/Joint Venture, --- means not available.
Source: MoPNG (2002).

Private Participation

Exploration bidding rounds to attract private investment started in 1979, far before the reforms of the 1990s, but the early rounds were not successful due to a host of factors such as, unattractive fiscal regimes, the impression that Indian basins are not worthy of large-scale exploration, restrictions of the Ministry of Petroleum and Natural Gas, etc. The first rounds were spaced over 12 years (1979-91). The next five rounds came in two years (1994/1995) and succeeded in generating some impression in the international oil industry. To further their interest, the government of India decided to award some small and medium sized fields for development to the private and joint sector respectively. The next round witnessed the growth of 'joint ventures', on the line of the developments of International oil industry-to reduce the risk for the private investors by associating ONGC/OIL as partners in these exploration ventures.

In order to boost domestic oil and gas production, the government also announced the new exploration licensing policies (NELP) in 1997, offering blocks on attractive terms to operators. The NELP has twin objectives of attracting the private capital and foreign technology for Indian upstream sector, and for mapping the sedimentary basins of the country as extensively as possible. Till date, three rounds of NELP have been conducted with a fourth round of NELP in the process. A total of 100 blocks were offered under NELP I, II, and III and 71 blocks were awarded.

The response under the first two rounds of NELP was mixed. Under the first round of NELP, 48 blocks were offered but only 25 were awarded. In the second round of NELP, 25 blocks were offered and 23 were awarded. Under the third round of NELP, GOI received 45 bids for 23 of the 27 oil and gas exploration blocks on offer. It was estimated by the Ministry of Petroleum and Natural Gas

(MoPNG) that NELP III will result in investment of 145000 million rupees in three phases. In the latest round, NELP-IV, a total of 24 blocks have been offered, of which 12 blocks are in the deep waters off the west coast, east coasts & Andamans; one shallow offshore in the east coast and 11 on land. Andaman area is being offered for the first time. It is to be noted that such government policies in the exploration front is suitably paying off recently. There are important new discoveries of gas as well as oil field in India (see Annexure 3.4). Map 3a shows the new significant discoveries in the Indian oil and gas sector.

Down Stream Sector

Refining

The installed refining capacity of the country's 17 refineries (see Annexure 3.5) stands at 114.66 MTPA (million metric tons per annum) at the end of April 2003, increasing by 2.08 MT from the past year. One-third of the country's refining capacity is in the private sector: the 9.69 MTPA Hindustan Petroleum Corporation Ltd (HPCL)/AV Birla Group JV at Mangalore, Karnataka, and the 27 MMTSPA refinery of Reliance Petroleum Ltd at Jamnagar, Gujarat. Following the recommendation of the Nitish Sengupta Committee on the merger of stand-alone refineries with integrated refining-marketing companies, the government sold its stake in the Kochi Refineries Ltd (KRL) and the Numaligarh Refinery Ltd (NRL) to BPCL and that in the BRPL (Bonaigaon Refineries and Petro-chemicals Ltd) and the CPCL (Chennai Petroleum Corporation Ltd) to the IOC. After the restructuring, the IOC accounts for the major share of the country's refining capacity with a total capacity of 44.95 MMTSPA. Map 3b shows the location of all the existing and proposed refineries with relevant details. The total quantity of crude processed in the country in 2002-03 was 112.56 MT, which meant an industry capacity utilization of 98%.

Consumption

The demand for petroleum products is linked with the energy requirements of the country, which is a function of the level of economic activity as measured by the GDP. Presently India is undergoing major economic and industrial reforms for integrating its economy with the global economy. In the liberalized scenario, the hydrocarbon sector has been identified as one of the main areas of the focus. Major policy changes are planned for the vital sector to make the oil industry globally competitive. With the reforms package formulated and expected high growth in all economic sectors, the demand for petroleum products is expected to show a compound growth of about 7%. In absolute terms, the demand for petroleum products by the year 2006-07 is expected to increase from the present level of 80 million tonnes to 155 million tonnes per annum.

The consumption of petroleum products in India in 1999-2000 stood at 96.29 MMTS. Domestic production accounted for only 68.1 million tons, while the balance was imported. Middle distillates constituted the bulk of the product imports, of which HSD (High Speed Diesel) accounted 10.5 million tons. The six-percent growth rate in demand for petroleum product over the last decade was arrested in 2000/01. The situation has changed dramatically with the increase in the domestic refining capacity in 1999/2000. The consumption of petroleum products in the year 2001-02 was 100.43 MT against the domestic production of 100.07 MT. in the year 2002-03, the consumption; as per provisional estimate is around 112.56 MT as against domestic production of 104.14 MT. The trends of product imports have therefore registered a negative trend in the years 2001-02 and 2002-03. Map 3c shows the product pipelines in India.

Natural Gas

The start of gas utilization in India can be traced back to the period after the commissioning of the Hazira-Bijaipur-Jagdishpur (HBJ) gas pipeline in 1986 (see 3d), which linked the gas producing areas in the western part of India to the consuming states in the north-western part of India. Since then the government of India has appointed a number of committees to assess the optimum use of gas. Initially gas in India was allocated for fertilizer production. Over the years, however the utilization of gas has taken place for other purposes such as generation of electricity, etc. the structure of gas consumption has also changed. Current gas consumption for power generation equals that for fertilizer production, with each sector accounting for about 40% of the total gas consumption in India.

Although the gas industry has witnessed a rapid development since, gas usage accounted for only 8% of the total primary energy consumption in the country in 2000. The demand for natural gas in India has been growing rapidly. Gas sales in the country increased at an annual rate of 7.4% during the period 1990/91-1999/2000. Gas has been primarily used as fuel in power generation and as feedstock in fertilizer production. Gas production in 2002-03 was 31.4 billion cubic metres. The three main producing basins in the country- the Western offshore region, the Cambay basin in Gujarat, and Upper Assam region-are in the mature phase of exploration. As per the projections of the Sub-group on Utilization of Natural Gas constituted under the Hydrocarbon Vision 2025, the domestic gas availability is expected to decline to about 16 BCM by the year

2011/12. On the other hand, the demand for natural gas in the country has been growing rapidly. Netting of LPG production and gas for ONGC's own use, gas sales aggregated 23.8billion cubic metres. Table 3.6 shows the detailed area-wise and sector-wise gas consumption pattern in India for the period 1999-2000.

Table 3.6: Area-wise and Sector-wise Gas Consumption in India, 1999-2000, (MMSCMD)

Region/State	Fertilizer	Power	Sponge Iron	Others	Total
Western Offshore:					
Uran	4.8	3.6	1.5	0.8	10.6
Hazira	2.8	--	1.7	0.9	5.3
HBJ	13.4	11.0	--	2.8	27.3
Sub-Total	20.9	14.6	3.1	4.5	43.1
Western onshore	1.2	4.1	--	1.4	6.7
Krishna	1.8	2.5	--	0.1	4.3
Godabari basin	--	--	--	--	--
Rajasthan	--	0.4	--	--	0.4
Cauvery Basin	--	0.0	--	0.2	0.2
North East	--	1.4	--	0.1	1.6
Total	23.9	22.9	3.1	6.4	56.4

Source: Gas Authority of India Ltd (GAIL).

Moreover, with gas production in the country set to increase by 50% when Reliance' gas comes to the market, the gas marketing scenario is all set to change. If Reliance is unable to sell its entire production in the east coast at a lucrative price, this may find its way into the west coast of the country where it will compete with domestics as well as imported LNG. Map V shows the prominent LNG terminals, proposed gas import pipelines and National gas grid.

Demand and Supply of Natural Gas

Natural gas off take, at 28037 MCM (million cubic metres) in 20001-02, was 0.6% higher as compared to 27680 MCM in 2000-01. Sixty-six percent of this gas was used for energy purposes while the rest was used as a feedstock in the fertilizer and petrochemical industry (see table 3.7). Usage of gas as a domestic fuel showed the highest percentage growth over last year (45%) followed by petrochemicals (16.7%), and captive usage/LPG shrinkage (6.7%).

However, the current gas demand is constrained by supply. The allocation of gas, as worked by the Gas Linkage Committee, is about 119 MCMD while the total sales are in the range of 66 MCMD, implying a current deficit of 53 MCMD. To bridge this gap, public and private sector companies are pursuing several gas import options. Many LNG terminals have been planned along the eastern coasts of the country while several pipelines are also in the planning stage. In fact, India has received its first consignment of 138,000 cubic metres of liquefied natural gas (LNG) from Qatar under an agreement between the two countries for a 25-year supply on 31st January 2004.

Table 3.7: Sectoral Consumption of Natural Gas (MCM)

Consumption	2000/01	2001/02	Change (%)
Energy Purposes	17199	18234	6.0
Power generation	8801	9214	4.7
Industrial fuel	2870	2979	3.8
Tea plantation	151	147	-2.6
Domestic fuel	335	485	44.8
Captive usage/LPG shrinkage	5004	5339	6.7
Others	38	70	84.2
Non-energy use	10661	9803	-8.0
Fertilizer industry	8480	7957	-6.2
Petrochemicals	779	909	16.7
Others	1402	937	-33.2
Total	27860	28037	0.6

Source: Tata Energy Data and Directory Year Book (TEDDY), New Delhi: TERI, 2002-03, p.76.

Demand Projections

Oil Demand

Generally, demand projections are made in the short-term as well as long-term period, so that appropriate policies can be devised and implemented in time of need. The short-term and long-term outlooks for oil demand are essentially supply driven, with considering the trend in the domestic as well as world scenarios. And the trends in the present scenario are extrapolated to reach at possible scenarios in the near or distant future.

The demand for oil compared with other primary source i.e. coal in India is expected to grow vigorously in the coming decades resulting from economic growth, population changes, increases in disposable incomes of households, and changes in the capital intensity of the Indian economy and as environmental factors and the cost of rehabilitation of land in coal-mining areas add significantly to the cost of coal mining. In addition, given the fact that coal reserves are predominantly located in the eastern and south-eastern part of the country, transportation costs, particularly where new transport capacity additions are involved, would make the price of coal at consumption points in other parts of the country much higher than current levels.

As per one short-term estimate[129], the oil demand of 75 MMTS in 1995-96 is expected to reach 115 MMTS by the year 2001 and to 155 MMTS by the year 2006. This estimate is based on 6% GDP growth rate during the 19990s.

[129] See Oil Asia, January-March 1999, p.16.

Another estimate[130] projects the crude oil demand of 91 MMTS in 1999/2000 to reach 364 MMTS by the year 2024-25. The details of the estimate are given in table 3.8.

Table 3.8: Projections of Supply/Demand- Petroleum Products 1999/00-2024/2025, (MMTS)

Year	Demand (without meeting gas deficit)	Demand (with meeting gas demand)	Estimated Refining Capacity	Estimated Crude Requirement
1999-2000	91	103	69	69
2001-2002	111	138	129	122
2006-2007	148	179*	167	173
2011-2012	195	195**	184	190
2024-2025	368	368	358	364

Notes: * Assuming 15 MMTSPA of LNG import by 2007. ** Assuming that by 2012, adequate gas is available through imports and domestic sources.
Source: Hydrocarbon Vision 2025, MoPNG, 2000.

One set of forecasts made by the TEESE[131] (TERI energy economy simulation and evaluation) model shows an increase in demand for oil products from 119 MTS in 2001 to 157 MTS in 2011. However TERI has made another set of forecasts up to period 2047. The demand for oil in the base case scenario in the forecast, has been extrapolated from the present trends and practices, adds up to 667 MTS by 2047[132]. In this sectoral projection for oil has also been made, which shows that the transport sector continues to drive the demand for oil in the country. In addition, oil demand for non-energy uses, e.g. feedstock, industrial consumables (greases, waxes, lubricants, etc.), and bituminous carpeting, and by industries is also high. Table 3.9 shows the estimates.

Table 3.9: Sectoral Oil Demand (MTS) Projections: the base case scenario

Year	Industries	Non-Energy	Transport	Agriculture	Commercial	Domestic	Power	Total
1997	12	13	39	1	2	14	3	83
2019	40	38	101	2	14	25	14	234
2047	126	119	292	4	50	35	41	667
1997-2047 (%)*	4.7	4.6	4.1	3.1	6.3	1.9	5.7	4.2

Note: * Compound Annual Growth Rate.
Source: TERI, "TERI Directions, Innovations, and Strategies for harnessing action (DISHA)", TERI, 2001, p.280.

Supply Projections

Domestic crude production is expected to fall short of the targets. Though the Planning Commission has set a target of 180 MTS during the 9th Five-Year Plan

130 MoPNG, *Hydrocarbon Vision 2025,* 2000.
131 As cited in MoPNG, "Restructuring Group Report 1996", MoPNG, 1997, p.5.
132 TERI, *TERI Directions, Innovations, and Strategies for harnessing action (DISHA)*, TERI, 2001.

period, it is estimated that actual production will be much lower, at about 162 MTS, according to the mid-term review of the Plan. Crude production in 2000/01 aggregated 32.7 MTS as against a refining throughput of 90.8 MTS. With an increase in domestic refining capacity, crude imports have increased considerably with imports in 2001/02 expected to be about 77 MTS.

Thus as the trends show large imports of crude is inevitable, which is also strengthened from the fact that improved domestic refining activity will prompt more imports of crude to feed the refineries which will increase value-added in the economy. The long-term import requirement of India has been well summarized by TERI DISHA, as shown in Table 3.10. Map VI shows the existing and proposed crude pipelines in India.

Table 3.10: Projected demand and supply of crude oil: the base case scenario (MT)

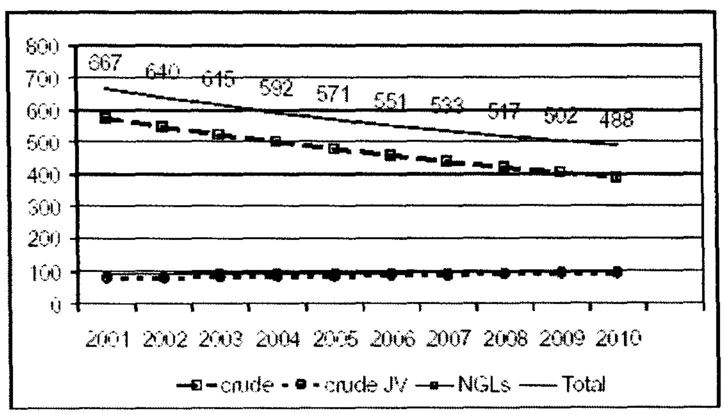
Year	Demand	Refinery throughput	Domestic production	Imports
1997	83	69	34	35
2019	234	246	80	166
2047	667	702	80	622

Note: Indicative refining throughput (assuming refinery fuel and loss at 5% and no product imports) is compared to domestic crude production to estimate import requirements.
Source: TERI, "TERI Directions, Innovations, and Strategies for harnessing action (DISHA)", TERI, 2001, p.280.

Figure 3.2 depicts petroleum (both Crude and NGLs) production outlook of India.

Figure: 3.2

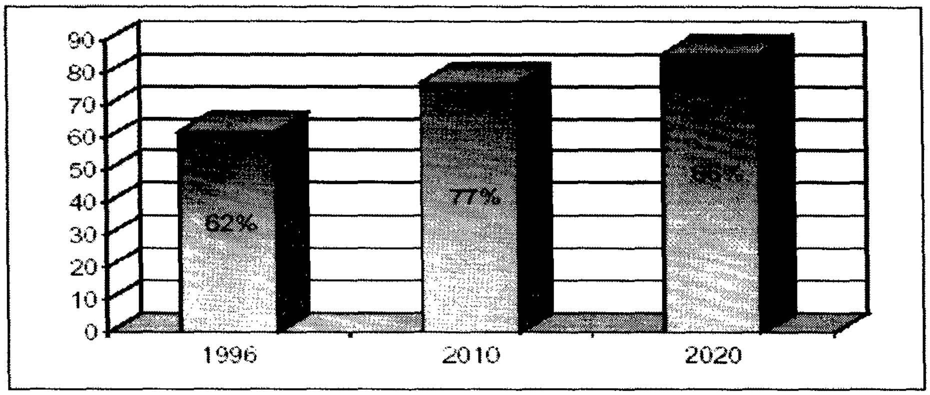
India –Domestic production outlook, crude and NGLs (kb/d)



Source: EIA, DOE, 2003.

As evident, India is poised to depend on oil supplies from overseas to meet its surging demand in the future. As per the IEA, India's external oil dependency will increase from the present level of around 65 percent (2002) to 77 percent by the year 2010 and to 86 percent by the year 2020 (see figure 3.3).

Figure 3.3
India – External oil dependency outlook



Source: IEA, March 2000.

Natural Gas Demand Projections

The short-term outlook for gas demand is essentially supply driven, with project expansions being linked to gas imports. LNG imports on the west coast are expected materialise by 2005. Additional gas from LNG terminals would cater to: (i) current deficits of existing gas consumers, i.e., the difference between gas allocated to them and actually supplies received and (ii) new gas based projects. In case of the power sector, current shortfalls add up to 10.3 MMSCMD. In addition, new gas based power projects would require about 20.6 MMSCMD of gas. Total additional short-term gas requirements are expected to be about 30.9 MMSCMD. With regards to gas demand for fertilizer production, the Planning Commission has estimated a demand-supply gap for urea of 3 MMTS by 2004[133]. For other sectors, new capacities/ projects have not been considered and the short-term outlook essentially reflects the difference between current allocation to various sectors and sales. Table 3.11 shows the short-term gas demand outlook[134].

Table 3.11: Short-term Gas Demand Outlook (MMSCMD)

Year	Power	Fertilizer	Industry	Transport	Domestic	Total*
1999	25.0	24.4	9.1	0.1	0.1	59.4
2005	55.9	33.2	11.9	0.5	1.3	102.7

Note: * gas for captive use, LPG shrinkage and other non-energy uses.
Source: TERI/FACTS, "Gas Demand", TERI, 2003, unpublished internal paper.

[133] Planning Commission, *Ninth Five Year Plan Documents*, GOI, 1998.
[134] TERI/FACTS, "Gas Demand", TERI, 2003, unpublished internal paper.

The long-term gas demand forecast based on trend analysis in India is problematic due to various reasons, such as; trend extrapolation becomes difficult as restricted gas sales do not reflect actual demand and the administered prices for natural gas disassociate 'perceived' demand from inter-fuel economics. However, the best possible scenario for forecasting gas demand is that which is based on criteria such as population growth and more importantly the economic growth rate, which is called GDP indexed demand growth (GIDG)[135]. Table 3.12 summarizes the available forecast studies on gas demand in India, apart from the well-used TERI technique.

Table 3.12: Various Gas Demand Projections

Scenario I- Gas Master Plan (MMSCMD)					Scenario II Hydrocarbon Vision 2025 (MMSCMD)				
Year	Power	Fertilizer	Others	Total	Year	Power	Fertilizer	Others	Total
2001	40	38	12	89	2001	40	54	23	117
2006	73	38	12	122	2006	67	66	33	166
2011	112	38	12	161	2011	90	83	43	216
					2024	153	105	64	322

Scenario III- TERI/FACTS Study (MMSCMD)						
Year	Power	Fertilizer	Industry	Transport	Domestic	Total*
1999	25.0	24.4	9.1	0.1	0.7	59.4
2005**	55.9	33.2	11.9	0.5	1.3	102.7
2010	69.3	40.3	15.6	0.7	1.7	127.6
2015	78.8	46.3	21.9	1.0	2.7	150.8
CAGR	7.4%	4.1%	5.7%	15.4%	8.9%	6.0%

Notes: * short-term estimate (supply driven), ** gas for captive use, LPG shrinkage and other non-energy uses.
Source: TERI/FACTS Study, 2003.

Supply Projection

A subgroup on the development and utilization of natural gas under the Hydrocarbon Vision 2025 group offers different scenarios of the likely production of domestic gas by 2024/25. The analysis is based on the estimates provided under the 'given scenario' based on production profile of existing fields. The trends have been interpolated to assess the gas production in 2019 and extrapolated to estimate the same in 2047, as shown in table 3.13.

Table 3.13: Projected Domestic Gas Production (BCM)

Year	Production
2001	25.6
2006	21.2
2011	16.4
2019	14.3
2024	13.1
2047	0.4

Source: Hydrocarbon Vision 2025.

[135] The GIDG parameter is the innovation of TERI.

As shown in the table, domestic gas production is expected to be marginal by 2047. These are very conservative estimates based on the rate at which existing fields are being depleted and assume that no new discoveries are made. However, in the absence of any reliable estimates or targets for the future (unlike oil in the Hydrocarbon Vision), these figures have been adopted. This implies that projected import requirements will change as and when new gas fields are discovered and exploited.

The Deregulated Indian Oil and Gas Sector

Though the above analysis reflects the deregulation process in the Indian oil and gas sector, yet an in-depth analysis will reveal the emerging opportunities and challenges in the sector. The section below starts with a brief historical background of deregulation in the Indian oil and gas sector and focuses on various aspects and issues in the deregulated oil and gas regime in India.

Brief Historical Background of Deregulation

The period after the 1970s saw nationalization of the oil industry, which resulted in the public sector dominance of the oil industry through buying up of private entities. In all public sector undertakings (PSUs), the government of India holds a stake of 51% or more of the paid-up share capital. However, with the restructuring of the Indian economy in the 1990s the process of deregulation started in all sectors and also in the oil and gas sector with a view to transforming it into a vibrant and globally competitive industry. In this regard by April 2002, the sector became fully deregulated.

In the early 1950s, pricing was based on a system of 'valued stock account' (VSA). Under this system, the basic selling prices of major petroleum products were determined as the sum of free on board (fob) Ras Tanura price, ocean freight, insurance, ocean loss, import duty, interest and other charges as well as 10% remuneration. However, the government decided to abandon this system of pricing as it was based on assumed costs rather than actual costs. Consequently, an Oil Price Enquiry Committee was set up in 1960, under the chairmanship of Mr. K R Damle[136]. The committee recommended that ceiling selling prices for bulk refined products should follow the 'import parity principle'[137]. Moreover, by the 1970s, it was felt that the refining capacity of the country was adequate to meet the needs and thus the dependence on imports of petroleum products was less. It was also felt that the West Asian product prices,

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[136] See Mehta, Balraj, op. Cit., pp.93-100.

[137] For detail understanding of the principle of 'import parity', refer Horsenell, Paul, Op. cit; and also see, International Trade Centre UNCTAD/WTO, *International Procurement of Crude Oil and Petroleum Products*, (Guide No. 24, UNCTAD/WTO (Import Management), 1995).

which were the basis for determining the import parity prices, did not necessarily reflect the actual cost pattern and operations of Indian refiners. Thus the government introduced the 'Administered Pricing Mechanism (APM)[138]' in 1977, which was later modified by the Oil Cost Review Committee in 1984. The Oil Co-ordination Committee was set up in 1975 to manage Oil Pool Accounts and to co-ordinate supply and other matters in the oil and gas sector.

The APM was aimed at ensuring continuous availability of petroleum products to consumers at fairly stable prices and crude to the refiners, while ensuring the socio-economic objectives of the government. However, in April 2002 the government dismantled the APM formula to initiate market determination of prices of petroleum products on import parity basis to get rid of subsidies-the major source of budget deficit.

Rationale for Deregulation

There are various factors that have contributed significantly in initiating and carrying forward the deregulation process. Some of the factors have already been mentioned in chapter. The other main factors can be analyzed as follows:

- The main reason for the deregulation of the sector was the serious loopholes in the APM mechanism and its unintended effects, which were economically unsustainable. Oil pricing has been used a tool for achievement of objectives of the government of the day, divorced from the basic economic realities. The prices of politically sensitive products do not reflect the economic cost of the producer. Subsidies and cross-subsidies have resulted in wide distortion in consumer prices and consumption pattern of petroleum products, which resulted in dieselation of the economy and consequent automobile fleet of the country. In case of highly subsidized products, the low pricing much below its economic value has led to inefficient, wasteful use resulting in sub-optimal inter-fuel substitution. Political compulsions often dictate price administration and pricing system is thus inflexible to changes in global prices. In a country, where more than 50% of the demand is met through imports of crude as well as products, such inflexibility can prove to be hazardous for the economy. The pool deficit became a source of serious concern. The APM provided little incentive for improving efficiency or productivity as returns were guaranteed on the capital employed. Competition was stifled with marketing companies acting as mere distribution companies.
- Over the last two decades, import of petroleum products soared ten-fold from over 2.2 MTS in 1975 to nearly 18 MTS in 1995. Given the high level of imports in the Indian economy, the APM, which insulated the oil economy from the global market, had lost its utility. Further, it was estimated that during the 9th Plan Period, an investment of about Rs 1,

[138] The APM essentially constituted a cost-plus pricing regime wherein costs were reimbursed as per standards laid out with respect to throughputs, yield pattern, fuel and loss, operating cost, capital employed, etc. companies were allowed a 12% post-tax return on their net-worth and reimbursed their borrowing costs. For a clear understanding of the mechanism of APM and OPA and its different components, see Rao, Saudamini, "The Indian Oil and Gas Sector Bracing for Deregulation", *Oil Asia Journal*, Mumbai, January-April-June 2001, pp. 25-54.

> 24,000 crores would be required to create the necessary infrastructure to meet the surging demand, it was recognised that such a scale of investment was not possible to be initiated by the public sector. Participation of the private sector was therefore imperative, as before the APM was not attractive to the private investors.

So in 1995, the Ministry of Petroleum and Natural Gas (MoPNG) set up the Oil Industry Restructuring Group ('R' Group) to come up with a time bound program for reforms in the petroleum sector. The Group prepared a blueprint for phased reform of the petroleum sector. As a follow up of the 'R' group recommendation, the government had appointed an Expert Technical Group (ETG), an inter-ministerial committee, which was required to examine the various scenarios reflecting the impact of different levels of duty structure on various sectors. The ETG recommended a time bound program of reforms to move towards a market driven pricing mechanism for petroleum products in the country.

In addition, the refining sector was delicensed in 1998. Further, while naphtha exports were decanalised with effect from June 1998, furnace oil imports were decanalised under the provision of the export-import policy in July 1998. Freight under-recoveries on HSD to the extent of 20% were passed on in the selling prices in January 1999. However, it may be noted that HSD prices are not being fixed at import parity, despite the government notification on the subject. Subsidies on HSD have, thus, inflated the deficit in the oil pool account. Administered HSD prices constitute a major distortion of the reform agenda[139].

In a significant move towards deregulation, the GOI in 20001 announced decontrol of ATF prices and the disinvestment in IBP with bidders being required to commit themselves to an investment of Rs 2,000 crores in exploration and marketing, refining, pipelines or terminals.

Features of Deregulation

Main features of deregulation as per the Gazette Notification[140] are as follows:

- Crude price payable by refineries will be on import parity.
- Retention price concept will be abolished for existing and new refineries.
- The tariff on crude and petroleum products will be rationalized in phases by 2001-02.
- Refineries will be free to decide their product prices except for LPG, MS, SKO, ATF and HSD. The refinery gate price for these five products till 2001-02 will be fixed by OCC at adjusted import parity for existing refineries. The government in the beginning of every year will announce the adjustment factor.

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[139] TERI, "Roadmap to Deregulation of the Indian Petroleum Industry," in *'Reforms in Energy Sector,'* TERI, New Delhi, 2001.

[140] Acharya, K K, and others, "Challenges in deregulated scenario", in Centre for High Technology, "*Hydro-carbon Technology*", August 1998, p.1.

Impacts on different aspects of the oil-gas sector

As a result of deregulation the oil industry in India is witnessing penetration of private players and there is also indication of intense competition in the future as and when the reform process became fully operational. This can be substantiated from the developments in the sector. When the Indian lubricants market was decontrolled in 1993 to parallel marketing, there were 20 new entrants who captured about 12% of the market share in just five years, eating in to the market share of established players like IOC and BPCL. The market also witnessed a spate of joint ventures as the Indo Mobil between Mobil and IOC to blend, package, distribute and market Mobil brand lubricants throughout India. Similar restructuring of the industry may be expected with the decontrol of transportation fuels- while the increase in number of new players may not be as high as in the case of lubes, primarily on account of the conditional marketing rights, the degree of competition in this sector would be more severe. In fact some of the private companies have now marketing super quality transport fuels for two-wheelers in the metro cities of the country.

Another impact of the deregulation can be noticed in the sourcing of crude oil. Till 2001, all PSU refineries had to source crude through IOC, which was the sole canalizing agent. Only the joint sector and private refineries had freedom in crude sourcing and importing. On March 14 2001, the government extended this freedom to all PSU refineries. The move was welcomed by the industry as imports could now be tailored to suit the exact requirements of a particular refinery.

External Policy Initiatives

With regards to the external policy initiatives, two things can be considered. One is the attempt to diversify the source of oil imports either through holding oil equity in areas outside the Gulf or through joint ventures. Second are the policy initiatives for the import of LNG. In case of the first, except some achievement in the form of joint sector development in Sudan and Russia's Sakhalin Project, nothing substantial has been achieved so far. This implies that India's dependence on its traditional supplier- the GCC countries- is most likely to continue for long.

Considering the burgeoning gap between demand and supply of natural gas, the government has started to promote the utilization of natural gas. For this, in 1996, Petronet LNG was formed to facilitate imports of LNG. Four public sector hydrocarbon majors-IOC, BPCL, ONGC and GAIL promote this company. The LNG projects have been proposed by companies like Shell at Hazira, CMC

Energy/Unocal/Grasim at Ennore, IOC/Petronas at Kakinada, Tata/Totalfina/GAIL at Mumbai and British Gas at Pipavav.

As the above analysis shows there are tremendous business opportunities in the deregulated Indian oil and gas regime. The prospective business opportunities in the form of volume of investment required in each sector can be summarized as follows (also see Annexure 3.6):

♣Exploration: Investment perspectives for petroleum exploration till 2010 might be of the order of about US $ 4-6 billion. This amount covers the G&G (Geology and Geophysics) and exploratory drilling activities for oil and gas. Investment for other alternative energy exploration (Coal-Bed Methane, Gas-Hydrates, etc.) in this period could be around US$ 200 million.

♣Oil-Gas Production: Rehabilitation and redevelopment of some of the major oil-gas producing fields has become one of the principal investment agenda, which need substantial investments. It is estimated that the production side of the upstream sector might require on investment of about 1 billion during the next 10-12 years. Therefore, the Indian owners of these fields are often looking for suitable partners who can participate in recharging, rehabilitation, and redevelopment of the fields on mutually acceptable terms.

♣Refining: investment opportunities in the Indian refining sector during next 8-10 years aggregate to about US$ 20-25 billion, in order to achieve capacity addition of about 110 MMTS.

♣Natural Gas: The quantitative mega images of the emerging investment opportunities in the business of natural gas in India for the next 15 years are like this:

- Proposed sub-sea pipeline from Oman to India for importation of LNG from Oman: US$ 5 billion.
- Setting up of LNG terminals of 2.5 MMTSPA-10MMTSPA: US$ 1.1 billion.
- Southern Gas Grid: US$ 2.4 billion.
- Domestic Transportation Network of 2000 Km: US$ 3.0 billion.
- Downstream (GAS) Business: US$ 10 billion.
- Importation of gas from Iran and/or other neighboring countries and other related activities: US$ 5 billion.
- City distribution projects and technological development in principal sectors of gas business in India: US$ 3.5 billion.
- Total: US$ 30 billion

Source: Oil Asia Journal, January-March, 1999, p. 16.

The latest development[141] in the policy front by the Government of India also signifies major emerging opportunities in the oil and gas sector. The government in January 2004 lifted almost all curbs on foreign direct investment in the petroleum sector. Foreign investors will now be able to bring in 100% FDI in refineries, marketing, explorations and pipelines — both natural gas and LNG. While removing existing FDI caps in these sectors, the government has also allowed investments via the automatic route instead of the existing FIPB route.

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[141] Full FDI flow for oil exploration, refining & sales, Times News Network, Friday, 16, 2004 01:20:33 AM, on line at http://www.indiatimes.com.

This investor-friendly move will encourage investments and do away with procedural delays.

The sectors where 100% FDI has been allowed via the automatic route include refineries, marketing, investments in small and medium sized exploration blocks and petroleum product pipelines. However, these foreign investments are subject to sectoral conditions and guidelines. For instance, in the case of retail marketing where the existing cap of 74% has been done away with, 100% FDI has been allowed subject to the existing sectoral policy and regulatory framework. The policy requires companies to invest Rs 2,000 crore in the petroleum sector either in refining, exploration or infrastructure (relating to the petroleum sector) to qualify for marketing licence. The licence is to be issued by the regulator in the oil and gas sector. This move is expected to attract foreign investments given the market size of the country and the growth potential of the industry.

In case of refining, where the government has allowed 100% foreign equity investments via automatic route, as against the existing policy of going through the FIPB route, it has been specified that this policy will not include PSU refineries where the cap of 26% remains, but only be applicable for private sector refineries. However, given the existing refining capacity in the country which is in surplus to the demand in the country, it will be sometime before foreign investments come into this sector. In the case of pipelines, while the existing cap of 51% has been removed, 100% FDI via the automatic route has been allowed only in the petro-product segment. As far as natural gas and LNG pipelines are concerned, investments will have to be approved by the FIPB.

The new policy also removes the present FDI limit in oil exploration of 60% in unincorporated joint ventures and 51% in incorporated joint ventures. The government has allowed 100% FDI via the automatic route in both small and medium sized fields subject to the policy on private participation in exploration of oil and the discovered fields of national oil companies.

Thus as the above discussion shows, India is vastly growing to be one of the largest energy markets of the world. It is a developing economy transiting from state regulated centrally planned economic discipline to the options, imperatives and practicalities of competitive market economy. Therefore it can be said that the Indian oil-gas sector is in the process of transformation from its normative present to a combative future. As mentioned by one analyst,

> "The sector is confronted with reserve replacement, stagnant oil production, surmounting oil-gas demand, depleting and/or

> dysfunctioning reservoirs of some of the major oil fields, vastly expanding oil demand of the national economy, technological deficiencies, impacting developments of deregulating oil-gas regime, and massive need of capital. All these problems and hazards are radically altering the risk, reward and rationalize the future of business in Indian oil-gas sector. On the other side, it is throwing up new possibilities and attractive opportunities for those countries/organizations/companies who are not threatened with the impermanence of corporate prosperity in a constantly changing business world"[142].

Prognosis of segment-wise investment potential for the next 10-12 years (see Table 3.14), of both upstream and down stream sectors of Indian petroleum industry, opens up new opportunities for the oil and gas exporting GCC countries, given that, GCC countries are the traditional energy suppliers to India and presently GCC countries as a whole account for 65% of India's energy imports.

Table 3.14: The Oily Demand of Investment in Indian oil-gas sector till 2010 (US$ billion)

Segments	Investment Requirements
Oil-gas and Coal Bed Methane Exploration	4-6
Oil-gas Field development, Rehabilitation and production	15-20
Natural Gas and LNG, Storage, Importation, Transportation, Distribution and Marketing	20-30
Oil Refining	20-25
Product Pipelines	7-10
Tankage, Storage and Port Facilities	5-7
LPG Import, Distribution and Marketing	20-25
Oil products distribution and marketing	
Total	96-123

Source: Oil Asia Journal, January-March 1999, and p.44.

Section II

GCC Oil and Gas Sector

GCC countries play crucial role in the world energy scenario. The strategic importance of the GCC countries in the global oil regime over the years is attributed to the availability of prolific reserves and the low cost of production of oil. However, this position has been challenged in recent years by rising penetration of outside OPEC players into the global oil-gas regime, major restructuring and cost cutting by the international oil firms, technological breakthroughs, conservation programs, environmental legislation, and taxation adopted by industrial countries. Besides these events have been accompanies by two major developments: first, the declining influence of Gulf oil vis-à-vis OPEC

142 B.K.Bose, Op.cit.

in a new world oil market and second, major changes in the politics and economics of the Gulf oil producing countries that have increased the dependence on oil revenues, while at the same time arresting the growth of the national oil industry, rendering it unprepared to meet the ever changing global developments.

Gulf Oil as a Unique Oil Supply Phenomenon

Since the early 1950s, outside the United States and the Former Soviet Union (FSU), Gulf oil has been the source of about 45% of total world supply. Its enormous contribution to global oil supply has, even so, been overshadowed by the region's share of proven reserves. This has ranged from a low of abou 61% in 1981 to a high of 78% in 1960, suggesting that the prolific nature of oil occurrence in the Gulf has never been matched by an equivalent dependence on its production, in spite of the extremely low cost of oil discovery and development in the region[143]. As mentioned by one analyst,

> 'The continuing indication for the past 40 years of a flat-or nearly flat -long run supply price curve for the Middle East oil up to potential level of production which, if they had been achieved, could have served most of the world's demand outside the FSU and the United States'[144].

It is also to be noted that the role of Gulf oil was critical to the industry's ability to meet the burgeoning demand during the 25-year period of a near 8% per annum rate of increase in the use of oil from the early 1950s. Table 3.15 shows aspects of the changes in the international oil industry vis-à-vis Gulf oil.

Table 3.15: Global, Middle Eastern and regional oil production and trade, 1955-2000 (MTS)

	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
Global oil production:	786	1,079	1,450	2,352	2,734	3,082	2,792	3,179	3,252	3,518.9
of which Middle East	164	264	385	689	975	927	514	862	967	1,096.8
As % of global production	20.8	24.2	26.5	29.3	35.7	30.1	18.4	27.1	29.7	31.2
Oil traded internationally:	291	456	677	1,263	1,508	1,588	1,264	1,612	1,815	2,215
As % of global production	37	42.3	46.7	53.7	55.2	51.4	45.3	51.2	55.9	62.9
Middle East exports:	145	229	340	631	918	864	447	704	825	926.8
As % of internationally traded oil	49.8	50.2	50.2	50	69.9	54.7	35.4	43.7	45.5	41.8
Intra-regional trade:										
Total	106	190	238	527	402	433	539	570	643	755

[143] See Adelman, M. A., *Economics of Petroleum Supply*, (Cambridge, M A: M I T Press, 1993).
[144] Odell, Peter R., "The Global Oil Industry: The Location of Production-Middle East Domination or Regionalization", *Regional Studies*, Vol. 31.3, pp. 311-322, 1997.

as % of international trade	36.4	41.7	35.2	41.7	26	27.3	42.6	35.4	35.4	34.1
as % of Middle East exports	73.1	83	70	83.5	43.7	50.1	120.6	81	79.2	81.5
Of which:										
a. Western Hemisphere	87	129	124	180	177	168	182	199	267	289
b. Europe/West Africa	11	42	158	310	175	193	308	313	296	304
c. East Asia/Australia	8	9	7	37	50	72	49	58	80	69

Source: BP Annual Statistical Review of the World Oil Industry (1955-80) and BP Statistical Review of World Energy (1985-2000).

As shown in table 3.15, in 1955, total world production of oil was 786 MTS of which about 37% was traded internationally. The Middle East produced just over 150MTS-under 20% of the total-but it was already responsible for almost half of the oil entering world trade. By 1975 world output was almost three times higher (2,734MTS) of which the Middle East produced almost 36%. The latter's output of almost 1,000 MTS was, however, six times up on 1955-and by 1975 it accounted for over 60% of internationally traded oil (over 900 MTS), compared with only 145 MTS 20 years previously. Of the 1,950MTS of additional oil demanded in the world economy by 1975 (compared with 1955), the Middle East was responsible for 42%, while 63% of the additional 1,200MTS, which was traded internationally, originated in the Middle East[145].

The beginning of the 1970s witnessed the geographical concentration of oil supply in the Middle East. Additionally the companies had moved in to exploit oil in certain new countries of the region-especially in the new low-cost Middle East producers such as UAE, Qatar and Oman- as per the contracts granted to them by respective governments. Company/government negotiations over their relationships in the Middle East, as well as in the North Africa, in the early 1970s had in essence confirmed the perceived mutually advantageous relationships, albeit in the context of higher excise taxes imposed by governments on the concessionary companies. Such changes in favour of the host governments were, however, matched, or even more than matched, by similar tax changes elsewhere so that the companies producing oil in the Middle East maintained their cost advantages. Thus, they continued to expect further growth in demand for oil from their Middle East concessions[146]. Thus, at that

[145] The latest trends have been discussed in Chapter II.

[146] For instance, ARAMCO, the single concessionary company in Saudi Arabia, foresaw its output rising from 400 to 1000 Mts. per year over the rest of the century, as cited in Adelman, M. A. (1995), op. Cit.

time, it was highly likely that the companies would continue to exploit the Middle East's oil resources to a degree, which would further enhance the region's share in global oil production for the indefinite future, providing only that the oil exporting countries did not change fundamentally the way in which the production and development processes were organized.

Adverse Supply Trends in the Gulf

The post 1975 period witnessed radical change in the pattern of the Middle East oil supply, as in the aftermath of the first oil crisis (1973-74), the countries concerned decided to terminate the concession-type arrangement and constitute national ownership over the resources and national control over the levels of production[147]. Within a few years, total or controlling ownership of both production and reserves in the entire main and small oil producing countries of the region had reverted to the nation states and their state oil companies. The previous concessionary companies retained some influence through management agreements with the state corporations and in some cases secured preferential rights to the supply of agreed minimum/maximum volumes of oil. However these arrangements were short-lived so that by the end of the 1970s all-important major decisions on Middle East oil production and supply were the monopoly of national entities. Importing countries' fears for the security of oil from each individual country in the region now became greatly enhanced. There was, moreover, concern for the security of Middle East supplies overall in the context of the main producers' membership of OPEC and its decision to operate as a cartel, with its quota for each member. This development eliminated the flexibility of supply, which the companies had previously enjoyed by virtue of their ability to play one nation off against another. These supply uncertainties were further intensified by the concomitant decline in the west's political influence in the region. This emerged partly because for possible expansionist policies into the region by the Soviet Union; partly because of a heightened concern for the installation of radical regimes in individual countries; and partly because of the rise of inter-state rivalries within the region for both political and religious reasons[148].

The consequential 'away from Middle East oil' policies by many countries (in the more general context of away from oil policies because of its high price and the widely held perception of oil as a scarce commodity) expressed the

[147] Odell, P R, *Oil and World Power*", (8th Edition, Penguin, Harmondsworth, 1986).

[148] Soviet incursion into Afghanistan in 1979; the overthrow of the Shah of Iran in the same year and the declaration of war by Iraq on Iran in 1981 illustrated the validity of the concerns. See, Peterson, J.E., op. Cit., 1983.

unacceptability of too much oil from the Middle East. Moreover the high price of oil after 1974 (five times up on 1970 prices) and the even higher price by 1980, coupled with the production/export limitations imposed by producers themselves, helped them to make Middle East oil unaffordable or even unobtainable. Given that OPEC had determined to price its oil up to the cost of alternative energy supplies, hitherto low-cost oil supplies from the Middle East became available only at prices, which included very high excise-taxes imposed by the governments of the oil producing countries. These taxes eliminated the economic advantage of buying Middle East oil. Additionally political concerns over security of its supply made sure that it would not be bought if any alternatives were available. Middle East oil was, moreover, on average, more distant from markets than all alternative sources, so that the geography of international trade in oil would inevitably respond to the transport-costs related, unfavorable location of the region's oil[149]. Thus the Middle East's share of world oil production peaked in 1975-the year following the first oil price shock-at 35.7%. it then fell year by year to 1985 when it reached a low of only 18.5%, with a volume of production which was only a little more than half that of 1975. Also the exports from Middle East was at peak in 1975, when they accounted for 61% of all internationally traded oil; by 1985, the volume of exports had more than halved and their share of world trade was only 35%. The dramatic changes in the international oil regime, thus, had undermined the hitherto dominant position of Middle East oil in the world oil market. Likewise the nationalization of oil companies' assets brought the long ongoing expansion of Middle East proven oil reserves of the region from under 20 bt in 1956 to 55 bt by 1974, to an end. By 1980, the proven reserves of the region had fallen to fewer than 50 bt and they did not recover to their 1975 level till 1987. The changed Gulf industry was unable to sustain the reserve accretion process, in spite of the huge economic rent that the low cost producers of the region earned against the very high unit price of oil over this period[150]. Against a full cost of production of no more than $1 per barrel for the most expensive barrel required, the unit price (measured in dollars of 1973) rose from about $3 per barrel in 1973 to a high over $20 in 1981 and still as much as $13 in early 1986, immediately prior to the price collapse later that year.

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[149] Weiner, R J, "Is the World Oil Market 'one great pool' ", *The Energy Journal*, 12 (3), pp. 95-108, 1991.
[150] Adelman, M A, 1995,op. Cit.

Post-1986 Developments in the Regime and its impact on the Gulf

Thus, as discussed above, the changes in the international oil regime from the mid-1970s undermined the previously economically dominant and highly competitive low-cost oil potential of the Gulf. In fact, it was the recognition of the severe implications of these changes for the producers eventually led to Saudi Arabia's decision in 1986 (later joined by Kuwait and UAE) to sell its oil for whatever price it would fetch in the market[151]. As a result the average price of international traded oil fell from $ 27.10 per barrel in January 1986 to a low of $8.96/b in July that year. This price collapse was followed thereafter by a modest recovery, as OPEC succeeded in restraining its production of its members. Since then, except for some months in 1990-91 during the Gulf War, the international oil price stabilized at about 60% of its level in 1985, measured in current dollars. In real terms, however, it is now priced at only about 45% of its 1985 value. Though the price fall has been steep over the years, it has, nevertheless, been moderated by two factors; first, by the supply interruptions caused by the Iran-Iraq war from 1981 to 1988 and by the events of the Gulf war in 1990-91 and since then the absence of Iraqi oil in the market; and second by the OPEC agreed and generally observed limitations on production by its members.

In spite of these constraints, Middle East oil made comeback to the international market. This is in part because of the re-expansion of global oil demand in the context of lower oil prices: from 1985 to 1995 world output grew from 2,800 to 3,250 Mts. In part, however, it arises from the specific ability of the Middle East to take advantage of the location of the growth in oil consumption in the Far East where alternative sources are less readily available than in the Atlantic basin. This also in a way explains the importance of the region to the prospects of the major oil exporters in the Middle East. Thus as shown in table 2.3.4, over the fifteen year period to 2000, Middle East production has grown by 85% and its share of world oil production from 18.5% to 30% in 1995 and to near about 32% in 2000. Likewise, its share of world trade grew from 35% in 1985 to near about 45% in 1995 and by 2000 it was near about 41%. On the basis of these data and in the context of an expected continuing expansion of oil demand, especially the Asian factor in general and India in particular, many analysts are predicting the near future predomination of Gulf oil in the international oil market.

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[151] Hartshorn, op. Cit.

In the event, however, the Middle East producers especially the GCC oil producers lost the market share they were realizing earlier. The market share of the Gulf decreased from 49% in 1979 to 36 in 1996[152]. From early 1990s until 1998, oil market perceptions were characterized by[153]:

- The ability of the OPEC to maintain a fair degree of cohesion amongst its members that helped to stabilize oil prices at artificially high levels and for a long period. The embargo on Iraqi oil was instrumental in maintaining OPEC's supply regulatory system, because it allowed many OPEC countries, especially Saudi Arabia and Venezuela, to increase their market share substantially without damaging price stability. OPEC's capacity to sustain oil prices at higher levels encouraged investment in new oil, despite the economic and political risks arising from investing in that part of the world.
- The oil technology revolution led to a spectacular reduction in the cost of finding and developing high-cost oil, so that even when the OPEC price declined from US$ 28/b in 1985 to US$17-18/b thereafter, the economics of investments in the area were still favorable. Investing company profits were enough to include them into further investment towards expanding their operation in this high cost area.
- Between 1994 and 1997, non-FSU world demand for oil grew ar robust rates with annual incremental demand exceeding 1.4 mb/d, a substantial proportion of which (41%) originated in the Asia-Pacific, whose economies were growing at fabulously high rates.
- Until the mid-1990s, most OPEC countries were persistent in the policy of closing their national industries to foreign investors, a factor that pushed the latter to find alternative investment opportunities.

All these favorable factors and market perceptions justified economically the rush to the areas outside OPEC, especially outside the Gulf, notwithstanding the high cost of developing the new oil and transporting it through difficult, costly and politically hazardous routes. The oil companies' penetration into outside Middle East was in line with the wave of huge investments in frontier areas, where costs are very high and risks are not negligible. This happened as a result of OPEC's past policies, which, with their self-defeating and uneconomic approach to oil, encouraged investment in those areas, to its own detriment. The result was that the OPEC itself, especially the GCC producers, paid a heavy price in terms of losing their market share in favour of the newcomers. The various factors responsible such down fall of OPEC can be summarized as follows:

- OPEC's past price-shock policies (which took the price of oil from US$3 per barrel in mid-1973 to US$ 34-36 per barrel in 1981) secured a very high margin of profits for investments in 'new' high-cost oil, which

[152] Porter, Edward D, "Non-OPEC Supply and World Petroleum Markets: Past Forecasts, Recent Experience and Future Prospects," American Petroleum Institute, Washington DC, 1999.
[153] Chalabi, Fadhil J, "Gulf oil vs. the oil of the Caspian sea", in ECSSR ed., *Caspian Energy Resources: Implications for the Arab Gulf*, (UAE: ECSSR, 2000), Chap. 8, pp. 156.

surpassed all the incumbent economic risks. For the whole of the 1970s and for part of the 1980s, OPEC policy makers naively thought that no matter how high the price they imposed on their oil, the market demand for their oil would increase. Unfortunately for them, the excessive high prices led to, among other things, investments in upstream oil outside their territories in new production capacities, irrespective of cost differences.

- More important, is that in its policy of keeping oil prices at artificially high levels, OPEC adopted the production quota system, which secured, for the new high-cost oil producers, marketing precedence over the OPEC, especially the Gulf. The system is based on the concept of 'swing producer' (residual supplier) which means that OPEC limits its production (the ceiling, which is the sum of all members' quotas) to the difference between world demand, on the one hand, and the oil supplies from outside OPEC including the FSU's net export, on the other hand. Buyers lift non-OPEC oil first and then turn to OPEC oil to fill the gap of their requirements. By doing so, OPEC, and especially the GCC producers, became suppliers of the last resort with a shrinking market share.
- Until the very late1980s, OPEC followed the system of fixed prices of crude oil under which the members are not allowed to sell their crude but leave the refined product to be priced according to market forces. This meant firstly, crude oil sellers from outside the organization were free to sell according to the market price, thus enjoying a competitive advantage over OPEC and crude oil-sellers; secondly, crude oil sellers within the OPEC, like Saudi Arabia, were placed under pressure to reduce their production in order to safeguard the price-a system from which other OPEC members with more sale of refined products like Venezuela benefited. While OPEC generally had to reduce its production and lose its market share in order to keep prices at an artificially high levels, thus carrying the burden of price protection from which non-OPEC producers benefit, Saudi Arabia and certain other member countries became the swing producers within the OPEC itself, carrying an even greater burden to protect prices, and hence losing greater market share than other members. The beneficiaries of these policies were the new, high-cost oil producers at the cost of the Gulf producers.
- To put themselves at a greater disadvantage, OPEC policies of full state ownership (except in the case of UAE, which retained 60 percent concessions of the former Iraq Petroleum Company Group for the national oil company, leaving the remaining 40 percent for the latter) benefited the high-cost producers mainly at the expense of the Gulf. Full state ownership of the oil industry in the Gulf led to a massive shift of capital away from the Gulf towards upstream investment in new, high-cost oil. Following wholesale nationalization of the oil industry in OPEC (either through legislation, as in the case of Iraq, or by agreement with the oil companies as in the case of Saudi Arabia and Kuwait), international oil companies started looking for new investment opportunities outside OPEC. It is estimated, for example, that during the period 1980 - 95 over US$350 billions were invested in the upstream sector of the oil industry in new areas. This contributed to a great expansion of new oil development, at the expense of OPEC.

North-Sea oil is the classic example of how OPEC policies were instrumental in shifting investments from low-cost, oil abundant areas in the Middle East to limited, high-cost areas. The recoverable reserves in the North Sea now stand at around 17 billion barrels, similar to that of the Caspian basin (1.5% of the world total). North Sea epitomizes spectacular production and the enhancement and recovery of reserves from a limited resource base through huge investments and technological breakthroughs. In 1973, the North Sea's recoverable reserves were estimated at 14.5 billion barrels, against 16.9 billion barrels in 1999. In the meantime, production grew from zero to almost 6.3 mb/d in 1999 and the cumulative throughput 1973-97 amounted to 28.7 billion barrels. In other words, additions of new reserves in the North Sea since 1973 were more than three times the size of reserves that had been estimated then.

Following these developments which favored investments in high-cost areas outside the Gulf, sweeping changes have taken place in the geography of oil and in the respective market shares. A new phenomenon presents itself, whereby oil from a limited, rather uneconomical resource base and high-cost oil from other frontier areas has been replacing oil from OPEC and especially the prolific, low-cost oil of the Gulf. World oil production outside OPEC, the US and the FSU (new oil) increased from 10.5mb/d in 1977 to 26.6 mb/d in 1998, or an annual increase of about 850,000 barrels per day. North Sea production alone increased during that period from about 1mb/d to 6.5 mb/d. Accordingly, 'new' oil's share in meeting non-FSU world consumption increased from 20 percent to 40 percent during the same period. This spectacular expansion of new high-cost oil was at the expense of Gulf oil. In 1998, the combined production of the five major Gulf producers was about 1.8 mb/d lower than that of 1977, at a time when non-FSU world consumption increased by 17mb/d. this means that the Gulf oil share in meeting world consumption fell from 42 percent in 1977 to 29 percent in 1997[154]. Although OPEC, as a whole, was losing market share in favour of the new oil, it was Gulf oil that lost market most heavily from this change, caused by OPEC price policies. The share of non-Gulf OPEC members in world consumption fell by only 1.7 percent during these twenty years compared with the Gulf's loss of 13 percentage points.

Impact of the changes on GCC countries' oil revenues

Oil revenue constitutes the lifeblood of the GCC economies. However, the transformations and changes witnessed in the global oil regime over the years have adversely affected the flow of oil revenue to the GCC countries. This has happened due to the fact that the revenue stream is highly sensitive to uncertain

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[154] "Oil Market Intelligence (OMI)", *Petroleum Intelligence Weekly (PIW*, (London: PIW, December 1998).

and changing factors such as price elasticities for oil demand, non-OPEC supplies and world economic growth[155].

During the heydays of OPEC, particularly during 1979 and 1981, Gulf as well as OPEC was able to attain price and revenue records and came pretty close to reach the 1977 records for market share and production. In 1979, OPEC oil revenue reached an all time high of about $ 276 billion, only to be followed by yet another record in 1981 when the average price of Arabian light crude climbed up to $34/b. many things have happened since OPEC's golden years, but the peaks attained at that time remain elusive till date. While OPEC's production has recovered considerably from its nadir of about 15.5 mb/d in 1985 to the current level of about 26.5 mb/d in 1999, international oil prices and OPEC revenue remain only a fraction of what they were in the 1979-81 period. Only a decade ago, when prices were hovering around $28/b, the market perceptions were that if OPEC allowed the price to drop temporarily to the low teens, non-OPEC producers would be decimated in a matter of couple of years. Consequently OPEC would re-emerge with the market power. But as evident from the developments, nothing could have been more incorrect than these predictions.

During the 1990s (up to 1998), the real price of oil in US dollars stood at around less than 30 percent of the 1981 level, yet non-OPEC production outside US and the FSU continued to increase. North Sea production has continued to rise. Table 3.16 shows the major increase in the non-OPEC productions up to the year 1998.

Table 3.16: Major increases in non-OPEC productions, 2002 ('000 b/d, including Ngls)

Country	1993	1994	1995	1998	2002
Norway	2,370	2,700	3000	3120	3330
UK	2,190	2,700	2,800	2,889	2463
Canada	2,180	2,270	2,330	2,345	2880
Australia	557	610	650	659	730
India	540	635	700	652	793
Vietnam	125	140	170	169	354
Angola	504	530	610	680	905
Brazil	880	910	1,000	1,080	1500
Argentina	595	665	725	729	800
Ecuador	341	373	410	415	410
Colombia	455	460	560	587	601
China	2888	2930	2989	3212	3387
Russian Federation	7173	6419	6288	6169	7698

Source: BP Statistical Review of World Energy, 2003.

[155] Gately, Dermot, "A Ten year Retrospective: OPEC and the World Oil Market", *Journal of Economic Literature*, Vol. 22, no. 2 pp. 11-14, 1984 and also, Gately, Dermot, "Strategies for OPEC's Pricing and Output Decisions", *The Energy Journal*, Vol. 10, no. 3, 1995.

The trend of oil revenue of the OPEC can be ascertained from the latest statistics. OPEC's 2001 net oil export revenue are estimated to have fallen by 21% from 2000 levels to around $ 191.3 billion and for 2002 they are forecast at $177.7billion, or 27% below 2000 levels, see table 3.2.6. With the established declines, OPEC net oil revenues in real terms will return to the levels of the early-to-mid-1990s, but will remain far below the levels from 1974 through 1985, prior to the oil price collapse of 1985-86. This boom-bust cycle of oil revenues in the OPEC countries in general and in the overwhelming oil revenue dependent GCC countries in particular, is making budgetary planning difficult and also complicating efforts in many cases to deal with balance of payment deficits, accumulated debt, budgetary deficit, and rapid population growth. In real terms (constant 2000 dollars), OPEC revenues peaked in 1980 at $ 598 billion and registered the worst year in constant dollar terms since the early 1970s in 1998, when revenues fell to only $ 113 billion in constant 2000 dollars, slightly below the previous low revenue year of 1986 ($117billion) following the oil price collapse late 1985/early 1986. OPEC revenues for 2001 are estimated at about $186 billion (constant 2000 $), which is less than one-third of 1980 revenues, but around 64% higher than 1998 revenues. For the 1990s as a whole (1991-2000), OPEC oil export revenues (in constant 2000 dollars) were $1,600 billion, compared to $2,400 billion in the 1980s and $3,300 billion in the 1970s. Thus, total OPEC oil export revenues in real terms during the 1990s were less than half of revenues in the 1970s.

Table 3.17: OPEC Oil Export Revenue (billion dollars)

Country/year	1972	1980	1986	1998*	2002F
Algeria	5.5	27.5	7.2	3.9	10.7
Indonesia	3.7	31.8	7.7	2.8	2.8
Iran	17.1	28.0	9.1	8.1	19.1
Iraq	6.0	57.8	10.6	4.9	12.1
Libya	12.2	47.6	7.4	4.6	10.1
Venezuela	12.7	38.9	11.1	8.9	18.1
Nigeria	8.7	51.0	10.2	7.4	16.4
Qatar	1.8	11.4	2.3	2.4	5.9
Saudi Arabia	19.3	223.2	31.2	23.6	48.6
UAE	4.3	40.3	10.5	7.5	16.2
Total	102.8	597.5	117.2	80.6	170.2

Notes: *All figures are estimates. The 1998 figures are in constant 1990 levels and all other is in constant 2000 levels. 2002F means forecast for 2002.
Source: Energy Information Administration (EIA), Deptt. Of Energy (DOE), USA.

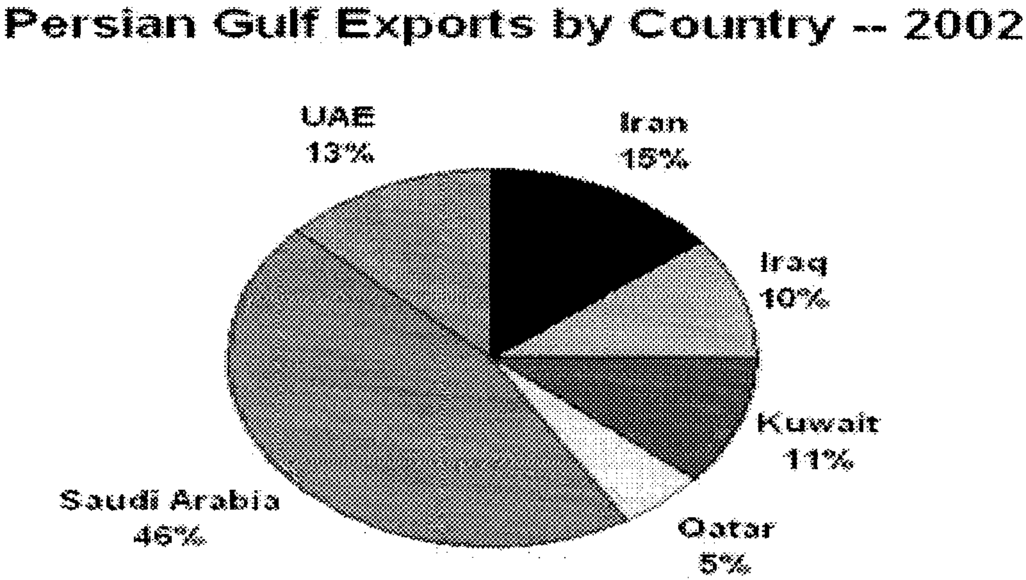
Moreover individual OPEC members' shares of total oil export revenues have fluctuated over the past three decades, but several trends are apparent. First, Saudi Arabia has consistently earned more oil export revenues than any other single member of OPEC, with Saudi share ranging from below 16% in 1971 to a high of 46% in 1981 and 29% in 2001. Second, Iran's revenue share fell after the 1978 - 79 Iranian Revolution (followed soon thereafter by the Iran -Iraq War for much of the 1980s), and has not recovered since. Presently, Iran accounts for about 11% of total OPEC oil export revenues, down from 17-19% in the 1970s. Third, Iraq's oil export revenue share has fluctuated sharply from a high of around 14% in the late 1980s, to basically 0% for several years following its August 1990 invasion of Kuwait. After the UN oil - for - food deal, which permits Iraqi oil exports and the share of Iraq in total OPEC oil revenue became around 7-8%. Thus, OPEC per capita oil export revenues (in inflation adjusted terms) are far below the peaks reached in the late 1970s/1980s. For OPEC as a whole, per capita oil export revenues are expected at $327 for 2002, down 10% from the $365 per person figure for 2001, and less than one-fifth of the $1,816 per capita revenues achieved in 1980. This has significant implications for OPEC oil price preferences and policies, especially combined with the fact that OPEC countries' populations are growing rapidly (mainly in Gulf OPEC countries), and that many Gulf OPEC countries, despite their seeming oil wealth, are heavily indebted. This is partly as a result of low prices for most of the period from the mid-1980s through the late 1990s. Table 3.18 shows the oil revenue dependence of OPEC countries and non-OPEC countries estimated by IMF for the year 2001 (see figure 3.4) Figure 3.5 depicts the changes in oil revenues of GCC countries.

Table 3.18: IMF Estimate of Oil Revenue Dependence for selected major Exporters, 2001.

Country	Government Hydrocarbon Revenue		Crude+Product Exports (1998)	
	% of Total Revenue	% of GDP	%of World Exports	mb/d
Bahrain	64	18	0	0.2
Kuwait*	68	45	4	2
Saudi Arabia	79	29	14	7.9
Qatar	78	26	1	0.7
UAE	60	23	4	2.4
Oman	85	40	2	0.9
Nigeria	82	38	4	1.9
Angola	90	51	1	0.7
Yemen	76	33	1	0.3
Venezuela	58	17	5	2.9
Mexico	31	7	3	1.8
Russia**	30	5	7	3.7
Norway	29	13	6	3.2
Syria	28	9	1	0.3
Algeria	77	30	2	1.2
Iran***	67	22	5	2.7
Libya	67	29	2	1.3
Ecuador	36	11	1	0.3
Azerbaijan	37	8	0	0.2
Cameroon	30	6	0	0.1
Gabon	67	23	1	0.3
Equatorial Guinea	88	25	0	0.1

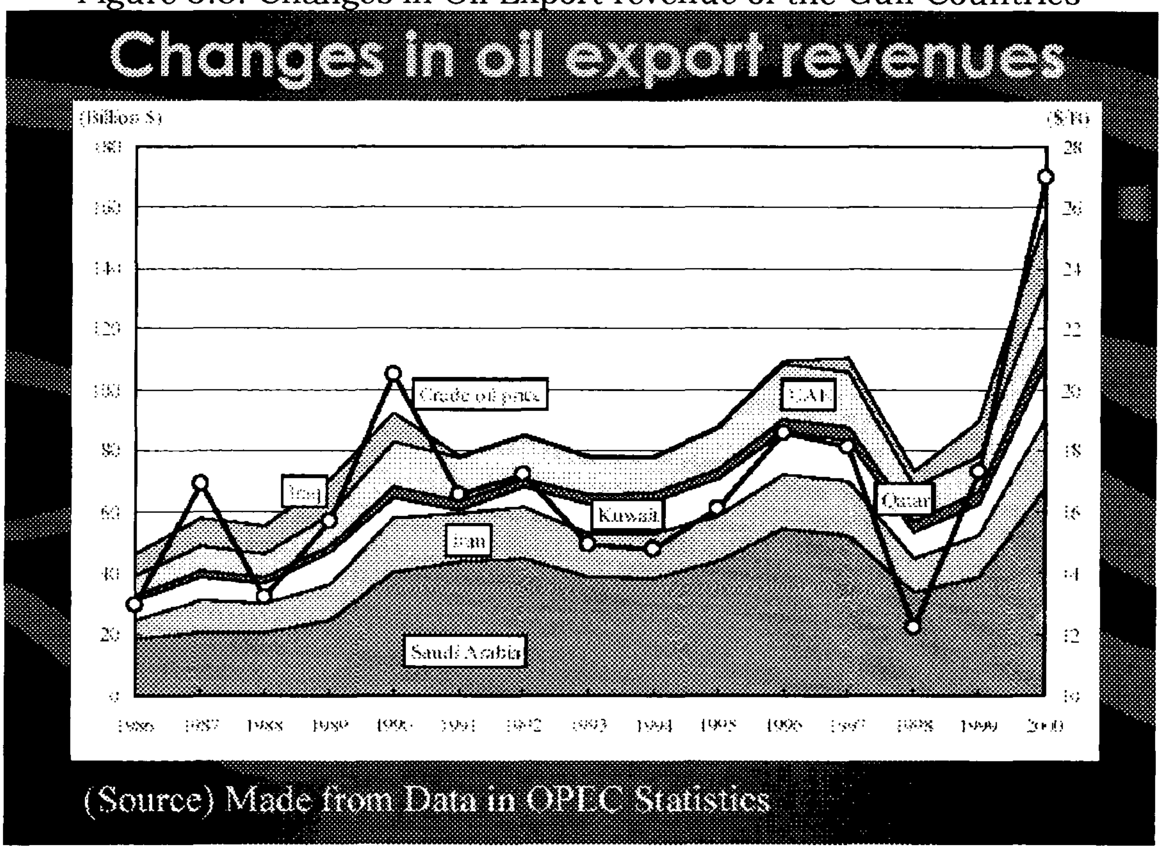
Notes: * Fiscal Year 1999-2000; ** Fiscal Year 2000/01 and *** Government Oil revenue estimate imprecise due to classification issues.
Source: MEES 45:4 February 2002, p. A15.

Figure 3.4: Gulf Oil Exports by Country, 2002, (%)



Source: http:// www.eia.doe.gov.

Figure 3.5: Changes in Oil Export revenue of the Gulf Countries



Source: IEEJ, March 2003.

Thus, as discussed above, there now remains, to a high degree, a situation, which reflects the implementation of energy policies adopted by the OPEC members and especially the GCC countries, which have encouraged oil production outside the Middle East. Moreover, the policies adopted by the main consuming nations have made the transition swiftly from the Middle East countries and in fact these policies conveniently fall into place within the context of three regional political-economic entities built around the main geographical groupings of the OECD countries, viz.; North America, Western Europe and Japan/Australia[156].

Issues in the GCC Countries' oil and Gas sector

The GCC account for 49% of the worlds proved oil reserves[157] and almost 15% of proved gas reserves. Oil is the lifeblood of GCC economies. Revenue from oil exports accounts for the largest shares of each country's export earnings and government revenues also see figure. Government expenditure represents a significant proportion of GDP. Taken together, the oil and government sectors account for a large part of each country's GDP, with oil exports as the driving force in each economy. The significant fact is that a large proportion of the revenue of state oil companies is transferred to governments. For example, between 1970 and 1990 the share of Saudi oil export revenue transferred to the government from the oil companies varied from a low of 53% in 1970 to a high of 96% in 1982[158]. In 1990, the share was about 78%. Since investments in oil and gas infrastructure have historically come from cash flow, changing the share transferred to the government have affected investments in the oil and gas sectors in these countries. Lower international crude oil prices since 1985, coupled with government financial requirements have resulted in inadequate investments in the oil and gas sector over the years.

As mentioned in chapter II (section on GCC), the GCC countries are at the threshold of real challenges and stumbling blocks to augment their economic growth rate. The oil and gas sector the mainstay of these countries is not in a position to derive the leverage from the global regime, due to the lack of foresight of the policy makers in devising domestic as well as external policies. As noted earlier in this section the major draw back of such policies adopted in the GCC countries in this regard has been the overwhelming presence of public sector in the oil and gas sector. While the low oil revenues due to almost stagnant international oil prices in the 1990s (except high in few years) have restricted the

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[156] Tahmassebi, Cyrus H., "The Changing Structure of World Oil markets and OPEC's Financial Needs", *OPEC Bulletin*, March 1995.
[157] Calculated from the *BP Amoco Statistical Review of World Energy*, 2001.
[158] Oil export revenue is not the total income of the national oil companies, since money is also earned from domestic sales. It is also not known how much domestic sales of crude oil and refined products amount to in Saudi Arabia, but limited data suggest that domestic revenue is not included in the above data. See, IEA/OECD, *Middle East Oil and Gas*, (IEA, Paris, 1995).

flexibility in managing budgets of national oil companies, the almost insularity of the oil and gas sectors from private foreign investments in these countries have proved fatal. The result is that, while on the one hand the global market share of the GCC oil exporting countries is on the wane; on the other hand they are not in a position to devise suitable policies to reverse their hold on the global regime, experienced during the 1970s and early 1980s.

Another disquieting factor is the surmounting domestic energy consumption in these countries, including that of oil and oil products, ignited by population growth and economic advancement (see table 3.19 and 3.20).

Table 3.19: Total GCC countries' Energy Consumption 1995-2000 ('000 boe/d).

Country	1970	1995	1996	1997	1998	1999	2000	Average 1970-2000
Bahrain	10.3	151	153	162	173	178	185	149.4
Kuwait	119.0	240	249	278	285	295	303	226.3
Oman	1.0	76	80	84	88	93	98	77.5
Qatar	18.8	141	145	159	161	167	173	142.8
Saudi Arabia	58.3	1,469	1,691	1,702	1,725	1,750	1,790	1,533.0
UAE	2.3	498	499	510	517	534	549	460.2

Source: MEES, 45:32, August 2002, p. A10.

Table 3.20 presents the GCC countries' estimates of consumption of oil products for the period 2001-2015.

Table 3.20 presents the GCC countries' estimates of consumption of oil products for the period 2001-2015.

Country	2001	2005	2010	2015	Average Growth Rate, 2001-15 (%)
Bahrain	7.4	7.6	8.0	8.6	-1.4
Kuwait	53.5	55.5	58.4	61.8	1.2
Oman	15.6	18.4	23.3	30.7	4.8
Qatar	8.0	8.9	10.5	12.6	3.3
Saudi Arabia	247.8	255.3	266.3	279.6	0.5
UAE	100.9	104.0	108.0	112.4	0.8

Source: MEES, 45:32, August 2002, p. A10

Energy Policies of GCC countries and Implications

The heavy dependence on oil revenues concurrent with the low global oil prices compelled the GCC countries to adopt pragmatic energy policies, through changing their mix of energy exports either by adding new products or by changing the balance of existing products (crude oil, refined products, natural gas/LNG and petrochemicals), in order to raise revenue. All the GCC countries except Bahrain export crude oil, refined products and petrochemicals; only the UAE exports natural gas in the form of LNG. In general the GCC countries tried to maximize revenue from liquid hydrocarbons by exporting lighter crude oil and more NGLs[159] and refined products. For instance, Saudi Arabia substituted production of lighter crude for heavier crude in 1994. Since lighter crude has a higher value per barrel, the effect is to increase revenue per barrel and total revenue, most of which accrues to the government. Therefore production of NGLs increased about 53% to 1.8 mb/d in 2000. This followed a mass expansion of refineries in the GCC countries. Qatar and Saudi Arabia expanded their refinery capacity and Kuwait and UAE followed the suit. Moreover the governments are now attempting to earn additional income by participating in ventures outside their borders. For example, Kuwait has become a partner to several companies that develop oil production and pipelines in North Sea and United States. Saudi Arabia and Qatar are owners or joint venture partners in foreign refineries[160].

In the 1990s, government financial constraints made the national oil companies to rely on debt to finance energy-related projects. Governments or state run companies resorted to borrowing internationally and domestically. Historically the GCC countries guaranteed loans for energy projects where projects were not financed from cash flow, but financial pressure are changing this approach. State oil and gas companies are now expected to obtain their own finance for projects. The effect will be to substantially decrease governments' financial burden. For instance, in 1992, Saudi Aramco and its tanker subsidiary, vela, borrowed about US$2.5 billion on the international market. The Qatari government is developing major gas projects with 'non-resource' finance (that is, with debt service tied to future project earnings, not to government guarantees). This is necessary because the cost of the two large LNG projects, Qatargas and Rasgas, is so high -more than twice the Qatari GDP. Non-resource finance lets the government continue its regular business while developing large-scale projects. This Qatari experiment has become a hallmark in the GCC to be emulated by other members in the future[161].

[159] NGLs (natural gas liquifieds) are not classified as crude oil; they have higher unit value than heavy or medium crude and they are not counted in Gulf OPEC quota commitments. So these exports not only earn more revenue per barrel, but also they bring in additional revenue, as these are not replacing crude oil.
[160] This is substantiated from the participation of GCC countries such as Qatar, Oman, Kuwait, and Saudi Arabia in various projects in India.
[161] For a more complete discussion of this topic see " The Investment Requirements for the Development of the Arab Oil and Gas sector and Related Downstream Activities until the End of the Decade", Arab Petroleum Investment Corporation, presented at the Fifth Arab Energy Conference, Cairo, 7-10, May 1994, as cited in MEES, 45:12 27 May 1994.

Further, in attempt to cut government deficits the national oil companies initiated cost-cutting majors. Cost reduction measures took various forms from increasing the efficiency of existing company to reduce the unit cost of production to decreasing the share of government participation in oil and gas projects. In Saudi Arabia, the former domestic oil marketing company, Samarec was merged in 1993 into Saudi Aramco, with one goal being to improve the overall operating efficiency of the state oil industry. Saudi Aramco then started competitive bidding of various projects. Kuwait adopted horizontal drilling techniques to increase oil well productivity, thereby reducing the cost per barrel produced. Kuwait Petroleum Corporation worked with foreign oil companies as a source of new technology and a means of completing projects at lower costs. In the UAE and Qatar the state oil companies also adopted similar policies.

Another feature of GCC oil policies is that despite not of much success, the trend of foreign participation in the domestic oil-gas operation in the GCC countries is continuing because the financially burdened governments are allowing this. For example, in Abu Dhabi, where foreign oil companies were never asked to relinquish all their operations when other Gulf countries were nationalizing, ADNOC now has its own Cray supercomputer and has developed in-house reservoir modeling capability. In 1994, Qatar signed two production-sharing agreements, with the US oil companies Pennzoil and Occidental, to bring capital, expertise and new technology to Qatar. For several years the government of Qatar attempted to get Shell to extend its production sharing agreements, but was unable to do so because of the terms it was offering were not that attractive to Shell. In the new agreement, the government improved the contract as per which Occidental will invest US$700 million over 25 years. Kuwait announced its production sharing agreements in 1996. After the Gulf War, Kuwait signed BP and Chevron to technical service contracts to evaluate its oil reserves. The main reason behind this exercise was to infuse technological expertise and management expertise of multinational oil companies. Saudi Arabia has recently opened up its upstream sector to foreign companies.

In short, production sharing, or a variety of agreements have been the usual procedure in most of the GCC countries to enhance foreign participation. The only exception has been Saudi Arabia. Because the Saudi State oil company-Saudi Aramco- has the financial strength to carry operations in new oil-gas projects on its own. There are enormous investment opportunities in the GCC oil and gas sector.

Kuwait has experienced a difficult end of the decade, but it is well placed to recover, holding roughly 9% of the world's total oil reserves. The country has a population of around 2 million people and is one of only a few oil-producing countries that have significant excess oil production capacity. Its government has for years applied some of its oil revenue to subsidizing services for the citizens. However, world pressure on oil prices and a stated government desire to privatize state-owned business to reduce the government's spending on subsidies indicates a willingness to consider foreign investment or participation in previously highly controlled and financed national businesses. In 1999, Kuwait made a major policy change regarding involvement of foreign oil companies in the upstream operations. Kuwait plans to increase its oil production capacity to more than 3mb/d by the year 2006 from its current level of 2.4mb/d[162]. In pursuit of this objective, Kuwait has sought foreign investment in the northern fields. Regarding downstream operations there are proposals for setting up of refineries in the aim of expanding its overseas operation to Asia and Europe.

Revenues from oil accounts for 40% of Oman's GDP and 75% of government revenue. However, compared with other oil-dependent GCC countries, Oman has limited oil resources. In fact, at current production levels, Oman is expected to exhaust its oil reserves by the year 2020. To offset the decline in oil reserves, the country has embarked on a plan to diversify its sources of revenue and has become more receptive to foreign investments. The country's oil resources are controlled by Petroleum Development Oman Ltd., in which the Oman government has 60% share and another 40% is held by foreign oil companies, including Shell and TotalFina. The government plans to increase current production capacity from 9,000 b/d to 1 mb/d by 2004. To achieve this goal, the assistance and investment of foreign oil companies is being actively sought in exploring for and developing new fields. Several bidding rounds have been undertaken and concession agreements have in recent years been signed with foreign oil companies. Oman is also pursuing an economic growth strategy of exploring gas development. Much of the investment in this sector has been sought from private parties. Official projections expect gas projects to contribute about 15% of GDP by 2004[163]. The LNG plant located near Sur built with a cost of $2.5 billion, promises bright future.

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[162] *Oil and Gas Journal* (OGJ), January 13, 2000.

[163] Stevenson, Michael J., and Paul Suddaby, "Middle East Petroleum Sector Offering More Foreign Investment Opportunities", February 14, *OGJ Special*, 2000, pp. 34-40.

Qatar has the third largest gas reserves in the world and is poised to be the major exporter of LNG in the world. Qatar exports about 600,000b/d of oil. In an attempt to increase revenues, Qatar is investing huge amounts in the petrochemical industries, as it will earn more per barrel of oil equivalent produced by exporting value-added products. Such investments also create jobs and reduce the increasing dependence on the government. During the 1990s, Qatar was at the forefront of attracting foreign investments and funding into the region. The country has been successful in raising over $10 billion and has partnered with multinationals such as ExxonMobol Corp., TotalFina, ARCO, Occidental Petroleum Corp., and Philips Petroleum Co. notwithstanding ex sting foreign investment in Qatar, much of which has focused on developing North Dome gas reserves, the decision to open the Doha Securities market to GCC citizens has become the signal regarding the government's commitment towards greater participation with countries in the era of liberalization. The general environment in the country is receptive to foreign investment, and indications are that this will continue to be so under the guidance of the current Emir. The scope of foreign investment is likely to be less in comparison to the recently completed projects such as Qatargas and Rasgas grassroots LNG projects. The larger upcoming development projects will probably focus on petrochemical projects such as Q-Chem, Qatar Vinyl Co., and expansion of Qafaco-4 and a toluene di-isocyanate project. One of the major proposed projects that is creating great deal of interest among investors and financiers is the Dolphin Gas project backed by the UAE Offsets group (UOG), which involves the off take of 3bcfd from North Dome. In March 1999, the UGO and QGPC signed a Statement of Principles for Dolphin Project. In March 2000, the UOG signed an agreement with Enron and TotalFinaElf to build the necessary infrastructure and pipelines[164]. The initial phase involves a transport pipeline to distribute 0.08 bcm daily of natural gas. This phase will require an investment of about $4 billion. A further $4-6 billion will be spent on downstream developments over a period of 6-7 years. In short, this project is one of the largest energy-related developments in the world[165].

Saudi Arabia holds one quarter of the world's proven oil reserves and has the world's fifth largest gas reserves. Through the exploitation and marketing of oil, the country has established strong ties with the US and other western countries.

[164] Jones, Mathew, "Enron and Elf in the Mid-East Venture", *Financial Times*, 2 March 2000, on the web, www.ft.com.

[165] Rhodes, Anne, "UAE offsets moves westward", *OGJ*, Vol.98, No.36, 4 September 2000, p. 31.

In 1998, Saudi Arabia supplied 16% of US crude oil imports. The country's oil and gas sector dominates its economy. However there are increasing signs that the government is seeking to diversify its income streams and is in the process of enhancing the process of privatization. Because of the huge need for continued capital investment and the requirement to use current technology, the government considered new avenues in terms of developing its hydrocarbon assets. For example, in September 1998, the Crown Prince Abdullah invited proposals for investments in the energy sector from foreign oil companies. This resulted in the oil majors submitting proposals for consideration. A ministerial committee has studied the proposals and submitted its report in July 1999. In January 2000, an 11-member Council for Petroleum & Minerals Affairs was established to determine all matters regarding investment in the Saudi upstream and downstream sectors[166]. Notwithstanding, the formation of the council, foreign direct investment in the upstream sector has been banned because presently, Saudi Arabia has excess production capacity of 3mb/d. As per industry a source, Saudi Arabia is looking for foreign investment in the downstream sector that would help in developing and producing additional gas volumes. In this regard, Saudi government started negotiations with multinationals such as BP Amoco, TotalFinaElf, Royal Dutch Shell, Eni, and ExxonMobil. It is expected that these foreign firms will bring in billion of dollars of investment[167].

Several characteristics can be identified in Saudi gas initiative[168]. First, there is a pressing need to provide sufficient volume of gas at commercial prices to support the development of competitive industries. Secondly, the companies will wholly finance the proposed projects, without the kingdom shouldering any financial responsibility. Thirdly, each area of investment will carry both upstream and downstream obligations. Fourthly, the international companies' bids will be assessed on their financial positions, technical ability and the extent to which they will provide job opportunities and training for indigenous Saudis. And fifthly, this initiative is a part of a wider effort by the Saudi government to diversify and reform its economic system.

The UAE is a key player in world oil and gas market, holding 10% of world's oil reserves and being one of the top five countries having gas reserves of about 205

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[166] *MEES* 17 June 2000, P. A3.

[167] "Deadline looms for IOCs gas proposals", *Middle East Economic Digest (MEED)*, Vol. 44, No. 22, 2 June 2000, p.8.

[168] Bahgat, Gawdat, "The Geopolitics of Natural Gas", *OPEC Review*, September 2001, p. 278.

tcf. The UAE has reserves sufficient for more than 150 years at current level of oil production of about 2.5 mb/d. UAE is one of the most diversified economies in the GCC. Nevertheless, with oil and derivative products accounting for about 78% of UAE's total exports, the oil price crash in 1998-99 put considerable pressure on the economy. During the 1970s and 1980s, the focus on investment was primarily oil related. In recent years, however, OPEC production Quotas and increased domestic consumption of electricity have provided the incentives for the UAE to develop its gas reserves. As part of this development process, UAE has embarked on major projects costing up to $10 billion to upgrade its onshore and offshore gas extraction and distribution systems, and to transfer the Taweelah commercial district into a gas-based industrial zone. Unlike countries such as Saudi Arabia and Kuwait, UAE, while maintaining control over its natural resources, has engaged in a number of joint ventures in developing its fields, such as with Conoco Inc., BPAmoco, TotalFinaElf and ExxonMobil.

Dolphin, one of the largest energy-related projects in the world, was launched in March 1999, to off-take gas from Qatar's northern fields and construction of a pipeline connecting Qatar with UAE and Oman. This project also envisages the construction of gas and liquid processing facilities with other downstream activities relating to the development of new and existing industrial clusters in the UAE, Qatar and elsewhere in the GCC region. To add value, the Emirates of Abu Dhabi and Dubai have separately sponsored projects to increase their downstream capacities. Downstream developments include Borogue, a joint venture of Borealis and Abu Dhabi National Oil Co. (ADNOC) which let a contract valued at more than $600 million to a joint alliance of Germany's Linde AG and Bechtel for construction of an ethylene plant at the Ruwais petrochemical complex. Other new developments in the downstream projects include Emirates National Oil Co.'s $300 million condensate refinery at Jebel Ali and independently owned naphtha-processing plant being constructed by ISO Octane. Also, during the 1999-2000, a restructuring of various elements of ADNOC's activities in order to enhance efficiency saw the creation of two new companies, the formation agreements of which provide for the possible of private sector investors at a future date. As a consequence of efforts to increase environmental awareness in the country, investment opportunities are also arising for business proposals such as the US-Oman joint venture, Onsite Arabia, which is setting up two hydrocarbons recovery facilities in the UAE.

These developments in the GCC countries share similar characteristics. First, the somehow insulated oil and gas sector of these economies are now opening up to foreign investments in the upstream as well as in the downstream sector in order to enhance production and recovery to sustain themselves in the world oil market by penetrating into the emerging economies. Secondly, the interest in gas exploration and development in the Gulf region is a new phenomenon. Only in the last decade or so has the gas industry attracted the well-deserved attention and the necessary resources in the GCC states. The gas resources in the early 2000s are still largely under-utilized and underdeveloped. Nonetheless, both production and consumption are soaring. Thirdly, the governments in these countries are continuing to negotiate with the IOCs for greater cooperation in the oil-gas sector in the future. The degree of opening up to foreign investment varies from country to country in the GCC, but all of them are, increasingly, showing signs of reforming their energy sector.

As per estimates, total investment required for oil, gas, refining and petrochemical sectors in the Arab countries during the period 2002-2006 at around $84 billion, of which $21billion will go for increasing oil production capacity (25% of the total), $36 billion for the gas sector (43%), $7billion for refining (8%) and $20billion for petrochemicals (24%), see table 3.21 and 3.22.

Table 3.21: Projected Financial Requirements for Maintenance and Expansion of GCC Oil Sector, 2002-06, ($Bn)

Country	Cost of maintenance of available capacity	Cost of expanding capacity	Total cost
Bahrain	0.1	--	0.1
Kuwait	2.3	0.9	3.2
Oman	1.5	0.2	1.7
Qatar	1.0	0.1	1.1
Saudi Arabia	9.3	5.2	14.5
UAE	2.8	2.1	4.9
Total	17.0	8.1	25.5

Source: MEES 45:21, 27 May 2002, p. A5.

Table 3.22: Projected Investments in GCC Gas, Refining and Petrochemical Projects, 2002-06, ($ million)

Country	Natural Gas	Refining	Petrochemicals	Total
Bahrain	--	600	--	600
Kuwait	--	126	3,500	3,626
Oman	980	870	2,060	3,910
Qatar	9,390	400	2,800	12,590
Saudi Arabia	5,000	1,500	5,085	11,585
UAE	3,400	900	--	4,300
Total	18,770	4,396	13,445	42,011

Source: same as table 3.21.

Thus as shown above, the government in the GCC countries, though in the past have resorted to wrong policies, now in the amidst of change and realities, are putting in place various appropriate measures to sustain themselves in the global oil and gas regime. In this regard, given the fact that they still rely on oil revenue, the emerging markets in the Asia and particularly India is of strategic importance to these countries. From the perspective of the global oil demand trends in the future, centering on the demand growth in the buoyant Asian economies in general and huge Indian economy, in particular, the future of the GCC countries and OPEC can be ascertained.

Forecast to 2010

Non-OPEC production has expanded by 1 to 1.5 percent per annum on an average since 1988. This has been accomplished during a period when prices were either stable or declining, with brief exception of increases during the Gulf War. A combination of technological advances and discoveries of new basins in South America in deep water and elsewhere contributed to this gain. Should this trend continue, non-OPEC production could reach 54mb/d by the year 2005 and 58 mb/d by 2010, roughly 64-68 percent of anticipated global demand of between 80 to 85 mb/d in 2005 and 61-69 percent of forecast global oil demand between 84 mb/d to 94 mb/d by 2010, assuming continuation of average historical price trends[169]. Such a forecast would imply that OPEC would need to hold back significant volumes of anticipated productive capacity for 2010 to balance supply with demand in 2005 and 2010 and promote moderate oil prices in the high teens. Given expected OPEC capacity gains for countries such as Venezuela, Iraq, Iran and Libya, among others, OPEC might need to shut-in between 8mb/d to 15mb/d by 2005-10 just to keep prices above current levels. By contrast, OPEC shut in 2 to 3 mb/d of productive capacity in 1998[170]. Ironically, as noted earlier, GCC countries such as Kuwait, Oman, and the UAE are pursuing foreign private investment to raise output capacity, despite expectations of lower oil prices. Saudi Arabia continues to guard its market share relative to other producers and refuses to return to the role of 'swing producer' to defend prices.

Thus, one rationale of market share-oriented strategy in the Gulf is that lower oil prices will discourage development of competing high-cost reserves such as those found in the Caspian basin. This market strategy makes sense but may

[169] See Jaffe, Amy Myers, "Price vs. Market share for the Arab Gulf Oil producers: Do Caspian Oil Reserves Tilt the Balance", in ECSSR ed., *Caspian Energy Resources: Implications for the Arab Gulf*, (UAE: ECSSR, 2000), Chapter-7, p. 146.

[170] IEA, *Monthly Oil Market Report*, January 1999.

not be able to wrest back as much market share as the GCC producers would like. In the very short term, low oil prices will neither force many oil field closures, not cancellations of major investments. Environmental and other considerations can also render it more costly to shut-in high-cost oil production wells than to operate at a loss for considerable periods of time. High-cost oil producers burdened with short-term expenses will likely wait to react to falling prices until it is clear that the price decline will be substantial and sustained. Some producers are hedged in forward, futures and derivatives markets and therefore will be immune to oil price swings for a period of time. This fact has shorn up US lower 48-state production (US oil production excluding Alaska and Hawaii) despite the sharp drop in oil prices in 1998. In the first eleven months of 1998, US production declined by only 60,000 b/d to 6.3 mb/d from levels of a year ago[171].

Eventually, nonetheless, there is some evidence that in the longer run, lower oil prices will stimulate increased consumer demand for oil. On a worldwide basis, many analysts believe global price elasticity of demand is unitary or less, meaning that the revenues of the world's oil producers would not be enhanced through consumption additions alone as price fall. But, to the extent that the GCC producers attract some of the limited foreign exploration investment dollars for their own fields, thereby diverting significant investment from oil fields outside their domain, Gulf market share could be enhanced further. Moreover, if lower oil prices can stimulate economic expansion of the economies of oil consuming countries, oil producers- in particular, those large producers of the Gulf-can benefit. The possibility that additional energy taxes could be imposed in consuming countries, especially in the industrialized countries could hinder the GCC producers' ability to garner enough sustainable additional market share for themselves at a lower oil price level to boost revenues overall.

However, the Energy Information Administration (EIA) has predicted bright outlook for the Gulf producers[172]. The IEA forecast based on latest estimates expect the global oil demand to register 2 per cent growth rate per annum and the world consumption to increase from its present level of 75mb/d to more than 115 mb/d by 2020. Oil demand grows faster in developing countries, slower in developed countries. This is based on an estimated gradual increase in oil prices to US $23 per barrel in 2020 (1996 dollar). Transportation is assumed to be the

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[171] Ibid.

[172] EIA, *International Energy Outlook*, (Washington D C, US Department of Energy, 2001).

major sector driving demand growth. In the reference case, IEA predicts that the increase in world oil supply of about 40mb/d by 2020 will come from OPEC countries, particularly from the low-cost Gulf producers. It has been assumed on the basis that the low-cost Gulf producers will make the necessary financial investments to expand capacity. Other assumptions include that the non-OPEC supply from proven reserves including the North Sea where production is estimated to peak at 7.6 mb/d in 2003 and then begin to decline gradually and oil production in the FSU increases to 9.5mb/d by 2005 and exceeds 13.1mb/d by 2020, of which just under 5.7 mb/d is exported mostly from the Caspian basin. This is based on the argument that "in potential major oil and gas exporting countries such as these, production will probably depend more on finance and export opportunities than on full success of internal economic reforms. However, the latter can speed up the process considerably by attracting additional domestic and foreign funds and promoting the timely installation of infrastructure necessary for oil and gas development. While the higher GDP growth generated by intensified reforms will entail more domestic energy use, the incremental amounts of consumption are assumed to be substantial than the additional energy exports made possible through increased production"[173].

As mentioned earlier, the steady increase in non-OPEC supply since 1988 has surpassed all expectations. But out of some 1,010 billion barrels of estimated proved reserves, only 230 billion barrels (23%) lie in non-OPEC countries and a significant proportion of that is in high-cost areas. Yet, the potentialities cannot be taken lightly with the changes in technology and operational efficiency recently in the global oil regime. There are numerous opportunities for the GCC countries in the present global oil regime. Considering the Asian factor in the global energy consumption where the booming Asian countries in general and India in particular are poised to experience sizeable oil consumption growth rate in the near future, the GCC countries being close to these economies will strive hard to penetrate into these economies.

Another aspect of the transformation with regard to the supply side of the global oil and gas regime in the perspective of the GCC countries witnessed in recent years is the overwhelming dependence of Gulf oil in Asia. Asian region in general and countries such as India and China-the main growth centres of world oil & gas consumption- have been the market for the Gulf oil exports. Table 3.23

[173] IEA, *Caspian Oil and Gas*, (IEA/OECD, Paris, 1998).

shows net oil imports from the Persian Gulf region. Figure 3.6 shows Middle East oil dependence on Asia.

Table 3.23: Net Oil Imports from the Persian Gulf Region

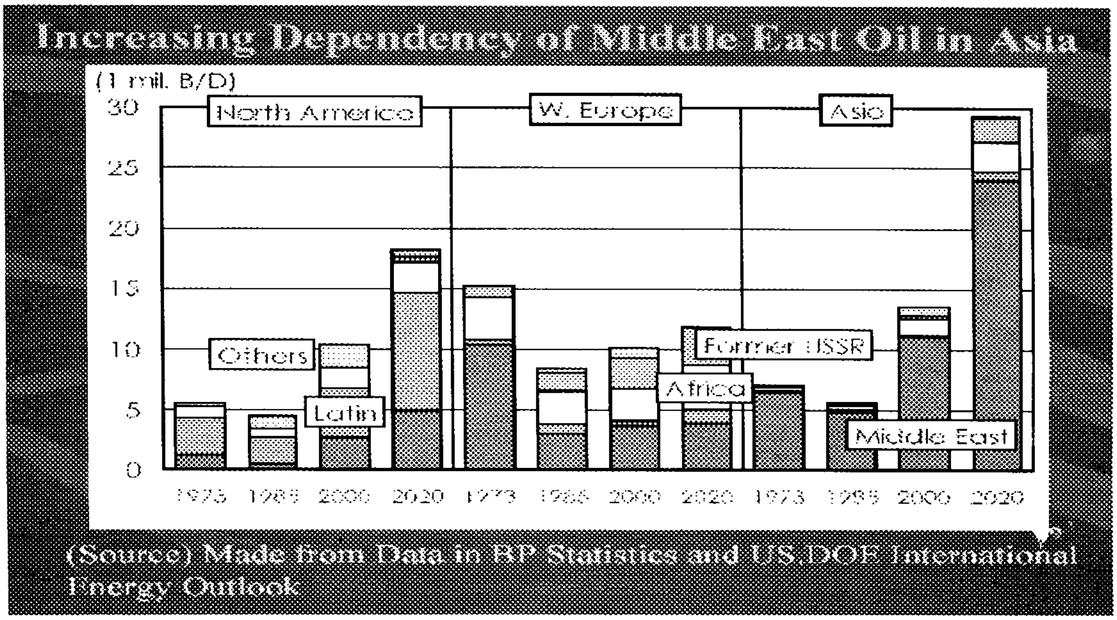
Year	AS % of Demand			As % of Net Oil Imports		
	US	W. Europe	Japan	US	W. Europe	Japan
1982	4.5%	N.A.	58%	16.1%	N.A.	60%
1983	2.9%	N.A.	60%	10.1%	N.A.	60%
1984	3.2%	N.A.	61%	10.6%	N.A.	61%
1985	1.9%	N.A.	58%	7.1%	N.A.	59%
1986	5.6%	N.A.	58%	16.7%	N.A.	58%
1987	6.4%	N.A.	59%	18.1%	N.A.	60%
1988	8.8%	N.A.	57%	23.2%	N.A.	58%
1989	10.7%	N.A.	64%	25.8%	N.A.	63%
1990	11.5%	29%	66%	27.4%	45%	65%
1991	11.0%	27%	64%	27.7%	41%	64%
1992	10.4%	26%	66%	25.6%	42%	66%
1993	10.3%	29%	69%	23.3%	47%	69%
1994	9.7%	25%	70%	21.4%	45%	69%
1995	8.8%	23%	70%	19.8%	44%	70%
1996	8.7%	21%	69%	18.8%	41%	70%
1997	9.4%	23%	75%	19.1%	44%	75%
1998	11.3%	26%	75%	21.8%	47%	77%
1999	12.6%	22%	73%	24.8%	43%	74%
2000E	12.6%	21%	75%	23.8%	42%	75%
2001E*	13.9%	19%	76%	25.3%	36%	76%

**January-September 2001*

Source: Online at, www.eia.doe.gov/cabs/pgulf.html

Thus as the above discussion shows that after the sharp decline in oil prices in 1997-98, the GCC states reevaluated their longstanding economic weaknesses, in particular the generous system of social benefits they provide to their citizens. However, the strong expectations in these countries of continued benefits led the Gulf countries to look to other ways to reform their economies. Rather cut benefits, impose or raise taxes, or dramatically reduce their defense budgets, some of the GCC countries have chosen to try to reduce economic vulnerability by attracting international capital to their economies, into the energy sectors in particular. Thus, there are opportunities and challenges for the GCC countries to sustain in the regime.

Figure 3.6: Increasing Dependency of Gulf Oil in Asia



Source: IEEJ, 2003.

Section III

Interdependence: Concept and Framework

The concept 'Interdependence' is often used in different conflicting ways. To put it, the term can be used both ideologically as well as analytically. As a political verb, interdependence is conjugated "I depend; you depend; they rule". As an analytical word, interdependence refers to 'situations in which actors or events in different parts of a system affect each other'. Simply put, interdependence means 'mutual dependence'. Such a situation is neither good nor bad in itself, and there can be more or less of it. In other words, interdependence is not merely an exchange relationship rather it is the capacity where the two parts/parties are faced with a situation of 'no substitution' or high cost of substitution.

The dimensions of interdependence can be explained through four different distinctions: its sources, benefits, relative costs and symmetry. Interdependence can originate in physical (i.e., in nature) or social (economic, political, or perpetual) phenomena. The distinctions make clear the degree of choice in situations of mutual dependence.

Generally speaking, economic interdependence[174] is similar to military dependence in that it is the substance of traditional international politics and

[174] For details see Jones, R.J.B., *Globalisation and Interdependence in the International Economy*, (London: Pinter, 1987).

has a high degree of social, especially perpetual, origin. Economic interdependence involves policy choices about values and costs. For example, in the early 1970s there was concern that world's population was outstripping global food supply. Many countries were buying American grain, which in turn, drove up the price of food in American supermarkets. A loaf of bread cost more in the US because the Indian monsoon failed and because the Soviet Union had mishandled its harvest[175]. Social choices as well as physical shortages affect economic interdependence in the long run. Therefore it has been argued that it is always worth considering the long-term perspective when making short-term choices.

The benefits of interdependence are sometimes expressed as *zero sum* and *nonzero sum*. In a *zero sum* situation, one's loss is another's gain and vice versa. In a positive sum situation, both gain; in a negative sum situation, both lose. Dividing a pie is zero sum, baking a larger pie is positive sum, and dropping it on the floor is negative sum[176]. Both zero sum and nonzero sum aspects are present in mutual interdependence. Some liberal economists tend to analyze Interdependence in terms of joint gain, that is, positive sum situations in which everyone benefits and everyone is better off. This type of view though ignores the political aspects of interdependence, yet it is true that both sides can gain from interaction. This approach has been adopted in the analysis of interdependence between India and GCC countries in the present study.

The costs of interdependence can involve short-run sensitivity or long-run vulnerability. Sensitivity refers to the amount and rapidity of the effects of dependence; that is, how quickly does change in tone part of the system bring about change in another part? For example, in 1987, the New York stock market crashed suddenly because of foreigners' anxieties about US interest rates and what might happen to the price of bonds and stocks. It all happened very quickly; the market was very sensitive to the withdrawal of foreign funds. More recently, in 1998, weakness in emerging Asian markets had a contagious effect that undercut geographically distant emerging markets in Russia and Brazil. A high level of sensitivity, however, is not the same as a high level of vulnerability. Vulnerability refers to the relative costs of changing the structure of a system of interdependence. It is the cost of escaping from the system or changing the rules of the game. The less vulnerable of the two parties is not necessarily the less

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[175] Nye Jr, Joseph S., *Understanding International Politics: An Introduction to Theory and History*, (New York: Longman, 1999), p. 179.
[176] Ibid.

sensitive but rather the one that would incur lower from altering the situation. For instance, during the 1973 oil crisis, the US depended on imported energy for only about 16% of its total energy uses. On the other hand, in 1973, Japan depended about 95% on imported energy. The US was sensitive to the Arab oil embargo in so far as prices shot up in 1973, but it was not as vulnerable as Japan was. In 1998, US was sensitive but not vulnerable to Asian crisis. The financial crisis cut half a percent off the US growth rate, but with a booming economy the US could afford it. Indonesia, on the other hand, was both sensitive and vulnerable to changes in global trade and investment patterns. Thus vulnerability involves degree[177].

India and GCC countries: Interdependence in the Global oil regime

Before discussing the pattern of interdependence between India and GCC countries in the present global oil and gas regime, it is to be noted that there are certain similarities between the oil-gas fundamentals of both India and GCC countries, which has resulted in interdependence. Consider:

- The oil and gas sectors in India and in GCC countries have traveled full circle- from multinational domination to nationalization and again to privatization, though the extent of privatization is limited to some extent in case of the GCC countries.
- The oil-gas fundamentals have put both in the focal point of global oil-gas regime- India on the consumption front and GCC countries on the supply front.
- Both are in search of market solutions to solve the intricacies of energy sector problems. While India being aware of the pernicious effects of supply disruption is trying to secure stable sources of supply, GCC countries are striving hard to secure stable outlets for their energy exports.
- Presently, the GCC countries as a whole account for near about 65% of India's oil imports[178]. There is every likelihood of this trend to continue in the future due to the ground realities of the Indian oil-gas fundamentals. The attempts for diversification of import sources have not resulted in substantial results either due to economic or geopolitical bottlenecks.

The evolving energy sector interdependence between India and GCC countries is itself part of the changing pattern of the global energy regime, in which India is on the way to become GCC countries' most important customer; and the GCC countries are the only source of energy for India. As discussed in the chapter the pattern of interdependence between India and GCC countries is consolidated on the basis of the oil-gas fundamentals.

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[177] This aspect of interdependence will be discussed in the next chapter.

[178] This figure has been calculated from CMIE (Centre for Monitoring Indian Economy), "Foreign Trade and Balance of Payments", *CMIE*, Mumbai, July 2001, p.217.

India-GCC energy interdependence propelled primarily because of India's heavy dependence on cheap Gulf oil imports given most of oil resources of South-East Asia, Africa and North America and the Caspian basin are traditionally by and large committed to the North, Gulf oil resources were the ultimate source for India. Moreover with the changing of fortune of the GCC countries in the global regime due to penetration of number of players, thereby making dents in the market share of OPEC in general and the GCC oil exporting countries in particular; the emerging markets like India and other Asia are the only hope of revival of GCC countries' fortunes, as these are and will continue to be the major oil-gas consuming and importing countries. The various initiatives taken both by India and GCC countries in this regard points to the growth of the pattern of interdependence.

Interaction between India and GCC countries in the Interdependence Framework

The energy sector interdependence is an important component of India's illustrious relations with GCC countries, premised basically on three factors:

- India's economic interaction with the Gulf region dated back to centuries old.
- India's dependence on the region for its energy requirements.
- Heavy presence of Indian migrant workforce in these countries.

As mentioned earlier in the section 'Global oil regime in India', the first instance of energy interdependence between India and GCC can be traced back to the then period of Indian oil history, when a deal with the Iranians was finalized which included the setting up of a refinery at Madras and participation of India in oil exploration in the Iranian offshore areas. Similar prospects afterwards came up in relation to other oil producing countries, the most important being the deal with Iraq.

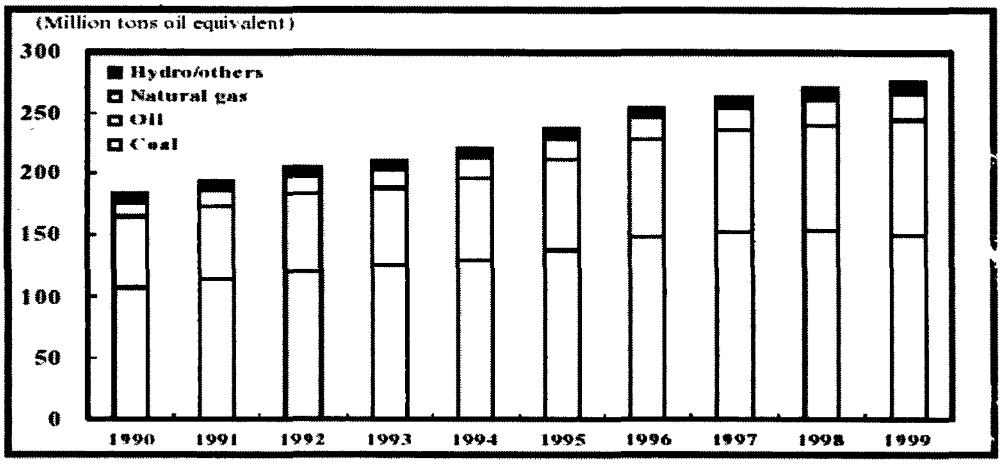
Reliance on crude oil imports from the Gulf

As already mentioned, India's oil demand has been growing rapidly as a result of its vibrant economic growth. According to the BP Statistics, this growth averaged 5.6% per year from 57.90 million tons in 1990 to 112.07million tons in 2002. On the other hand, crude oil production remained virtually unchanged, moving only from 34.80 million tons to 36.20 million tons over the same period. As a result, the oil supply-demand gap widened, and this in turn led to a sharp growth in imports. A breakdown of imports (crude oil, petroleum products) reveals conspicuous increases in crude oil imports since the mid-1990s[179]. At the same

[179] In the mid-1990s, refining capacity failed to keep up with the growing oil demand, and petroleum product imports, particularly diesel, increased considerably. As a result, the share of crude oil imports in total oil imports had plunged to about 60% by FY1995.

time, progress has been made in increasing India's refining capacity. Partly as a result of Reliance, a private company, having put its newly built giant refinery (capacity 27 million tons) on stream in July 1999, India's crude oil imports in FY1999 reached some 45 million tons and occupied a high 77.5% of total oil imports (Fig. 3.7).

Figure 3.7: India's oil imports



Source: prepared from BP statistics.

Among the constituents of India's crude oil imports in recent years, an increasing share of African crude oil, particularly from Nigeria, has been noted. This is attributable to various factors. Firstly, in view of the greater preponderance of white oils in India's oil demand mix and upgraded specifications (lower sulfur contents) of petroleum products, the Indian refining sector is basically in need of low-sulfur crude oil. Among others, although African crude oil prices are primarily linked to North Sea Brent, the market's supply-demand relations have often made African crude less expensive, so that crude oil imports from Africa make good sense economically. Nonetheless, although it is true that African crude oil imports have been growing rapidly, Mid East crude at present still constitute the mainstream of India's crude oil imports. The background to this includes the following factors:

- The short distance between the Gulf and India means that economic advantages exist in points such as transportation cost.
- The Gulf has sufficient supply potential to cover India's import requirements.
- India and the Gulf have long-standing economic/trade relations and have virtually formed a single "market zone." For these reasons, most of India's incremental crude oil requirements are likely to be met by imports from the Gulf.

On the basis of these projections, India has considered a number of projects to build new refineries in joint ventures with the Gulf oil-producing countries. Such projects are expected to be beneficial to both sides: introduction of capital from Gulf oil producers will enable India to mitigate its financial burdens incurred in refinery construction, while stable crude oil supplies can be secured at the same time. The oil-producing countries for their part will be able to secure a stable outlet for their crude oil and gain a foothold in India's vast market place. In reality, however, most of such refinery projects have been canceled, or have ended in pullouts by the Gulf oil-producing countries. This outcome is the result of various factors. First, new refinery construction involves total investments on an enormous scale. Second, owing partly to the Asian economic crisis, refining margins remain sluggish in Asia, casting doubt on the economic viability of massive investments in the refining sector. Among others, India's moves to deregulate and free its oil downstream sector remain uncertain. In addition, it is significant that India, the host country of investments, failed to offer any especially favorable treatments/incentives to the joint venture projects with the Gulf oil-producing countries in return for securing oil imports[180]. In fact, the decision whether or not to support a specific project appears to have been decided on the basis of the respective economics in each case.

Basically, both the Gulf oil-producing countries and the majors seem to be highly interested in the Indian market, in which expansion and liberalization are likely to be realized before long. The Gulf oil-producing countries, with their massive crude oil production capacities and interest in acquiring security/expansion of outlets, are expected to continue searching for approaches to India's downstream oil sector while keeping a watchful eye on market trends[181].

Natural gas import plans

Natural gas currently accounts for about 8% of India's total primary energy consumption and occupies the position of third energy source after coal and oil. Natural gas is principally used in power generation and fertilizer production. When combined, the two consuming sectors alone account for about 80% of the

[180] As already mentioned, for India to receive oil supplies from the Middle East is sometimes viewed by Indians as being entirely natural. This derives from the concept that, as India is a "natural market" for Middle Eastern crude, its security should involve no extra cost.

[181] Among recent moves, Kuwait (KPC) is reported considering equity participation in Reliance Refinery and Mangalore Refinery.

country's total natural gas consumption[182]. With these two sectors occupying center stage, India's natural gas consumption grew sharply by 7.5%/year from 12.70 MTOE (12.5 billion cubic meters) in 1990 to 21.40 MTOE (23.7 bcm) in 1999. During the period, natural gas production has grown favorably along with consumption[183], and the entire domestic demand has been met by domestic output. However, it is believed in some quarters that India's "potential demand" for natural gas is greater than its actual consumption, which has been regulated by supply restraints involved in domestic production[184]. The potential demand— i.e., the possibility of expanding consumption— is believed to originate from the two above-mentioned sectors of power generation and fertilizer production. India's basic electricity demand is on the rise in reflection of its economic development, and there is a constant demand for generating fuels. As will be discussed later, while the principal generating fuel is coal, from the viewpoints of environmental conservation in urban areas and accessibility to fuel coal (distance and transport cost from mines), in certain locations natural gas-fired power generation often proves superior. Furthermore, in agriculture-based India, expansion of the fertilizer supply is among top priorities in the country's efforts to increase output and self-sufficiency in foods. This means there is massive demand for fertilizer feedstock. Accordingly, it is considered that once the supply of natural gas becomes sufficiently available at affordable cost, potential demand will be realized by the same margin as incremental supply, thus leading to expansion of actual consumption.

The first option in boosting the natural gas supply is to increase the domestic natural gas output. At present, India is giving clear-cut priority to this option of enhancing domestic gas production, and is implementing the (previously mentioned) NELP to that end. However, as hopes should not be pinned only on sharp domestic output increases, natural gas imports are under consideration as the second option for increasing supply. Natural gas imports are roughly divided into pipelined imports and LNG imports, and India appears basically to prefer the former. This is because, although distance from the supply source has to be taken into account, pipelined gas supply is considered to be economically advantageous if the other conditions remain constant. At present, there are two pipeline gas supply projects to India. One is an export project from Bangladesh,

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[182] As of 1998, the natural gas consumption mix consists of fertilizer production 39.4%, power production 38.7%, and other industrial uses 13.4%.

[183] India's natural gas production grew sharply from 11.80 MTOE in 1990 to 22.40 MTOE in 1999.

[184] This view was often expressed by people we interviewed at Indian government organizations, etc.

and the other from Iran. However, owing to factors such as deviating policies and conflicts with the transit country (Pakistan)[185], neither of these projects stands much chance of realization for the time being. LNG projects have therefore been highlighted in recent years as being more feasible.

A succession of LNG import projects are being considered in major coastal and near-coastal cities from the point of view of favorable transport cost. Particularly on the West Coast, large numbers of projects are being examined or are under way, assuming imports of LNG from the Middle East. By the end of the year 2002, there were reportedly more than 15 LNG projects targeting the Indian market. Regarding contents and actual states, however, many of these are still at the study stage. The few that are actually in progress include the Dabhol project, Petronet LNG project, Pipavav project and Trombay project. The most advanced of these is the Dabhol project, which was being carried out under Enron's leadership. This project, studies for which were started in the early 1990s, is designed to construct an LNG import terminal, build and operate a power plant, and supply natural gas to gas distribution business in Maharashtra Province[186]. Fueled by naphtha in its first phase, the power plant was commissioned as early as May 1999. The second phase of the power plant includes capacity expansion and fuel switching to LNG. Construction works, etc. at first made good progress toward the second-phase commission slated for November 2001[187]. But however, the project got a severe jolt in the aftermath of the Enron's financial scam and consequent liquidation of the firm in the late 2003.Table 3.24 depicts the major LNG projects of India and GCC countries.

Table 3.24: Major LNG Projects of India with Qatar & other GCC Countries

Consortium	Location	LNG Required	Period	Supplier	Status
PETRONET LNG	Dahej(Gujarat)	5 MT	25 yrs	RasGas	SPA concluded
PETRONET LNG	Kochi	2.5 MT	25 yrs	RasGas	SPA concluded
DBEC	Ennore	2.5 MT	20 yrs	RasGas	Heads of Agreement

185 As Bangladesh gives top priority to domestic supply, a government permit for the export project is at present unlikely to be granted. The Iranian project also faces many difficulties at home and abroad as the pipeline runs through Pakistan, whose relations with India are tense due to the Kashmir dispute, etc.

186 LNG receiving capacity is designed at 5.00 million tons. Of this, 2.20 million tons will be used by the power plant built under this project.

187 With LNG supply scheduled to start in the fourth quarter of 2001, sales-purchase agreements (SPA) were concluded with Oman LNG (20 years, 1.60 million tons) and Adagas (20 years, 480,000 tons). Also, a letter of intent was signed with MLNG Tiga, from which India would buy 2.60 million tons of LNG for 20 years to be used for industrial use.

RELIANCE	Jamnagar(Gujarat)	2.5-3.0MT	20-25 Years	Qatargas	Talks in progress
Gujarat Pipavav LNG	Pipavav(Gujarat)	2.5 MT	20 yrs	Qatargas	Talks in progres ,
INGC (Tata-Total)	Trombay(Mumbai)	3.0 MT	-	-	Preliminary talks
India Gas Co.	Manappad (T.N.)	1.5-2.5 MT	25-30 years	-	Preliminary talks
ENRON	Dabhol(Mah)	2.1 MT	20 yrs	ADGAS/ Oman LNG	SPA concluded

Source: http://www.indianembassy.gov.qa/iqhyd.html

Majors and producing countries strengthening commitments to greater investment opportunities

Trends and developments in India such as soaring energy demands, policies of introducing foreign capital to facilitate domestic energy development, deregulation and liberalization of energy markets, and reorganization of energy industries, are providing the international energy industry with big investment opportunities. During the turbulent days of sluggish crude oil prices until early 1999 followed by skyrocketing crude oil prices, the international oil/energy industry has undergone a series of reorganization/restructuring moves. Amid the resultant turmoil, major players on the market have been under pressure to introduce streamlining/efficiency-improvement measures, while it has become a matter of vital importance to secure promising investment targets for the sake of growth and better earnings in the future. Accordingly, the leading market players—notably the majors and Gulf producing countries (state-run oil companies)—currently appear to have China and India in their sights as priority investment targets.

In fact, the majors and Gulf oil producers have made increasingly aggressive commitments to the Indian market in recent years, and various developments have been noted. In their approaches to India, the majors are also focusing on gas (LNG) businesses and oil downstream operations. Regarding the former, particularly because LNG supply from the Middle East is expected to become the nucleus, the majors are struggling to secure outlets and increase sales of specific LNG projects in which they have become involved. Furthermore, in an effort to secure LNG marketing, moves are also being made toward participation in downstream operations (LNG terminal construction, gas marketing)[188].

[188] For example, Total Fina Elf is joining in the Trombey project and RD Shell in the Hazira project. Also, in March 2001, RD Shell announced it had decided on $3-billion investments in gas projects (construction of pipeline and gas-fired power plant) in India.

Regarding the latter, while carefully watching moves to abolish the APM and liberalize the market as discussed in Chapter 2, the majors are seeking chances to enter downstream oil operations. By trying to establish their brand image through expansion of already freed lubricant marketing, among others, the majors are steadily preparing the ground for a rosy future. The Gulf oil producers, for their part, intend first to secure and increase sales of crude oil, their most important commodity, in both China and India. One reason for this is their expectation of an enlarging "pie": they feel that oil demand and imports by these countries are likely to keep growing in the long run. They also have other reasons that justify their approach, including the facts that:

- The European/American markets, important outlets so far, are now exposed to intensifying competition from the former Soviet republics, Africa, Latin America, etc., and do not allow easy market expansion, and
- Asia-bound crude oil can be sold for higher prices than that destined for Europe/America[189].

On the Indian market, joint-venture refinery projects have since 1990 been under consideration between Gulf national oil companies and their Indian counterparts. These have included Saudi ARAMCO and HPCL, Kuwait's KPC and IOC, Oman's OOC and BPCL, OOC and Essar Oil, OOC and HPCL, and the UAE's ANDOC and IOC. Although these JV projects have made little progress for reasons already cited, the producing countries' interest in the Indian market has basically remained high. More recently, as demonstrated by KPC's plans for equity participation in existing refineries as well as entries by establishing partnership with majors, tentative new approaches have been noted[190]. From now on, the Middle Eastern producing countries are likely to step up their commitments to India, while carefully watching the effects of product pricing deregulation and market liberalization slated for late March 2002. Incidentally, Iran's approach to planned pipeline gas exports now under negotiation is somewhat exceptional among attempts to tap into the Indian gas market, in that most such initiatives at present consist of efforts to increase LNG sales in partnership with majors.

The GCC countries and India have engaged themselves in various upstream and downstream projects over the years. As per one report, the GCC counties have

[189] The so-called "Asia Premium." There was a premium of about $1 – 1.5/bbl on average in 1990 - 1999.

[190] Good examples are KPC's plans for equity participation in Reliance Refinery, etc., and an alliance between Saudi ARAMCO and RD Shell in downstream operations in Asia region-wide, including India.

planned to invest $6billlion to build refining capacity in India[191]. This was illustrated by the agreements signed between India and Oman in June 1993. The three agreements signed between India and Oman included construction of a gas pipeline with estimated investment of $5 billion covering 900 miles by Oman linking two countries and setting up of two refinery projects in India: Bina Refinery and Deogarh refinery projects. These refineries are expected to refine Omani crude and it is a joint venture of the Oman Oil Co. and two Indian firms, Hindustan Petroleum Corporation and Bharat Oil Co. A memorandum of understanding has also been signed between India and Oman for the construction of a gas based fertilizer plant for the production of ammonia and urea in Oman. The Kuwait Petroleum Corporation has also agreed to participate in an Indian Oil Corporation venture with 26% equity in the joint venture refinery to be set up by IOC in Daitari, Orissa[192]. Kuwait is also interested in other refinery projects in India. Qatar with its gas reserves is also interested in setting up joint ventures in the Indian oil-gas sector. Qatar has signed an agreement with Enron to develop massive new LNG facilities to penetrate to the booming Indian market. Besides crude oil supplies and refining sector, there are tremendous potentialities in the petrochemical sector to be incorporated in the interdependence. In fact the GCC countries have become a source of investment in India, mainly in the refineries sector. The total investment of about US$694.44 million has been committed by the Oman Oil Co., KPC and Saudi Aramco[193]. However the Oman Oil Co. dropped its plan in 1997 and the Saudi Aramco went ahead in the refinery project in Phulo Khari in Punjab to expand the capacity of their joint venture from 6 Mts to 9 Mt at a cost of US$ 2.5 billion. The most noteworthy Indian investments in the Gulf region are the two fertilizer joint ventures in Oman, UAE[194]. The recent Qatari proposal for the setting up a petrochemical plant in Kerala is also worth mentioning[195]. To put it briefly, there are interactions between India and GCC countries in the framework of interdependence and given the location of both in the present regime, the framework of interdependence will consolidate into a very vibrant and solid for in the coming future.

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[191] Pant, Girijesh, "The Changing Gulf Market and India: Trends and Prospects", in Pasha, A. K., ed., *Perspectives on India and Gulf States*, (New Delhi: Détente Publishers, 1999), pp. 112-126.
[192] MEED, "KPC to set up Indian Oil refinery", *MEED*, January 27 1995, p.21.
[193] MEED, 16 February 1996, p. 14.
[194] Roy Choudhury, Rahul, "Sea Power and Indian Security", *Brassey's*, London, 1995, p.89.
[195] See *Oil Asia Journal*, June-September, 2001.

The framework of interdependence between India and GCC countries in the coming years will be based on the following aspects of the oil and gas sectors in both countries:

- Given the fact that Indian consumption of oil, products, and natural gas will register impressive growth rates, and the inadequate domestic availability of these, India will continue to rely on the GCC countries. Moreover, the recent capacity expansion in Indian refineries will call for increased crude imports from the GCC countries.
- The GCC countries as an emerging market to penetrate into the Asian products markets can use the improved refinery sector in India.
- India can make use of the advanced technologies of GCC countries for domestic exploration through joint ventures. India can also get some concessions for exploration and development in the GCC countries.
- There are tremendous opportunities in the natural gas front as the future viable interdependence between India and GCC countries.

Interdependence in the Liberalized Economic Regimes in India and GCC countries: Emerging Opportunities

Another important aspect of interdependence is the vast opportunities emerging in the liberalized economic regime in India and GCC countries.

The GCC countries are implementing policy reforms to accelerate non-oil growth and create employment opportunities for a rapidly increasing labor force in a sustained fashion, while reducing vulnerability to oil price shocks. They are aware of the need to adjust to the challenges from regional integration and the globalising world economy.

Following the sharp drop in oil prices in 1998–99 and the associated financial pressures, the authorities in the GCC have reinforced their structural reform programmes[196] (see Annexure 3.6). Since the programmes are driven by specific pressures in each country, they are at different stages of implementation. In all GCC countries, progress has been made over the past few years toward fiscal consolidation, lessening the budgets' vulnerability to terms of trade shocks from oil price volatility. Some countries have made progress in separating public expenditure decisions from the short-term developments in oil revenues, including (as in Kuwait and Oman) through formal oil savings and stabilization funds. Attempts to raise non-oil revenues have met with mixed results; they are expected to be more successful in the medium term. Moreover, containment of public expenditure has proven to be harder than expected: reducing public sector employment and curtailing the scope and budgetary impact of subsides

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[196] Fasano, Ugo, 2001a, "With Limited Oil Resources, Oman Faces Challenges of Economic Diversification, Structural Reforms," *IMF Survey*, (July 30), pp. 254–57.

have been difficult and the generous welfare systems have remained largely unchanged.

The restructuring and privatization of utilities and related services have been placed at the top of the agenda in many GCC countries. Oman, Qatar, and the United Arab Emirates are presently relying on the private sector and foreign direct investment to fund and manage infrastructure projects in the energy and water sectors, while Saudi Arabia has moved aggressively to privatize telecommunications. The state enterprise reform and privatization can be sustained by a more sequenced approach, including establishing a process-monitoring system, further reducing regulation, offering common treatment of investors, implementing time-specific programs to improve the efficiency of state enterprises, and gradually increasing energy and water tariffs to recover costs[197].

New incentives have been recently adopted in all GCC countries to attract foreign direct investment. These include the establishment of regulatory, institutional, and legal frameworks to govern foreign capital inflows under a generally liberal exchange and trade system. In fact, 100 percent foreign ownership of companies has been allowed in most non-hydrocarbon sectors. Corporate income tax on foreign corporations has been reduced substantially, administrative steps for investment approval streamlined, and foreign investors' access to local stock markets improved.

More significantly, the banking systems of all GCC countries have remained resilient to the volatility in oil prices, as high capitalization and strengthened prudential oversight, together with cautious monetary policies, have helped preserve the quality of banks' assets. Steps have also been taken to deepen the financial system through the promotion of capital and equity markets in a number of GCC countries.

Implications of Adjustment in the GCC Countries for India

Given the traditional links with India, economic diversification and fiscal retrenchment in the GCC countries would be expected to influence the economic performance of the rest of the region through a number of channels: the flow of workers' remittances, financial aid, merchandise trade, as well as the flow of investment to the region.

- Employment opportunities in the GCC countries for foreign labor are likely to become more limited in the short run. The contraction of the oil sector would initially dampen non-oil activities, and large-scale

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[197] Barnett, Steven, and Rolando Ossowski, 2002, "Operational Aspects of Fiscal Policy in Oil-Producing Countries," *IMF Working Paper* 02/177 (Washington: International Monetary Fund).

infrastructure development has reached saturation in several countries. Moreover, there is a recent trend in the GCC countries to substitute Asian workers for workers from the region. In addition, most of the GCC countries have initiated long-term programmes of nationalization of their labor force through employment policies.

These factors suggest that with reduced reliance on foreign labor, the larger share of adjustment would possibly fall on workers from the region. In addition to the direct balance of payments impact, there would also be effects on investment and growth associated with the loss of remittances, as these flows have traditionally financed small-scale private investments (mostly in construction) in the recipient countries.

- Over the past two decades, the GCC countries have been an important source of financial support for India, both directly through grants and soft loans, and indirectly through contributions to other socio-economic projects in India. During the 1974-94 period, concessional financial assistance from the GCC countries to other developing countries totaled about US$90 billion, representing 3 percent of donors' GDP. Budgetary constraints have made it difficult to maintain high levels of official financial assistance. Further expenditure restraints would be expected to result in relatively limited aid flows to India.
- Looking forward, the expansion of domestic economic base and export diversification in the GCC countries would be expected to lead, over time, to higher exports from the GCC countries to India, particularly in areas where the GCC countries have a clear comparative advantage (e.g., secondary and tertiary petrochemical products) and consequent higher imports from India in other fields where India has expertise such as electrical goods, software, automobile parts, textiles, etc.
- Finally, in the present liberalization era, the prospects of macroeconomic stability, supported by simplification of investment procedures and the lowering of the barriers to entry of foreign capital in India would offer opportunities for increased investment by the GCC countries. Moreover, the prospects of peace in the Gulf region, combined with sound economic and financial policies, would improve investment incentives and create opportunities for joint projects that have not been fully exploited because of socio-political risks. Although most GCC countries would be expected to pursue economic diversification based on domestic investment, their comfortable overall capital position would still allow large investments in the region. There are only a few other capital surplus economies in the region that could benefit from the opening of equity markets and privatization programs in the GCC countries. Hence India has numerous opportunities to penetrate the booming GCC countries in the future.

Another important aspect of the interdependence between India and GCC countries in the present regime can be identified as the synergy between energy (oil and gas) and knowledge, which in fact describes the respective deficits of the both. India being a leader in the global knowledge industry of the present era will play a major role in the GCC countries' attempts at building a knowledge society. In recent years, there are renewed efforts by both India and GCC countries to devise strategies to fill up the deficits of both in the framework of interdependence. This aspect will be discussed fully in the last chapter.

Thus to sum up, this chapter analyzed how India and GCC countries are becoming prominent in the present global oil and gas regime. The GCC countries though have lost their supremacy due to different policies as well developments in the past regimes, yet they are in the process of consolidating themselves to place them in the regime again. They are carrying out policies to penetrate to the emerging potential markets such as India in the framework of interdependence to secure their position. India on the other hand being geographically close to the GCC countries and additionally having historical links with the region is on the process of establishing secure source of energy supplies from the GCC countries in the framework of greater interaction. Moreover besides the hydrocarbon interdependence there are other avenues of sustaining the interdependence framework especially the newer arenas precipitated by the liberalized economic regime such as knowledge sector.

Chapter IV

Interdependence and Mutual Vulnerability: Issues in Energy Security

As discussed in chapter III, the oil and gas fundamentals of India and GCC countries will result in greater interdependence in the present global oil and gas regime. The costs of interdependence involve sensitivity and vulnerability. While sensitivity refers to the amount and rapidity of the effects of dependence; that is how quickly does change occur in one part of the system bring about change in another part? Vulnerability refers to the costs of changing the structure of the system of interdependence. Vulnerability involves degree.

Energy dependence and especially energy import dependence on Gulf sources and energy security has been a debatable issue for quite long time. On the hand, it has been argued that there is no direct link between energy import dependence and energy security[198], on the other hand, arguments run that increased dependence on imported energy, especially oil and gas from the Middle East, is a threat to energy security[199], have provided a driving force for energy policies and strategies in the past. This chapter explains the interdependence framework with its implications for energy security of both the oil and gas importing countries (India), and the oil and gas exporting countries of the GCC.

The concept of Energy Security

Security in common parlance refers to the abilities, capacities and preparedness to confront the challenges, uncertainties and effects of an inevitable crisis. Therefore, energy security can be defined as the capabilities to mitigate the vicissitudes of uncertainties in the event of a crisis in terms of energy supply as well as demand disruptions during a period of time. The term 'energy security' covers a wide range of issues and many different resources. Energy security refers to the degree of vulnerability accruing from dependence on particular form of energy, say oil or gas or electricity. Therefore 'energy security' in this study refers to the degree of dependence on oil and gas as sources of energy.

Moreover, energy security is defined in terms of the physical availability of supplies to satisfy demand at a given price. The security problem therefore involves a quantity risk and a price risk. It also has a long-term and short-term component: a long-term trend of rising prices for energy imports have a different implication for an economy rather than sudden price hikes or prices volatility. The difficulty in addressing energy security is defining the nature of the problem

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[198] See Lichtblau, John H., *Oil Import and National Security: Is there still a connection*, (New York: Petroleum Research Foundation, 1994) and also Koyama, Ken, "Oil Supply Security in Asian Economies: Growing oil imports and their response measure", *Energy in Japan*, January 1998, Institute of Energy Economics (IEE), Japan.

[199] Yergin, Daniel, *The Prize: The Epic Quest for Oil, Money and Power*, (New York, Simon & Schuster, 1991), pp. 582-632

in these terms and attempting to evaluate the costs of failing to meet security objectives[200].

Thus, energy security is a function of energy dependence, since energy dependence determines the degree and extent of energy security. Energy dependence can also be defined as the dynamic problem of short and long run market power. The potential monopoly of an oil or gas cartel depends on its world market share and the elasticities of demand and supply for the energy (oil or gas), while the sensitivity and vulnerability of energy importing countries depends most directly on the quantity of imported oil/gas and their respective cost share in the GDP of the importing countries.

The concept of energy security has thus two dimensions such as demand as well as supply. In other words, there is different perception of energy security for energy producing and exporting countries and energy consuming and importing countries. For most industrialized countries, energy security remains synonymous with ensuring access to foreign oil supplies at reasonable prices. For oil-gas producing and exporting countries, energy security means the physical protection and transport of oil-gas to markets at reasonable prices. Both consumers and suppliers must therefore concern themselves with events that could jeopardize oil-gas's physical security, its delivery to market and price[201]. Thus the dynamics of energy security can be analyzed from two aspects such as demand disruptions affecting the energy producers and exporters and from the supply disruption aspects affecting the energy consumers and importers.

In addition, the economics of energy security also implies energy security differently for developed industrial consuming countries and developing consuming countries. It has been argued that[202], for the main economies (which are developed industrialized and trading countries), relative costs and risks of energy security are critical in the sense that they are sensitive to supply disruptions. This has attracted attention recently due to the movement towards liberalization of the energy sector in these economies. Though liberalization of energy sector in many developed countries reflects a choice of competition as the best means of procuring and delivering final energy like other goods and services at the lowest possible cost, yet, the consumers in these countries can be affected

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[200] IEA/OECD, *Towards a Sustainable Energy Future*, Paris, IEA/OECD, 2001), p. 76.

[201] See Kemp, Geoffrey, "The Persian Gulf Remains the Strategic Price", *Survival*, Vol. 40, no. 4, winter 1998-99, pp. 132-49, International Institute for strategic Studies, Washington D C.

[202] See Mitchell, J. V., "Renewing Energy Security", London, The Royal Institute of International affairs, Sustainable Development programme, July 2002.

during the transition period in case of supply disruption. On the other hand, for most developing countries, security of supply means security of expanding supply in line with their economic growth. Liberalization to achieve lower costs may compound the difficulties which under-funded state monopolies (or private utilities squeezed by price controls) face when investing to expand (as the case in India). And for developing countries dependent on oil exports (as the GCC countries) there are additional challenges. Their economic growth will not be sustainable unless the revenues gained from exports are sufficiently combined with the human, social and economic capital of their countries to diversify future economic growth. Energy exports themselves may create barriers to that development and diversification. Export rents flowing into a narrow structure of elites may increase social divisions, perpetuate authoritarian regimes, and fund civil or regional military conflicts, which will impair global energy security.

The recent manifestation of the concept of energy security has been expressed on the basis of apprehensions of terrorist attacks on vital installations of oil and gas infrastructure or supply routes. Therefore in the aftermath of 9/11 terrorist attacks, concerns expressed about energy security from the perspective of supply interruptions by questioning the relevance of benign dependence. As *The Economist* observed,

> "The previous arguments assume that Middle Eastern oil producers will know what is good for them. But if a Taliban-like regime were ever to gain control of the Saudi oilfields, could it be relied on to maximize profits in a sensibly self-interested fashion? It might decide to blow up the wells, in pursuit of drive out poverty and punish the West for its corruption. An indefinite cessation of production from what is now Saudi Arabia is not something the West could take on its stride, with or without flexible markets. And going to war for the oil might not be straight forward, especially if one postulates nuclear arms in the possession of such a state"[203].

Such apprehensions and policy measures are vindictive of the fact that America raised its war on terror on Iraq to dethrone the regime on the plea of possession of WMDs, but there are questions regarding the real motive behind such exercise. Analysts are in fact pointing towards the so-called 'oil factor' behind the impulsive American exercise in Iraq. The increasing long-term dependence of the US economy on imported supplies of oil has been well documented:

> "The National Energy Policy Development, under the leadership of Vice President Dick Cheney, reported in May 2001 that US oil production would fall by 12 percent over the next two decades. With US oil consumption expected to rise by one-third over the same period, this

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[203] 'Energy and Geopolitics: Addicted to oil', The Economist, December 13th 2001, on the site, http://webs.wichita.edu/physics/labs/111/articles/Energy%20and%20geopolitics.doc.

means that US dependence on imported oil, which has risen from one-third in 1985 to more than half today, will climb to two-thirds. According to the Cheney report, Persian Gulf producers alone will supply up to two-thirds of world oil exports in 2020. This means that control of the region will become even more important in the future than it has been in the past. The significance of Iraq under these conditions has been remarked on many times. It has the world's second largest oil reserves, 115 billion barrels, and a figure that may rise to as much as 220-250 billion barrels when potential reserves are fully explored"[204].

Notwithstanding the terrorist threat or war for oil assertions behind the energy security debate now days, there are real apprehensions from this perspective for the consuming countries, especially like India. As per press reports,

> "India's most significant oil field at the Bombay High is under threat from terrorist attacks. The Navy reckons the Bombay High oil rigs could be targets of "9/11-type attacks" or its sea-borne variants. Bombay High produces about 11 million tonnes of the 30 million tonnes domestic oil production that's absolutely vital for the Indian economy. 'Well-established terrorist groups have enough maritime resources to cause damage and disruption to the off-shore infrastructure"[205].

Brief History

Concern about the security of petroleum supplies has been a key element of strategic planning since the First World War. The United Kingdom was the first major power to suffer from vulnerabilities of oil supply disruption during wartime. This has been well summarized as:

> "First Lord of the Admiralty Winston Churchill's decision just before the World War I to shift from coal to oil to fuel the Royal Navy's warships was based on sound military logic, but it forced Britain to acquire bases and sources of oil capable of supporting an oil-filled fleet. Unlike the US, the UK did not possess a domestic supply. At the outbreak of war, Britain set out to control new oil resources in Iraq. The UK's failure to amass sufficient domestic oil reserves did not greatly affect the conduct of military operations until February 1917, when Germany resumed its campaign of unrestricted submarine warfare. The effectiveness of the U-boats nearly immobilized the Royal Navy for lack of oil, leaving an indelible impression on British military planners"[206].

Moreover, access to oil reserves also played an important role in Axis and Allied strategy during the Second World War. The Axis powers (Germany, Italy and Japan) were desperately short of fuel supplies, and both Germany and Japan were greatly influenced by the need to secure petroleum resources. The Nazi-Soviet Pact of 1939 contained several secret clauses concerning oil and the Middle East that in fact influenced early war strategies[207].

[204] Beams, Nick, "Oil and the Coming war against Iraq", on the site, http://www.wsws.org/articles/2003/.
[205] The Statesman, February, 28.02.2004.
[206] Kemp, Geoffrey, Op. cit, p. 133.
[207] Ibid.

During the 1950s, the control of oil and of its distribution woke up the concerns about energy security in the precipitation of two crises such as: first, the Iranian nationalization of the jointly owned Anglo-Iranian Oil Company in 1951; and second, the nationalization of the Suez canal by Egypt in 1956, in retaliation for the decision by the US, supported by Britain, to cancel a World Bank loan to Egypt to build a dam on the river Nile. The UK and France went to war with Egypt in part to ensure control over oil supplies from the Gulf to Europe via the Canal.

Following the 1973 Arab-Israeli war and subsequent Arab oil embargo, the issue of energy security again assumed strategic dimensions for three reasons. First, the emergence of OPEC as a powerful counterweight to the industrialized countries campaign of a fundamental redistribution of international power, with the oil-exporting countries becoming, in effect, the world's bankers. Second, the crisis coincided with the growth of the Soviet Union's military power projection capabilities and apprehensions that Moscow and its supporters would resort to oil supply cuts from the Middle East and Africa in future crisis. In fact, this prompted the Western military strategies to protect oil supplies, especially from the Persian Gulf and to defend sea lines of communication across the world's oceans. A third factor was the rise of environmental movement and the emergence of an influential doomsday literature that predicted 'limits to growth[208]' and advocated abandoning the ethos of capitalist expansion reflected in the success of the OECD. However the gloomy situations as predicted by the doomsday advocates did not happen and the Western countries concentrated on development of energy sources outside the Gulf through economic incentives, establishing strategic petroleum stockpiles and production sharing agreements and investing on new technologies to improve efficiency and adaptation.

The West's resilience in the face of energy disruption was tested again in the mid-1980s when, during the Iran-Iraq conflict, Baghdad embarked on a 'tanker war' to curtail Iran's oil exports. Teheran responded by attacking Arab tankers. However the oil market was saturated due to slackening demand from the industrialized West, economic recession and abundant new sources of supply. A more serious threat to global order emerged in August 1990, when Iraq suddenly

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[208] Thirty years ago, a group of academic theorists called the Club of Rome put forth the "limits to growth" theory, predicting disaster for humankind unless we abandoned natural resource-depleting economic and technological progress, for details see, Gerlagh, Reyer, and Michiel A. Leyzer, "Limits to Growth Theory", on the site, http://130.37.129.100/english/o_o/instituten/IVM/org.

invaded Kuwait and moved his forces to the Saudi border which had ripples flown across the world economy due to triggered high prices of oil.

In the mid-1990s, new forecasts were made of another energy crisis around the end of the century, driven in part by the booming Asian economies and the growing energy needs of large populated and modernizing economies such as China and India[209]. While the fundamental problem of meeting Asia's energy demands still remains a challenge, in the late 1997 another energy-security problem emerged, this time precipitated by Asia's financial crisis. The crisis coincided with a warm winter, resulting in a sharp drop in demand for petroleum and a significant fall in its benchmark price. It soon became clear that the decline in oil prices was itself a factor undermining the economic stability of key oil exporting countries, especially the GCC countries. Another significant effect of the downturn in oil prices has been the slow capital investment in new oil development, including in the promising areas of the Caspian basin.

Thus it can be argued that, energy security in today's world is the concern of both oil/gas producers/suppliers and the oil/gas consumers/importers. Both are sensitive and vulnerable in the wake of any possible either supply or demand disruptions.

The late 2002 and the early part of 2003 witnessed another round of discussion regarding energy security in the event of possible American war against terror in Iraq to get rid of the regime in Iraq off weapons of mass destruction. Though there was no concrete focus regarding the outcome of this campaign, yet everywhere, at least in the oil consuming and importing countries, like India, there was heated discussion going on. However the aftermath of the campaign witnessed no such apprehensions regarding energy security as the oil exporting countries of the OPEC assured the world that there were sufficient oil in the market and oil can never be used as a political weapon. It can be argued that these assurances by the oil exporting countries are in fact the recognition of the pernicious long term effect of previous oil crises on their domestic economic conditions as demand for OPEC oil declined, adversely affecting their fiscal position.

In today's world, concerns about energy security focus less on the possibility of a global confrontation between major powers, and more upon the possibility of oil prices[210]. Oil is a fungible commodity, universal commodity that commands a

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[209] "Power to the People: A Survey of Energy", *The Economist*, 18 June 1994, p.14.

[210] Kemp, Geoffrey, op. Cit., p. 136.

worldwide benchmark price. If supplies from one region, such as the Gulf, are disrupted, prices will rise in the short-term until the market adjusts itself. From an economic view point it does not matter that North America and Western Europe import only 20% and 29% respectively from the Gulf, whereas Asia imports 74%[211]. All three regions will be equally affected if oil supplies from the Gulf or from any other region are disrupted, or their transportation endangered. Fluctuations in oil prices can have serious consequences for consumers and producers. For the industrial countries, in the short-term, a rapid price increase is a concern because, in the short-term, the demand for petroleum products in industrial countries is relatively inelastic: for a given increase in price, there will not be a proportional decrease in demand because it is difficult to find substitutes for petroleum products. The high oil prices affect everybody, since the cost of energy is closely linked to the general price level. In the long-term, significant rises in oil prices will invariably lead to lower demand and fall in prices. The industrial countries have efficient mechanisms for adjusting over time to high oil prices through conservation, innovation and taxation. Furthermore, the oil-sharing program set up by the International Energy Agency in 1974 are still effective and the US and others still maintain a strategic petroleum reserve which they could draw upon to lower the market price of oil. But, for many countries such as the developing countries, steep rise in oil prices can be disastrous. The short-term spike in oil prices in 1990-91 pushed India to the brink of bankruptcy and forced massive reforms* in the country. Many emerging economies are today in similar position; the impact of sudden oil-price spikes on the economies of emerging economies is therefore have serious repercussions.

Similarly, a significant fall in oil prices generates immediate economic benefits for importing countries, but poses serious problems for the oil producing and exporting countries. The low oil prices in 1997-98 bears testimony to the vulnerable position of the oil/gas exporting GCC countries, as oil revenues constitute the major proportion of these governments' revenue and international prices are linked to their budget preparation. In addition, demand disruptions due to economic crisis in the importing countries also affect directly the exporting countries. This has been witnessed during the Asian financial crisis, dampening the oil/gas imports of the countries in Asia and thereby affecting the

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[211] Energy Information Administration (IEA), *International Energy outlook*, (Washington D C, US Department of Energy, 2000), p. 36.

oil/gas exporters, as Asia has become the major oil/gas-consuming region in the world. The only reprieve of low oil prices for the exporting countries is that it induces consumption and thereby the market share of major producers such as the GCC countries increases and moreover, the investments in the search for new oil in high-cost regions get delayed. But the direct effect of low oil prices directly affect the revenues and therefore budgets, of the GCC countries, causing serious political problems. Falling oil revenues also restrict the options of new investments in the oil and gas sector in the GCC countries. As a consequence, pressure is growing on the GCC member countries to modify their restrictive and nationalist oil policies, which can be vindicated from the recent policies of allowing foreign investments in oil/gas sectors in some of the countries.

Thus, ironically, both producers and consumers are becoming more financially interdependent just when economic hardships of the major oil/gas producing countries, especially in the GCC countries may cause domestic instability, which can affect energy security concerns.

Supply and Demand Disruptions

As mentioned earlier, supply disruptions can be defined as the physical scarcity of supplies to meet demand at a given price. And demand disruptions refer to the lack of demand to adjust to the available supply. These terms thus refer to the quantity component of energy security.

Oil supply disruptions have occurred rather frequently (see table 4.1): over the past half-century, there have been at least 14 significant disruptions involving a loss of 0.5 mb/d or more crude oil. Most of these disruptions were related to either military or political upheavals, especially in the Middle East. Since 1973, four major crises-the 1973 Arab-Israeli war, the 1978-79 Iranian Revolution, the 1980 Iran-Iraq war and the 1990-91 Gulf war- resulted in initial shortfall of between 3.0 and 3.5 mb/d. It is to be noted that, virtually all past disruptions have been short, typically no more than six to nine months. Moreover, the politically motivated supply disruption can be broadly grouped into two categories such as: first, random shocks, caused by internal unrest in OPEC countries such as the Iranian Revolution in 1978/79, the Nigerian civil war of 1967-70 or wars involving OPEC states like the Iraq-Iran war and the Gulf war of 1990-91; and second, strategic shocks involving willful exercise of market power by the oil cartel such as by the Middle East oil producers (Arab oil Embargoes) in 1957, 1967 and 1973-74.

Table 4.1: World Oil Supply Disruptions

Dates	Supply Disruption	Magnitude of supply Disruption (mb/d)	World Oil Consumption (mb/d)	Percent of Consumption
Mar. 1951-Oct.1954	Iranian Fields Nationalized	0.7	13.2	5.3
Nov.1956-Mar. 957	Suez War	2.0	17.5	11.4
Dec.1966-Mar.1967	Syrian Transit Fee Dispute	0.7	34.3	2.0
Jun.1967-Aug.1967	Six Day War	2.0	40.0	5.0
Jul.1967-Oct.1968	Nigerian Civil War	0.5	40.1	0.3
May 1970-Jan.1971	Libyan Price Controversy	1.3	48.0	2.7
Apr.1971-Aug.1971	Algerian-French Nationalization Struggle	0.6	50.2	1.2
Mar.1973-May1973	Lebanese Political Conflict	0.5	58.2	0.9
Oct.1973-Mar.1974	October Arab-Israeli War	4.3	58.2	7.4
May 1977	Damage at Saudi Oilfield	0.7	62.1	1.1
Nov.1978-Apr.1979	Iranian Revolution	5.6	65.1	8.6
Oct.1980-Jan.1981	Outbreak of Iran-Iraq war	4.1	60.4	6.8
Mar.1989-Apr.1989	Exxon Valdez Accident	<0.5	51.6	<1.0
Apr.1989-Jun.1989	UK Cormorant Platform	0.5	51.6	1.0
Aug.1990-Jan.1991	Iraqi Invasion of Kuwait	4.3	66.3	6.5

Note: Initial Production loss only, in some cases, this was quickly made up by production increases elsewhere.
Source: IEA/OECD, *Towards a Sustainable Energy Future*, (Paris, IEA/OECD, 2001), Chap. 4, Table-7, p. 79.

Demand disruptions actually occurred in the global oil regime during the period of nationalization of Iranian attempts, when the industrialized countries put embargo on Iranian oil supplies from being marketed. And recently the embargo on oil by the US on Iraq, Libya and Iran can also be considered demand disruptions, as the oil supplies of these countries are not in the market. These disruptions can be attributed to the asymmetry of interdependence whereby the balance of power is in favor of powerful consuming nations due to the structural intricacies (that means the consumers can do away with the supplies from these countries as supplies are substantial in relation to demand) of the global oil regime. Moreover, the market forces domination in the present regime saw demand disruption due to domestic economic crisis in the consuming countries such as in Asia in 1998, affecting the world demand and thereby the oil revenue dependent Gulf countries.

The Energy Security Debate

The scarcity of energy sources such as oil in the global energy scenario sparked off the debate about energy security. Consistent with economic doctrine, a group of energy experts argue that a commodity in scarce supply becomes more expensive. This encourages conservation and discovery of new sources of energy and new supply sources and technological breakthroughs making energy efficiency production process. These factors make it highly unlikely that the world can run out of a key resource like petroleum. While others argue that in the short-term, unexpected supply disruption and price instability can be extremely damaging and have negative effects on inflation, growth rate, productivity, and balance of payment position of the importing economies. Therefore suitable policies should be devised and strategically adopted to counteract the energy crisis.

However, questions arose as to the possibilities that the world would someday run out of petroleum and therefore everybody should be cautious. In order to vindicate such type of queries, it is necessary to delve into the economics of natural resources and the controversies that the literature in this field has engendered[212]. Economists in the Malthusian mould always forecast ultimate doom because of resource scarcity in relation to the world population growth and thereby assert prime importance to energy security. But by any standard, until the mid-1900s, resources were plentiful in the US and other industrialized countries. Concern for energy security to sustain economic growth therefore made little sense. Even with a growing population, economists believed that technological advances would assure adequate supplies of energy. As time progressed, low-grade resources simply would take place of the high-grade resources. Technological changes and advances that would ease the transition would accompany the replacement of one type of resources by another. Such cycles in resource use were common, which could be seen in the historical

[212] Marcus, A. A., *Controversial Issues in Energy Policy*, (New York: Sage publications Inc., Vol. 2, 1992), p. 25.

experience of minerals such as iron ore[213]. But the oil embargo of 1973 rekindled the controversy about whether the process would actually work as economists have predicted before. The dominant view was that any supply problem, should it exist, was distant. Vast potential new supplies of high-grade oil and natural gas were still available. Yet, the worldwide energy crisis of 1973 woke up the concerns of supply disruptions owing to short-term price fluctuations. After the multinational oil corporations (e.g., Exxon, Mobil, Shell, etc.) lost ownership of crude oil production to the oil producing states, the producing states controlled production levels and prices. They restricted the role of the multinationals to transportation and downstream refining. These actions brought on worldwide energy crises: the near quadrupling oil prices that followed the Arab-Israel war (from $3.50/barrel in 1973 to $13.50/barrel in 1974) and near tripling of oil prices that followed the Iran-Iraq war (from $13.50/barrel in 1979 to $34.50/barrel in 1980)[214]. These abrupt price shocks created havoc in the world economy and the energy security debate gathered momentum.

The development of energy security issues in the international oil and gas market can be analyzed in two three ways: first, from the aspect of the implications of the structural changes of the global oil and gas regime to the oil-gas supply issues and secondly, from the aspect from the recent phases of the regime. These issues can be summarized as in the following Box.

Box4.1: Development of Oil/Gas Supply and Demand Security issues in the Global Oil and Gas Regime

Structural Changes of the Global Oil Regime and its Implication to the oil supply and demand issues

♠Sluggish oil demand in the Industrialized countries and in the main oil-consuming OECD countries, Promotion of alternative energy development and massive energy conservation.

♠Rise of non-OPEC production, Shifting investments from OPEC in general and GCC countries in particular, Technological innovations and increasing production in high-cost areas.

♠Development of futures/spot trading markets, shift of oil pricing mechanism to market-related type.

♠Oil-producing countries' recognition of interdependence with oil consuming and importing countries (the learning effect from the era of the high oil prices up to the early 1980s).

♠Establishment of emergency preparedness in the industrialized west (formation of IEA in 1974 and stockpiling build-ups).

♠Stagnated oil prices and prevailing outlook for low oil prices in the 1990s and consequent lower revenues for the oil exporting countries, market search by the oil producing countries for increasing revenues.

♠The Asian Currency Crisis and lower oil demand affecting the major oil producing countries in the GCC and investments in the new areas and in the GCC capacity expansion attempts.

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[213] For details regarding the energy transition, see Smith, V. K., *Scarcity and Growth Reconsidered*, (Baltimore, MD: John Hopkins University Press, 1981).

[214] The detail causes and consequences and events, which led to the above crises, have been illustrated in chapter-1 of this study.

Recent Issues on oil Supply Security

♠Proposed US military operations in Iraq and its impact on world supplies in the current phase of high oil prices than the mid-1990s.
♠Shrinking world surplus crude production capacity and its concentration in few politically unstable Gulf countries.
♠Regional (Asia) Energy Shortages have become acute. Signs of rising dependence on the Gulf where 65% of reserves of oil and 16% of gas reserves lie.
♠Domestic instability in major oil producing countries (economic difficulties in the Gulf countries and problems in the non-OPEC region such as Caspian basin oil being marketed).
♠ Liberalization and Privatization in the energy sectors in the developed and developing countries. Private oil companies' policy to keep their stocks at minimum level, its effects on the deregulated energy markets such as in India.
♠Steady rises expected for oil and gas demand in the long-run future, particularly in India and its impact on the various sectors of Indian economy.
♠The outlook of India's heavy dependence on the Gulf for energy supplies and the risks.
♠Possible economic breakdown in India affecting its oil/gas imports and its impact on the GCC oil/gas exporting countries.

As a result of surging non-OPEC output since the late 1970s and slowdown in world oil demand spurred by the energy conservation and alternative energy development policies of the industrialized countries (which account for more than 50 percent of world oil demand), the OPEC's share in the global oil production capacity dropped significantly from 53% in 1973 to less than 30% in 1985. Though OPEC's share recovered after the late1980s due to the combined effects of robust oil demand in developing countries and slow-down in non-OPEC production due to lower oil prices; yet it remained at around 40% in the 1990s. Moreover with the emergence of new high-cost oil producers in the market, the degree of concentration of crude oil supply market dropped. The concentration of crude oil supply market, measured by the 'Herfindahl Index'[215], indicates that, from a peak of 1,158 recorded in 1981, the degree of concentration of crude oil supply market dropped to a low of 628 in 1999. This signifies the loose of grip of the global oil regime from the OPEC.

With the changes in oil supply and demand and market structure as discussed in chapter I and II, as the background, oil pricing mechanism in the global oil market has transformed into market related type over the years. Particularly, both future oil prices and spot market prices, having significantly developed since the 1980s, came to serve as the indicator of global oil price, thereby evolving transparency in global oil pricing mechanism[216]. One analyst has aptly summarized the implication of the market domination on the OPEC[217]:

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[215] Herfindahl Index is the sum of the squared market share of each supplier.

[216] For details see, Horsenell, Paul, and Robert Mabro, *Oil Markets and Prices: The Brent Market and the Formation of World Oil Prices*, (Oxford, oxford University Press, 1993), Chapter-II.

[217] "OPEC: Cartel facing the Fact that some Producers are beyond its Reach", International Herald Tribune, April 9, 1988, as cited in Nye Jr., Joseph S., *Understanding International Conflicts: An Introduction to Theory and History*, (New York: Longman, 3rd Edition, , 1999), Chapter-7, p.192.

> "The major development that has curbed OPEC's role as the arbiter of prices is the advent of news and telecommunication systems-the thousands of instant market-monitoring, computerized devices that tell bankers, oil traders and commodity market speculators what the price of oil at any moment. They also relay news that affects those prices. That development has encouraged wild growth in the trading of oil futures, placing hundreds of new investors in the oil markets whose role is limited to trading 'paper barrels' for the sake of bettering on oil's price. Such trading on the New York Mercantile Exchange alone reached 40 million barrels a day in 1987. By comparison, world oil consumption that year was 49 mb/d. This means the speculators' ability to influence oil prices approaches the power of OPEC and non-OPEC producers combined. .... OPEC, however, is a consistent, and sore, loser in this game. When prices drift too low, it is obliged to promise meetings or curbs on output that prop up its image as the protector of oil prices, a role it can no longer veritably perform. The organization has not helped itself by its constant failure to meet the goals of the ceilings on production that it sets. OPEC members consistently either produce above their quotas or discount their oil to stimulate their sales, or both".

As discussed in the previous chapters, many OPEC nations, especially those in the Gulf (the GCC countries) are facing difficult social, economic and political challenges, because they are overwhelmingly dependent on oil revenues.

This situation of the GCC countries further worsened in the beginning of the year 1997, which marked the 'reversal oil price shocks', affecting the oil export revenues, balance of payments, budgets and overall economic conditions of these countries. Low oil prices since late 1997 till late 1999 have been caused by several main factors, including OPEC's December 1, 1997, agreement to raise the organization's production quota by 10%, a warmer than normal winter in the Northern Hemisphere, increasing Iraqi oil exports, and reduced demand stemming from the severe economic crisis in East Asia.

Collapsing oil prices till late 1998 actually thrown GCC countries' budgets into chaos, as they scramble to cut expenditure, raise revenue and minimize budgetary deficits. These situations in the GCC countries have been discussed in chapter III. Thus, the GCC countries and other OPEC members, having enjoyed high oil prices up to the early 1980s, came to realize the effects of their 'process of self destruction', which resulted in penetration of high cost non-OPEC producers in the world oil-gas regime, stagnation in world oil demand and decline in demand for OPEC oil. The declining demand for OPEC oil coupled with duping international oil prices since the oil price slump in 1986, made GCC countries' oil revenue stringent and consequently damaged their economic stability. The situation of the Gulf countries has been well summarized by one analyst as,

> "Things have changed in the kingdom (Saudi Arabia), and in the Gulf as a whole. The welfare states built in the 1970s, with seemingly limitless resources for very small populations, are now strained by high population growth rates and flat oil prices. Indigenous middle classes created by state education and employment policies except remunerative employment and increasingly seek an outlet for their hope of political participation"[218].

The oil exporting GCC countries are therefore in the threshold of a major threat, not only due to their substantial loss of market share, but also due to their further inability to meet their overall revenue needs. This situation thus precipitated a policy dilemma before the GCC governments: while a continuation of recent trends in market share could be disastrous in the long run, any attempt to recapture the lost market share through 'controlled-production management mechanism', carries with it enormous short-term financial risks. Because of this 'learning effect', oil producers in the OPEC, especially the GCC countries therefore, began respecting interdependent relations with consuming nations, as well as they became keen to secure stable outlet for their energy exports in the emerging markets.

Recognizing the first oil crisis as the turning point, industrialized countries have advanced such establishments of emergency preparedness for oil supply disruption as oil stockpiles and this is why it can be argued that IEA was formed in 1974 as an international framework to tackle with oil supply disruptions. In a sense, the IEA could play an important role to stabilize the world oil/gas market. In fact it helped to calm down the international oil market through its coordinated actions during the Gulf Crisis in 1990-91. In fact, the IEA has used the strategic reserves very effectively recently in the 2001 to control oil price spikes[219].

Thus, until 1980s, oil was often regarded as a strategic commodity, used as a weapon to manipulate productions, costs and prices owing to the whims or political intentions of oil producing states' or the OPEC's cartel behaviour, but with the changes described above; oil has become 'market leading commodity', of which supply-demand and prices are dictated by free forces of market mechanism. Since the early 1970s when energy security was debated seriously, considerable changes in oil and gas markets have altered the picture. Suppliers have increased, as have proven reserves and stocks, and prices have become flexible and transparent, dictated by market forces rather than by cartel

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[218] Gause, Gregory F., "The Gulf Conundrum: Economic Change, Population Growth, and Political Stability in the GCC States", *The Washington Quarterly*, 20:1, pp. 145-65, p. 146.

[219] The US released 30 million barrels from its strategic reserves to bring down prices, which were hovering over more than $35/barrel. This controlled prices temporarily.

arrangements. Moreover global as well as regional conflicts are lessening and trade is flourishing and becoming freer. It is to be noted that suppliers have not imposed any oil/gas sanctions since the early 1980s, nor have there been any real shortages anywhere in the world. In stead, the major consuming country (US) has imposed trade sanctions on some of the producing countries such as Iran, Iraq and Libya. Though, this has not resulted in supply disruption, yet it has created demand disruptions in the world market, not only affecting the producing countries in question, but also, in a way the world market, because had there not been any sanctions, then the supplies from these countries would have resulted in more world supplies and consequent low prices-some relief from the energy security point of view for the high energy consuming and importing countries like, India. In other words, all this points to the present abundance of oil/gas supplies.

Moreover, in today's market environment energy security is a shared issue for consumers/importers as well as producers/exporters. As much as importing countries are anxious to ensure security by having sustainable sources, exporting countries are anxious to export to ensure sustainable income[220]. History reveals that oil supply disruptions have negative effects on oil exporting countries. As consumers in importing economies shift away from oil, the lower demand causes severe economic damage to the exporters. In addition, many oil exporting countries, especially Gulf countries have recently obtained stakes in downstream operations in importing countries. This can be vindicated from the involvement of some Gulf countries in OECD countries, thereby contributing to the energy security of the OECD countries, as supply disruption could mean a loss of opportunities for both oil exporters and importers[221]. In this sense, concern about oil supply security due to oil producers' political intention and price manipulation by producers has been viewed as less relevant. Thus, in those circumstances, the issue of oil supply security, which used to be given priority by the market participants, has become somehow less relevant now days. In addition, the oil exporting countries of the GCC have become intensely vulnerable in the process of transition of the global regime over the years.

Yet, the recent developments in the global oil and gas regime have shown emerging moves noteworthy for considering the issue of oil supply security, as

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[220] Mitchell, J. V., *Will Western Europe Face an Energy Shortage?*, (Strasbourg:Energy Council of Europe, 1997).

[221] United Nations, *World Energy Assessment and the Challenge of Sustainability*, (UN, 2001), Chapter- 4, p. 118.

summarized in the box above. Moreover, analysts have challenged the contention that market forces domination of the regime really dampens the possibility of future supply disruption, as market forces will automatically match demand with supply. The critics argue that despite market forces and the structural changes in the regime, geopolitics is and still have important bearing on the energy security phenomena[222].

Security of crude oil supply

Over the past two decades many changes in the oil market have improved the overall security of the global energy market. The world economy has become less dependent on oil, as most consuming regions have diversified their energy sources. Oil constituted almost 46 percent of world commercial energy sources in 1973, compared with 40 percent now (year 2002). There has also diversification of supply. In the early 1970s the OPEC accounted for more than half of the world's oil; today it provides only 42 percent. The world now has 80 oil-producing countries. The oil markets have now become more like traditional commodity market, with futures markets, transparent and able to respond quickly to changing circumstances. Big strides have been made in energy efficiency, gradually reducing the dependence of economic growth on increased oil consumption (particularly in developed countries). Advances in technology have led to discoveries, and significant improved the recovery rate, increasing oil resource base to an estimated 2, 3000 trillion barrels. World trade has flourished in recent years. In 1998, it was three times that in 1980 and now (2002) accounts for 44 percent of global GDP, compared with 39 percent in 1980[223]. Both energy exporters and importers benefit from trade. Most exporters, especially the GCC countries are low-income countries that badly need oil income for development.

Even with the increase in the number of oil producing countries, the fact remains that almost two-thirds of the world's oil reserves are in the Middle East, mostly in the Gulf[224] region. Although these countries now (2002) account for only 36 percent of global crude oil supplies, they are expected to double their share to 52 percent in 2010[225]. The Gulf countries have not been historically

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222 See for details, Mitchell, John, and others, *The New Geopolitics of Energy*, (London, Royal Institute of International Affairs, 1996) and also see, United Nations (UN), *World Energy Assessment and the Challenge of Sustainability*, (UN, 2001).

223 These figures are adapted from International Monetary Fund (IMF), "Direction of Trade statistics", IMF, 2002.

224 The Gulf region here includes the Islamic Republic of Iran, Iraq, Saudi Arabia, Kuwait, Qatar, and UAE.

225 United Nations, *World Energy Assessment and the Challenge of Sustainability*, UN, 2001), Chapter- 4, p. 120.

known for political stability and security. There is also likelihood of the world depending more on oil from the Middle East, especially from the Gulf region. Moreover, the global surplus crude oil production capacity, which helped to stabilize the market at the time of oil supply disruption in the past, has sharply dropped from 10.10 mb/d in 1996 (excluding Iraq) to nearly3.00 mb/d in 1997 and to 6.7 mb/d in 1999. Most OPEC countries, especially those in the Gulf have spare productive capacity due to the current oil market conditions precipitated by weak demand and high incremental non-OPEC oil production. Among the Gulf producers, Saudi Arabia due to its large reserves maintains the largest spare production capacity, estimated at between 2-2.5 mb/d and the total OPEC spare capacity is around 5.3 mb/d. This is expected to go even further over the foreseeable future[226]. To add to the matter worse, the current surplus capacity concentrates only in a few GCC countries, i.e., Saudi Arabia, Kuwait and UAE. Table 4.2 shows world's greatest oil and gas reserves. Table 4.3 shows the break up of idle capacities of OPEC countries in the first half of the year 2001. Figure 4.1 shows the oil reserves, excess production capacity, and natural gas reserves of the GCC countries as percentage of the World total for the year 2002.

Table 4.2: Greatest Oil and natural Gas Reserves by Country, 2002

	Oil		Natural Gas	
2002 Rank	Country	2002 proved reserves (billion barrels)	Country	2002 proved reserves (trillion cu ft)
1.	Saudi Arabia	261.7	Russia	1,700.0
2.	Iraq	115.0	Iran	939.4
3.	Iran	99.1	Qatar	757.7
4.	Kuwait	98.9	Saudi Arabia	228.2
5.	United Arab Emirates	62.8	United Arab Emirates	204.1
6.	Russia	53.9	United States	183.5
7.	Venezuela	50.2	Algeria	175.0
8.	Libya	30.0	Nigeria	159.0
9.	Nigeria	30.0	Venezuela	149.2
10.	China	29.5	Iraq	112.6

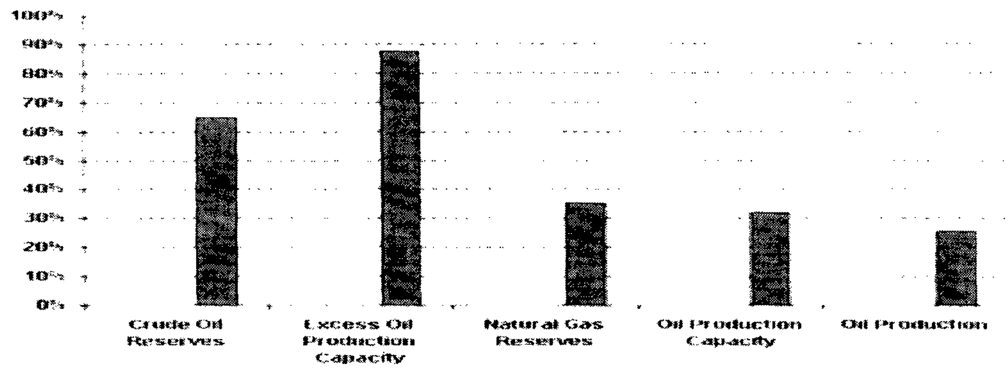
NOTES: Figures for Russia are "explored reserves," which are understood to be proved plus some probable. All other figures are proved reserves recoverable with present technology and prices.

Source: U.S. Energy Information Administration, *International Energy Annual 2001* (March 2003).

[226] MEES, 17 September 2001.

Figure 4.1

Persian Gulf as a Percent of World (2002)



Source: http://eia.doe.gov.

Table 4.3: Idle Capacities of OPEC Countries in the first half of 2001 (mb/d)

Member Countries	Idle Capacity	Average Production
Algeria	0.07	0.83
Indonesia	0.01	1.24
Iran	0.08	3.82
Iraq	0.66	2.14
Kuwait	0.31	2.09
Libya	0.10	1.40
Nigeria	0.08	2.12
Qatar	0.04	0.70
Saudi Arabia	2.32	8.18
UAE	0.30	2.18
Venezuela	0.13	2.91
OPEC	4.13	27.60

Source: Prepared from various issues (18 June, 16 July, and 30 July 2001) of MEES.

In the current low oil demand, high oil price scenario, demand for OPEC and Gulf oil is rising at a snail's pace. However, even in this low growth world and with steadily increasing non-OPEC production, the call on OPEC through the end of the 2003 is estimated around 25.5mb/d[227]. About 17mb/d and including another 19mb/d from North Africa representing 67% of current OPEC production or 22% of global oil production come from the Middle East[228]. There is no way the world could adjust to a scenario without the Middle East oil for any length of time short of facing a calamity. Moreover, many global oil supply assessments conclude that incremental non-OPEC production will slow, if not decline, later in this decade even at currently prevailing prices. All scenarios

227 Petroleum Economics Ltd., London, *MEES*, 45:37, September 2002, p. D3.

228 Ibid.

point at sharply rising demand for Gulf oil in next decade (2010-20). As per the projections of both the IEA and EIA, significant growth in demand for Gulf oil is expected even in this decade. Though their timing and extent of dependence on Middle East oil differs, all analysts agree that the importance of the region to meet future global oil demand will steadily rise. The EIA's International Outlook of 2002 estimates global demand on the Gulf in 2010 as high as 28mb/d in its reference scenario, with the share of Saudi Arabia estimated in excess of 12mb/d. In either case, Saudi Arabia remains the number one world oil exporter (see table 4.4).

Table 4.4: World Oil Production by Region and Country, Reference Case, 1990-2025 (Mb/d)

Region/Country	History (Estimates)			Projections			
	1990	2001	2005	2010	2015	2020	2025
		OPEC					
Persian Gulf	16.2	20.6	21.7	24.8	29.2	34.6	40.5
Other OPEC	8.3	9.8	9.9	11.3	12.2	13.6	15.1
Total OPEC	24.5	30.4	31.6	36.1	41.4	48.2	55.6
		Non-OPEC					
Industrialized							
United States	9.7	9.0	9.0	9.2	9.0	9.4	9.4
Canada	2.0	2.8	3.1	3.4	3.6	3.8	4.1
Mexico	3.0	3.6	3.8	4.2	4.5	4.6	4.8
Western Europe	4.6	6.9	6.6	6.5	6.0	5.6	5.1
Other	0.8	0.9	0.9	1.0	1.0	0.9	0.9
Total Industrialized	20.1	23.2	23.4	24.3	24.1	24.3	24.3
Eurasia							
China	2.8	3.3	3.5	3.6	3.5	3.5	3.4
Former Soviet Union	11.4	8.8	9.7	11.6	13.3	14.4	15.9
Eastern Europe	0.3	0.2	0.3	0.3	0.3	0.4	0.4
Total Eurasia	14.5	12.3	13.5	15.5	17.1	18.3	19.7
		Other Non-OPEC					
Central and South America	2.4	3.8	4.3	4.7	5.7	6.2	6.7
Pacific Rim	1.7	2.5	2.5	2.6	2.8	2.7	2.6
Other	3.5	4.8	5.4	6.1	7.3	8.1	9.4
Total Other Non-OPEC	7.6	11.1	12.2	13.4	15.8	17.0	18.7
Total Non-OPEC	42.2	46.6	49.1	53.2	57.0	59.6	62.7
Total World	66.7	77.0	80.7	89.3	98.4	107.8	118.3
Persian Gulf Production as a Percentage of World Consumption	24.6	26.7	26.8	27.7	29.6	32.0	34.1

Note: Production includes crude oil (including lease condensates), natural gas liquids, other hydrogen hydrocarbons for refinery feedstock, refinery gains, alcohol, and liquids produced from coal and other sources. Totals may not equal sum of components due to independent rounding.
Sources: **History:** Energy Information Administration (EIA), Energy Markets and Contingency Information Division. **Projections:** EIA, System for the Analysis of Global Energy Markets (2003); and U.S. Department of the Interior, U.S. Geological Survey, *World Petroleum Assessment 2000* (Reston, VA, July 2000.

Table 4.5 shows Saudi Arabia's oil production, OPEC oil production and Saudi share in OPEC production from 1980 to 2001.

Table 4.5: Saudi Oil Production and its share of Total of OPEC ['000b/d, 1980-2002].

Year	Saudi Production	OPEC Production	Saudi % of OPEC
1980	9,990	27,445	36.40
1981	9,985	23,380	42.70
1982	6,695	19,930	33.59
1983	5,225	18,425	28.35
1984	4,760	18,470	25.77
1985	3,565	17,215	20.70
1986	5,150	19,555	26.33
1987	4,600	19,345	23.77
1988	5,720	21,605	26.47
1989	5,635	23,215	24.27
1990	7,105	25,135	28.26
1991	8,820	24,692	35.72
1992	9,098	26,074	34.89
1993	8,962	26,875	33.34
1994	8,873	27,204	32.61
1995	8,890	27,466	32.36
1996	9,036	28,252	31.98
1997	9,213	29,553	31.17
1998	9,219	30,821	29.91
1999	8,549	29,368	29.10
2000	9,115	30,901	29.49
2001	8,768	30,181	29.05
2002	8,680	28,240	30.73

Source: Prepared from BP Statistical Review of World energy, Various Issues.

Moreover, as the single largest reserve holder, Saudi Arabia has a unique oil policy that is designed to maximize the benefit of holding so much of the world's oil supply. Saudi Arabia's goal is to assure that oil's role in international economy is maintained as long as possible. It has been argued that Saudi policy has always denounced efforts by industrialized countries to wean themselves from oil dependence, whether through tax policy or regulation[229]. In fact, Saudi strategy focuses on three different political arenas, reflecting the oil strategy. The first involves ties between the kingdom and other OPEC countries. The second concerns the kingdom's relationship with other non-OPEC producers such as, Mexico, Norway, and Russia. Finally there is Saudi Arabia's links with the major oil importing regions-most importantly North America, but also Europe and Asia. Given the size of the Saudi oil sector, the kingdom has a unique and critical role in setting world oil prices. Since its over-ridding objectives are maximizing

[229] Morse, Edward L., and James Richard, "The Battle for Energy Dominance", *Foreign Affairs*, Mar./Apr., 2002, p. 16-31.

revenues generated from oil exports and extending the life of its petroleum reserves, Riyadh aims to keep prices as high as long as possible. But the price can not be so high that it stifles demand or encourages other competitive sources of supply. Nor can it be so low that the kingdom can not achieve minimum revenue targets. The critical balancing act of Saudi policy therefore is to maintain the price within a reasonable band. Stopping oil prices from falling below the minimum level requires cooperation from other OPEC and occasionally from non-OPEC countries. Preventing prices from rising too high requires keeping enough spare production capacity to use in an emergency situation. The kingdom can afford to maintain this spare capacity because of the abundance of oil reserves and the comparatively low cost of developing and maintaining reserves. In today's soft market, in which Saudi Arabia produces around 7.4mb/d, the kingdom has close to 3mb/d of spare capacity. Its spare capacity is usually ample enough to entirely displace the production of another large oil-exporting country if supply is disrupted or a producer tries to reduce output to increase prices. This spare capacity is greater than the total oil exports of all other oil-exporting countries-except Russia. In addition, even in the low demand, high non-OPEC production growth scenario, the Middle East still accounts for 65-70% of OPEC production and more than 20% of global oil production. Saudi Arabia would account for 25-30% of OPEC production and 8-11% of global production. Under any scenario (even the most conservative demand outlook), Saudi Arabia would need to produce between 7mb/d and 9mb/d to meet global oil demand, even taking into account prospects for a slighter adjustment of OPEC quotas. Saudi Arabia would remain the single largest oil exporter in the world and the only country with sufficient spare capacity to continue to play its role as one of the pillars of global oil supply security. No other producer will be able to challenge the position of Saudi Arabia as the largest oil exporter and prime provider of oil supply security in this decade[230]. This spare capacity has helped the kingdom to maintain cordial relations with major oil consuming/importing countries such as the US in the past. Therefore Saudi Arabia is the most important element in energy security. Saudi Arabia supplies, more than 9mb/d (2002) which is expected to rise to 13-15mb/d in 2010 to meet growing oil demand and offset resource depletion in non-OPEC countries. In fact, as one analyst has outlined that "global oil security rests on twin pillars of the strategic stocks of the IEA member states and Saudi Arabia's spare

[230] Franssen, Herman, "Arab-US Energy Needs in Perspective", *MEES*, 45:37, 16 September 2002, D1-D7.

capacity"[231]. Though Saudi Arabia has the potential and the reserves to meet projected demand but the expansion will call for massive investment. And given the social, economic, and political condition in Saudi Arabia, the implementation of suitable policies is the need of the hour to ensure energy security of the world. And the necessary investment should easily flow into the country to ease the task. It has been, therefore, argued that, disruption of Gulf oil supplies is a major threat to energy security, which would lead to global recession[232]. Thus the short-term supply disruption due to regional conflict can not be ruled out. However, over the years the means to overcome such disruptions have developed in the global regime. The best illustration of this is the minimal effect of Iraqi invasion of Kuwait in 1991 on the world oil market. Although 4-mb/d oil dropped from the market, Saudi Arabia increased its production and restored stability to the oil market and prices within a week. Instruments for stabilizing the oil market are improving year after year-strategic stocks held by oil companies and major oil consuming countries, development and liberalization of oil markets, and regional and global energy agreements. For instance, the enormous expenditure on the 1990-91 Gulf war, totaling several hundred billion dollars, was meant to ensure energy security for major oil importing countries. The six GCC states, which control nearly 45% of the world's recoverable oil reserves contributed more than $60 billion to the US led allied offensive to eject Iraqi forces from Kuwait in 1991[233]. This also signifies the vulnerability of GCC countries in the wake of any possible supply disruption due to regional conflicts. Another factor in determining energy security is the quantity of stocks-the cushioning against supply disruption. Oil stocks are usually held by oil companies for operational purposes, and by countries and state utilities to provide a cushion against unexpected surges in demand and possible disruptions in imports. Oil companies usually hold stocks that account for 55-65 days of consumption. IEA members are required to hold emergency oil stocks equivalent to at least 90 days of import. But in case of developing countries, it is not easy to hold oil stocks. Because of the cost, their stocks are relatively smaller than those of the IEA countries, which amount to only 25-55 days of consumption that is also typical of oil companies in these countries. In 1997, world oil stocks were about 5,500 million barrels, equal to 70-80 days of average

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[231] Ibid.

[232] David, S. R., "Saving America from the Coming Civil wars", *Foreign Affairs*, 78, pp. 103-16.

[233] AFP (Agence France-Presse), "Gulf States can not Afford to Finance another war", *Jordan Times*, 16 February 1998, p.10.

global consumption. Though this implies that there are enough stocks, yet this is only for a short period. This can be substantiated from the experience of past years. Oil stocks/stockpiles in the US/Europe dwindled in 1998, which reflects the western oil companies' policies of maintaining stocks minimum in their effort to slim management to survive in the phase of liberalization. In addition various governments (in France, US) have used the stock either selling in the market to secure fiscal discipline[234] or to meet statutory standards for their regional trade union[235]. The reduction in the level of stockpiles, the shock absorber for supply disruption, indicates that the world emergency preparedness was impaired. Thus energy security depends on the policies of industrialized countries in this regard. Moreover, with the continued growth of non-OECD oil consumption, centering on the Asian Growth factor, it can be argued that stocks will function less effectively. Their size relative to the global oil market is small; since most developing countries do not maintain emergency oil stocks (may not be able to afford them). On this trend it can be said that, vulnerability to sudden and substantial oil supply disruption is enormous.

Another aspect of energy security is the liberalization of energy markets in importing countries. Liberalization and deregulation, coupled with the development of oil futures and forward markets, mean an easier and more secure flow of oil from exporting to importing countries. Most oil producing countries are now inviting foreign oil companies to participate in oil development, which significantly enhance security of the global oil market. Although, security in terms of flows of oil and gas to importing countries is improving, the security of supply to consumers faces new challenges. Liberalization, the withdrawal of government responsibility for supply, and competition among private suppliers are creating challenges in securing reliable supply to individual consumers. In this regard, it is worth analyzing the concept of 'energy security externality'[236], which has implications for consumers in a deregulated scenario of energy sector. A security cost that energy consumers can take into account in their private decisions is not an externality. For instance, companies who buy a particular fuel may in various ways buy insurance against

[234] In March 1996, the US government decided to sell part of the strategic petroleum reserves to secure fiscal revenues and the SPR sold in 1996 reached a total of 28 million barrels.

[235] In July the German government decided a partial (of about 14 million barrels) sale of national reserves to meet the EU standards for the monetary union.

[236] An 'energy security externality', associated with the use of a given fuel, is "the cost of an interruption in its supply that is not borne by purchasers of the fuel", for details see, IEA/OECD, "Safeguarding Energy Supply Security", in *'Towards a Sustainable Energy'*, IEA/OECD, Paris, 2001, pp. 75-98.

supply interruptions; however, since they bear this cost themselves it is not an externality. External costs are those that accrue to others in the economy. In the case of energy security externality, the costs for emergency measures, diversification and other instruments to manage the risk of supply disruptions would be borne by the importers and eventually the consumers of the fuel that causes the externality. Though attempts have been made to estimate the economic costs of a supply disruption or sudden price spikes, it is not possible to distinguish between the internal and external costs in a comprehensive way. However, one study carried out by the US Department of Energy (US DOE), an annual external cost for the period 1990-2020 lies in the range of US$ 0.44-1.27 per barrel of oil consumed. The estimate is reduced to US$ 0.17-0.49/bbl if the strategic petroleum reserve is taken into account. As per these estimates, the oil security externality for the United States amounts to some 1-3 percent of current US crude oil spot prices[237].

Another development in the dynamics of energy security is the proposed US military strike on Iraq and its implications for the security of the global oil regime. Given the fact that the Middle East region has been historically unstable, any possible military strike on Iraq will put the whole region into turmoil, which will have serious short and long-term implications for the world and especially energy security. Analysts projected various scenarios of possible strike and its impact on the world energy security. One such projection has been made by the Washington based Center for Strategic and International Studies, as summarized in the box below.

Box 4.2: Global Oil Market Consequences of an Attack on Iraq

Scenario	**Oil Price Impact (WTI)**	**Price Forecast ($/b WTI)**			
No War Continuation of status quo, lingering uncertainty about prospects for war. **Probability: Low**	Market uncertainty keeps price steady at $30/b through 1Q003 but then decline sharply to $22/b in 2Q03 as war premium disappears. Prices hold at lower level through end-year. Rising output from both OPEC and non-OPEC outpaces demand and triggers further decline to a low of $16/b by 2Q04.	2003		2004	
		1Q	30.00	1Q	20.00
		2Q	22.00	2Q	16.00
		3Q	22.00	3Q	16.00
		4Q	22.00	4Q	20.00
		YR	24.00	YR	13.00
Benign Case US invasion meets little resistance, Iraqi forces collapse within weeks, and regime change takes place. **Probability: 60%-80%**	No serious damage to oil fields or infrastructure. Iraqi production ceases for three months then slowly recovers in 2Q and reaching 2mb/d by 3Q. Other OPEC makes up lost Iraqi output. Prices likely to spike at the start of hostilities but early in conflict, US announce intent to use	2003		2004	
		1Q	36.00	1Q	24.00
		2Q	25.00	2Q	24.00
		3Q	21.00	3Q	20.00
		4Q	22.00	4Q	20.00

[237] Ibid.

	US announce intent to use SPR crude which calms market.	YR	26.00	YR	20.00
Intermediate Case Stiff resistance by Republican guards. WMD not used but high number of civilian casualties. Major battles come to an end within a few weeks but attacks on US forces and acts of sabotage against Iraqi oil infrastructure. **Probability: 30%-40%**	Regional unrest forces GCC members with spare capacity to withhold extra supplies from market. Fear of higher oil prices trigger hoarding in non-IEA countries. US govt. and OECD allies each release 1mb/d from strategic reserves. Global supplies remain tight through 1H2003 but lower economic growth and oil demand, coupled with increased non-OPEC and OPEC production causes prices to fall in late 2H. In 2003, prices spike to \$42/b in 1Q, ease to \$40/b in 2Q, \$36/b in 3Q and \$30/b in 4Q.	2003		2004	
		1Q	42.00	1Q	30.00
		2Q	40.00	2Q	30.00
		3Q	36.00	3Q	30.00
		4Q	30.00	4Q	30.00
		YR	37.00	YR	30.00
Worst Case Invasion meets strong resistance and Iraq uses WMD in efforts to cause as many as casualties as possible. Iraq attacks Israel, which widens conflicts considerably. **Probability:5%-10%**	Iraq oil fields severely damaged; production halted for all of 2003. Sabotage of other Mideast fields sharply reduces production. Oil supplies disruption of 5-6 mb/d. US SPR and OECD release up to 3mb/d but psychological impact of war spreading with no end in sight triggers oil price jump to \$80 in 1Q03.	2003		2004	
		1Q	80.00	1Q	45.00
		2Q	60.00	2Q	40.00
		3Q	50.00	3Q	40.00
		4Q	50.00	4Q	35.00
		YR	60.00	YR	40.00

Source: MEES, 45:46, 18 November 2002, p. A3.

The report also has made comparison between the situation before Gulf war and present situation, to assess the economic impact of the strike. This is shown in the box below.

Box 4.3: War Considerations: Then and Now

The 1990-91 Gulf Crisis	The Current Situation
• Iraq invasion surprise. • Instant loss of 4.5mb/d; loss of Kuwait refining, particularly for jet fuels. • Market worries about neighboring OPEC supply, strategic reserves held back and not drawdown until January 1991. • Commercial stocks comfortable going into summer. • Saddam burns Kuwait oil wells-two years before production returns to normal. • Price elasticity of demand low, but large fuel substitution available. • Negative influence on the economy.	• No surprise, time to prepare. • Possible loss of at least 1.5mb/d Iraqi exports, military has time to arrange for jet fuel needs. • OPEC announces intention to make supply losses, governments could/must announce intentions to use strategic stockpiles early. • Commercial stocks tight going into 4Q02. • Iraq could damage own wells and/or damage to neighbors. • Price elasticity of demand lower. Little fuel substitution available. • Economy losing momentum. Energy price shocks equivalent to a consumption tax.

Source: same as box 4.2.

As can be seen from the box, there might happen different scenarios, but the thing is that it will impair the energy security. But as evident although there were no physical disruption of oil supplies in the aftermath of the America's war on Iraq, there were surging prices, as the oil market of today is integrated to the world financial transactions augmenting 'panic buying syndrome' resulting in higher oil prices.

Besides these issues, another most important issue regarding oil security is the transit route. Since bulk of the oil and gas reserves are in the Persian Gulf region, Strait of Hormuz is counted as the potential choking point. As per one estimate,

> "Over 14 mb/d of oil flow through this strait to Japan, United States, Western Europe and other countries. It is the world's most important oil chokepoint. At its narrowest, it consists of 2-mile wide channels for inbound and outbound tanker within the Omani side of the Strait, and a 2-mile wide buffer zone...The US Department of Energy reference case indicates that exports through the Strait must more than double by 2020, reaching 42 mb/d. This implies that up to three times more tankers will transit the Strait in 2020 than transit it today. Closure of the Strait of Hormuz would require use of longer alternate transportation routes at increased costs and these routes cannot meet anything approaching current export levels. The routes include the 4.8 mb/d capacity Petroline, the 2.2 mb/d IPSA- I & II lines and the Abqaiq-Yanbu natural gas liquids line across Saudi Arabia to the Red Sea" [238].

The sensitivity of the issue needs to be appreciated in view of the emerging markets in the Asia Pacific region with China and India as the leading destinations. It has been argued that "sharp increased tanker traffic in particular the number of ships passing through, raises the question of providing security for the increased volume of trade and securing the requisite number of ships not to mention the prospects of oil spills and ship accidents"[239].

Security of Natural Gas supply

Natural Gas is slowly gaining importance in the world energy scene. Between 1987 and 1997 gas consumption increased from 1,756 giga cubic metres to 2,197, for an annual growth rate of 2.27 percent, compared with 1.47 percent for total primary commercial energy consumption. Over the period until 2020 natural gas demand is expected to still faster-at an annual rate of 2.6 percent, compared with 1.9 percent for oil. And natural gas supply, since it is starting from a much lower base, than oil supply, is not expected to peak until well beyond 2020[240]. International traded natural gas accounted for 19 percent of gas

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[238] Cordesman, Anthony H., 'Are Energy Wars Still Possible?, center for Strategic and International Studies, Washington, DC, February 11, 1999.

[239] Pant, Girijesh, "India's Energy Security: The Gulf factor", *GSP Occasional Paper Series*, GSP 2002/2, New Delhi: GSP, CWAAS, SIS, JNU, 2002, P.8.

[240] IEA, "World Energy Outlook 1998", IEA/OECD, Paris, 1998.

consumption in 1998, compared with 44 percent for oil. So just as for oil, though to a lesser extent, there is mismatch between the location of gas supply and its consumption. Security of gas supply, therefore, is critical. But the physical characteristics of natural gas make the supply security more critical. Unlike crude oil, natural gas requires expensive pipelines or LNG infrastructure. These delivery systems of natural gas are inflexible, since, pipelines can not be moved or built over night, and LNG, although somehow portable, still requires an expensive receiving terminal. Moreover, gas is difficult to store in significant quantities. The energy content per unit of volume is much lower for gas than for oil.

At simplest level, gas supply security can mean operational reliability-in other words that gas flows to the consumer when it is required. Security of supply also involves reducing strategic risk, mainly the risk of a major disruption to supplies caused either by political factors or by major technical failure. Strategic risk is growing in parallel with the growing share of natural gas in meeting countries' primary energy requirements. The long-term risk is to ensure that consuming countries can secure future and additional supplies as their existing supplies are depleted. This represents a challenge as the bulk of world's gas reserves are in the areas that are far from current markets and also often have a high level of country risk. With the increase in internationally traded gas, as expected in coming decades, political risks to gas supplies and security of interregional grids have come to the forefront of energy security discussion.

Another important fact in considering the security of gas supplies is the implications of liberalization of gas markets for security. Traditionally, international gas trade has been conducted on the basis of long-term 'take-or-pay contracts'[241], which is completely different from a commodity market, where supply and demand balance at whatever is the market-clearing price. The traditional system is also frequently involved either monopsony or oligopoly buyers such as the European and Japanese utilities. However it has been argued that such system was the only way to match supply with demand, ensure orderly development of the market, and allow all parties to recoup their

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[241] Under 'take-or-pay' contract system, designed to manage risk, the buyer agrees to take a certain volume over a period of time and to pay for that volume regardless of whether it is actually used. In effect, the buyer takes all the volume risk (the risk as to how much gas the end-use market will actually consume). The seller agrees to sell a certain quantity at a price indexed to such factors such as the price of competing fuels, the price of electricity and producer inflation. The sellers therefore take the risk that this price will cover its cost of production and provide a return on its investment. For details see, Chambers, Ann, *Natural gas and electric power in non-technical Language*, (Tulsa, Oklahoma: Penwell Pub. Co., 1999).

investments. In fact, from importing countries' viewpoint, it has evidently worked: the record on gas supplies security in Europe and Japan.

But recently in the phase of liberalization, where third party access is being given, so that any producer has the ability to transport its product to the end market, and any customer can buy gas from any producer/wholesaler, the security aspect is being talked of. Though this system has worked succeeded in ensuring gas supply security in the US, yet it can not be emulated in other markets. Long-term take-or-pay contracts do not completely eliminate political or commercial risks. If a country is unable or unwilling to export its gas reserves for whatsoever reason, who has legal title to them is irrelevant. However, it has been argued that such contracts can do and have done in the past is to give the parties a degree of confidence in the viability of a project and help securing financing. The separation of transport from supply, liberalization, over the long term will encourage producers able to supply the market at the lowest cost to meet consumers' demand. This has become successful in the United States, where pricing of gas supply and associated services are transparent and explicit, and making market participants searching for the most cost-effective ways of ensuring gas supply. However, the result of such policy depends upon the structure of industries and players and the regulative structures in countries' concerned.

Another most important aspect while considering the issue of gas supply security in recent years has been the impression that major gas producers' possible cartelization and its impact on world gas supply security, in the lines of illustrious OPEC to increase revenue or for other motives. Against the backdrop of liberalization and the changing structure of gas industry- which has developed security sensitiveness among consuming and importing countries- the recent initiative of the major gas producers and exporters, at Algiers in February 2002, to establish a Forum of the Gas Exporting Countries (FGEC), to protect their mutual interest, has attracted a great deal of attention and prompted concerns that they may move to assume an OPEC-like role in managing the world gas market. This attempt by the major gas producers and exporters is jeopardizing the effort to promote competitive energy markets in consuming and importing countries[242].

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[242] Aissaoui, Ali, "Gas-Exporting Countries: Towards Cartelization", *MEES*, 45:32, 12 August 2002, pp. D1-D3.

Despite their differences in terms of their reserves, production and exports, the 15 gas producing and exporting countries (see table 4.6) which have so far shown interests in some form of consultation, are now seen to have the potential to wield more power than OPEC. Indeed, they contribute 63% of global gas trade, as compared to 47% for OPEC oil, and control 84% of LNG exports.

Table 4.6: Adherents to the Forum of Gas Exporting Countries: Reserves, Production and Exports (2001, bcm).

Country	Proved Reserves	Net Production***	Exports Pipeline	Exports LNG
Algeria	4,250	78.2	32.2	25.5
Bolivia*	680	4.1	2.5	
Brunei	390	11.4		9.0
Egypt*	1,000	21.0		
Indonesia	2,620	62.9	1.0	31.8
Iran	23,000	60.6	0.1	
Libya*	1,310	5.4		0.8
Malaysia	2,120	47.4	1.5	20.9
Nigeria	3,510	13.4		7.8
Norway**	1,250	57.5	50.5	
Oman	830	13.4		7.4
Qatar	14,440	32.5		16.5
Russia	47,570	542.4	126.9	
Turkmenistan**	2,860	47.9	4.2	
Venezuela*	4,180	28.9		
Total 15 (bcm)	110,240	1,027.0	218.9	119.7
World's Share (%)	71	42	53	84

Notes: *** net production excludes gas flared or re-injected. * Countries which joined the FGEC at its second meeting in Algiers. ** Countries which participated in the Teheran meeting but dropped out of Algiers.
Source: MEES, 12 August 2002, Table 1, p. D2.

Analysts have so far dismissed the potential of an OPEC-like cartel 'cartelization' of gas exporting countries on the grounds that, in contrast to oil, there is no world gas market. According to these analyses[243], gas markets are essentially regional as a result of high transportation costs and physical inflexibility. In addition, the structural and regulatory features of the gas industry in each region have resulted in different market values for gas and, as a consequence, different levels of prices even though gas prices have directly or indirectly linked to those of oil. This therefore explains, even when acting within the institutional framework of OPEC, gas exporters have been unable to coordinate their pricing policies. However, the establishment of FGEC is a clear indication that gas-

[243] See MacDougall, Michael, and Peter T. Linder, "Long Term Outlook for World Gas Trade: 1990-2015", Calgary, Canada, Canadian Research Institute, 1992 and also see, Gray, Dale, "Reforming the Energy Sector in Transition Economies: Selected Experience and Lessons", *World Bank Discussion Papers*, no.246, Washington D C, 1995.

exporting countries have resorted to act independently of OPEC, which have serious implications for energy security.

Income (Demand and Supply) Security[244] of GCC Oil/Gas Exporters

As discussed above, the GCC countries have become vulnerable to possible demand as well as supply disruptions. These countries depend on oil/gas revenue not for income only, but for their overall economic development. Their dependence on oil/gas export revenue is not restricted to them only; the benefits spread to other countries in the form of trade and investments and also to their region as wage remittances and financial assistance to other regions. In the GCC countries, oil export revenue accounts for almost two-thirds of government revenue. The dramatic drop in oil prices in 1998 and early 1999 led not only to budgetary problems in these countries, but also to unemployment and significant drop in income level. Such economic problems were not only restricted to the oil exporters, but were also experienced their neighboring countries, which depend on revenues from exports of goods and services to these countries and on remittances from workers in these countries. For energy-exporting countries, export security is becoming as important as energy import security is to resource-scarce countries. All this is therefore enhancing the prospects for global energy security, in a sense.

Dependence on energy exports has an additional implication for the GCC countries. These countries are worried about the possible long-term impact on export demand of policies to mitigate environmental impacts, promote energy efficiency; and increase use of renewable energy sources. Although exaggerated in the short-term, the potential impact could pose long-term problems for countries, adversely affecting their economic and social development. Having met the needs of global energy needs over the past years, oil-exporting countries are asking for compensation if mitigation actions start to bite. This request is being reviewed in international organizations and negotiations. It may be many years before exporting countries' income is affected. Meantime, it is expected that with international assistance and compensation, they will be able to diversify their income sources and reduce their dependence on oil/gas exports.

In addition to the above factors, all forecast studies suggest the global oil demand to maintain a modest growth rate of near about 2% per year, as compared to 0.3% per year during the 1980s. This strong growth in oil demand is solely attributable to developing Asian economies in general and India and

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[244] Income security here can be defined as the secure revenue sources for oil/gas exporting countries.

China in particular; which are poised to register higher demand growth rates in the coming years in reflection to their strong economic growth rate and the fact that these countries are starting oil/gas consumption from a lower base. This factor is expected to be the main driving force for the world oil/gas demand growth.

Thus in the backdrop of recent developments in the global oil and gas regime, it can be aptly argued that as the oil/gas demand continues to grow centering on the Asian factor, the world is expected to become more and more dependent on oil supplies from politically volatile region-the Gulf-, and that the oil stockpiles becoming lean, vulnerability to oil/gas supply disruption is gaining momentum as a strategic global issue once again.

Energy Security of Developing Asian Countries

The most notable point in considering issues of energy security since the end of the cold war is the fact that, along with the rapid rise in population and impressive economic growth of developing countries, the demand for energy by these countries is continuing to follow a sharply rising trend. In recent years, the Asian countries, in general, and China and India, in particular, have taken the center stage in world economic growth and maintained high growth rates in the climate of recession in most of the industrialized west. Though, these countries' per capita energy consumption is still very low compared to that of the developed countries, yet these countries are experiencing increases in the consumption of every form of energy. An issue of growing importance, therefore, is that for Asian countries and India, to sustain economic growth rate, long-term energy supply sources will have to be found, since regional reserves and production are insufficient to match either current demand or future demand.

Under such scenario, because local crude oil/gas production/reserves are inadequate to meet demand, energy imports in the Asian region increased substantially. Asia' total net oil imports grew from a total of 6.60 mb/d in 1990 to 11.7mb/d in 1997 and due to the East Asian Currency crisis, it steadied around 11.0mb/d in 1998. From now on, given outlooks for their primary energy supply-demand and crude oil production, net oil imports of the Asian region is projected to rise to 16.7 mb/d in 2005. Meanwhile by 2005, Asia will have five economies, aside from Japan growing into big oil importers with their net oil imports exceeding a 1mb/d each. The five economies include the Republic of Korea with 2.6mb/d, China with 2.0mb/d, India with 1.8mb/d, Thailand with 1.2mb/d and Taiwan with 1.02mb/d. Another fact is that even now, Asia registers by far the higher dependence on oil/gas imports from the Middle East and particularly from the Gulf region (77%), more than the US and Europe[245]. And many projections indicate that Asia's dependence on Gulf will keep rising in the short-term and long-term. Thus Asia is particularly vulnerable to any future supply disruption, unlike the sensitive Western countries. Moreover, except the Republic of Korea, no Asian country has any provision of energy stockpiles, only maintenance stocks held by either government utilities or private companies. As mentioned earlier sections of this chapter, the liberalization process going on in the energy sectors of these economies add to the concerns of supply security. Further, in Asia, there is no organizational framework to confront the vulnerabilities of energy supply disruptions, unlike the IEA for OECD countries. It can be mentioned that in the background of high energy imports by the Asian countries in the near future and their thrust for oil and gas supplies from overseas, a competitive environment in the Asian region itself is in the making, which will have multidimensional regional as well as global implications. Moreover the intensity of competition among the Asian players is seen as an emerging dimension to contemporary energy security concerns. It is argued that,

> "With the end of the Cold War, economic competition may replace ideology as the focus of international conflict. Oil will remain the critical strategic and economic commodity. Most importantly, developing oil shortages in Asia could lead to a stress on a global scale and if not handled well the situation could lead to a new global war"[246].

Another analyst has given a more alarming prognosis of the Asian competition. According to him,

> "As oil commerce in increasingly global and transparent markets has come to be shaped more by transport costs than political relationships, a largely bifurcated global market has arisen: oil flows from the Middle East gravitating to Asia; oil supplies from the Western Hemisphere (Mexico, Venezuela, Colombia and Canada) to a large degree displacing Gulf oil in the US markets"[247].

Gulf and Asia: Energy Interdependence and Vulnerability

All energy experts are unanimous on the view that Asia, not Europe and OECD is the global hotspot for energy demand growth caused mainly by the relatively high tax effect on the consumption in other energy consuming part of the world and the fuel-switch which is sweeping in that part of the world. While oil demand in Europe reduced by 0.8% and 0.5% in 1999 and 2000 respectively, consumption in the Asian region grew by 3.6% in 1999 and over 5% in 2000.

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[245] Details regarding this can be accessed on line at, http://www.eia.doe.gov.

[246] 'Oil, Technology and War in the next decade', *Crustal Fluids* GP/PE/GES 200, Spring Quarter, 1995/1996, http://srb.stanford.edu/nur/classes/otw.html.

[247] Manning, Robert A., 'The Asian Energy Predicament', The International Institute for Strategic Studies, *Survival*, Vol. 42, No. 3, Spring 2000.

According to the latest statistics, most of Asia's growth in oil demand is accounted by four economies of the region, i.e., Japan, China, South Korea and India, which together import 60% of their total oil consumption. The IEA expects this figure to increase to 90% by the year 2020. More importantly, virtually all these imports will originate from the Gulf region, as only the OPEC producers are strategically located to these markets. Hence any supply disruption or abrupt price hikes will severely affect these economies and ultimately the Gulf countries, as this region is the latest hope for the Gulf's reestablishment in the global oil regime.

This interdependence between Asia and Gulf countries is a major factor in the global energy security conundrum. The main concern for the Asian countries is the instabilities in the Gulf region and its pernicious effects on ensuring energy security. Moreover, this interdependence between Asia and Gulf countries has developed concerns among Western policy makers, as they think; the greater interdependence will hamper their long-term political, strategic calculations, which may swing in favor of these emerging countries. As one has put it,

> "With a pacific region importing 20-24 mb/d from the region in 2020, the benign commercial relations between the two regions are likely to see a qualitative change including the possibility of an 'Islamic-Confucian Civilization Alliance'-one of the West's worst nightmares"[248].

The implications of energy interdependence between the Asian countries and the Gulf countries has been aptly analyzed through three different scenarios—the near term (to 2010) and tangible; the long term and intangible and potential nightmare scenarios[249]:

- "The first scenario underlines the growing interdependence in terms of mutual need to trade and invest in the energy sector. According to one estimate, by 2010, if Asia is importing 17 mb/d from the Middle East at $24 a barrel, the result would be capital transfers to the Middle East to the worth of $124 billion annually. Even in today's global financial markets, where nearly $2 trillion a day floats through cyberspace, that is serious money. Such revenues could, in part, be recycled into downstream investment in dynamic Asian economies. Expanding capital flows to the Middle East would also go some distance towards ameliorating a growing list of problems in major oil exporting countries such as Saudi Arabia, Kuwait, Iran and Iraq. Riyadh for example has seen a significant decline in living standards over the past 15 years, has a large demographic bulge of young adults to absorb into its economy, and has accumulated foreign debt of $130 billion".
- "In the second scenario it is visualized that 'such capital flows could also accelerate efforts to obtain a new cycle of modern weapons including WMDs'. If at least the rough lines of anticipated economic and financial consequences

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[248] Ibid.
[249] Pant, Girijesh, Op. cit, p. 10.

of the Middle East-Asian energy interdependence for the global economy are discernible, the political and security implications enter the realm of the intangible and speculative. In the 1930s, it was energy security that led Japan to occupy Indonesia (then the Dutch East Indies) and take control of its oil fields. Indeed the US oil embargo was an important factor leading Tokyo to attack Pearl Harbor, bringing the US into the Second World War. Some analysts see in China, a rising power with a new found energy dependence, the potential for twenty-first century repetition of these experiences. The problem for Asian stability, growing with each barrel of Chinese oil imports, is now clear-asserts Kent Calder in an influential book on energy and security in Asia. It is the danger that China's attempts to safeguard its oil supply lanes and defend its historical sovereignty in adjacent seas poses threats for other nations, especially Japan. China claims 80 percent of the South China Sea as territorial water, 70 percent of Japan's oil supplies pass that way. Thus logic runs, as Chinese imports steadily rise, defending the fragile sea-lanes to the far off Persian Gulf becomes a new security imperative for the PLA Navy".

- "In the third scenario, such speculation begins to move from the merely intangible into the category of nightmare scenarios, in which China deploys destroyers and aircraft carriers to interdict tanker traffic in a confrontation over the disputed Spartly Island in the South China Sea, goes to war with Japan over the virtually inhabited Senkaku Island, or, worse still, allies with Iraq or Iran in a future Gulf War. It is easy to conjure up such scare stories. The number of oil tankers navigating the waters of the Indian Ocean, through the straits of Malacca and the South China Sea for ports in Pusan, Yokohama and Shanghai, in the two decades ahead is likely to increase three-fold. But whether this prospect poses a security threat depends to a considerable degree on whether China elects to view energy security geo-strategically or geo-economically".

However, discounting the possibility of tensions among the Asian consumers, one analyst sees such ensuing competition among the Asian players will act as a founding stone towards the establishment of a framework of co-prosperity. As pointed out,

> "The new pattern of supply and transport has created a reasonable rather than destructive rivalry among Asian countries. There is no stampede to sign contracts at any price or to offer unreasonable terms. In today's transparent oil market, prices are based on futures markets or other formulas. Indeed no major producer in the Middle East sets its own prices today. The Asian rivalry is based on an economic mandate to form strong economic and energy bonds with the Middle East and to create linkages that ensure the smooth flow of oil and gas. This is two way street. Key Middle East suppliers recognize that Asia is their best market and try to ensure credibility and consumer satisfaction. The Asians seek to negotiate the best deals, but do not wish to depend solely on one economy or region. All this has mitigated the fears regarding Asia's energy security problems. The issue of the reserve base is no longer a critical energy security concern because there are enough identified resources in the Middle East"[250].

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[250] Fesharaki, Fereidun, "Energy and the Asian Security Nexus", *Journal of International Affairs*, Vol. 35, No. 1, Fall 1999, New York: Colombia University.

Energy Security in India

A modest growth rate and sustenance of that growth rate in an economy has become essential in recent times due to the process of globalization sweeping across continents. The maintenance of a modest growth path considerably depends on the availability of substantial energy sources, as energy is used as strategic input in every economic activity. India, an emerging vibrant economy, presently achieving a modest annual growth rate of 6 to 7 percent in average need substantial energy supplies to sustain the growth rate in the foreseeable future. In such scenario, energy security debate is being debated in the country every now and then. The gigantic volumes of oil/gas consumption, scarce domestic reserves and stagnant productions, and consequent voluminous energy imports have made energy security in India imminent and pertinent. In such regional and global scenario, as discussed in earlier chapters, India is poised to be a significant factor in regional (Asia) and global energy scenario in the coming years. Table 4.7 shows worlds top ten oil importers and India is in the 8th place.

Table 4.7: Top Petroleum Net Importers, 2000, (mb/d)

Rank	Country	Consumption	Production	Net imports
1.	United states	19.5	9.0	9.8
2.	Japan	5.6	0.1	5.6
3.	Germany	2.8	0.1	2.7
4.	South Korea	2.1	0.1	2.0
5.	France	2.0	0.1	2.0
6.	Italy	2.0	0.1	1.8
7.	Spain	1.5	0.0	1.5
8.	India	1.8	0.7	1.1
9.	China	4.6	3.2	1.4
10.	Taiwan	0.8	0.0	0.8

Notes:
1. Consumption is estimated using average oil consumption growth rates from recent years and adjusting according to analysts' judgment.
2. Production includes crude oil, lease condensate, natural gas liquids, other hydrocarbons and alcohol, and refinery gain.
3. Net imports are calculated by subtracting estimated production from consumption.
4. Columns may not add across due to independent rounding.

Source: On line at, www.eia.doe.gov.

As pointed out earlier India is taking strides in world energy demand, consumption, and imports. There are also clear projections regarding India's potential growth in the future. Thus energy security is of vital concern to India's global standing and sustenance in the future.

Vulnerability of India's Energy Security

In India, commercial fuels constitute about 68% of the total energy consumed. Crude oil is the second largest commercial fuel (accounting for 27%), after coal (61%), and followed by natural gas (9%). Oil and now natural gas are critical inputs to every sector of the Indian economy. India is emerging as a leading consumer of petroleum products with consumption rising at 6.4% annually. India's dependence on crude oil and now natural gas is increasing day by day, compared to domestic production and reserve accretion. India imports about 70% of oil for domestic consumption while only 30% is produced domestically (see table 4.8 and also see table 3.4, Chap-III). Though till now, the imports of natural gas has not taken place, yet, as discussed in earlier chapters, the import of natural gas will increase substantially in the future, as it is being used in large volumes in electricity generation and other productive processes in the country. The share of oil and petroleum products in total imports has risen to 31% in 2000-01 compared to 25% in 1999-2000 and 15% in 1998-99. This has happened due to the high oil prices in 2000 and early 2001. While India's share of global oil production of crude oil in 1998 was less than 1%, its share in world consumption was 2.15%. Imports of crude oil exceeded domestic production for the first time during 1992-93.

Table 4.8: India's Net Imports of Crude Oil and Products, (quantity in MMT and Value in Rs. Crore)

Quantity	Crude Oil	Products	Gross Imports	Product Exports	Net Imports
1999-00	57.8	16.6	74.4	0.7	73.7
2000-01	74.1	9.3	83.4	8.4	75.0
2001-02*	84.9	8.8	93.7	9.8	83.9
			Value		
1999-00	40028	14185	54213	698	53515
2000-01	65932	12093	78025	7672	70353
2001-02*	78116	11076	89192	10519	78673

Source: Prepare from Basic Statistics on Indian Petroleum Sector, MoPNG, GOI, Various Issues.

The most important aspect is the fact that, GCC countries account for more than 65% of India's oil imports. India is the one most dependent country on the Gulf region. Table 4.9 shows India' source of oil imports. Table 4.10 shows GCC countries' share in India's total imports.

Table 4.9: Sources of India's Import of Crude Petroleum and Products, (US $ million).

Country	1995-96	1996-97	1997-98	1998-99	1999-2000
Bahrain	807.11	778.19	500.83	361.81	260.97
Kuwait	1872.38	2276.44	2109.66	1334.55	1740.11
Qatar	0.87	16.77	7.84	7.80	119.33
Oman	3.88	0.08	0.07	0.02	47.10
Saudi Arabia	1539.76	2140.93	1769.73	1191.81	2420.99
UAE	1050.52	1328.73	978.69	909.90	1798.57
Iran	433.69	677.14	429.32	256.25	1028.21
Iraq	-	24.82	185.60	150.90	199.76
Egypt	49.91	57.86	168.68	161.99	411.78
Yemen	17.15	12.20	10.04	1.78	251.73

USA	58.16	93.42	36.39	42.37	55.19
France	77.52	97.95	48.56	8.83	17.89
Germany	9.33	5.15	4.94	8.04	10.00
Italy	165.50	80.13	45.44	13.51	9.55
Spain	12.98	14.26	7.13	0.81	8.95
Greece	41.35	8.82	9.70	0.14	7.42
Netherlands	24.66	81.78	10.48	7.42	6.60
South Africa	1.33	0.34	4.35	10.31	7.36
Nigeria	716.29	1478.68	1033.57	1108.91	2871.69
Singapore	268.46	243.35	227.06	410.35	425.26
Japan	11.00	13.10	14.89	15.19	11.79
South Korea	15.07	5.08	65.06	36.27	181.37
Thailand	-	-	9.45	16.30	9.55
Malaysia	104.89	157.98	170.25	256.87	529.49
Indonesia	33.54	114.80	112.64	37.12	110.52
China	9.98	8.33	34.62	27.58	12.19
Pakistan	-	-	0.14	3.05	8.29
UK	33.52	32.90	43.37	8.59	15.84
Mexico	-	-	-	-	42.72

Source: CMIE, "Foreign Trade and Balance of Payments", Mumbai, July 2001, p. 217.

Table 4.10: GCC countries' share in India's total imports of crude oil and products (%)

Country	1995-96	1996-97*	1997-98*	1998-99*	1999-2000*
Bahrain	10.71	7.75	6.13	5.66	2.07
Kuwait	24.84	22.66	25.81	20.86	13.78
Oman	0.05	-	-	-	0.37
Qatar	0.01	0.17	0.10	0.12	0.95
Saudi Arabia	20.43	21.31	21.65	18.63	19.17
UAE	13.94	13.23	11.97	14.22	14.24
Total GCC	70	65.12	65.66	59.49	50.58

Note: * implies figures for Oman are not available.
Source: Prepared from, CMIE, "Foreign Trade and Balance of Payments", Mumbai, July 2001, p. 217.

Moreover, India is far more dependent than the US or Europe on the import of crude oil from Middle East. In 1998, about 90% of India's total imports were from the Persian Gulf, while for the US and Japan (19% and 74%), see table 4.11.

Table 4.11: Imports from Persian Gulf as % of total Imports.

Year	India	US	Japan	Former Western Europe
1990	87.7	27.5	65	48
1991	88.6	27.8	64	43
1992	83.3	25.6	66	43
1993	92.2	23.4	68	50
1994	90	21.5	68	48
1995	90	19.9	70	47
1996	90	18.9	70	43
1997	90	19.2	74	47

Source: On line at, www.eia.doe.gov.

Thus it is the soaring of oil consumption, the low level of domestic production and productivity and the lack of development of alternatives that have given rise to vulnerabilities in energy security. For example, productivity of oil consumption or the energy intensity levels have been very week, as reflected by the figures: oil consumption per $ 1000 of GDP has risen by 13% in India during over the period 1981-91, while the same has decreased by 45-60% in developed countries.

The past experiences of world oil shocks reveal the vulnerability of India more vividly. During the first oil shock of 1973-74, India's import bill rose by over 50% in the first year. During the Gulf war of 1990-91, the net value of oil imports rose by 50% and that of petroleum products by 72% to Rs. 11,000 crores. The abrupt rise in oil prices has pernicious effects on the Indian economy. It has been estimated that every one dollar increase in oil prices drag down the GDP growth rates by 0.04% and increase the inflation level by one percentage points. As per one study, the oil pool deficit in the year was 12,600 crores, which was estimated to rise to Rs. 14,500 crores at prices $25.b in 2001-02 and further to Rs. 21,200 crores at prices $28/b[251].

The study by FICCI-IDSA has descriptively analyzed the vulnerability and impact of an oil shock on the various sectors of Indian economy. The findings are summarized in the box below.

Box 4.4: Effects of Oil shock on Indian Economy

Sectors

Transportation, Industry, Agriculture, Power, Tours and Travel, Equity Market

Impacts

- *Transportation is by far the largest oil-consuming sector accounting 62% of total oil consumption. Crude oil is crucial for this sector-be it road, sea or air transport. The impact of an oil shock would be transmitted through this sector. For example, heavy metals and first moving consumer goods, which depend on this sector, would be directly hit. A further sectoral impact would be a fall in demand for industrial products consuming fuels such as motor vehicles and oil engines.*
- *Naphtha as a feedstock in fertilizer industries accounts for 75%. An oil shock would have a deep impact this sector, which will ultimately affect the agricultural sector and this may call for subsidies, which have adverse fiscal implications.*
- *The travel and tourism industry is hardly hit in the post-terrorist strike on Iraq. This shows that possible supply disruption now will result in recession in this sector.*
- *Equity markets are indirectly affected by oil price shocks. In equity markets an increase in oil prices generally lead to an initial weakening in the earnings of firms producing energy intensive output and their market valuations. This occurs both through higher production costs, which would be particularly severe in the traditional manufacturing and transportation companies, as well as through the slowdown in demand.*
- *Big price movements due to oil price hikes such as that of 1998 are disastrous because they curtail investment plan and also affect human capital and corporate performance.*
- *Consumer confidence could also plunge. For example, during the 190-91, Gulf war, the conference board's index of consumer confidence fell 74 points from August, the month of invasion to January 1991, the end of the war.*
- *High oil prices will affect the general price level, employment and thereby overall growth of the economy.*

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[251] FICCI-IDSA, "India's Energy Security and Managing Oil Shock", *FICCI-IDSA*, New Delhi, November 2001.

There are several key obstacles in realizing India's quest for stable, secure and sustainable energy supplies at relatively stable prices. While these vary in kind and in degree from one energy source to another, they are essentially two fold in nature: the internal, problems of political/ bureaucratic inertia and entrenched resistance to outward looking liberalized trade and investment policies; and built-in constraints of geology and geopolitics[252]. The various factors underlying India's quest for energy security in the past and also in the coming years can be summarized as follows:

- Lack of expertise and technical ability, financial constraints and inadequate policy decisions: India's oil refining and oil recovery capabilities and overall energy technology is inadequate to meet the challenges of recent changing global energy sector. Though some public and private sector entities like ONGC Videsh Ltd. and Reliance Pvt. Ltd. have recently entered into technological alliances with foreign partners, lot is to be done to overcome these hurdles.
- The meager equity levels and financial strength of Indian oil and gas companies has affected the international presence. High interest rates in India relative to other countries have acted as a liability for the Indian oil and gas companies to compete for equity oil abroad. Moreover generating loans in the international market for oil and gas sector operations has not been successful due to India's lower position in world financial markets' country ranking. In addition, neither Indian banks nor the Indian government have provisions of special incentives in the form of soft loans for equity oil projects. Overall, the policy-making loopholes have affected adversely the quest for energy security. India doesn't have a coordinated energy policy till date.
- Geopolitical hurdles: Regardless of the efficacy of India's reforms, India's hopes of diversifying supply as a means of enhancing energy security have been - and will continue to be - constrained by its political geography for the foreseeable future. India's geopolitical realities in regard to oil and gas resources are in many respects, the reverse of many other Asian actors. For example, Japan has spent tens of billions of dollars over the past three decades searching for oil fields in the Middle East or pursuing oil and gas schemes with Russia in an effort to diversify supplies. More recently, as we have seen, China has also purchased oil fields from Sudan to Central Asia

[252] Manning, Robert A., *The Asian Energy Factor: Myths and Dilemmas of Energy, Security, and the Pacific Future*, (New York, for Council on foreign Relations, 2000).

and entertained the idea of constructing massive pipelines that have little economic rational in the hope of diversifying supplies in the name of geopolitics and energy security.

But for India, the opposite is true: energy projects that have a compelling economic logic are stifled by the geopolitical realities of South and Southwest Asia. Positioned on the Arabian Peninsula, only 885 miles separate India's westernmost bulge from Oman on the tip of the peninsula, a major supplier of oil and gas. Turkmenistan's enormous gas reserves are also within range of commercially viable pipelines to India. Only its land border with Pakistan physically separates India from Iran. And of course, northeast India shares a long border with gas-rich Bangladesh, whose independent national existence was obtained with Indian support in 1971. India has sought oil and gas relationships with all these actors in the exception of Oman, where technical/economic problems have sidelined plans for an Oman-Bombay pipeline.

Some prime examples of this dilemma involve Turkmenistan gas, Iranian oil and gas, and Bangladeshi gas. In the case of Turkmenistan gas, a Unocal-led consortium had laid the legal financial groundwork for building a 1,400 km pipeline from Turkmenistan through Afghanistan to Multan, Pakistan, with an additional 600 km connecting link to New Delhi. By the end of 1995 agreements were reached between Turkmenistan, Pakistan, and the Unocal group to build the pipeline, which could send some 1.6 billion cu.ft. of gas a day into Pakistan and some portion to India. Construction was due to begin by the end of 1998, with initial deliveries to Pakistan in 2001. Yet in November 1998, continued instability and conflict in Taliban-led Afghanistan led Unocal to cancel the project. Another eventual obstacle may have been the pathology of Indo-Pakistan rivalry. Though Pakistani officials had publicly indicated support for the Indian leg of the pipeline as a 'win-win proposition', prior to its cancellation, it is unclear whether Pakistan would in fact have permitted the pipeline to be extended to India[253]. Moreover, skepticism about the prospects for Indo-Pakistani energy co-operation can be reinforced by Pakistan's reluctance to co-operate with a number of Indo-Iranian energy interdependence schemes in recent years. Though India and Iran have discussed a range of means of delivery; overland or under water pipelines,

[253] Dadwal, Shebonti Roy, "India's Energy Situation: Crisis in the Making", *Strategic Analysis*, IDSA, New Delhi, June 1997.

over land train Pakistan territory or territorial waters or usual LNG transports; yet there are both skepticism and apprehension affecting the policy making in this regard.

According to some analysts[254], perhaps the most frustrating and certainly the oddest geopolitical impediments for India, which would appear a natural economic relationship, is the case of neighbouring Bangladesh. For one of the world's poorest country-Bangladesh -, its substantial proven gas reserves (around 11 trillion cu.ft.) could have become a source of economic prosperity, had these resources been marketed in the immediate vast Indian energy market. But a host of self imposed obstacles have not only stifled the exploration and production of Bangladeshi gas, despite strong initiatives from major multinational firms like, Shell, Unocal, Occidental and Halliburton[255]; but also any initiatives to export to India. Moreover, there supposed to be apprehensions in the Bangladeshi policy making circles that economic integration with India would disadvantage its domestic industry, and more broadly, increased Indian domination. Therefore one analyst has rightly observed, "Why the Bangladeshis are reluctant to sell gas to India is one of the great mysteries"[256].

It can be mentioned that in recent years there are some positive developments regarding the source of diversification of import sources. Though these endeavors are marginal in comparison to attempts by China to secure oil imports from abroad, yet these give respite and encouragement for the future.

India is taking a "calculated risk" to venture into countries where multinational angels fear to tread. ONGC Videsh Limited, the only firm permitted to pursue overseas exploration projects, has gone into strife-torn Sudan, outcaste Libya, explosive Iraq to secure that extra energy. The strategy was to tie up with countries, which required less investment, but were oil-rich, since safe havens like Saudi Arabia, Kuwait and UAE were already cornered by the MNCs. That strategy is reflected in the country's Hydrocarbon Vision 2025, a report prepared by a Group of Ministers chaired by then Finance Minister Yashwant Sinha. In the medium term, it said, the focus should be to build strong relations in focus countries with high attractiveness like Russia, Iraq, Iran and North African countries.

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[254] EIA, "India - Country survey", online at http://www.eia.doe.gov.

[255] EIA, "South Asia Regional Overview", Department of Energy, US, April 1999.

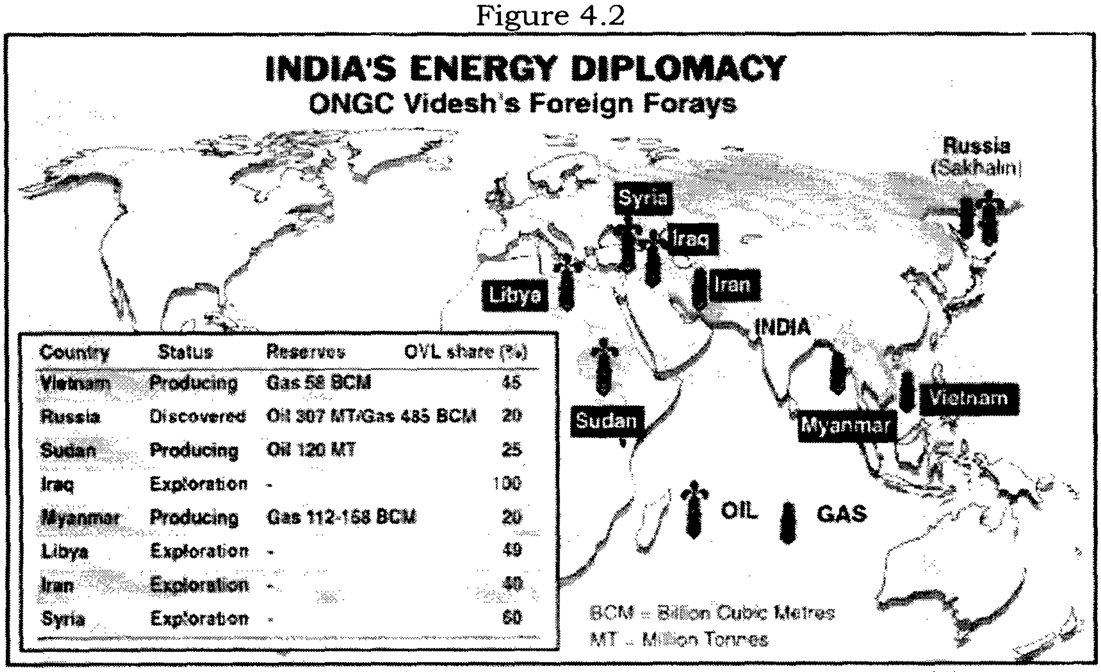
[256] The Hindu, 13 October, 1999.

No wonder then that India's gambles — some of which are now paying off — include Sudan, Libya, Syria, Iraq, Myanmar and now Angola, where OVL plans to acquire Shell's 50 per cent equity in a large discovered field. On the radar is Nigeria and Azerbaijan (see figure 4.2).

The oil diplomacy is also using another tool suggested by the Group of Ministers: leveraging India's 'Buyer Power' to obtain quality exploration and production projects abroad. Last year, it managed to arm-twist Iran into yielding highly prospective oil fields in return for India's purchase of five million tonnes of liquefied natural gas (LNG). Teheran even agreed to give OVL and its Indian partner's equity in the South Pars field to provide gas for conversion to LNG. Indian Oil Corporation, which has established deep relations with Middle-East exporters because of its annual term purchases of crude oil, has been able to get its foot in Saudi Arabia's exploration programme.

The security concern has also translated into diversifying the crude purchase points. India currently sources 65 per cent of its crude imports from the Middle East but the strategy is to reduce the country's dependence on the forever troubled region. A government strategy paper suggests that refineries switch over to low sulphur crude oil from Nigeria and net imports from North Sea, Venezuela, West Africa, and the Far East etc. In the last few years, India has tied up with new sources like Brunei, Libya, Nigeria and Yemen and efforts are on to build new contracts with Venezuela and Angola.

Figure 4.2



Country	Status	Reserves	OVL share (%)
Vietnam	Producing	Gas 58 BCM	45
Russia	Discovered	Oil 307 MT/Gas 485 BCM	20
Sudan	Producing	Oil 120 MT	25
Iraq	Exploration	-	100
Myanmar	Producing	Gas 112-158 BCM	20
Libya	Exploration	-	49
Iran	Exploration	-	40
Syria	Exploration	-	60

IE Graphics/B.K. SHARMA

Source: Indian Express, January 25, 2004.

However the ground reality is different as per analysts. India can not afford to lower its dependence on the Gulf region as the domestic as well as global realities of the world oil and gas industry has transformed dramatically with competition spiraling to hurricane proportions. Being fiscally and technologically deficient, these efforts to shy away from the Gulf regions and diversifying imports from other parts of the world is really a Herculean task.

Mutual vulnerabilities of India and GCC Countries

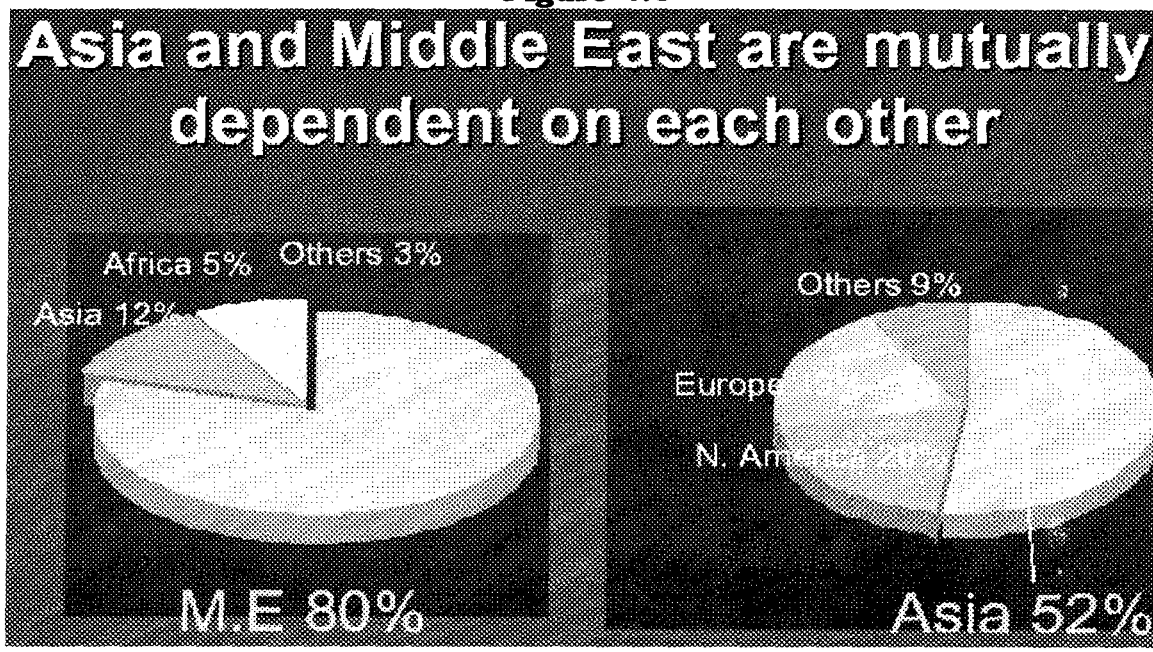
As discussed above, oil security was of prime importance for the oil importing countries before the structural changes initiated in the global oil industry. Oil producing countries used to detect the terms for the oil consuming countries at that time. The oil importing countries were quite vulnerable to the whims and caprices of the oil suppliers. The extent of their vulnerability could be seen in the wake up of world energy crises of 1974. The price shocks of 1974 led to usurious rates of inflation from an already high rate of 8% in the world's major industrialized countries to double-digit levels. Economic growth in the industrialized countries slumped from an average annual rate of 4.9% in 1965 - 1973 to 2.7% in 1973 - 79. Similar effects occurred after the second price shocks. Price shocks caused more domestic resources to be traded for each unit of energy, with a loss in consumer purchasing power. The 1974 oil price shock meant a transfer of about 2% of GDP from the developed countries to the oil-exporting countries.

But due to the structural changes, as discussed above, the oil consuming countries, especially the developed countries became capable of facing any supply disruptions owing to their improved technology and some legislation, oil security for them became somehow less relevant. And the oil exporting countries, which until that time were the superiors, became conscious about oil security, due to their significant loss of oil revenue which accounted for their overall affluence over the years. Their situation further worsened due to their loss of market coupled with lower oil prices and environmental regulations around the globe. These factors made them striving for survival and impinge lots of socio-economic hardships on them. The Gulf Co-operation Council (GCC) oil exporting countries therefore became vulnerable and are in desperate search for stable outlets for their energy exports.

Unlike the developed oil consuming countries, the developing oil consuming countries are not secured in the wake of any eventual supply disruptions, because of their insatiable appetite for oil imports to augment economic development. The developing oil consuming countries especially those in the Asian region, which accounted for the major proportion of global oil demand during the decade of 1990s, are likely to be vulnerable in the wake up of any supply disruptions. India an emerging vibrant economy, with its present degree of dependence on the Gulf and future dependence on the Gulf for vital energy imports, is therefore quite vulnerable in the wake up of any possible supply disruption in the future.

Given the fact that, the oil supply pattern for the world's three major oil consuming regions- North America, Europe, and Asia- shows that major increases in oil supplies may be expected both within and near American and European markets, as noted earlier, the dependency of these, markets is not so intense in comparison to that of Asian region. On the other hand, underlying the fact that domestic and regional oil/gas supplies are not sufficient to match the demand in the future and possible greater dependence on oil/gas imports from the Gulf, signifies the vulnerabilities of India and other Asian countries to supply disruptions. From the perspective of the GCC oil and gas exporting countries, on the other hand, India and other Asia appear as promising future markets. If assuring oil supply and price security will be important for India, the security of demand and price will be equally important for the GCC countries. Moreover, underlying GCC countries' search for market stability is their concern for stable flow of energy export revenues, which render them anxious to protect their earning capacity, in order to defray their mounting government expenditures. Thus, such stability cannot be established without the effective cooperation of their major customers - the oil importers like India and other Asia. This implies that the rising dependence of the GCC countries on India and other Asian Countries will increase their economic vulnerabilities owing to any cyclical disruptions in the growth rate of energy demand - the effects of 1998 Asian Financial Crisis on the GCC countries is notable here. This can be substantiated from the trends of mutual dependence of Middle East and Asia from the demand as well as supply aspects (see Figure 4.3).

Figure 4.3

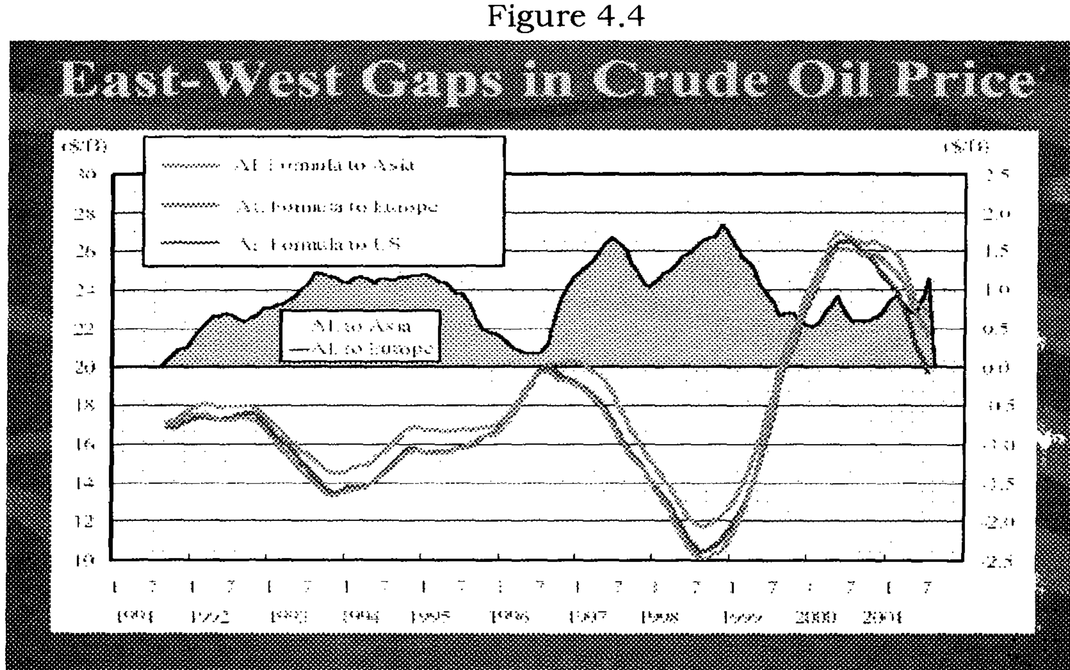


Asia Imports ME Crude Exports

Source: IEEJ, November, 2003.

There are also other issues like the price of crude exports from the Middle East to the Asian market in comparison to other markets is high, given the fact that the Asian region is and will remain the stable outlet for the oil exports from the Gulf region. This will in fact create apprehensions in the Asian importing countries in general and India in particular to seek imports from other regions. Figure 4.4 shows the East-West gaps in crude oil prices.

Figure 4.4



Source: IEEJ, November 2003.

Thus, in the global energy regime, the oil producing/exporting and oil consuming/importing countries are mutually vulnerable and the interdependence is gaining strength day by day, which also emphasizes the degree of their future vulnerabilities to any possible demand as well as supply disruptions. It will therefore be important for India and the GCC countries to strategically modifying the energy sector interdependence framework, to minimize the cost of interdependence and increase the benefits of interdependence, in order to ensure energy security of both. This calls for pragmatic policies from both to hedge against the apprehensions of energy security. The possible and most appropriate way in this perspective would be to augment mutual beneficial economic relation, given that both share a traditional long illustrious co-prosperity framework of interaction.

Chapter V

The Interdependence Framework: A Catalyst to Augment Economic Relations between India and GCC Countries

As discussed in the previous chapters, the energy fundamentals of both India as a potential vibrating consumer and the GCC countries as producers are in the process of evolution towards a framework of interdependence due to their sheer strategic positioning in the present global oil and gas regime. Besides there are renewed apprehensions regarding energy security from the perspective of demand security for the GCC countries and supply security for India. These factors are compelling them to address the issues of vulnerabilities of energy security through a broad based interaction in the form of mutual economic relations basically premised on the 'newer realities of energy interdependence' in order to hedge against the concerns and to strengthen their position in the world oil and gas regime in the coming years. The present chapter seeks to analyze these issues and implications thereof. The chapter starts by highlighting the sustained economic relations between India and GCC countries over the years as a background and then focus on the prospective areas and means of a broader economic relations evolving around the hydrocarbon interdependence between India and GCC countries, as enunciated in the present global oil and gas regime. The unfolding opportunities in the liberalization phase in both the regions will be minutely identified to delineate the future pattern of economic interaction between India and GCC countries.

Economic Relations between India and GCC countries: A Overview

The Gulf region with its geo-strategic location is important to India from the economic and security viewpoints. Centuries-old interaction between India and the region and the region's centrality in the Islamic world makes the Gulf also, politically important.

India enjoys traditionally cordial relations and cooperation with the GCC countries. India's old, historical ties with GCC states, coupled with increasing imports of oil and gas, growing trade and investment opportunities, and presence of 3.5 million Indian workers in the region, are of vital interest to India. India's economic linkages with the GCC have increased steadily during 1970s, 80s and 90s, especially due to growth in oil imports. These continue to make steady progress to-date. During 2002-03, India's exports to GCC were around US $ 5 billion. The bilateral two-way trade exceeded US $ 12.5 billion (2002-03). Information Technology exports to GCC stand at US$ 170 million (2002-03) and is poised for a significant upswing.

Since the October 1973, the Gulf region has undergone revolutionary changes. The oil wealth brought an unparalleled boom in economic activities in the Gulf region, making the region an attractive destination for exports of goods, projects and services. In the wake of the unprecedented import growth in the GCC countries, import from India increased phenomenally from Rs. 21,970 lakhs in 1975-76 to RS. 73,450 lakhs in 1985-86, recording a growth of 234.31 percent over the same period. However with the beginning of the 1980s, the decline in oil prices reduced the import volume of the region in consonance with the decline in the region's imports. Imports from India also declined till they reached Rs. 69,240 lakhs in 1987[257]. Significantly, the decline in imports from India was by a wider margin than the regional import. As a result India's share in the region's import declined from 2 percent in 1975 to 1.3 percent in 1982 and one percent in 1987.

But the overall trends of India's exports to the GCC countries as a whole in a decade-wise break up shows that the annual average growth rate of India's exports has registered a steep increase from 30.75% during the period 1973/74 to 1983/84 to 85.82% over the period 1983/84 to 1993/94. However, during the period 1993/94-2003/04, this has declined to 33.02%. Table 5.1 shows the decadal trends of India's exports to the GCC from 1973-74 to 2002-03 and annual average growth rates.

Table 5.1: Trends of India's Exports to the GCC (Decade wise break-up), in Rs. Lakhs and Annual Average Growth Rate in percentage.

Year	Exports	Year	AAGR
1973-74	15,330		
1983-84	62,470	1973/74-1983/84	30.75
1993-94	598,624	1983/84-1993/94	85.82
2003-04*	237,7678.88	1993/94-2003/04	33.02

Note: The figure for 2003-04 has been extrapolated on the basis of the previous year.
Source: Calculated from the statistics of Director of Foreign Trade, GOI.

Therefore, it can be pointed out that Indo-Gulf economic ties have remained confined to oil, spices and manpower. As the trend shows, the economic relations between India and GCC countries which developed during the oil boom period remained limited in composition despite growth in volume. The GCC countries transacted more extensively with the Western market. But as the decline in oil revenue has forced these countries to diversify their economies by developing the non-oil sector and building capacities to process oil to realize higher value added to their products, India with a market of 100 billion becomes relevant for them. It is not merely energy consumption, but the heavy demand

[257] These figures have been adapted from Abidi, A. H. H., ed. *Indo-Gulf Economic Relations: Patterns, Prospects and Policies*, (New Delhi: Intellectual Publishers, 1989).

for oil-based products like petrochemicals and fertilizers that provided the basis for a more asserted beneficial economic relationship between the two[258].

The Gulf region gained prominence in India's foreign trade particularly after the trade policy liberalization which began in 1991.Trade policy reforms have provided an export friendly free trading environment conducive to accelerated export performance with simplified procedures. In order to promote trade interest India has granted Mutual Most Favored nation (MFN) status to the Gulf countries.

India's principal exports commodities to this region are tea, spices, fruits, vegetables, tobacco, oil cakes, chemicals, drugs and pharmaceuticals, engineering goods, electronic engineering goods, electrical goods, textiles, etc. India's trade with the GCC countries is conducted against payments in free foreign exchange[259]. India's trade and economic relations with the GCC countries is kept under regular review through bilateral Joint Commissions. India has such institutional arrangements with all GCC countries[260]. Table 5.1 shows India's exports to GCC countries from 1997-98 to 2002-03.

Table 5.1: India's exports to GCC region (In US$ million)

Country	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
UAE	1629.56	1867.59	2082.74	2597.52	2491.79	3327.48
Saudi Arabia	689.89	774.29	742.50	822.94	826.43	940.74
Kuwait	178.37	164.67	154.30	199.11	206.25	250.56
Oman	109.29	118.55	132.77	144.62	148.99	198.61
Bahrain	61.20	56.84	60.20	78.67	75.59	99.56
Qatar	44.07	40.16	35.56	63.63	49.00	96.10
Total	2712.38	3022.01	3208.07	3906.49	3798.05	4913.05

Source: Ministry of Commerce, Government of India.

Importantly, the 1990s witnessed large migration of workers from India to the GCC countries and consequent sustained flow of remittances from these countries (see figure 5.1 and 5.2). As per one recent study[261], labour migration from India to Middle East picked up momentum since 1992. Also, in recent years a clear shift towards workers with higher skill noticed in outflow of Indian labour primarily to Middle East.

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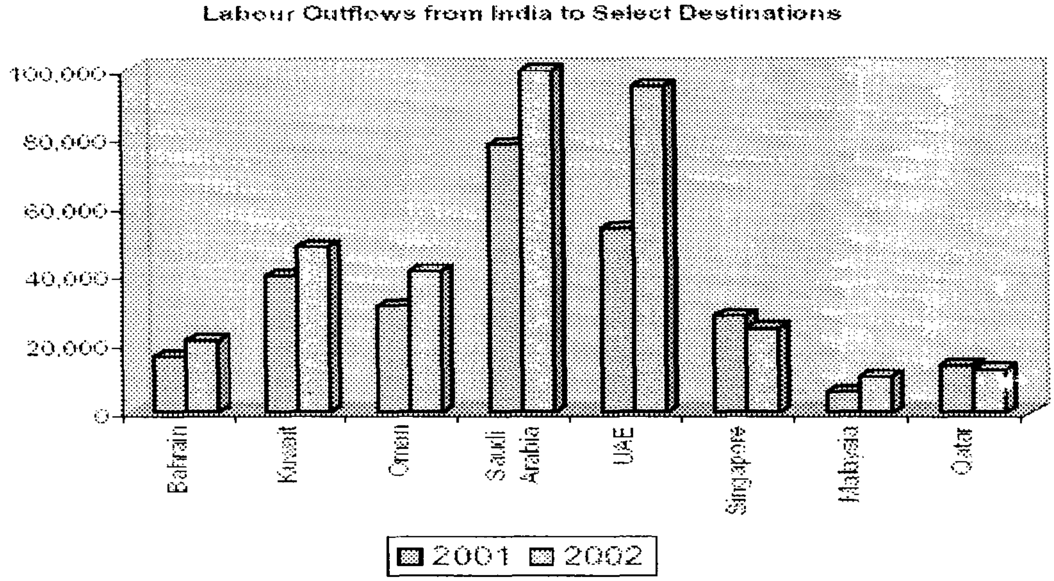
[258] Pant, Girijesh, 'The Changing Gulf Market and India: Trends and Prospects' in A. K. Pasha, ed., *Perspectives on India and Gulf States*, (New Delhi: Détente Publishers, 1999), pp. 112-126.

[259] Ibid, p. 108.

[260] Ibid.

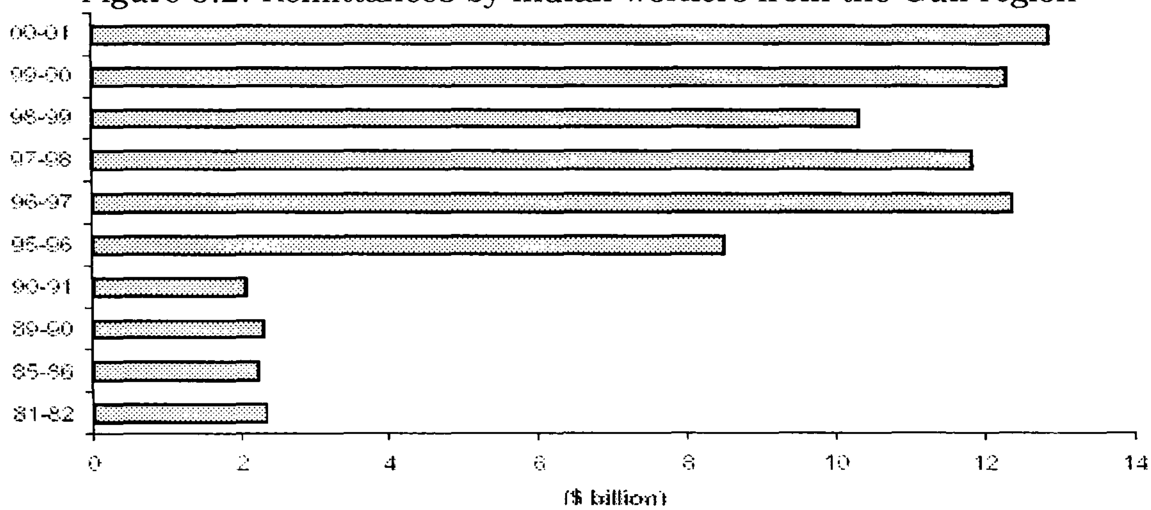
[261] Majumdar, Manab, "Symposium on Movement of Natural Persons", 19 March 2003, Tokyo, for FICCI, New Delhi.

Figure 5.1: Labour Outflows from India to the GCC countries



Source: Federation of Indian Chambers of Commerce and Industry (FICCI), 2003.

Figure 5.2: Remittances by Indian workers from the Gulf region



Source: same as figure 5.1.

Country-wise Analysis of India's Economic Relations with the GCC countries and Prospects in the Phase of Liberalization
India-Bahrain Trade and Economic Relations

Bahrain and India have enjoyed strong economic and trade relations spanning over several centuries. Since the oil boom of the early seventies these relations received a new impetus. Relative prosperity and higher standard of living boosted global imports of goods and services, including from India. Bahrain Government's policy of industrial diversification also played its role in enhancing economic cooperation between the two countries. In addition, new job opportunities attracted a large number of Indian expatriates to the Island.

India and Bahrain signed an economic and technical cooperation agreement in April 1981 during the visit of the Amir to New Delhi. Instruments of Ratification were exchanged in 1983[262]. The first meeting of the Indo-Bahrain Joint Economic and Technical Committee was held in New Delhi in 1986 and the second in Bahrain in 1991. The third session was held in New Delhi on 11- 12 November, 1998. The two sides identified a number of areas of cooperation including economic, commercial, educational, training and cultural.

Joint Business Council

A Joint Business Council (JBC) was set up on 12th October, 1994. The first meeting was held in Bahrain in 1996. At the invitation of the Federation of Indian Chambers of Commerce & Industry (FICCI)) & ASSOCHAM, a 21-member high-level trade delegation organised by the Bahrain Chamber of Commerce & Industry visited India, 17-24 February, to attend the 2nd meeting of the Joint Business Council. The delegation was led by the Chairman of Bahrain Asian Trading Committee (BATC) Hamad Abdul Abul. The delegation comprised of prominent members such as Ebrahim Zainal, Chairman, TRAFCO and Khalid Suwaid of BATELCO. Ebrahim Zainal also visited Anand Dairy in Gujarat and proposed to enter into long term arrangement to source milk powder from India. The visit of the delegation coincided with their visit to a major engineering exhibition organised by the CII – IETF, 2001. FICCI made a number of presentations to the Bahraini delegations on sectors relating to information technology, food industry, telecommunications and small & medium industries. The delegation also had a number of one-to-one meetings with prospective Indian entrepreneurs both for exports as well as setting up joint ventures in Bahrain. The delegation's visit to "IETF 2001- India Expo" resulted in a number of deals with Indian companies for purchase of industrial products. The figures of India's total non-oil exports to and imports from Bahrain for the last five years are given in table 5.2 (also see fig.5.3).

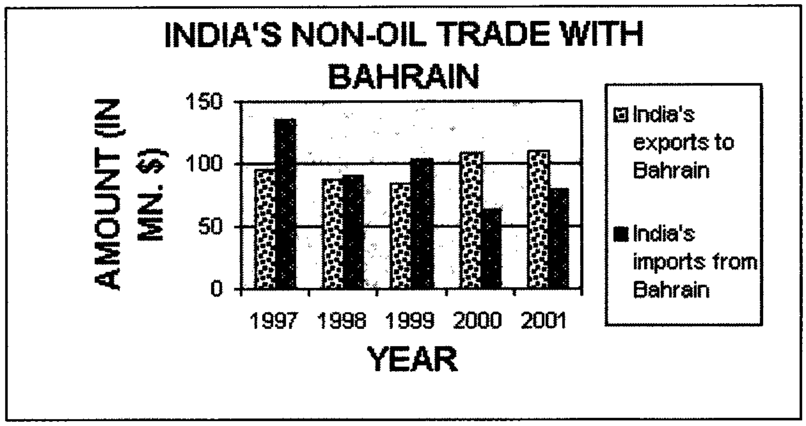
Table 5.2: India's Non-oil Exports to and Imports from Bahrain (figures in million $)

	1997	1998	1999	2000	2001
India's exports to Bahrain	95.3	86.67	83.52	108.16	109.29
India's imports from Bahrain	136.1	90.94	103.41	62.34	78.32

Source: http://www.meadev.nic.in/foreign/bahrain.htm#trd

[262] For details see, http://www.meadev.nic.in.

Figure 5.3



Source: http://www.meadev.nic.in/foreign/bahrain.htm#trd

Table 5.3 shows India's top ten leading export commodities for the year 2000. As evident from the table, textile and textile products is the leading export item to Bahrain, followed by vegetables.

Table 5.3: India's Exports to Bahrain (Leading ten commodities) – 2000

S.No	Commodity	Amount	
		USD (in Million)	BD (in million)
1.	Textiles & textile products	38.05	14.251
2.	Vegetable products	20.38	7.633
3.	Base Metals & Articles	8.48	3.177
4.	Machinery, electrical & electronic equipment and accessories	7.68	2.877
5.	Live animals and Animal products	4.80	1.801
6.	Plastic and related products	3.94	1.475
7.	Chemical and chemical products	3.82	1.430
8.	Mineral products	2.81	1.052
9.	Foodstuffs, beverages, spirit, tobacco etc.	2.72	1.017
10.	Articles of stone, plaster, cement, asbestoes, mica, ceramic products, glassware etc.	2.60	0.974

Source: http://www.meadev.nic.in/foreign/bahrain.htm#trd.

There are good prospects for export of Indian products, particularly agricultural products, sanitary fixtures, drugs & pharmaceuticals, plywood, ceramic tiles, power generation and transmission equipment, light engineering goods, leather products, textiles and related products. Information Technology is the new emerging field of India's exports.

There is a large NRI business community in Bahrain which is engaged primarily in trading activity. They have invested in their business establishments and are regular stockists of Indian products. These include agencies for Titan watches, Onida televisions, Videocon, BPL, Godrej, etc.

Major Contracts and Projects Envisaged

- Videocon - The project has been temporarily shelved as the Videocon are concentrating on their plant in Italy and are likely to commence their negotiations in Bahrain this year.
- Education Consultants of India Ltd. (ED-CIL) - The proposal to open a Gulf Institute of Technology was submitted to the nodal Bahraini Ministries - Education and Labour & Social Affairs. The Economic Development Board of Bahrain has also shown keen interest in the proposal and is pursuing the matter with concerned Ministries.
- Software Solutions of India: India's software education company, SSI would be opening its training centre in Bahrain in association with Jameel Ali Ebrahim Group. The overall outlay of the project has been estimated at BD 100,000 and it would focus on corporate segment training to upgrade the skills of staff in information technology with courses like Impact, e-commerce, Java etc.
- IT-Academy: Pentasoft Technologies Ltd of Chennai, India and Taib Bank of Bahrain have formed a joint venture to establish an IT –Academy in Bahrain. The Academy would provide for a national IT literacy programme, in close association with the Government of Bahrain. The Academy would offer courses on enterprise, engineering and multi-media at the introductory and high-end technical levels.

Favoring closer socio-economic and trade ties with India, Bahrain emphasized the need for stepping up people-to-people contact through increased communication to help discuss issues of mutual benefit. Speaking at a FICCI-CII business meeting, the Prime Minister of Bahrain, Nah Sheikh Khalifa bin Salman Al-Khalifa, said,

> "More frequent visits between the people and officials of both countries would be mutually beneficial as this would give the opportunity to know each others' resources and potential and develop a better understanding. He invited Indian investors to tap the country's potential in areas of IT, tourism and healthcare services even as his Commerce Minister, Ali Saleh al-Saleh, suggested that industries should not be restricted to Bahrain alone as the entire region is a potential market for Indian businessmen and could be easily accessed through a regional base in Bahrain. Highlighting Bahrain's strategic geographical location in the Gulf region backed by solid infrastructure and investor-friendly policies, Al Saleh said he expected "greater investments" from India"[263].

[263] 'Bahrain for closer economic ties with India', on line at http://www.hinduonnet.com, January 14 2004.

The Confederation of Indian Industry (CII) signed a Memorandum of Understanding (MOU) with the Bahrain Businessmen's Association (BBA) to promote bilateral trade and economic activities. The MoU, signed by the chairman of the CII Council for Middle East and Gulf, M.A. Pathan, and BBA's Khalid A. Almoayed, is also aimed at increasing investment in both the countries, joint ventures and technology transfer.

Indo-Kuwait Trade and Economic Relation

India and Kuwait continue to enjoy traditional friendly relations. Geographical proximity, historical trade links, cultural affinities and presence of a large number of Indian expatriates in Kuwait have all continued to sustain and nurture the longstanding relationship over the years. India was a natural trading partner and a destination for higher learning. Until 1961, the Indian rupee was legal tender in Kuwait.

The presence of a huge Indian workforce in Kuwait has ensured close cultural interaction and bond between the two countries. The two countries continue to build on long established commercial relations. This friendship found a new impetus with the discovery of oil in Kuwait with this Kuwait is exporting oil and other petrochemical products to India while numerous commodities are imported from India. In fact India was perhaps the first country to establish trade links with Kuwait centuries ago[264].

Though India was the first country to establish trade links with Kuwait centuries ago, but with the inflow of goods from other parts of the world, it lost its leading position. In 1989, a joint trade committee met in Kuwait to evolve ways and means of diversifying and augmenting trade. However the Kuwaitis were not so receptive about the Indian efforts due to low competitiveness in terms of quality of Indian goods in comparison to goods from other parts of the world. Mr Abdur Rahim, the Director of Foreign Trade in the Kuwaiti Ministry of Commerce at that time remarked that,

> "Although India produces high-quality goods, they are unable to face competition from other foreign goods due to their unimpressive finishing and packaging"[265].

But in the mid-1990s, Indo-Kuwaiti trade registered marked improvement, despite keen competition from countries in the South East Asia, Europe, US and Japan, each persisting to secure a share in an open market condition. During

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[264] Khan, Jawed Ahmad, *India and West Asia: Emerging Markets in the Liberalization Era*, New Delhi: Sage Publications, 1999, p. 95.
[265] Ibid.

1988-89, the country's total exports to Kuwait amounted to Rs. 1.54 billion-an increase of Rs 0.49 billion over the figure for 1987-88. Its corresponding import bill touched Rs. 5.03 billion, an increase of Rs 0.2 billion over the previous financial year. Trade between the two countries also started to pick up after the disruption caused by the Iraqi invasion, but the balance of trade was in favor of Kuwait because of India's oil imports. In 1991-92 Indian exports to Kuwait were of the order of Rs 0.74 billion and imports were of the order of Rs 3.64 billion. India was the third largest trading partner of Kuwait in the year 1999[266].

It is to be noted that a new dimension was added to Indo-Kuwait relationship in the post-Gulf war period when Indian companies played a major role in the restoration of war-ravaged Kuwait in record time. India's economic liberalization policy has opened new avenues to foreign investors. Kuwait has responded positively to the liberalization policy, which has borne fruit in the form of joint ventures between the two friendly states. Kuwait signed one Memorandum of Understanding (MoU) for building a refinery in Orissa.

A number of high-level exchanges have taken place between the two countries aimed at exploring and realizing the potential of bilateral commercial relations. Kuwaiti Fund for Arab Economic Development (KFAED) has played an important role in boosting commercial relation. It was established in 1961 to assist Arab and other developing countries by providing them loans and grants required to facilitate the implementation of their development programme. India is one of the many countries which has benefited and is among the highest recipients of these grants. An important project has been the improvements in the combined electric system in India. This project aims at improving the performance of electricity systems in rural areas of Kerala and Andhra Pradesh, by promoting the conducting and distributing networks to reduce the percentage of deficit of supplied electricity and to improve the quantity and quality of electrical energy in rural areas. The total cost of the project is estimated around $ 48.84 million (around KD14, 8 million).

In the field of Information technology too, there is close collaboration between the two countries, as is evident from the recent visit of Sheikh Ahmad Abdullah Al-Ahmad Al-Jaber Al-Sabah, Communications Minister of Kuwait, to India. Bilateral relations and possibilities of future cooperation between India and Kuwait in the field of communications and IT were discussed. India and Kuwait agreed to a mutual widening of cooperation in the telecom and IT sectors, with

[266] http://www.ikcc.org/objectives.htm..

the focus now being on the development of telecom infrastructure and Information, Communication and Technology (ICT) training.

Apart from this, the two apex bodies in the field of Science and Technology in both countries -- Kuwait Institute of Scientific Research (KISR) and Indian Council for Scientific and Industrial Research (ICSIR) -- have been exchanging views and have been cooperating in conducting higher research. A number of Indian scientists/researchers are working with KISR and other such organizations. A protocol for the cooperation was signed in 1995 which is still in operation. The two countries have a joint committee which identifies various areas for technical cooperation such as oil refining industry, energy optimization in refining and refrigeration industries, periodical seminars, symposia, etc[267].

To give a fillip to the traditional Indo-Kuwait relations, the India-Kuwait Chamber of Commerce (IKCC) was formally inaugurated on 8 December 2003 in the Commission Hall of the FICCI [Federation of Indian Chamber of Commerce and Industries]. The India Kuwait Chamber of Commerce (IKCC) is a registered establishment incorporating members from both India and Kuwait with the avowed objectives[268]:

- To facilitate the expansion of business relationships between India and Kuwait,
- To guide the Indian and Kuwaiti businessmen towards new business opportunities through market research and dissemination of business commercial and regulatory information in India and Kuwait, and
- To analyze the economic and political policy announcements in India and Kuwait through regular reports to help the trade, and to sponsor scholarships, grants, awards in recognition of excellence in the fields of trade, culture and education.

Indo-Oman Trade and Economic Relation

Exchanges between India and Oman go back to centuries. Until the Omani Renaissance that commenced with Sultan Qaboos taking over the reins of the country, Oman almost entirely depended on India to meet its basic necessities. Such extensive commercial interaction helped greatly in laying the foundation for the development of a multi-dimensional relationship between the two countries, in the modern times. Oman has, of late, taken a conscious decision to make India as its main economic partner in its drive towards industrialization

[267] http://www.kuwait-info.com/sidepages/indoku_over.asp.
[268] http://www.ikcc.org/objectives.htm.

and diversification of the Omani economy, taking into account the size of Indian market, and India's industrial capabilities.

Mindful of India's large market and its industrial and technological capabilities, Oman sees India as a major economic partner. The current economic imperatives have made Oman to increasingly look towards India for sourcing both goods and technology. The two countries have already concluded Agreements on Avoidance of Double Taxation and Promotion and Protection of Bilateral Investments, which provide the requisite legal framework for facilitating trade and investment flows. Several local business houses that have had traditional links with India and are keen to explore mutually beneficial opportunities for trade and investment. The presence of a large number of Indians at senior positions at the private sector is a helpful factor in generating awareness on Indian capabilities.

Series of high level visits in recent years have helped to create a political environment that is extremely conducive to expansion of trade and investment ties. While Oman is India's closest friend in the Gulf region, there is also a shared desire at the highest levels to forge a strategic partnership, which would be largely driven by economic and commercial engagement. A MoU to form a Strategic Consultative Group has been concluded between the two countries.

India now (2002) ranks the eighth largest source for imports (about 3.5%) into Oman. Major items of Indian exports include textiles and garments, machinery and equipment, electrical and electronic items, chemicals, iron and steel products in addition to traditional items like tea, coffee, spices, rice and meat products. The bilateral trade figures for the last three years have been as follows as depicted in table 5.4.

Table 5.4: Indo-Oman Bilateral Trade 1998-2000 (US$ million)

	1998	1999	2000
India's exports	164	159	163
India's imports	52.3	28	17

Source: http://www.meadev.nic.in/foreign/oman.htm.

Joint Commission

Arising out of the Agreement on Economic, Trade and Technical Co-operation, the first Indo-Oman Joint Commission Meeting to review economic and commercial co-operation was held in April 1995 in New Delhi. The two delegations were led by the respective Commerce Ministers. Besides reviewing the hydrocarbon agreements, the talks covered the entire gamut of commercial relations with a view to further expanding economic and commercial cooperation between the two countries.

The Second Indo-Oman Joint Commission Meeting was held in October 1997 in Muscat. During the discussions, the Omani delegation made two formal proposals – to set up an Indo-Oman Holding Company and India and Oman entering into a bilateral 'Strategic Trade Agreement'. The joint holding company was proposed to act as a vehicle for setting up joint venture projects[269]. The Indian side reiterated its interest in registration of Indian pharmaceutical companies in Oman to enable them to export their products. Several areas of cooperation including information technology, meteorology, agricultural research, science and technology and civil aviation were identified for bilateral cooperation.

The third Session of India-Oman Joint Commission met in New Delhi in April 2000. Maqbool Sultan, Minister for Commerce and Industry, led the Omani delegation. Omani side, in an advancement of its earlier proposal for a Strategic Trade Alliance, suggested the establishment of a Free Trade Area. It was decided to further examine the proposal in accordance with relevant WTO guidelines.

Joint Business Council

The Joint Business Council (JBC) that was set up as a result of an agreement between FICCI/ASSOCHAM and OCCI (Oman Chamber of Commerce and Industry) during the Joint Commission Meeting in April 1995, held its first meeting in October 1996 during the visit of the President of India.

The fourth meeting of the Joint Business Council was held on the margins of the Joint Commission Meeting held in New Delhi in April 1997, where a high level Omani business delegation participated. Both the JCM and JBC meetings helped to review existing levels of cooperation and devised ways to expand them. IT, Food Processing and Tourism were identified as thrust areas for cooperation.

Joint Ventures

The US$ 969 million Joint Venture Fertilizer Project which is being set up in Sur (Oman) has been finalized. Minister of Fertilizers & Chemicals Shri S.S. Dhindsa visited Muscat in December 1999 and initialed various key agreements including the Urea Off-Take Agreement. Omani companies have several joint ventures functioning in India. OCS International at Bangalore develops computer software, Shantha Biotechniques; Hyderabad produces hepatitis B vaccines,

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[269] The proposal for setting up a Joint Holding Company could not gather momentum in view of the fact that joint venture prospects essentially depend on private sector initiatives on the basis of their anticipated commercial viability.

Nisma Aircon International, Chennai, manufactures heat pump air conditioners and Raha Poly-products manufactures state of the art mattresses. Also the Zubair Group has set up a furniture manufacturing unit in Tamil Nadu in collaboration with the Balaji Group of Chennai. The Bahwan Group has recently set up a software development facility at Bangalore.

As for Indian companies that have set up joint ventures in Oman, L&T is active in the field of civil construction with their local partners and Asian Paints is in the process of starting commercial production in a paint manufacturing unit. Renewable Energy System Ltd. is putting up a joint venture in Oman for production of Silicon Wafers.

In addition to joint venture arrangements, a large number of Indian companies have executed large and prestigious projects in Oman. BHEL has been active in the power sector, has already put up two power plants (30MW and 60MW respectively) and is presently executing a US$ 50 million power project. Larsen & Toubro have carried out an extension of the largest cement project in Oman at Salalah and are currently involved in construction work for a Pharmaceutical and Steel Billet Plant. Essar Oil Ltd. has, in the past five years succeeded in the face of stiff competition to win contracts to supply 5 drilling rigs and personnel to PDO in Oman for drilling oil and gas at an approximate contract value of US$ 95 million. They are the second largest drilling contractor in Oman after SEA LAND, an American group. Dodsal Ltd has been actively involved in laying oil and gas pipelines for PDO. They have won a major contract worth US$ 180 million for laying gas pipeline from the central gas fields to Salalah. M/s Jyoti Structures has also won a US$ 60 million electrical transmission project. Two other Indian companies have recently won contracts, these include, KEC - a transmission Line Project worth US$ 45 million and TCIL – Expansion of Telecommunication Network. Consultancy Engineering Services (CES) have been active in Oman and have executed several prestigious projects including consultancy services for construction of buildings for government ministries, expansion of facilities at the International Airport. Recently two Indian companies, M/s Saw Pipes and M/s Welspun Pipes have won US$ 10 million order each for supplying pipes for oil and water sectors respectively. A number of Indian companies are showing interest in bidding for projects in Oman.

Moreover, the state owned Bharat Heavy Electricals (BHEL) has successfully commissioned a 70 mega watt (mw) gas turbine power unit in Oman[270]. The unit

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[270] 'BHEL commissions power unit in Oman', The Times of India, 26 March 2004.

has been commissioned for Petroleum Development Oman (PDO), a joint venture between Oman government, Total, Shell International and Partex. In fact, this is the first advanced class gas turbine ever to be exported from India and the first state-of-the-art advanced gas turbine-based generating unit in the Sultanate of Oman. Bhel had achieved a breakthrough by bagging this export order for setting up a 140 mw gas turbine-based turnkey power plant from PDO. The order envisaged supply, installation and civil construction of two turbines of 70 mw each for its project at Qarn Alam. The project is scheduled for completion by June 2004.

Technical Cooperation

It is estimated that some 2,000 Indian doctors work for Ministry of Health, Royal Guard of Oman, Oman's Armed Forces, and Royal Oman Police and in clinics in private sector. India has also provided experts to Government of Oman on request include cartographic experts, statistics consultants, survey officers, enumerators for census operations, consultants for price index etc. There are also some 30 Indians in the Sultan Qaboos University's various departments and faculties.

Under the ITEC, GOI provides 40 slots for Omani nationals to avail of training facilities in diverse areas such as development administration, planning and management, fertilizer quality control, computer software and hardware, rural industry promotion and maintenance of electronic systems. India has also assisted Oman in setting up the Information System Audit Function in its State Audit Department, on the pattern of the Indian Comptroller and Audit General's office.

Financial Sector

The Bank of Baroda has been functioning in Oman since 1976 with 3 branches. In addition, the Syndicate Bank and State Bank of India have set up exchange houses in collaboration with local Omani companies. The New India Assurance Co. set up a full-fledged office in Oman in 1975 in collaboration with a local partner and has been providing insurance service to both the Indian expatriate population and the Omani public. Oman International Bank has been functioning in India from October 1985 and has 2 branches, in Bombay and Cochin. It has also signed a MoU with India Investment Centre for economic and industrial cooperation between India and Oman. Bank Muscat Al Ahli Al Omani opened a branch in Bangalore in September 1998.

Further opportunities

Awareness of Indian products, geographical proximity and presence of large Indian expatriate community constitute a significant potential for increasing exports to Oman, especially when there is an increasing sense of cost-consciousness in the local market. Apart from food items, chemical and pharmaceutical products, plastic products, synthetic fiber and yarn, ceramic products, iron and steel products, machinery and appliances and information technology products hold significant potential. Manpower development is yet another area where India has a distinct edge in this market.

Significant opportunities also exist for Indian companies to participate in the industrial diversification and privatization plans of the Government. The main thrust areas[271] are Information Technology, Food Processing, Pharmaceutical Products, Sponge iron & steel rolling mills, Petrochemical sector, Precision engineering industries, Metallurgical Units, and Privatization of infrastructural facilities, etc.

Indo-Qatar Trade and Economic Relation

India's traditional and historical friendship with Qatar has over the years matured into a strong relationship, which makes both the sides' reliable economic partners having shared interests in trade and commerce, economic and technical cooperation and energy security. From the economic standpoint, there is a growing synergy between India and Qatar in the hydrocarbons and other industrial sectors[272]. Indian private sector companies are getting more and more involved in industrial and civil construction and consultancy projects in Qatar.

The economic framework for bilateral cooperation is well in place. The Avoidance of Double Taxation Agreement (DTAA) and Bilateral Investment Promotion and Protection (BIPA), which were signed during the visit of Qatari Emir His Highness Sheikh Hamad Bin Khalifa al-Thani to India in April 1999, have since been ratified and are in force. The first meeting of the Joint Business Council (JBC), launched between the Qatar Chamber of Commerce and Industry (QCCI) and the Federation of Indian Chambers of Commerce (FICCI) is scheduled to take place in October 2001. The other Memoranda of Understanding (MoUs) signed by QCCI with the Confederation of Indian Industry (CII) and the National Small Industries Corporation (NSIC) are under different stages of implementation.

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271 http://www.meadev.nic.in/foreign/oman.htm

272 Sayeed, Ausaf, "India-Qatar: Synergy in the Oil & Gas Sectors", http://www.indianembassy.gov.

Trade

India is the 5th largest destination of Qatar's exports, behind Japan, Singapore, South Korea and Thailand and the 10th most in terms of value of Qatar's imports. According to the latest Economic Statistics Indicators released by Qatar's Planning Council, India's exports to Qatar during the first half of 2000 crossed QR 190.92 million, while its imports from Qatar during the corresponding period reached QR 280.55 million. India is the topmost supplier of Qatar for Ready-made Garments, Tea and vegetables. India also has a significant share in Qatar's import market for Rice (23.98%), Marble (11.74%), Gold & Precious Metals (10%), Bus Tyres (7.42%), Beauty Products (6.43%) and Textiles and Ceramics (each over 5%). During 1999, India's exports to Qatar stood at QR 238.52 million while its imports form Qatar stood at QR 567.74 million.

The Indo-Qatar bilateral trade increased by 14.29% in the first 9 months of the financial year (April-December 2000) as per the latest statistics released by the Directorate General of Foreign Commercial Intelligence and Statistics (DGCIS), Kolkatta. The total trade increased from Rs.3841.73 million during April-December 199 to Rs.4390.91 million during April-December 2000. India's imports from Qatar increased by 7.31% from Rs.2716.28 million to Rs.2914.92 million while India's exports to Qatar increased by 31.14% from Rs.1125.44 million to Rs.1475.99 million. Inorganic chemicals, organic chemicals, artificial resins and plastic materials, and sulphur and unroasted pyrates were the top five commodities of India's import from Qatar. Machinery and instruments, RMG cotton, cotton yarn, fabrics and made-ups, paper and wood products and glass, glassware and ceramics were the top five commodities exported by India to Qatar during April-December 2000. According to the latest statistics published by Qatar's General Secretariat of Planning Council, India is ranked as the 7th destination of Qatar exports and 10th biggest supplier of goods to Qatar during 1999.

Table 5.5: INDO-QATAR BILATERAL TRADE 1995-96 TO 1999-2000 (value in $ million)

Year	Total Trade	Imports from	Exports to	% increase in (T.Trade)
1995-96	143.783	108.577	35.206	17.08
1996-97	168.339	133.777	34.562	17.07
1997-98	146.360	101.35	45.010	-13.05
1998-99	111.88	72.21	39.67	-23.55
1999-2000	128.57	92.44	36.13	20.33
2000-2001 (April - August)	50.37	33.52	16.84	7.46

Source: Directorate General of Foreign Trade (DGCIS), Calcutta.

Table 5.6: Top Fifteen Commodities of India's Export to Qatar

S. No.	Commodity	Value in Rs. Million for the period April 1999–December 1999	Value in Rs. Million for the period April 2000–December 2000
1	Machinery & Instruments	121.09	168.44
2	RMG Cotton Including Accessories	77.71	86.65
3	Cotton Yarn Fabrics and Made-ups	126.63	59.79
4	Paper Wood Products	43.65	55.58
5	Glass, Glassware, Ceramics, Refractories Cement	12.1	43.26
6	Machinery & Transport Equipment		
7	Paints, Enamels, Varnishes	21.61	40.22
8	Plastic & Lenoleum	47.35	28.53
9	Oil Meals	23.68	28.45
10	Rice Basmati	18.77	28.34
11	Primary & Semi finished Iron & Steel	43.73	26.53
12	Manmade Yarn Fabric Madeups	41.08	25.58
13	Processed Minerals	61.7	24.8
14	Rice other than Basmati	8.72	24.29
15	Fresh Vegetables	35.73	23.5
	GRAND TOTAL	1125.45	1475.99

Table 5.7: Top Commodities of India's Import from Qatar

S. No.	Commodities	Value in Rs. Million for the Period April 1999-December 1999	Value in Rs. Million for the period April 2000-December 2000
1	Inorganic Chemicals	1033.44	1648.64
2	Organic Chemicals	545.14	530.29
3	Artificial Resins Plastic Materials	423.13	364.72
4	Sulphur & Unroasted Iron Pyrates	140.5	312.68
5	Transport Equipment	44.37	32.11
6	Machinery Except Electrical & Electronics	31.22	18.27
7	Fertilizer Manufacture	391.54	0
	GRAND TOTAL	2716.28	2914.92

Source: http://www.trade-India.com/exim/country.

An analysis of the latest trade statistics of Directorate General of Commercial Intelligence & Statistics (DGCI&S), Kolkata reveals that India's exports to Qatar increased by a phenomenal 87.7% during the last financial year i.e. April 2000-March 2001 (see table 5.8). This is the highest percentage growth among India's exports to the other GCC countries -- UAE, Saudi Arabia, Oman, Kuwait and Bahrain. In actual terms, the exports increased from Rs.1540.90 million during April 1999-March 2000 to Rs. 2893.91 during April 2000-March 2001.

Significantly, this increase in exports is not limited to just traditional areas of exports like agricultural products, but extends to diverse areas like project goods, machinery & instruments, Ready-made garments, bulk drugs & pharmaceuticals and ores and minerals. Interestingly, project goods earned revenue of Rs.814.26 million from zero in the previous year. This is primarily due to the project works undertaken by Indian companies like Dodsals, Larsen & Toubro, Bharati Shipping and Dalal Consultancy, which have all won major contracts in Qatar during recent times. The other items that showed an increase in exports include Machinery & instruments from Rs 177.01 million to Rs 236.04 million, Ready Made Garments of cotton from Rs87.87 million to Rs 137.44 million, Cotton fabrics from Rs 66.5 million to Rs 119.48 million, Paper & Wood products from Rs 39.33 million to Rs 88.82 million, Transport equipment from Rs 18.19 million to Rs 63.68 million, Plastic & Linoleum products from Rs 32.4 million to Rs 63.55 million and Ores and Minerals from Rs 18.73 million to Rs 31.06 million.

India's imports from Qatar fell by 12.02% from Rs 4029.50 million during April 1999-March 2000 to Rs 3544.85 million during the last financial year. Interestingly, there was no import of fertilizers from Qatar during April 2000-March 2001, while in the previous year India had imported manufactured fertilizers valued over Rs 396 million. Likewise, import of organic chemicals also showed a fall of 12% from Rs 943.95 million in April 1999-March 2000 to Rs 829.75 million during the last financial year. India's total trade with Qatar, however, increased by 15.59% to Rs. 6.438 billion during April 2000-March 2001 from Rs. 5.570 billion in the previous financial year.

Table 5.8: India's Bilateral Trade with Qatar 1999-2001(Figures in Rs Million)

	Total Trade	Imports From	Exports to
April 1999- March 2000	5570.40	4029.50	1540.90
April 2000- March 2001	6438.76	3544.85	2893.91
% Change	(+) 15.59 %	(-) 12.02 %	(+) 87.8%

Source: Directorate General of Commercial Intelligence & Statistics (DGCI&S), Kolkatta.

Hydrocarbons

One of the most significant aspects of India's relations with the State of Qatar is cooperation in the hydrocarbons sector. The geographical proximity between India and Qatar virtually ensures mutually beneficial interaction in the field of energy on a long-term perspective. There are enormous opportunities for expanding bilateral linkages in the hydrocarbon sector in the fields of exploration, refining, marketing, petrochemicals and fertilizers.

LNG

India does not import any oil from Qatar. However, it has firmed up arrangements for import of LNG from Qatar on a long-term basis. Import of LNG constitutes the most important facet of India's bilateral economic relations with Qatar. After the conclusion of the Sales and Purchase Agreement (SPA) in June 1999 between India's Petronet LNG and Qatar's RasGas for supply of 7.5 MMTA of LNG to Petronet starting from 2003 for a period of 25 years, both the sides have taken steps to tie up the transportation arrangements. Both the sides are also keen to take equity in each other's projects to make their relationship stronger. Petronet is keen to take 5% equity in the RasGas II expansion venture by investing Rs 1.15 billion ($26.7 million). RasGas in turn plans to take 10% equity in Petronet LNG. On January 30 2004, the first LNG imports came to India from Qatar[273].

There has been no fresh progress in the LNG negotiations by other parties, although India's Dakshin Bharat Energy Consortium (DBEC) had concluded a Heads of Agreement (HoA) with RasGas in August 1999 for supply of 2.5 MMTA over a period of 20 years for 1886 MW power plant in Ennore in Tamil Nadu. LNG is required for several private sector projects in India like the Indigas project at Trombay, GPPL-British Gas project at Pipavav, Reliance project at Jamnagar and India Gas project at Vembar. Qatar could be the likely source of LNG for these projects, though some other countries in the region are also in a position to supply gas.

Fertilizers

India is a major buyer of organic chemicals (ethylene, propylene, etc.) inorganic chemicals (ammonia, fertilizers (urea) and plastics (polyethylene) from Qatar. India has substantial dealings with the Qatar Fertilizer Company (QAFCO) and the Qatar Petrochemical Company (QAPCO). India buys about 22% of the total ammonia and 66% of the total urea produced by QAFCO.India had imported about 215,920 metric tonnes of ammonia from Qatar during 1999, which was valued at $ 24.1million. This is an increase of 32.62% from the 162,800 metric tonnes of ammonia valued at $ 21.2 million during 1998. The Qatar Fertilizer Company (QAFCO) has long-term agreements with India's Oswal Chemicals and Fertilizers and Southern Petrochemicals Industries Corporation Limited (SPIC) for supply of ammonia. India also imported 147,160 metric tonnes of urea from Qatar in 1999 valued at $ 11.1 million while in 1998 it had imported 198,000 metric tonnes valued at $ 18.1 million (see table 5.9).

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[273] The Economic Times, 30 January 2004.

Table 5.9: India's import of Urea and Ammonia from Qatar (1994-1999(Value in 000 metric tonnes)

		1994	1995	1996	1997	1998	1999
Urea	Qatar's Total Production	857.8	886.0	870.2	1440.0	1686.0	N.A.
	Exports to India	320.0	292.0	306.0	348.0	198.0	147.16
Ammonia	Qatar's Total Production	785.3	794.1	783.1	1147.5	931.0	N.A.
	Exports to India	241.0	234.0	180.0	215.0	162.8	215.92

Source: Department of Industrial Development, Ministry of Industry, Energy, Electricity & Water, on the site http://www.indianembassy.gov.

Petrochemicals

India is an important buyer of low-density polyethylene (LDPE) and ethylene from Qatar. During 2000, India imported 28.03 million kilograms of polyethylene from Qatar, as against an import of about 30.94 million kilograms (valued at US$ 17.95m) during 1999. India also imported 56.90 million kilograms of ethylene valued at US$ 25.02 million from Qatar during 1999. However, during 2000 there was a drop in India's imports by 25.7 million kilograms from Qatar and the total ethylene imports stood at 31.20 million kilograms. India's import of polyethylene from Qatar constituted about 7.84% of Qatar's total exports of polyethylene during 2000, while its import of ethylene constituted nearly 39% of Qatar's total export of ethylene (see table 5.10).

Table 5.10: India's Import of Polyethylene & Ethylene From Qatar (1996-2001)(WT: million kilograms)

		1996	1997	1998	1999	2000	2001 (Q1)
Polyethylene	Qatar's Total Exports	178.8	345.63	357.49	386.34	357.25	93.86
	Exports to India	10.3	23.75	30.43	30.94	28.03	7.76
Ethylene	Qatar's Total Exports	114.7	120.38	136.74	103.52	80.10	23.32
	Exports to India	61.9	44.70	33.32	56.90	31.20	4.42

Source: same as table 5.6.

Consultancy & Projects

The signing of a long-term LNG deal with Qatar has thrown open new vistas of opportunities to Indian companies to participate in upstream and downstream activities in Qatar especially in the fields of consultancy, turnkey projects and subcontracting in energy-intensive and export-oriented projects including LNG, Oil, Fertilizer, Petrochemicals and other major civil construction projects.

Leading Indian companies like Dodsal, Larsen & Toubro and Dalal Consultants have established their presence in Qatar. Dodsal is presently working on a $ 60 million subcontract for Qatar Chemical Company (Q-Chem) plan at Mesaaied. Larsen & Toubro has bagged a contract worth Rs 5.3 billion for construction of two stadiums in Qatar for the forthcoming Asiad-2006. It is understood that L & T may get a similar contract for construction of two more stadiums. The Dalal Consultants, who has been working with the Ministry of Energy, Industry, and Electricity & Water as well as with other agencies in Qatar for the past five years, is currently working on the design and construction of a new industrial city in Qatar meant for medium and small industries and another project for an offshore platform.

Essar Oil successfully completed an EPC contract worth QR 15 million which was awarded to it for changing pipelines at Dukhan oil field. Essar had earlier executed a contract worth $ 62 million for Qatar Petroleum for supply and operation of oil drilling rigs. Another Indian Company Furnace Fabrica had bagged a QR 4.57 million contract from Qatar Industrial Manufacturing Company for supply of Machinery and equipment to Qatar Sulphuric Acid Company, which is being built at Mesaaied.

Oil and Natural Gas Corporation of India (ONGC) has signed a MOU with Mannai Corporation to provide a spectrum of services to upstream oil and gas sectors of Qatar. The Institute of Oil and Gas Production Technology, an arm of ONGC, has tied up with Specialized Oil Services (SOS) of Qatar for providing consultancy and training services to Qatar Petroleum, QatarGas, RasGas and other oil drilling companies in Qatar. The Indian Oil Corporation (IOC) is expected to join hands very soon with a leading business group in Qatar to explore possibilities of providing technical consulting, training and manpower management, apart from bidding for various maintenance and engineering jobs. Earlier a senior delegation from IOC and Gas Authority of India Limited (GAIL) visited Qatar to study the possibility of setting up of a dimethyl Ether (DME) plant. The Engineers' India Limited (EIL), which has been providing engineering services for Qatar's National Oil Distribution Company (NODCO) refinery expansion and planning, is set to re-open its office in Doha. Other leading Indian companies like Bharat Heavy Electricals Limited (BHEL), Indian Petrochemical Corporation Limited (IPCL), Fertilizer Corporation of India, Bridge & Roof, Dredging Corporation of India, Tata Projects, Associated Cement Companies Limited (ACC), Simplex Concrete Piles Limited and Otto India Private Limited have shown interest in different segments of Qatar's economy. Besides, two of India's leading valve manufacturers, Audco India Limited and Man Group have shown keen interest in supplying valves and pipes to Qatar Petroleum and RasGas.

Shipping

Ship Building has emerged as a new area for cooperation between Indian and Qatari companies. In July 2001, India's leading private shipyard, Bharati Shipping which has been engaged in the design and construction of all types of seagoing/inland vessels up to 125m length for over two decades, bagged a prestigious contract valued at $4.5 million from M/s Halul Offshore Services Co for building one Wireline Support Vessel which will be used by the Qatari company for offshore services for Qatar Petroleum. This is the second major contract won by the Bharati Shipyard from Q-ship. Bharati Shipyard had already built and delivered four tugs for Q-Ship's Harbour Towage operations at Mesaieed Port for Qatar Petroleum, fulfilling the terms of a $15mn 10-year-contract contract signed by it in November 1999 with Q-Ship. Another leading Indian shipbuilder ABG Shipyard Limited has entered into a $27.47 million (QR 100 million) contract with Halul Offshore Service (HOSC) in January 2001 for building and launching four identical 60m anchor handling tug/supply vessels. The vessels are expected to be in service in the first quarter of 2002. The Indian company also won another contract from HOSC on 10th July, 2001 for construction of one Wellhead Maintenance Vessel.

Information Technology

A Hyderabad-based company Quba Software Limited has executed a major project for the Qatar Football Association. Recently Chennai based IT company Banyan Networks, which specialises in Networking and Telecom Systems Architecting, has made a presentation to Q-Tel about their proposals for carrying out e-governance projects in Qatar. Other leading software companies like Mumbai-based e-Melcosoft Technologies and Hyderabad-based Organon Management Services are keen to share their expertise with Qatar.

All the above developments indicate that there is a mutual recognition of the strengths and complementarities between the Indian and Qatari companies. This is also a testimony of the growing confidence of Qatar in Indian technology. The economic relations between India and Qatar are rapidly expanding and diversifying. Both countries have shown an urge to march forward together with greater confidence by forging a mutually beneficial and enriching relationship in all sectors.

Problems and Prospects

Indian exports must adhere to quality as Qatari's orientation towards Western products is essentially due to their perception that the Western product quality standards are high. Indian suppliers have to compete with their competitors aggressively and adhere to strict quality control standards and delivery schedules. The Qatari authorities are very strict about quality of goods being imported into the country. In addition, participation of Indian suppliers in trade exhibition/fairs held in Qatar is either nil or very poor.

Strategy for Increasing Exports

Bridging the information gap by participation in the seminars, conferences and trade-fairs, evolving aggressive marketing strategies, and increasing the competitiveness and quality of products are the strategies to penetrate the booming Qatari market. Focus should be given to the export of non-traditional items such as project goods, computer software and hardware, electronics, oil field equipment, heavy engineering goods, automobile spare parts etc. Additional efforts by Indian trade promotion organizations, like CII, FICCI, and FIEO etc towards export promotion of Indian goods in Qatar. Reputed Indian companies should be encouraged to establish Representative offices in Qatar for aggressive promotion of their products.

Projects /Contracts/Joint Ventures[274]

- Indian Shipbuilder Bags QR 100 million Contracts: Indian Shipbuilder ABG has entered into a QR 100 million contract with Halul Offshore Service (HOSC) in January 2001 for building and launching four identical 60m anchor handling tug/supply vessels. The vessels are expected to be in service by the year 2002. This is the second time that an Indian company has bagged a prestigious contract from Qatar.
- Larsen & Toubro Bags Qatar Stadia Contracts: Larsen & Toubro of India has bagged a contract in September 2000 to construct two stadia in Qatar for Rs.5.3 billion. The work involves construction of a sports stadium at Umm-al-Afaai with a seating capacity of 25,000 and another stadium of 20,000 seating capacity at Garaffa in Doha. The stadium is being built ahead of 2006 Asian Games for which Doha was name as the venue.
- Indian Firm Bags QIMC Contract: A leading Indian company Furnace Fabrica Company has bagged a QR 4.57 million contract in May 2000 to supply machinery and equipment to Qatar Sulphuric Acid Company, a venture fully owned by Qatar Industrial Manufacturing Company (QIMCO). The QR 9mn Suplhuric Acid Company is expected to go on stream by the end of 2001.
- Bhilai Engineering Corporation Ties Up with Qatari Company: A leading company Bhilai Engineering Corporation (BEC) has entered into an exclusive agency agreement with local Teyseer Industrial Supplies and

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[274] Commercial and Economic Report for Qatar for the Month of March, 2001, http://www.trade-india.com/exim/country_focus/qatar_aug16.html?type=country.

Services (TISSCO) in May 2000. BEC specializes in manufacturing intricate castings and equipments for turnkey projects and heavy industries like steel, mining, cement, oil and gas etc will join hands with TISSCO for participating in future projects and contracts in Qatar in the above areas.

- Dalal Consultants Opens Doha Office: The leading Indian consultants Dalal Consultants & Engineers Limited opened their office in Doha in January 2001. Dalal Consultants & Engineers have been working in Qatar for the past 5 years with the Ministry of Energy, Industry, Electricity and Water as well as other agencies. The Indian company has executed several important projects in Qatar as is currently working on the design and construction of a new Industrial Area meant exclusively for medium and small industries next to the existing Salwa Industrial Area.

Thus all the above developments indicate that there is a mutual recognition of the strengths and complementarities between the Indian and Qatari companies. This is also a testimony of the growing confidence of Qatar in Indian technology. The economic relations between India and Qatar are rapidly expanding and diversifying. Both countries have shown an urge to march into the new framework of interdependence with greater confidence by forging a mutually beneficial and enriching relationship in all sectors.

Indo-UAE Bilateral Trade and Economic Relation

Trading links between India and UAE have existed since long. Growing Indo-UAE economic and commercial relations over the years has contributed to the stability and strength of a rapidly diversifying and deepening bilateral relationship with both sides striving to further strengthen these ties[275].

The bilateral trade between India and UAE which was Rs.12, 905.25 crore in 1997-1998 rose to Rs.15, 203.44 crore in 2001-2002. In this period the rate of average growth in trade was 5.85 per cent. Except the years 1997-1998 and 1999-2000 the balance of trade between India-UAE has always been in favor of India. The average growth rate of export-import between UAE and India has remained at 17.13 per cent and 9.88 per cent respectively. The bilateral trade between India and UAE mainly comprises merchandize goods. India mainly exports gems and jewellery, RMG cotton, man made yarn, metal products, plastic and linoleum products and electronic goods. India's exports to the UAE are well diversified with a large basket. Major items India's exports to UAE have been RMG cotton including accessories, gems & jewellery, manmade yarn, fabrics and made-up, manufacturers of metals, cotton yarn, fabrics and made-up, marine products, machinery & instruments, plastic & linoleum products, tea

[275] http://www.indembassyuae.org/text2.htm.

and meat & preparations. Similarly, major items of imports from UAE include petroleum and petroleum products, gold & silver, metal ores & metal scrap, sulphur and unroasted iron pyrites and pearls, precious and semiprecious stones.

Indo-UAE trade, valued at US$ 180 million per annum in the 1970s, is today at US$ 4284.47 million (2002-2003). India is the sixth largest exporter to the UAE after Japan, USA, Germany, China and UK. UAE is the second largest destination for India's exports after USA. The statistics of Indo-UAE bilateral trade for the last five years are summarized below in Table 5.11 (also see figure 5.4). There is also prominent presence of Indian companies in UAE.

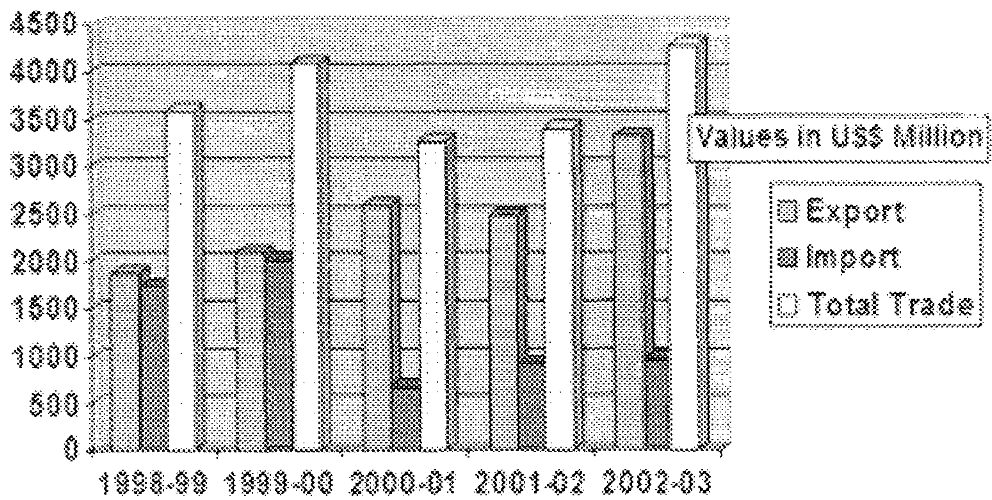
Table 5.11: Summary of Indo-UAE Bilateral Trade, 1998/99-2002/03 (Values in US$ Million)

	Year				
S.No	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
1. EXPORT	1,867.59	2,082.74	2,597.52	2,491.79	3,327.48
2. %Growth		11.52	24.72	-4.07	33.54
3. IMPORT	1,721.24	2,003.24	658.98	915.09	956.99
4. %Growth		16.38	-67.1	38.86	4.58
5. TOTAL TRADE	3,588.83	4,085.98	3,256.51	3,406.88	4,284.47
6. %Growth		13.85	-20.3	4.62	25.76
7. TRADE BALANCE	146.35	79.49	1,938.54	1,576.70	2,370.49
7. Exchange rate: (1US$ = Rs.)	42.0706	43.3327	45.6844	47.6919	48.3953

Note : Since 2000-2001, India's import figures (given above) do not include imports of Petroleum Products and Crude Oil

(Source : Foreign Trade Statistics issued by DGCIS, Calcutta)

Figure 5.4: Indo-UAE Bilateral Trade 1998/99-2002/03



Indo-Saudi Bilateral Trade and Economic Relations

India and Saudi Arabia are old business partners: their trade relations go back to centuries old. Today, the bilateral business ties are being steadily expanded and further strengthened by continuous interaction and cooperation, including regular exchange of business delegations. Besides being a major trade partner, India sees the Kingdom as an important economic partner for investments, joint ventures, transfer of technology projects and joint projects in third countries.

Institutional framework for improving trade and economic relations in the form of Joint Commission for economic, trade, scientific, technical and cultural cooperation (JCM) between India and the Kingdom was established in 1981. A meeting of the Indo-Saudi Joint Business Council was held in 1997 in New Delhi and FICCI has proposed to hold the next session in Riyadh soon. A Bilateral Investment Protection and Promotion Agreement (BIPPA) have been finalized between the two countries in June 2001 and are expected to be formally signed soon. This will provide institutional mechanism to protect and further enhance economic interaction between the two countries. A proposal for Double Taxation Avoidance Agreement is also under active consideration.

Saudi Arabia is the 14th largest market for India and accounts for over 7 percent of India's total exports. On the other hand, India is the fifth largest market for Saudi Arabia accounting for about 4.5 percent of its total exports. India ranks 10th in terms of imports by Saudi Arabia accounting for 2.8 percent of its total imports (see table 5.12). Indian commodities that can enjoy bigger share in the Saudi market include basmati/non-basmati rice; tea; man-made yarn and cotton yarn. On the other hand India can step up imports of crude oil; iron; pyrites; non-ferrous metals; ores; metal scarps and dates.

Indo-Saudi bilateral trade today is over US$ 5 billion of which import of crude oil from the Kingdom alone accounts for over US$ 4 bn. Crude imports from Saudi Arabia jumped by 41.2% to 18.816 million tonnes in fiscal 2002-03 compared with 13.321 million tonnes in the previous fiscal. India's exports to Saudi in 2002-03 stood at US$ 941 million compared with US$ 742 mn in 1999-20. India's trade deficit with the Kingdom has widened to US$ 2.7 bn. Currently India's export to Saudi Arabia mainly constitutes of cereals, man-made filament, apparels & clothing, iron and steel.

Table 5.12: India's Trade with Saudi Arabia (1997-98 to 2002-03) (In US$ million)

	1998-99	1999-2000	2000-01*	2001-02	2002-03
Export	774.29	742.50 (-4.11)	822.94 (10.83)	826.43 (0.42)	940.74 (13.83)
India's total export	33218.72	36822.49	44560.29	43826.73	52719.43
Share in total export	2.33	2.02	1.85	1.89	1.78
Import	1831.47	2419.24 (32.09)	621.12 (-74.33)	463.99 (-25.30)	504.72 (8.78)
India's total import	42388.71	49738.06	50536.46	51413.29	61412.13
Share in total import	4.32	4.86	1.23	0.90	0.82
Total Trade	2605.76	3161.74	1444.06	1290.42	1445.47
India's total trade	75607.44	86560.55	95096.75		
Share in total trade	3.45	3.65	1.52	1.35	1.27
Trade Balance with SA	-1057.18	-1676.74	201.82	362.45	436.02
India's trade balance	-9169.99	-12915.57	-5976.16	-7586.56	-8692.70

SOURCE: Ministry of Commerce, Government of India

Note: The country's total imports since 2000-01 does not include import of petroleum products (27100093) and crude oil (27090000). Figures in bracket represent year-on growth.

The direction of trade, both in terms of exports to and imports from India from 1960-61 till 2001-01 is shown in the table 5.13.

Table 5.13: Direction of Trade: Imports from Saudi Arabia

Year	Imports from SA		Exports to SA	
	Value in Rs.Crores	Percentage Share	Value in Rs.Crores	Percentage Share
1960-61	14	1.3	3	1.3
1970-71	24	1.5	15	0.9
1980-81	540	4.3	165	2.5
1990-91	2899	6.7	419	1.6
1995-96	6773	5.5	1613	1.5
1998-99	7705	4.3	3257	2.3
1999-00	10483	4.9	3218	2.0
2000-01	2838	1.2	3760	1.8

Source: DGCI &S.

Main Indian exports to Saudi Arabia are basmati/non-basmati rice, tea, manmade yarn, fabrics, made-ups, cotton yarn, primary and semi-finished iron and steel, chemicals, plastic & linoleum products, machinery and instruments. India's major imports from Saudi Arabia are petroleum and petrochemical products. Saudi Arabia is the largest supplier of crude oil to India. It provides around a quarter of India's crude exports. During 2002-2003, the India's imports of Crude Oil and petroleum products from Saudi Arabia amounted to 18.816 million metric tonne(MMT) worth approximately US $ 3.6 billion (see annexure 5.1 &5.2).

Indian Manpower

Contribution by Indian manpower to Saudi economy is an important dimension of the Indo-Saudi relationship: 1.3 to 1.4 million Indians is at present working in Saudi Arabia, over 90% of who are in the blue-collar category. These people have made immense contribution to Saudi economy, and they play an important role in strengthening the Indo-Saudi bilateral relations. Cooperation in the field of manpower is an important dimension of the Indo-Saudi relations. Remittances to India by Indian expatriates are estimated at US$ 3 billion annually.

Indian Investment and Joint Ventures

Since mid-2000, a number of Indian firms have taken advantage of the new Saudi laws and established joint venture projects or wholly-owned companies in the Kingdom. According to Saudi Arabian General Investment Authority (SAGIA), during last two years it has issued new 65 licenses to Indian companies for joint ventures or 100% owned entities, which were expected to bring a total investment of around US $ 362 million in Saudi Arabia. In addition, several Indian companies operate in Saudi Arabia in collaborations with local Saudi companies.

Saudi investment in India

Attracted by emerging business opportunities in India, the Saudi investment in India is growing. Saudi Arabia is the 22nd biggest investor in India with investments during 1991- 2002 amounting to US $ 170 million. There are more than 55 Indo-Saudi joint ventures or Saudi owned companies in India, in diverse fields such as paper manufacture, chemicals, computer software, granite processing, industrial products and machinery, cement, metallurgical industries, etc.

Indian Business delegations to Saudi Arabia

During last couple of years, a large number of Indian trade and industry delegations have visited Saudi Arabia to explore the opportunities for long-term partnerships and cooperation, including joint ventures. These delegations received warm and enthusiastic response from the Saudi business community. Indian and Saudi companies regularly take part in trade fairs in each other's country.

Saudi Business delegations to India

In recent times, the number of Saudi businessmen and delegations visiting India has grown substantially, indicating growing interest in emerging business opportunities in India.

Thus there is considerable evidence showing intense engagement between India and Saudi Arabia over the years. According to the Chairman of the Saudi

Arabian General Investment Authority (SAGIA), Prince Abdullah bin Faisal bin Turki Al-Saud,

> "There is good basis for a constructive, mutually beneficial relationship and we believe the future holds definite promise for stronger Indo-Saudi ties".

"Relations between the two countries are passing through a very exciting phase and the future of these relations is very bright indeed", asserts the Indian Ambassador to the Kingdom, Mr. Kamaluddin Ahmed[276]. Both the messages are forthright, unambiguous and carry the same spirit, the spirit of camaraderie architectured over a period of half-a-century. The visit of King Saud in 1955 followed by India's first Prime Minister, Jawaharlal Nehru in 1956 have set the ball rolling which had been punctuated by occasional slow-down for variety of reasons but it never gathered moss and today both the countries are in best of relations. There is a growing awareness on both sides of the many potential areas of investment. India today ranks sixth among top ten foreign investors in the Kingdom reflecting India's undisputed credibility in the eyes of the Saudi government. Today, Saudi Arabia accounts for the largest share of India's imported crude oil from the Gulf region. The relationship is not only strengthening but expanding too.

Since mid-2000 so far, SAGIA has granted 58 licenses to Indian companies to set up joint ventures or 100 percent wholly owned subsidiary. These projects together are expected to bring in investment into the Kingdom to the tune of around U$ 358.04 million. Of this, 43 JVs have already been set up in different sectors including telecom, pharmaceuticals, IT and construction. One of the major arguments India has been harping on is the restricted entry of Indian pharmacy products. When Indian pharmacy products are allowed entry into most advanced countries like the USA, the Saudi restriction is considered as a major hurdle India is facing to step up exports the Kingdom. The Saudi Ambassador in India, Mr. Salah M Al Ghamdi has recently assured the Indian government to look into the matter. Trade relations apart the Kingdom's geo-strategic position is of utmost importance to India. "In fact the Kingdom's geo-strategic location in the Arabian Peninsula makes it an integral part of India's extended neighbourhood. Saudi Arabia occupies a privileged position in the Arab and Islamic worlds, having considerable influence on issues pertaining to

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[276] http://www.indiaonestop.com/tradepartners/sa/saudioverview.html.

regional and international peace and security of great interest to India", says Mr. Ahmed[277].

The Service sector that offers potential of greater employment opportunities has been identified as one of the major focus areas. This offers an excellent opportunity to Indian industry to forge partnership with its counterpart in the Kingdom to build a stronger and more vibrant Saudi economy.

Table 5.14: Total Finance for Licensed Projects

Activities	Number of Projects	Joint Venture Projects: Saudi Share Value (In SR billion)	%	Foreign Share Value (In SR billion)	%	Total (In SR billion)	Fully Foreign Projects Value (In SR billion)	%	Total Investments: Saudi Share Value (In SR billion)	%	Foreign Share Value (In SR billion)	%
Industrial	825	6.371	57.1	4.777	42.8	11.148	17.406	60.9	6.371	22.3	22.183	77.7
Service	1170	1.469	47.1	1.648	52.9	3.117	20.822	87	1.469	6.1	22.470	93.9
Agricultural	5	0.037	40.6	0.054	59.3	0.091	0.075	45.2	0.037	22.2	0.129	77.7
Total	2000	7.877	54.9	6.479	45.1	14.356	38.303	72.7	7.877	14.9	44.782	85.1

Source: SAGIA

The potential sectors for business in Saudi Arabia, identified by the Confederation of Indian Industry (CII), include Information Technology; Hydrocarbons- Oil & Gas, Process Plant Equipment for Oil Refineries; Petrochemicals; Fertilizers and Chemicals; Water Treatment Plants; Sewage Treatment and Waste Water Plants; EPC Contracts- Oil & Gas, Power, Infrastructure, Telecom, Chemical and Industrial Plants, water & Effluent Treatment; Infrastructure/Construction; Machine & Hand tools; Pumps, Valves; Diesel Engines; Auto Components; Electrical Equipments; Spares and Cables; General Engineering Products; Pharmaceuticals and Chemicals; Engineering Consultancy and Specialized Engineering Services; Industrial & Professional Training including Health Care Sector etc.

The Saudi IT sector offers to Indian firms vast scope to tap the market in the Kingdom. Riyadh is being planned to develop as a Middle East hub for IT. Saudi Arabia accounts for 40 percent of IT sales in the Gulf region. The Riyadh Chamber of Commerce and Industry chairman, Abdul Rahman Al-Jeraisy expects a 20 percent annual growth in the telecommunication, personal computers and Internet sector:

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[277] Ibid.

> "The IT sector of Saudi Arabia holds great deal of promise for partnerships with Indian companies as a large number of Saudi companies are making large investments in adopting information technology in their business processes".

With the opening up of the market and economic reforms already initiated, Saudi Arabia expects about US$ 900 billion foreign investment in the Kingdom within 20 years. Of the expected FDI, housing and services for Riyadh would be the prime attraction, the investment being estimated at around US$ 293 bn followed by infrastructure that is likely to lure an investment amounting to US$ 138.6 bn. Electricity (US$ 114.6 bn), petrochemicals (US$ 92 bn), gas sector (US$ 50 bn including US$ 25 bn Gas Initiative), water sector (US$ 8ℇ bn), telecommunication (US$ 58.6 bn), technology and information (US$ 10.6) and railways (US$ 8 bn). In terms of foreign investment in the Kingdom, India ranks sixth in the first ten countries. The list is led by US followed by Japan, France, UK, and Syria. India is followed by Germany, Jordan, Sweden and Palestine. The sector wise analysis of investments okayed by the SAGIA authorities revealed that the industrial sector attracted highest foreign investment at SR 28.55 bn involving 825 projects although in terms of number projects, service sector topped the list with 1170 projects entailing proposed foreign investment of the order of SR 23.93 bn. As far as Indian investment is concerned "the sincerity of the Indian investors has been recognized and appreciated by the Kingdom", as stated by Mr. Ahmed. Almost all sectors of the Saudi economy offer vast scope for Indian companies to invest. The promising sectors include water, power, mining, education, railways, roads, telecommunications, IT & It-enabled services and tourism and textiles.

Indian pharmaceutical companies are trying to penetrate Saudi market. However, Saudi regulations for registration of foreign pharmaceutical companies are very stringent and Indian companies find it difficult to comply with them. Still, it is interesting to note that an Indian company, M/s Ajanta Pharma, has established a joint venture in the Kingdom to produce a variety of prescription and OTC drugs for the Saudi and Gulf markets.

A high level team of Saudi officials visited India in November 2000 to hold discussions with Indian authorities for lifting the ban on import of Indian bovine meat, which was imposed in 1983. The matter is under consideration of the Saudi Government.

In the field of Science and Technology, cooperation between the two countries is continuing under different fora. In 1997, CSIR and King Abdul Aziz City for Science and Technology (KACST) signed an MOU. CSIR has extended an invitation to the President of KACST to visit India to familiarize himself with the Indian scientific laboratories. The visit is expected to take place in the near future.

A 3 member scientific delegation from the National Physical Laboratory and CSIR paid a visit to the Kingdom in June 1997. KACST showed interest in the field of space science, remote sensing and Internet development. ISRO has extended an invitation to the Vice President of the KACST, which is likely to take place shortly.

A programme of technical cooperation was signed in June 1993 between the CSIR and the Saudi Arabian Standards Organization (SASO). It has been renewed up to December 2002. Under this programme, Indian experts in the field of measurement and calibration have been deputed to Saudi Arabia. Saudi experts have also visited India under this programme.

There is ongoing cooperation between India and Saudi Arabia in the field of training of agricultural experts:

> "Eight Indian experts in the field of red palm weevil management were deputed to the Kingdom during the period 1993-98; again six Saudi agricultural experts in the same field visited India in January 2001 for a two week orientation cum study tour. Their programme included visits to agricultural research facilities in New Delhi, Bangalore, Kasargod and Kayankulam".

Indian companies have established 21 joint ventures in Saudi Arabia in different sectors such as management and consultancy services, construction projects, telecommunications, information technology, pharmaceuticals, etc. There are also collaborations between Indian and Saudi companies in the areas of designing, consultancy, financial services and software development. There are 37 Indo-Saudi joint ventures in India. Soon after new investment laws came into force in Saudi Arabia, in mid-2000 two Indian firms obtained licenses, involving a total investment of US$287.2 million, for the manufacture of LAB and natural paraffin. Subsequently, a few other Indian firms have also taken advantage of the new Saudi laws providing for 100% foreign ownership of projects in the Kingdom.

A 13-member team from the Confederation of Indian Industry (CII) visited Saudi Arabia from April 13-20, 2001. The delegation members represented sectors such as steel, chemicals, process plant and equipment, information technology, plastics, telecom related services, industrial products, pumps, etc. During its visit, the delegation signed four MoUs for joint ventures in the fields of plastics and organic food, in addition to a general MOU for enhanced cooperation between CII and the Council of Saudi Chambers of Commerce and Industry.

The Secretary General of the Council of Saudi Chambers of Commerce and Industry, and the Governor of the Saudi Arabian General Investment Authority (SAGIA) are likely to visit India shortly on the invitation of the CII.

Delegations of businessmen sponsored by the Power loom Development and Export Promotion Council (PDEXCIL), Synthetic & Rayon Textiles Export Promotion Council, and Gem & Jewellery Export Promotion Council, all based in Mumbai, and Tea Board, Dubai, visited the Kingdom and received good and positive response from Saudi businessmen.

A delegation from the Indian Department of Posts also organized a road show for promotion of International Money Transfer Services from the Kingdom to India launched by them in collaboration with Western Union Financial Services, Inc. USA.

Promotion of India as a tourist destination among Saudis is also a major focus area this year, and efforts are under way to device a new approach and plan effective strategy.

In order to showcase their products, Indian companies regularly take part in trade fairs and exhibitions in the Kingdom in the fields of health care, engineering, machinery, plastics and chemicals, textiles, fashion accessories, foodstuffs and beverages, agriculture, building materials, leather, automobiles, etc.

In November 2000, the Consulate General of India launched a website, http://www.cgijeddah.com, to help create a mutually beneficial interface with the Indian community at large for various Commercial, Consular, Information and Haj services.

The Saudi Fund for Development (SFD), which assists developing countries in their economic development programmes by granting loans for financing developmental projects, has extended the following four credits to India, see table 5.15.

Table 5.15: Saudi Fund for Development Assisted Projects in India, (Figures in million US dollars)

Sl. No.	Project	Date of agreement	Amount
1	Srisailam & Nagarjunasagar Hydroelectric power project	June 1977	94.13
2	Koraput-Rayagada Railway Line Project	August 1983	27.46
3	Ramagundam Thermal Power project – Stage II	May 1985	45.87
4	Nhava Sheva Port Project (Renamed as Jawaharlal Nehru Port Project)	December 1987	37.6
	Total		205.06

Source: SAGIA

The Indo-Saudi bilateral relations got a further boost with the historic visit of Hon'ble Shri Jaswant Singh, Minister of External Affairs, to Saudi Arabia from 19-21 January 2001. This was the first ever visit by an Indian Foreign Minister to Saudi Arabia[278]. During the visit, the Minister called on the King and Crown Prince Abdullah, and held wide ranging talks with Foreign Minister Saud Al Faisal on issues of bilateral interest and also signed an agreement on regular Foreign Office consultations. He also met the Saudi Minister of Electricity and Industry and exchanged views with the Secretaries General of Council of Saudi Chambers of Commerce and Industry (CSCCI) and the Riyadh Chamber of Commerce and Industry.

Thus India and Saudi Arabia have cherished a long term vibrant economic relation through impressive trade and investment programmes in their respective economies and there are future potentials to be strategically exploited for the mutual benefits. India has to focus more and more on valued added industrial products and services. Saudi Arabia today is moving steadily towards a free market economy with gradual decontrolling of many important sectors of the economy. Structural changes are being effected to ensure a smooth transition in the economy keeping in view the changing international economic environment.

As the above analysis shows India and GCC countries have realized their potentialities and embarked on a path of renewed assertive economic cooperation premised on the hydrocarbon interdependence. The major factor behind this renewed cooperation has been and will be the interdependence between India and GCC countries due to their strategic positioning in the global oil and gas regime.

[278] <http://meaindia.nic.in/treatiesagreement/1974/chap505.html>

Besides there are other recent developments having been contingent to augment and reassert economic ties between India and GCC countries. The Iraq war and the resultant anti-West sentiment in the Gulf region have worked to the advantage of India. The country is playing host to Gulf investment like never before. Besides, trade between India and the Gulf at $10 billion during 2002-03 compared to $8 billion during 2001-02 has also shown remarkable growth. In the words of Saleh Mohd Al Ghamdi, ambassador of Saudi Arabia in New Delhi,

> "The governments in the Middle East had realized that they should have better economic relations with India. Recently a group of 22 businessmen from Saudi Arabia was here to explore opportunities in various sectors, especially information technology (IT); IT enabled services, pharmaceuticals and higher and technical education. The idea was to establish better trade relations between the two countries. The Saudi businessmen are looking for investment opportunities in India, simply because India is an important country in the global economy. It is the fourth largest economy in the world"[279].

Mr Kamaluddin Ahmed, Indian Ambassador to the Kingdom of Saudi Arabia, echoing the similar sentiments, said that,

"Saudi Arabian businessmen were increasingly becoming aware of the rich opportunities for investment in India, where their capital, coupled with locally available state-of-the-art technologies, unmatched human resources/expertise, large and expanding market, skilled labour, etc can bring in rich rewards"[280].

There are already 55 Indian joint ventures in Saudi Arabia and 40 Indo-Saudi ventures in India. India was increasingly co-operating with the Gulf states for oil exploration and it could be the biggest market for these countries since it was moving ahead in ensuring for itself energy security in the years to come, thereby providing the Gulf region with an avenue for investment, pointed out a ministry external affairs official.Besides the oil sector, India and the Gulf could co-operate on knowledge-based products. This area was identified by President APJ Abdul Kalam during his recent visit to the United Arab Emirates (UAE). India, being the hub of knowledge-based industries, students from the Gulf region can send students here for higher education.

GCC was India's second largest trading partner after the US. According to Salem Nasser bin Ismaily, executive president, the Omani Centre for Investment Promotion and Export Development (OCIPED), Oman,

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[279] Siddiqui, Huma,"Anti-West Feelings Have Gulf Companies Turning To India", The Financial Express, January 22 2004.
[280] Ibid.

"With the Indian economy reaching an all-time high growth rate, trade between GCC and India was expected to grow. To accelerate economic growth, there is a need for easy movement of people, goods and services".

According to some businessmen from Qatar,

> "There are lots of private companies who are looking for investment opportunities in India. For us, India is a safe destination where rules, regulations and procedures are being continually simplified and streamlined to facilitate business. And, sectors like transportation, services and airport projects were attractive for us".

Thus there are tremendous potentials to be exploited through pragmatic policies not only in the oil and gas sector but also in other most promising areas as outlined above. The most promising area in this regard will be the knowledge sector where India has global leverage and the Gulf countries are striving on establishing such to achieve broad based human resource development to absorb their mass educated unemployed youth.

Hydrocarbon Interdependence and the Synergy between Energy and Knowledge

As discussed before in the work, the most significant aspect of interdependence between India and GCC countries is the respective areas of deficit such as the energy requirements of India and the GCC countries' thrive to establish a knowledge society to address their internal vulnerabilities. Thus the synergy between energy and knowledge will act as an impetus for both GCC countries and India due to their global leverage in these areas to usher in a newer assertive framework of close economic relations in the coming years.

Building Knowledge Society: Major Policy Thrust by the GCC countries

The Gulf States depend heavily on rents from the exploitation of state-owned petroleum reserves to fund their development efforts and generous welfare policies. Over the years they have gone through a far-reaching social and economic transformation while maintaining social stability. Despite ample reserves, new development challenges over coming decades will test their ability to reconcile traditional institutions with the requirements of a modern economy in an increasingly competitive global environment.

The Years of Plenty

In the years following the first oil boom, the Gulf governments embarked on massive investment programs with priority to basic infrastructure, aiming to transfer part of the windfall to the population at large as well as to future generations. Substantial investments were also made in the social sectors. The population at large benefited from generous welfare schemes in the form of access to housing grants, as well as basic foodstuffs, fuels, water and electricity at highly subsidized rates. Expansion of the government sector served the dual purpose of providing public services for the population and job opportunities for Gulf nationals. Most of the Gulf States also initiated programs to build up domestic industrial capacity, boosted by very generous subsidies. These programs envisioned using abundant hydrocarbon resources as feedstock, and aimed to diversify economies away from extreme reliance on oil rents. After 1973, limited absorptive capacity to formulate and implement development programs – coupled with a small, if rapidly growing, population and the sheer magnitude of the rent transfer – initially led to a huge accumulation of official foreign reserves. Local businesses amassed fortunes on lucrative government contracts. Since the development programs designed by benevolent governments ensured that everybody gained from the newly acquired fortunes, the programs received broad popular support.

In many ways, the programmes initiated during the oil boom years have met with considerable success in raising living standards, including a massive expansion in education. However, the Gulf States generally have not been able to translate the huge investments in infrastructure and human development into vigorous, self-sustained private sector growth. Instead, the efficiency of investment has been steadily declining, reflecting poor screening of the economic viability of projects. At the same time, the socioeconomic implication of the "welfare-state" strategies followed by the Gulf states -- with focus on the distribution of oil wealth through public programs rather than on developing new sources of wealth – also created severe unintended structural anomalies in the form of persistent dependence on oil for export earnings and fiscal revenues, overgrown public sectors whose omnipresence in the economy stifles the private sector, distorted incentives to work, and extreme dependence on government to provide jobs for Gulf nationals.

The End of the Boom

As oil revenues fell dramatically after the mid-1980s, the Gulf governments resorted to large-scale draw-down of accumulated foreign assets to fund the completion of the infrastructure investments initiated during the boom years. However, long-term expenditure commitments also grew due to the expansion of public services, including education, health, and growing public sector employment. Petroleum revenues remained broadly flat resulted in growing fiscal strains over the coming years[281]. Faced with persistent fiscal deficits since the early 1980s, the some GCC countries, especially the Saudi government initiated domestic borrowing in 1988, and domestic debt now (2002) significantly exceeds usable reserves. As fiscal pressures continued to mount, recurrent expenditures for maintenance and subsidies as well as capital outlays were cut back, while efforts were initiated to raise non-oil revenues. As non-oil sector growth stagnated while the number of new entrants to the labor market escalated throughout the 1990s, the tightening fiscal constraint constrained the scope for continuing to use the public sector to absorb job-seeking nationals. In the case of Saudi Arabia, annual non-oil sector growth is estimated to have been a minuscule 1.2 percent during the 1990s, relative to a labor force growth rate of over 4 percent, reflecting high fertility rates during the oil boom years. Only some 40,000 of the 120,000 Saudi nationals who entered the labor market in 1999 were able to find jobs in the non-oil private sector[282]. Cautious reforms aimed at addressing the underlying structural problems behind these trends were initiated during the 1990s. The collapse of oil prices in early 1998 in the wake of the Asian Crisis severely affected the fiscal situation of the Gulf countries and strengthened the political awareness of the need for structural and institutional reform. Local discontent has been growing over unemployment and reductions in per capita incomes while privileged "groups" are seen as basking in conspicuous consumption inconsistent with traditional values, and funded by the capture of an undue share of the remaining subsidies. At the same time, the eternal but elusive hope of recovery in oil revenues together with resistance from groups that see their interests threatened have thus far limited the scope of reform. The strong consensus culture of the Gulf countries-while an asset in terms of solid support for decisions once made-also retards the pace of reform.

The Challenge to Overcome: Obstacles towards a New Development Paradigm

Over the next decade, the Gulf States will face mounting fiscal pressures to expand public services because of population growth -- on top of high payroll costs. While remaining oil and natural gas reserves may last for up to 100 years at current levels of production for several of the Gulf countries, the scope for

[281] The Kuwaiti government – which already employs 93 percent of all nationals in the labor force – saw its payroll cost grow by well over 6 percent per annum in the 1995-2000 period, even as total and recurrent budgetary expenditures remained constant in nominal terms, resulting in crowding out of other expenditures, in particular, capital outlays.

[282] Saudi American Bank, August 2001, on the site <http:// www.samba.com.sa>.

boosting oil revenues beyond current levels is constrained by OPEC agreements and the realities of competition from other suppliers with liberal oil tax regimes. The public sector can no longer be used to absorb the rapidly increasing number of new entrants to the labor market. These trends generate an urgent need to accelerate non-oil private sector growth to create new job opportunities for Gulf nationals. However, to realize this objective, Gulf governments will have to abandon development strategies pursued over the past quarter century and overcome severe political hurdles towards a sustainable strategy.

Despite stable macroeconomic conditions, the dominance of petroleum and the strength of the local currencies continue to frustrate progress on developing the non-oil tradable sectors. The notable exception is the United Arab Emirates – spearheaded by the Dubai Emirate (which anticipates the depletion of its oil reserves over the next decade) that has followed a liberal, business- friendly and market-oriented strategy aimed at diversifying the economy. However, given the generally high import content in private consumption in the economies of the Gulf states, exchange rate adjustment to promote economic diversification and create non-oil private sector jobs in the long run would meet strong resistance from the general population facing immediate price increases and reductions in real per capita incomes, and creating social discontent that could be exploited by powerful groups. At the same time, the prospective gains, in terms of future job opportunities in the non-oil sectors for Gulf nationals, are likely to be too abstract to create a strong constituency. Influential groups with interest in investing abroad to raise returns or avoid real or perceived political risks would also probably oppose an exchange rate adjustment of the required magnitude. Gulf governments would see net gains from an exchange rate adjustment, but their expenditure commitments are now such as to preclude the option of sterilizing part of these gains in savings funds with assets held abroad to sustain the adjustment -- a viable option until some 10-15 years ago.

Opposition to the reform of widespread producer and consumer subsidies will also have to be overcome if a more rational price structure is to support efficient investments in line with comparative advantage. Saudi Arabia has made progress by eliminating budgetary transfers to fund subsidies for agriculture, industry, and housing in recent years – thus limiting subsidized credits to what is available through repayment of old loans. But the Gulf countries will still have to overcome strong consumer resistance (and worries that some groups might exploit consumer discontent) to rationalizing charges for water and electricity with the aim of enhancing the private sector's interest in investing in these sectors as well as curtailing waste. Entrenched interests are also likely to delay education reform to make curricula more relevant to the needs of a modern economy.

Strong and deeply entrenched interests have also largely frustrated attempts to address the perceived lack of transparency and predictability in legal and regulatory frameworks that continues to constrain private sector take-off in the Gulf[283]. The judiciary is widely seen as lacking appreciation for the requirements of modern business legislation and the need for a level playing field, while suffering from capacity problems that result in extremely long delays in settling commercial disputes. Red tape, in the form of requirements for permits and licenses, still persists in varying degrees and contributes to a generally poor competitive environment, slowing structural change while creating handsome rents for well-connected business interests. As the world increasingly moves towards an integrated, information and knowledge-driven economy, the general lack of even basic statistical information and easy access to rules and regulations – making, for example, market analyses and feasibility studies hard – will become an even more severe drawback.

Thus the oil boom of the previous era provided the impetus to the GCC states to build up infrastructure catering to the needs of the changing times. The states generally depended upon the expatriate labour force for such purposes as the domestic work force were either reluctant or semi skilled in comparison to the expatriates. There are wide ranging debate on this issue especially among analysts and experts of this region. While some argue that the faulty human resource development policies of the states are responsible for this, others argue that the oil boom is the major factor as it evolved welfare states in these countries or what is called *'Baksish States'* –the premise is that it is the responsibility of the states to take care of all the needs of their citizens.

However with the oil revenues dwindling in the years, the policy makers in these countries realized the heavy burden of such institutional arrangements and the pernicious impact of such policies for the long-term sustenance of the regimes in these states. Simultaneously the countries of the GCC experienced voluminous population growth and consequent large pool of work force. The major problem facing the GCC countries is perhaps how to absorb the large pool of domestic

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[283] A beginning to reform has been made with the recent adoptions of new investment laws and other institutional reforms in Kuwait, Oman and Saudi Arabia.

workforce in their respective economies overwhelmingly occupied by expatriate labour force. The result is growing discontent among the idle workforce, which has severe implications besides the immediate threat to the ruling regimes in these countries. In short the challenge is the transition from rentier economy to knowledge economy in the GCC countries.

In such scenario, like all other sectors where the GCC countries have initiated structural programmes, they are also devising ways to build knowledge society- the key to be integrated with the global economy. The importance of building a knowledge society in the Gulf has been aptly delineated by the Second Arab Human Development Report (AHDR), 2003:

> "Deficient knowledge capabilities represent a formidable impediment for the Gulf countries in their attempts to face the challenges of the 21st century. These countries cannot make any tangible progress in the long term without acquiring the knowledge and technological capabilities that are indispensable for prosperity in the new millennium. Indeed the absence of these prerequisites could well invite unforeseen disasters. Ingraining and embedding knowledge in Gulf societies is the crux of any attempt to resolve the human development crisis in this region. Knowledge is one of the key instruments of human development, be it in instituting good governance, guaranteeing good health, producing the ingredients of material and moral welfare, or promoting economic growth. As such knowledge is a vital factor of modern production and an essential determinant of productivity and competitive capacity"[284].

One of the main features of the production pattern prevailing in the Gulf countries, which influences knowledge acquisition, is a high dependence on the depletion of raw materials, chiefly oil, and reliance on external rents. This rentier economic pattern entices societies to import expertise from outside because this is a quick and easy resort that however ends up weakening local demand for knowledge and forfeiting opportunities to produce it locally and employ it effectively in economic activity. A large part of Gulf countries' economic activity is concentrated on primary commodities, as in agriculture, which remains largely traditional, and in industries specializing in the production of consumer goods, which depend heavily on production licenses obtained from foreign companies. At the same time, the share of the capital goods industry and of industries embodying higher technology continues to shrink. Demand for industrial products is negatively influenced by the small size of Gulf markets, the weak competitiveness of Gulf economies and the absence of transparency and accountability, which encourages overlap, and sometimes collusion,

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[284] UNDP, '*Arab Human Development Report* (AHDR), 2003, p.VI.

between political and business elites. Lack of competition reduces productivity and therefore demand for knowledge in economic activity. Instead, competitive advantage and the ability to maximize profits derive from favouritism in power structures, manifested in money and politics. Resistance to opening up to the outside world by the Gulf economies due to their old perceived notion of "Resource Nationalism" in the heydays of oil boom period and their lack of exposure to foreign competition coupled with at times excessive protection to local products through import substitution policies, have also slowed the advancement of productivity and the employment of knowledge to that end.

Demand for knowledge has been weakened not only by faltering economic growth and productivity in Gulf countries during the last quarter-century but also by the over-concentration of wealth in a few hands. Although some economies of the world have succeeded in the past in achieving economic growth while their income and wealth distribution patterns were skewed, this occurred in a different global context, characterized by a large number of closed economies throughout the world. The opening up of capital markets promoted by globalization reduces the chances of local growth through concentration. The vast amount of Gulf capital invested in industrialized countries and, therefore, denied to this region, is strong evidence that, in human development terms, it is not the possession of money and wealth that matters but how productively such wealth is invested.

Therefore it has been argued that recovery of economic growth in the GCC countries and its main driver-increased productivity through diversifying their narrow depleting-resource based economies– are the two prerequisites for the advancement of knowledge in order to achieve overall human resource development[285].

As can be seen from the above, there is perceived urgency for the development of knowledge society in the Gulf, as this is the key policy framework to be integrated with the present global economy for their sustenance. Thus in such a backdrop, it can be visualized that there are tremendous opportunities for major players in the global knowledge economy like India to penetrate into the vast unexploited knowledge sector of the GCC countries.

India a Global Leader in knowledge Industry: Role to Play in the GCC Countries' Knowledge Society

The question whether the twenty first Century could be India's arises because the industrial revolution which moulded global economic power structures for

[285] Ibid.

over two centuries is now drawing to a close, and a new revolution is beginning, built around information technology. Speaking about global economic power structures, with the United States of America occupying the 'core' and maintaining its hegemony for many centuries, India's potential to emerge as a leader in the knowledge industry is threatening United States of America's unrelinquished position.

How has this situation arisen? All revolutions throw up new leaders. The agricultural revolution threw up civilization leaders like India, Egypt and China. The industrial revolution threw up at least two: Britain and the United States of America. The logic is the same as it was during the Industrial Revolution. Wherever there was coal, sooner or later, coal mines came up. In any economy the trend has always been that industry goes to the raw material and not vice versa. In the global economy resourcing is also a global function. The chief cause of the success of the

InfoTech industry in India has been its ability to deliver low-cost, high-quality raw material.

There are three inter-locking driving forces that shaped the knowledge economy. The first is the globalization of products that cater to the global market. This combined with knowledge intensity and the third most important force, connectivity, which drives and shapes the new economy in the process of globalization. Thus globalization provided an opportunity to India to emerge as a leader in the software industry.

It can be noted that India has traditionally fought automation due to pro-labour policies followed by successive governments. The information technology industry received its initial boost in 1986 when the government reduced duties on imported computer components. The engine behind the growth of the information technology industry in India has been software exports. This industry has been growing at an annual rate of 30percent since 1998. There are no signs of abatement in that growth rate. There are an abundance of software programmers and skilled management personnel in India and this would attract more international companies to form tie-ups. The customer base for hardware is split equally between the government and the private sector firms. The customer base transcends the type of industry.

Computers in India have a longer life period compared to developed countries. Due to the low cost of maintenance and high cost of new hardware, Indians tend to use computers for many years. The crucial advantage for India is the ability to leap-frog over many intermediate technologies and uses the latest. The high cost of hardware forces programmers to develop cost-effective and efficient programs that gets the best out of machines.

The information technology industry in India has been recording an annual average growth rate of 25percent, since July, 1991. Large platform usage in India is restricted to big firms in the public sector and the private sector. The hardware market in India was estimated at $1billion in 1994. Sale of PCs was just 1,80,000 which is a mere 1percent of the total sales in the world. This figure is expected to touch the 1million mark by the end of this century. Approximately 6,00,000 PCs are in use all over the country with nearly 20percent of them connected in LANs. While PCs still dominate the hardware market, LAN server sales are growing at a fantastic rate. The growth rate in 1993-94 in the LAN server segment was a whopping 152percent. India's computer companies have formed strategic alliance with major foreign players to meet the changing demand of Indian consumers.

The Indian strength in hardware is in design and integration of computers rather than manufacture of components. India's traditional strength has always been software because of the abundant availability of cheap and talented programmers. The software industry in India generated more than $600million, most of it in exports in 1993 and its growth over the last 8 years has been more than 30percent annually. National Association of Software and Services Companies (NASSCOM) has estimated that revenues from IT software and services yielded around Rs.60, 000 crores, almost 2.4 percent of India's GDP in 2002-03. Close to 80 percent of this-Rs.47,500 crores-was accounted for by exports. Much of this growth was driven by the Inform Technology Enabled Services (ITES) sector, which alone grew at over 65 percent, upping revenues from Rs. 71 billion in 2001-02 to Rs. 117 billion in 2002-03[286]. In the information technology industry, software exports and offshore services are the biggest area of export from India. Clearly India's advantage lies in its vast resource of technically skilled computer personnel. A recent World Bank report showed that India's software exports could touch $10 billion by the end of 2005[287]. The biggest consumer of India's exported software is the United States followed by Western Europe where Germany is the most important market. The biggest advantage for India is that it could offer a wide spectrum of software

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[286] "Meeting the Challenge", *The Frontline*, Chennai, March 12, 2004, pp. 55-56.

[287] Nayar, Vineet; "The Virtual Asset" in *Business world (Special Millennium Issue)*; 17 January, 2000.

services ranging from clerical support and date processing to sophisticated software systems. The most important point worth mentioning is that recent years have witnessed a spurt in software trade of India with the Gulf countries[288].

In short, India's strengths in the information technology area are:-

- Availability of unlimited pool of cheap and talented software personnel.
- Presence of the biggest English speaking population after the United States.
- Availability of western educated management personnel.
- Lack of regulation in the software industry.
- Burgeoning middle class of nearly 150million consumers; and
- No baggage of outdated software technology.

Looking at India, keeping the evolution of this new economy in perspective, the advantage for India lies in generating a high quality of knowledge resources at the lowest possible cost. The American and the European countries, because of a high level of automation, have a high ingredient cost, thereby affecting their position in the knowledge-ware business. The cost per person to generate knowledge-ware in India continues to be one of the lowest in the world. Hence with respect to the cost and the quality of raw material, the knowledge economy will be in the hands of low-cost economies such as China, India and Malaysia amongst others[289].

Here are other reasons why India is an emerging leader among the winners in the global Knowledge society:

(a) Industries that will define most of this century – information technology, telecommunications – are areas where India and Indians have shown a surprising amount of skill and creativity. Software exports now account for 8 percent of our total exports, a little over 1 percent of the global market, and are still booming. Meanwhile India is increasingly coming to be identified with software – in the same sense as Japan was once identified with consumer electronics or Germany with engineering.

(b) As jobs become more and more fungible across borders, India's large base of skilled manpower is finally going to be an advantage. The expected earnings from IT-related services in 2008 is $17 billion, and that is more than half India's total exports today; and

(c) The explosion of Indian enterprise has happened in the closing years of the twentieth century; middleclass India has woken up to the entrepreneurial dream and the new, mind ware-related businesses that they are starting are not as dependent on the efficiency of the government as the older businesses are. It has been aptly remarked by Lester Thurow,

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[288] In fact, besides remittances by the Gulf expatriates, software exports to the Gulf constitute a major component in India's record foreign exchange reserves in the current financial year 2003-04.

[289] Joseph, Tony, *The Turning Point* in *Business world (Special Millennium Issue);* 17 January, 2000; p.8.

> "Each of the leading industries of the twenty first century depends on brain capacity. Any one of them may be installed anywhere in the planet. Where they will end up going depends on who has the brain capacity to take advantage of them. In the coming century, the comparative advantage of nations (India) will be entirely a human creation"[290].

Thus it can be contended that India is a leading player in the present global knowledge sector. There are various opportunities and consistent policy perspectives to reach the benefits of the booming sector to strengthen India's economic prowess. In this scenario India has the strategic leverage to penetrate into the emerging Knowledge markets of the GCC countries, still at an evolving stage. This assertion has been recently confirmed by the Economic and Social Commission for Western Asia (ESCWA) of the United Nations in the World Summit on the Information Society (WSIS) held at Beirut, 4th to 6th February March 2003[291].

Role to be Played by India in the Gulf Knowledge Society

Given the traditional trading affinity of India with the GCC countries and the vast potentials of economic engagement between the two in the globalised environment, India's prospective role in the emerging Gulf knowledge society can be identified as follows:

- Hard Infrastructure: This denotes hardware, telecommunications, networks, databases, telephones services, personal computers, mainframe and supercomputers, etc. In a nutshell, this constitutes the foundation over which all other components rest.
- Soft Infrastructure: Also referred to as the policy and regulatory environment; this includes laws, regulations, intellectual property, cyber laws, electronic signature, etc. The ICT environment cannot function harmoniously without this safety net.
- Talent base: This is related to skill development and human resources within the technology sphere. This is concerned with (1) efforts attracting a pool of talents from the region; (2) development of nationals within the local community; and, (3) instituting information technology training in the professional educational sector.
- Help in setting up service sectors such as the BPO (Business Process Outsourcing) as India has global advantage. This sector is the main ingredient in providing highly sophisticated jobs in India. This may be useful for GCC countries to emulate the India model to employ their surging workforce. In fact as per press reports Iran is presently pursuing the strategies to initiate BPO sectors in their domestic economy.
- India's successful experience in E-Commerce and E-governance can be also helpful for the GCC countries.

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[290] Ibid.

[291] For details see UN/ESCWA, 'Information Knowledge Society: The Case of UAE', Western Asia Preparatory Conference for the World Summit on the Information Society (WSIS), Beirut, 4-6 February 2003.

Thus India has a larger role to play in the knowledge economy of the GCC countries in the coming years. It is here worth-mentioning that in recent years there are some interactions between India and GCC countries in the perspective of the Information knowledge society which can be summarized as follows:

- Several well-known Indian IT companies participated in the three-day event organized by the Indian Business Council, Dubai, in collaboration with the consulate-general of India and NASSCOM in March 1999.
- Indian firms such as Wipro, Tata Consultancy Services, Pentafour, Aptech, Congruent Software, DSQ Software, Online Solutions and Orient Information Technology are presently active in some GCC countries.
- Four masters of computer applications courses in Arabic script started in Madras, Aligarh, Hyderabad and Delhi, where students from the GCC countries will be offered education.

However there are concerns regarding India's policy front to garner efforts to exploit the potentialities. As one analyst[292] has remarked that, Is India loosing the Gulf to China? He further asserted that:

> "India is in the danger of becoming a big loser in the Persian Gulf if it does not quickly respond to the economic changes taking place in the region. India's concerns in the Gulf have had a rather narrow mercantile focus on oil purchases, labour exports and remittances from expatriates. But as the Gulf States move towards regional economic integration and seek to globalize, India could easily squander the many natural advantages it has in the region. While the Gulf States are looking towards greater economic cooperation with India, which they see as a big future market, New Delhi may not be doing enough to tap the new opportunities that are opening up in the Gulf.
>
> If India is dozing at the wheel, China is rapidly raising its economic presence in the Gulf. Chinese consumer goods are already flooding the markets. For Chinese business, the rich Gulf area is a new and important destination. China, with its more open economic environment is also drawing huge investments from the region. With deepening economic links to the region, it is inevitable that Beijing's political influence in the Gulf will begin to grow. The slow pace of India's reforms and an unwillingness to devote political energies to exploit economic possibilities in the Gulf are giving a relatively free hand to China which could emerge as a future player in an area of vital concern to India.
>
> Cultural affinities and historic relations make the Persian Gulf a natural economic partner for India. If India continues to dither, it could well find China outflanking it in the region"[293].

Therefore the need of the hour is to take pragmatic policy decisions in order to harness the opportunities and potentialities as India has high stakes other than the economic involved in this strategic region. It can be mentioned that there are

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[292] Raja Mohan, C, 'Is India Loosing the Gulf to China', The Hindu, February 13 2003.
[293] Ibid.

some positive developments in this regard in recent years. This can be substantiated from the first ever industries ministers' meeting was held between India and GCC countries in February 2004 at Mumbai, jointly organized by CII, Ministry of External Affairs[294].

Moreover, from the strategic point of view, India and GCC share the desire for political stability and security in the region. The common political and security concerns of India and GCC translate into efforts for peace, security and stability in the Gulf region and South Asia. The emerging common security perceptions create further opportunities for GCC-India cooperation in the future. The GCC states are going through important changes and transformation; the process of understanding and integration is coming of age. Along with it the areas for cooperation are also widening beyond investments, trade and commerce and sharing and development of human resources to security. This envisages jointly preparing to meet emerging domestic and regional challenges, foremost being the common threat from terrorism and extremism.

Thus as evident from the developments Indo-GCC economic ties premised on the narrow oil-gas, worker remittances, is poised to swell and diversify in the coming years. This will be the ideal framework to hedge the vulnerabilities of the both in the global oil and gas regime in the wake up of any future supply as well as demand disruptions.

[294] The Economic Times, February 19 2004.

Concluding Chapter

Competition-Interdependence-Co-prosperity: India-GCC-Asian Energy Charter

The global oil and gas regime has undergone structural shifts and basic transformations over the years, repositioning the major players -both consumers and producers, reshaping the geopolitics of energy, and redefining the patterns of trade, pricing, etc. Most importantly, one aspect that has become evident throughout the transition is that although the Gulf Region did experience erosion of power in the global regime, yet it retains its strategic salience. In the coming times they are likely to regain the loss of status, though it might not be of the same quantum. The other most important significant change is the strategic positioning of Asian countries in general and India in particular in the global energy map as the most vibrant consumers of imported energy especially oil and gas. The factor behind this transition is attributed to the definitive shift of global economic thoughts and the economic might of these emerging economies in the world economy.

The Asian region in general and India has taken centre stage in the global oil and gas demand pattern. With the global economic strength centering on this region, the centre of gravity of energy consumption has shifted to this region at the beginning of the 1990s, when the region overtook Western Europe's oil consumption by 435,000 b/d. The demand trend discernible in the region during the recent years reveals that the region is poised to overtake North America (including Mexico) by the year 2005 to become world's largest consumer of crude oil.

The real growth of oil and gas demand in India started with the rapid economic growth rate in the1990s as a result of economic reforms and liberalization policies pursued by the government. Paralleling impressive growth rates, the demand for every forms of energy in general and oil and gas in particular surged up. Though India's energy mix was heavily biased towards coal due to its abundance, but gradually, it became oil reliant premised on the pattern of economic growth and production process. It does not mean that oil and gas was substantially available domestically rather it was the cheaper imports of oil, as other sources of domestic energy such as electricity and specifically coal was not optimally used. The meager domestic as well as regional oil and gas sources have resulted in increasing volumes of oil imports from the Gulf region. The strong oil demand growth in India encouraged refining capacity expansion. By the mid-1990s, India built new and additional refineries. Yet the capacity expansion failed to catch up with the soaring demand surges. The shortages of toppers widened to around a million barrels in the whole Asian region. Amid such emerging supply-demand gap, India relied heavily on oil imports. The oil demand surges combined with refining sector boom sent India's oil demand soaring and resulted in voluminous crude imports, particularly from the Gulf region. Because of growth of domestic oil production plateued over the years and because India is situated far from the non-Gulf producing area and because Indian refineries are technically designed to process Gulf crude, consequently the dependence on the Gulf region rose considerably, despite the fact that, Indian and Asian bound oil cargoes have been more costly than those shipped to Europe and US (The differential widened to around $3 per barrel in the year 2000).

However, sensing the strategic importance of the hydrocarbon sector in the overall economic set up and the underlying heavy import dependence, the Government of India started reforming the petroleum sector, albeit slowly. The pace of reforms, though, was slow initially, yet has resulted in some desired achievements. Most importantly among the achievements are the discoveries of major oil and gas fields in recent years by private as well as public sector joint ventures facilitated through the NELP, securing equity oil abroad through joint ventures in an attempt to diversify import sources from the Gulf, equalizing prices of petroleum products on import parity, withdrawing subsidies, etc.

Despite such policy measures taken by the GOI to be secure on the vital energy front by diversifying the import sources of oil and gas, yet the present and future trends of oil and gas consumption concretely envisage that the dependence on the Gulf is likely to remain and even increase in the near future. So given the nature of the Gulf region as politically volatile and vulnerable, there are apprehensions regarding India's perennial quest for energy security.

The supply side transformation witnessed in the global regime over the years is that the Gulf countries are constantly facing threats regarding their survival and stability. The threats are from both demand as well as supply side of the global oil game. On the demand side, the threats are the byproducts of the measures that were undertaken by the industrialized and major oil importing countries in reaction to the two oil shocks of the 1970s. They include successful price-induced energy conservation measures-implemented through fiscal policies and technological innovations and an increase in the pace of oil discovery and production outside OPEC spurred by the high prices of 1973-74-through tax incentives and technological breakthroughs. Among other developments that slowed down the reestablishment of Gulf as the dominant force in the world oil market are the relatively low economic performance of the industrialized oil importers (which reduced oil demand) and moves away from oil towards other energy sources especially natural gas. This has in fact created a supply structure 'away from the Gulf syndrome' in the global oil regime. These factors would not have represented a problem were it not for the risk of 'oil obsolescence' for OPEC producers, holding huge reserves; less Gulf oil will be needed as more conservation and energy efficiency measures are put in place; as alternative sources of energy developed and as new non-OPEC sources are brought on line to increase world supply.

As discussed in the study earlier, it is apparent that OPEC and Gulf countries in particular have contributed to their marginalization and also their past policies of defending prices at all costs (through the role as residual producers) have encouraged other non-OPEC producers to expand their exploration programmes, to develop technology to extract oil and gas in domestic and remote areas that were inaccessible a few years ago and to increase the productivity and longevity of the existing oil wells. This has resulted in substantial non-OPEC supply in the world oil market. In fact OPEC's residual role in the world oil market has resulted in the present 'production-at-will mentality' that prevails in the non-OPEC countries and in a declining OPEC share of world oil output that has recently begun to recover from the lows of the 1980s, owing to the Asian region's in general and India and China's heavy dependence on this region.

Besides the aforesaid external factors, several internal developments within the Gulf region also threaten to undermine the dominance of Gulf in the global oil regime. Just the Gulf countries experience challenges externally due to increased competition from non-OPEC supply, an increasing domestic consumption of energy, resulting in drain of oil revenue earnings. The ever-expanding government expenditures to maintain welfarism combined with lowest oil prices in the 1990s and consequent lower oil revenues have made the matters worse for the Gulf countries. This has further been exacerbated by their low financial strength to augment investment in the oil and gas sector to penetrate into new emerging consuming destinations and thereby secure market share lost during the1980s.

However the trends of world oil and gas reserves, production, and exports reveal that there is every likelihood of Gulf countries' reestablishment in the global oil and gas regime. As analyzed in the study, the non-OPEC reserves, production and supply are highly fluctuating and in fact organically related to market prices and investment movements. Gulf countries holding nearly 65% of world's oil reserves having more than 100 years of R/P ratio are the ultimate source of global oil and gas supply in the coming years. Given the fact that the centre of world oil and gas consumption is Asia in general and India in particular, there are tremendous scope for the GCC countries for their reestablishment in the regime due to the region's strategic location and geographical proximity to these emerging markets.

Thus as evident there are complementarities between India and GCC countries in the present global oil regime which place them strategically in the global energy scenario-India as an emerging vibrant consumer and importer of oil and gas and GCC countries as the dominant suppliers and exporters of oil and gas. A pattern of interdependence in the oil and gas sector can also be witnessed between India and GCC countries. There are also other aspects of such interdependence, but oil and gas factor is the most fundamental one. Another argument for a potentially brighter future for the GCC states emphasizes the fact that the world economy has changed in a fundamental way in recent years and that only a thorough understanding of the new emerging markets will lead to successful competition in the world oil and gas trade. The new patterns point to the Gulf's greater trading affinity with India than other countries of the Asian region. However care should be taken not to assume that the GCC countries would reap all the benefits that an increase in oil and gas demand of India will generate. Given the region's past experience with hostilities and inherent instabilities, India will seek diversification of its import sources. Yet due to numerous constraints such as geo-political, bilateral and financial besides others, the diversification attempts will not be adequate enough to bridge the gap between demand and supply. This can be substantiated from the continuing interaction-both upstream as well as downstream- between India and GCC countries premised on the hydrocarbon interdependence in recent years.

There are also clear indications of Gulf countries' dependence on India and the rest of Asia for a secure stable outlet for their oil and gas exports. The dependence of Gulf countries on the Asian market can be substantiated from the pernicious effects of Asian currency crisis in 1998, resulting in lower oil demand in these countries and consequent lower world oil and prices and lower oil revenues for the oil exporting GCC countries. However, thanks to China and India, the two untouched by the crisis, maintained their steady growth in oil demand and accounted for 3% and 7% (1999) growth in their oil imports from the GCC countries, which somehow stabilized the Gulf prospects. Thus there is a shift from complementarities to interdependence between oil consumers and producers in recent years, which have made both vulnerable to the bottlenecks and periodical rigidities of the global oil and gas regime.

Moreover given the fact that Asia is going to be the main centre of energy consumption in the near future and importantly the main market of the GCC oil and gas exports, India due to its strategic positioning and refining expertise and strength can be the destination to penetrate into the booming Asian market through locating refineries, which will definitely curtail the transportation costs. Besides there are also tremendous opportunities, especially in the petrochemical and other downstream activities in India that can be beneficial for the GCC countries.

Thus the oil suppliers and importers have become vulnerable in the present regime due to their skewed interdependence. This is radically different from the earlier eras when the producers and suppliers used to dictate the terms of the trade for the importers. This mutual vulnerability of both the exporters and importers is therefore being regarded as the major indicator of the prospect of global oil and gas business in the coming years.

The concerns of demand as well as supply disruptions generated from the matrices of the interdependence framework have compelled the producers as well as consumers to seek more assertive vigorous interaction to address the vulnerabilities thereof. The oil suppliers of the GCC are reciprocating interdependent relations with India and other importing countries in the Asian region. This framework of interdependence points to a dissonance between the emergence of international oil market dominated more than ever by economic forces and domestic economies in the oil exporting countries dominated by political considerations not always in agreement with an optimal allocation of resources. This is therefore a challenge for the GCC oil producing states to adhere and devise prudent policies to accommodate consuming country's wishes and simultaneously initiating efforts for their survival.

This calls for the extension of the framework of interdependence as a catalyst to augment economic relations between India and GCC to taper off the mutual vulnerabilities of energy security. In recent years, both have focused on such arrangements to augment their economic relation to higher proportions for their mutual benefit, acknowledging the emerging potentials of both in the global oil and gas regime as the background.

In this respect another most promising areas of interdependence between India and GCC countries can be visualized in the liberalized economic regimes, especially the knowledge economy. As mentioned earlier in the study, the GCC countries are pursuing policies to establish knowledge society in order to harness all round human development and absorb the surmounting unemployed work force in these sectors in their countries in which the domestic workforce were earlier reluctant to go for available semi-skilled jobs. India, having global leverage from the knowledge industry perspective is suitably placed to penetrate into these booming markets.

Besides the interdependence between India and the GCC counties, there are also concerns regarding the ensuing competition for secured energy sources in the GCC countries by other Asian countries. As analyzed before, though the Asian countries are pursuing a strategy to diversify the sources of supply particularly with Central Asian hydrocarbon showing a lot of promises yet trends indicate that the Persian Gulf region is going to be the major hunting ground hence competitive. The recent report from FACTS, *Energy Advisory No. 264: Asia-Pacific Crude Oil Market – An Update*, points out that in 2000, Asia –Pacific imported nearly 55 percent from the West Asia.

> "Future crude oil import requirements are crucially dependent on the refinery construction in the region over the next 10 years. Based on our survey of the regional refining industries, it is obvious that a few countries are continuing with their plans to expand their refining capacities and upgrading capabilities. By 2010, imports of crude oil from outside the region are projected to be up substantially from 2000. Of the total crude use in 2010, oil from outside the Asia-Pacific region is expected to rise substantially to 70% in 2010. The share of the region's crude imports from the Middle East is expected to increase to 62% in 2010 while crude imported from other parts of the world is forecast to reach 8%.If the Asian countries are building bridges with the Gulf countries, the latter also need the Asian market, thus there is a kind of mutually dependent relationship" [295].

Taking into account the demand-supply matrix, the Asian players especially China, India and Japan will actively be pursuing their interest in the Gulf market. Whether their search will enhance the intensity to competition and conflict could be an issue of debate[296]. Moreover, while it is naturally important for the individual countries to make efforts to secure their own energy supplies, there is also a possibility that excessive pursuit of the national interest by any

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[295] 'Middle East Crudes Will Supply Most of the Rise in Asian Demand', Says FACTS, OPEC Bulletin, VOL. XLV No 4 28 January 2002.

[296] Pant, Girijesh and Samir Ranjan Pradhan, "Emerging Asian Competition for Gulf Hydrocarbon Resources: Implications for India's Energy Security", Paper resented at the National Seminar on 'India's Energy Security', JNU, New Delhi, February 19-20, 2004.

single country could damage the energy security of the rest of the region. It is consequently becoming increasingly important for the issue to be treated as one in which all countries in the region have a common stake. One has aptly remarked that the greatest challenge before the Asian energy dependent countries is perhaps the transit route that is the Strait of Hormuz-the potential strategic choke point-that portends future conflict among the major oil importers of the Asian region[297].

In the changing context where hydrocarbon despite being strategic commodity is moving to the arena of market to be traded as "just another commodity", the pressure of market seems to be prevailing in defining the parameter of emerging regime. One plausible scenario could be:

> "Asia's tremendous expansion of energy demand over the next two decades will force key regional powers such as India and China to accept far greater levels of cross-border energy dependency, and this will constitute a new cultural mindset for leaders long accustomed to viewing energy primarily as security vulnerability. As such, we choose a. our pinnacle moment the shift from buying natural gas via LNG ships to erecting permanent pipelines that create long-term energy interdependencies"[298].

However it will be too simplistic to assume that market will be the decisive factor. The perceived strategic concern expressed by the dominant power namely USA cannot be ignored. There is a school which argues that,

"There is a shift in strategic geography hence new emphasis on the protection of supplies of vital resources, especially oil and natural gas. Whereas Cold War-era divisions were created and alliances formed along ideological lines, economic competition now drives international relations -- and competition over access to these vital economic assets has intensified accordingly. Because an interruption in the supply of natural resources would portend severe economic consequences, the major importing countries now consider the protection of this flow a significant national concern. In addition, with global energy consumption rising by an estimated two percent annually, competition for access to large energy reserves will only grow more intense in the years to come"[299].

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[297] Cordesman, Anthony H., "The Changing Geopolitics of Energy – Part VI: Regional Developments in East Asia, China, and India", *Strategic Energy Initiative, Center for Strategic and International Studies,* August 12, 1998.

[298] Asian Energy Futures Event Report (VI): The There and Then of Asian Energy, 2020, on the site http://www.nwc.navy.mil/newrulesets/AEFreport6.htm.

[299] Michael T. Klare, The New Geography of Conflict, *Foreign Affairs*, May/June 2001.

Thus the recipe for avoiding a catastrophe is cooperation and information exchange among countries. Energy security is as much a collective concept as military security. The Institute of Energy Economics, Japan (IEEJ) in a recent presentation has rightly noted that,

> "In Asia (and East Asia in particular), achievement of the "three Es" (economic development, energy security, and environmental preservation) can no longer be viewed as a task to be addressed by each country separately; instead, it should be approached through region wide cooperation as a goal of common interest. Similarly, the perspective of region wide optimization as opposed to pursuit of national interest should take on increasing importance. In this context, Japan would have a critical role to play as a leader in the aspects of technology, infrastructure, economic power, and institutional design. It should regard this role not merely as a variety of assistance to fulfill its obligations as a developed country but also as a huge opportunity for development of business deriving from energy and the environment"[300].

India must take the lead in bringing the important Asian energy consumers into a forum, which could reduce the cost of research, improve energy efficiency and work towards an Asian Energy Charter.

Here the example of the Energy Charter, an inter-governmental organization promoting energy cooperation, is worth mentioning. The Energy Charter Conference is the governing body of the Energy Charter Treaty. The Energy Charter Treaty is a legally binding treaty under public international law uniting 51 European and Central Asian states in the establishment of an energy policy foundation addressing transit of energy, energy investment, energy trade and energy efficiency and environmental policy.

The Energy Charter Transit Protocol currently being negotiated by 51 European and Central Asian states, including the member states of the European Union, the Russian Federation, the Commonwealth of Independent States and Japan, is expected to contain public international law provisions encouraging the removal of any obstacles to the execution of cross-border energy swaps. This important energy policy initiative is expected to facilitate secure, efficient, uninterrupted and unimpeded execution of cross-border energy swaps. The 51 states will also take necessary measures to prevent and address illegitimate taking of energy being delivered or redelivered under cross-border energy swaps[301].

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[300] IEEJ, 'Asia/World Energy Outlook: Burgeoning Asian economies and the changing energy supply-demand structure', 10 March 2004, (Japan: IEE).

[301] By cross-border energy swap is understood the exchange of energy by two players in two different jurisdictions based on a mutually beneficial sharing of energy price differentials.

Thus the Asian Energy Charter, if formed, would facilitate transit of gas through third countries and open up international gas trade in Asia. The same forum would help in an oil supply crisis through joint management of strategic reserves and by cooling down the market through exchange of information on stocks, taxation and rationing proposals, etc. In this respect it can also be mentioned that the Asian Energy Charter should include the GCC countries, who are also the traditional energy suppliers to India and the whole of Asia. This would be on the lines of much discussed OPEC's consumer-producer dialogue process, initiated in recent years to address the complexities of the interdependence between producers and consumers.

However, the success of this forum will depend on the participation of India, China and Japan. Neither ASEAN nor APEC includes all of these countries. Could either of these be persuaded to expand its membership? Is it possible to link the research institutes and think tanks in these countries together for collaborative research? It is time we took a good long look at these questions. However the feasibility of such forum is possible in the light of a recent development when the ASEAN became an official observer-organization to the Energy Charter Conference[302].

However, in a multi-polar world, whose prosperity and security is considerably influenced by such transnational commodities as oil and gas, each group has to tread cautiously if it is not to provoke a drastic reaction from other actors to the detriment of all parties concerned. This applies to various aspects of decision making, such as pricing, trade and investment. Also of significance in this interdependence is the fact that each group is not composed of homogenous members. There are wide disparities in conditions, needs and priorities. This diversity may furthermore facilitate the development of cross group relations and alliances, which has already witnessed in the development of relations between the United States and Saudi Arabia-the two major players in the global oil regime during the 1970s and 1980s. In this regard one factor that may act as a hindrance in the greater ties between India and GCC countries can be visualized as the growing and deepening defence and other relation between India and Israel. But given the fact that there are imminent economic compulsions of the changing times will compel both India and GCC countries to strive for mutual beneficial relations premised on the hydrocarbon interdependence in order to position them securely in the global oil and gas matrix.

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[302] http://www.pipelinedubai.com/press/pr_1329.htm

Oil, as analysts has put, has remained a key vector of rivalry or cooperation in transnational relations. Institutions created in response to various challenges posed by the oil and gas sector will have to evolve by adapting their (India as an emerging consumer and GCC countries as suppliers) functions and operations to the changing realities-if they are to survive and develop. The essence of sustained cooperation is, therefore, adaptability.

Selected Bibliography

Primary Sources

Government of India, *Restructuring Group Report,* (New Delhi, GOI, 1996).

Handbook on Indian Petroleum and Natural Gas Industry and Investment Scenario 2001, (New Delhi: India Book Centre, 2001).

International Monetary Fund, *Direction of Trade Statistics Yearbook,* (Washington D.C., 1998-2003).

____________, *International Financial Statistics,* (Washington D.C., 1998-2003).

International Trade Centre UNCTAD/WTO, *International Procurement of Crude Oil and Petroleum Products*, Guide No. 24, UNCTAD/WTO (Import Management), 1995.

Ministry of Commerce, *Annual Reports*, (Government of India, 1991/92-2001/2002).

Ministry of Finance, *Economic Survey,* (New Delhi: GOI, 2001/02-2002/03).

Ministry of Petroleum and Natural Gas (MoPNG), *Annual Report,* (New Delhi: Government of India, 1990/91- 2002/03).

________, *Hydrocarbon Vision 2025,* (New Delhi: MoPNG, 20000).
Planning Commission, *Ninth Five Year Plan Documents*, (GOI, 1998).

TERI, *Indian Oil and Gas Conference (3rd & 4th) papers,* (New Delhi: TERI, 2002-03).

United Nations, *Annual Yearbook of World Energy,* (Paris: UN, (issues up to 1995).

Reports

Al-Harthy, Khalifa Bin, *Oman's Foreign Policy and Relations with India,* GSP Guest Lecture Series, GSP 2000, New Delhi: GSP, CWAAS, SIS, JNU, 2002.
Commercial and Economic Report for Qatar for the Month of March, 2001, http://www.trade-india.com.

EIA, *International Energy Outlook,* (US Department of Energy, Washington D C, 2000 and 2001).
______, *South Asia Regional Overview,* (US Department of Energy, April 1999).
El-Beblawi, Hazem, *The oil Decade: An Appraisal in Perspective,* (The IBK Papers, Series No.10, Kuwait: The Industrial Bank of Kuwait K.S.C., September 1983, p.42).

FICCI-IDSA, *India's Energy Security and Managing Oil Shock,* (New Delhi: FICCI-IDSA, November 2001).

GAO, *Oil Supply Disruptions: Their Price and Economic Effects,* Washington D. C., 1983.

ICRIER, *Colloquium on Gulf Oil Exporting Countries and India: Trade and Investments*, (New Delhi: Indian Council for Research on International Economic Relations, 1983).

IEA, *Caspian Oil and Gas*, (Paris: IEA/OECD, 1998).

____, *Monthly Oil Market Report*, (January 1999).

____, *Energy Policies of IEA Countries*, Paris: IEA/OECD, 1999.
_____, *Middle East Oil and Gas*, (Paris: IEA, 1995).

______, *Natural Gas Information 2000*, (Paris: IEA/OECD, 2000).
_______, *Oil Supply Security: The Emergency Response Potential of IEA Countries*, Paris: IEA/OECD, 1995.
_______, *Safeguarding Energy Supply Security*, in 'Towards a Sustainable Energy', Paris: IEA/OECD, 2001.

_______, *Towards a Sustainable Energy Future*, (Paris, IEA/OECD, 2001).
_______, *World Energy Outlook 2002*, (Paris: IEA/OECD).
_______, *Asia Gas Study*, (IEA, Paris, 1996).

MacDougall, Michael, and Peter T. Linder, *Long Term Outlook for World Gas Trade: 1990-2015*, (Calgary, Canada: Canadian Research Institute, 1992).

Mitra, A., *Oil and Natural Gas Explorations in India: Acceleration of output and Private Sector Participation-A Package of Recommendations*, (New Delhi: Business India Policy Unit, 1990).

Pant, Girijesh, *India's Energy Security: The Gulf factor*, GSP Occasional Paper Series, GSP 2002/2, New Delhi: GSP, CWAAS, SIS, JNU, 2002.

Petroleum Economist, *India: It's Energy Potential*, (London: Petroleum Economist, 1995).

Porter, Edward D, *Non-OPEC Supply and World Petroleum Markets: Past Forecasts, Recent Experience and Future Prospects*, (Washington DC: American Petroleum Institute, 1999).

Tata Energy Research Institute (TERI), *TERI Energy Data and Directory Year Book*, (New Delhi: TERI, 1998-99 to 2001-02).

______, *Defining an Integrated Energy Strategy for India: A Document for Debate, Discussion and Action*, (New Delhi: TERI, 2002).

______, *India's Energy Security*, New Delhi: TERI, 1999.
TERI, *Roadmap to Deregulation of the Indian Petroleum Industry*, in *'Reforms in Energy Sector*,' (New Delhi: TERI, 2001).

______, *TERI Directions, Innovations, and Strategies for harnessing action (DISHA)*, (New Delhi: TERI, 2001).

United Nations (UN), *World Energy Assessment and the Challenge of Sustainability*, (Paris: UN, 2001).

________, *World Population Prospects: The 1998 Revision*, UN.

World Bank, *The East Asian Miracle: Economic Growth and Public Policy*, (Oxford: Oxford University Press (OUP), 1993).

__________, *World Development Report 1991*, (Oxford: OUP, 1992).

Secondary Sources

Books

Abidi, A. H. H., ed., *Indo-Gulf Economic Relations: Patterns, Prospects and Policies*, (New Delhi: Intellectual Publishers, 1989).

Adelman, M. A., *Economics of Petroleum Supply*, (M I T Press, Cambridge, M A, 1993).
_______, *The Genie out of the Bottle: World Oil Since 197*', (MIT Press, Cambridge, M A, 1995).

Ahrari, Mohd. E., *OPEC: The Falling Giant*, (The University Press of Kentucky, 1986).

Al-Chalabi, F.G., *OPEC and the International Oil Industry: A Changing Structure*, (Oxford: Oxford University Press, 1980).

Al-Otaiba, Mana Saeed, *OPEC and the Petroleum Industry*, (London: Croom Helm, 1975).
Amuzegar, Jahangir, *Managing the Oil Wealth: OPEC's Windfalls and Pitfalls*, (New York: I.B. Tauris Publishers, 1999).

Bernad, P.D., *Asian Energy Chartbook: Checking the Pulse of the Asian Oil Industry*, (New York: Goldman Sachs & Co., 1998).

Bhatia, R., *Energy Demand Management Policies in India*, (Manila: Asian Development Bank, December, 1986).

Blair, John, *The Control of Oil*, (New York: Pantheon Books, 1976).

Bohi, Douglas R., and W. David Montgomery, *Oil Prices, Energy Security and Import Policy*, (Washington: Resources for the Future Inc., 1982).

Bradley, P.G., *The History of global energy demand in the perspective of oil trade*, (MIT Centre for Energy Policy Research, 1985).

Chambers, Ann, *Natural gas and electric power in non-technical Language*, (Tulsa, Oklahoma: Penwell Pub. Co., 1999).

Cremer, Jacques, and Djavad Salehi-Isfahani, eds., *Models of the oil market*, (Switzerland: Harwood publishers, 1991).

Cyrus, Bina, "The Economics of the Oil Crisis," New York: Merlin Press Ltd., 1985.

Dadwal, Shebonti Roy, *Rethinking Energy Security in India*, (New Delhi: Knowledge World, 2003).

Dasgupta, B., *Oil Industry in India: Some Economic Aspects*, (London: Frank Cass, 1971).

Datt, Ruddar, and K.P.M. Sundaram, *Indian Economy*, (New Delhi: S. Chand & Company, 2001).

Deese, David A., and Joseph S. Nye, *Energy and Security*, (Cambridge: Ballinger Publishing Company, 1981).

Duncan, Raymond W, and others, *World Politics in the 21st Century*, (New York: Longman, 2002).

Economic Intelligence Unit (EIU), *OPEC and the World Oil Outlook: Rebound of the Exporters?*, (London: The Economic Intelligence Unit, 1983).

Economides, Michael, *The Color of Oil: The History, the Money and the Politics of the World's Biggest Business*, (Texas: Round Oak Publishing Company, Inc., 2000).

ECSSR, ed., *Caspian Energy Resources: Implications for the Arab Gulf*, (UAE, ECSSR, 2000).

_______, *The Future of Natural Gas in the World Energy Market*, (Abu Dhabi, UAE: ECSSR, 2001).

El Azhary, M. S., ed., *The Impact of oil revenues on Arab Gulf Development*, (University of Exeter: Croom Helm, 1984).

El Mallakh, Ragei, ed., *OPEC: Twenty Years and Beyond*, (NY: West View Press, Inc., 1981).

El-Beblawi, Hazem, *The oil Decade: An Appraisal in Perspective*, (The IBK Papers, Series No.10, Kuwait: The Industrial Bank of Kuwait K.S.C., September 1983).

Ferrier, R.W., and A.Fursenko, ed., *Oil in the World Economy*, (London/New York: Routledge, 1989).

Field, Michael, *A Hundread Million Dollars a Day*, (London, Sidgwick and Jackson, 1975).

Gilbar, Gad G., *The Middle East Oil Decade and Beyond*, (London: Frank Cass, 1997).

Hartshorn, J. E., *Oil Trade: Politics and Prospects*, (Cambridge University Press, 1993).

Harvey, D., *The condition of Post modernity,* (Oxford: Blackwell; 1989; p.241}.

Heal, Geoffrey, and Graciela chichilnisky, *Oil and the International Economy,* (Oxford: Clarendon Press, 1991).

Henderson, P.D., *India: The Energy Sector,* (New York: Oxford University Press for The World Bank, 1975).

Hogan, W.W., *Oil Market Adjustments and the New World Order,* (Cambridge, Massachusetts, USA: Centre for Business and Government, John F. Kennedy School of Government, Harvard University, 1992).

Hoopes, Stephanie M., *Oil Privatization, Public Choice and International Forces,* (London: Macmillan Press Ltd., 1997).

Horsenell, Paul, and Robert Mabro, *Oil Markets and Prices: The Brent Market and the Formation of World Oil Prices,* (Oxford: Oxford University Press, 1993).

Horsnell, Paul, *Oil in Asia: Markets, Trading, Refining, and Deregulation,* (OUP for Oxford Institute for Energy Studies, Oxford, 1997).

Jasjit Singh, ed., *Oil and Gas in India's Security,* (New Delhi: Knowledge World and Institute for Defence Studies and Analysis,(IDSA), 2001.

Jeremy, Russel, *Geopolitics of Natural Gas,* (Cambridge: Ballinger Publishing Company, 1983).

Jones, R.J.B., *Globalisation and Interdependence in the International Economy,* (London: Pinter, 1995).

Joshi, Vijay and I. M. D. Little, *India's Economic Reforms, 1991-2001,* (New Delhi, 1996).

Katouzian, Homa, *The Political Economy of Modern Iran,* (N Y, London: NY University Press, 1981).

Kent, Marian, *Oil and Empire, British Policy and Mesopotamian Oil 1900 – 1920,* (London: Macmillan Press, 1976).

Khan, Jawed Ahmad, *India and West Asia: Emerging Markets in the Liberalization Era,* (New Delhi: Sage Publications, 1999).

Lall, Sanjaya, *Learning from the Asian Tigers, Studies in Technology and industrial Policy,* (Macmillan Press, Basingstoke, and Laos 1996).

Levy, Walton J., *Oil Strategy and Politics, 1941-1981,* (London: West View Press, 1982).

Luciani, Giacomo, *The Oil Companies and the Arab World,* (London: Croom Helm, 1984).

Mabro, R., *Oil Price Crisis of 1998,* (Oxford: Oxford Institute for Energy Studies, 1998).

Manning, Robert A., *The Asian Energy Factor: Myths and Dilemmas of Energy, Security, and the Pacific Future,* (New York, Council on foreign Relations, 2000).

Manoharan, S., *The Oil Crisis-End of an Era,* (New Delhi: S.Chand Publishers Pvt. Ltd., 1974).

Marcus, A. A., *Controversial Issues in Energy Policy,* (New York: Sage publications Inc., Vol. 2, 1992).

Marcus, Alfred Allen, *Controversial Issues in Energy Policy,* (NY: Sage Publication, Inc., 1992).

Mc Veigh, J. C., and J. G. Mordue, eds., *Energy Demand and Planning,* (Report No. 31, London/ NY: E & SPON, for the Watt Committee on Energy, 1999).

Mehetre, M.G., *Energy Crisis in India,* (Allahabad: Chugh Publications).

Mehta, Balraj, *India and the World Oil Crisis,* (New Delhi: Sterling Publishers Private Ltd., 1974).

Mikdashi, Zuhayr, *A Financial Analysis of Middle East oil Concessions, 1901 – 65,* (New York: Praeger Publishers, 1966).

__________, *The Community of Oil Exporting Countries,* (Itchaca Press, New York: Cornell University Press, 1972).

__________, *Transnational Oil: Issues, Policies and Perspectives,* (London: St. Martin's Press, 1986).

Mitchell, J. V., *Renewing Energy Security,* (London: The Royal Institute of International affairs, Sustainable Development programme, July 2002).

Mitchell, John, and others, *The New Geopolitics of Energy,* (London: Royal Institute of International Affairs, 1996).
Mitchell, John, et al, *The New Geopolitics of Energy,* (London: The Royal Institute of International Affairs, 1996).

Nazli, Choucri, *International Energy Futures: Petroleum Prices, Power and Payments,* (London: MIT Press, 1981).

Niblock, Tim and Rodney Wilson, eds., *The Political Economy of the Middle East,* Vol. I, Economic Development, (Cheltenham: Edward Elgar Publishing Ltd., 1999).

Noreng, Oystein, *Oil Politics in the 1980s: Patterns of International Cooperation,* (USA: McGraw Hill Book Company, 1978).

Norouha, L., *Oil Exploration and Development in India 1974/75-86/87,* (New Delhi: TERI, 1989).
Nye, Joseph S., Jr., *Understanding International Conflicts: An Introduction to Theory and History,* (3rd edition, New York, Longman, 2000).

Odell, P R, *Oil and World Power*, (Harmondsworth, Penguin, 8th Edition 1986).

Oweiss, Ibrahim M, *The Arab Gulf Economies*, (UAE :ECSSR, 2000).
Owen, Roger, and Sevket Pamuck, *A History of Middle East Economies in the Twentieth Century*, (London: I. B. Tauris Publishers, 1998).

Pachauri, R. K., *The Political Economy of Global Energy*, (New Delhi: OUP, 1985).

Pant, Girijesh, *The Arab Gulf Economies*, (New Delhi: Haranand Publishers, 1996).

Pasha, A. K., ed., *Perspectives on India and Gulf States*, (New Delhi, Dètente Publishers, 1999).

Pees, S.T., ed., *History of the Petroleum Symposium Guidebook*, (Titusville: American Association of Petroleum Geologists, 1989).
Penrose, Edith T., *The Large International Firm in Developing Countries: The International Petroleum Industry*, (London: Allen and Unwin, 1968).

Penrose, Edith, *The Growth of Firms, Middle East Oil and Other essays*, (London: Frank Cass & Co. Ltd., 1971).

Peterson, J.E., *The Politics of Middle East Oil*, (Washington, DC, Middle East Institute, 1983).

Rachkov, Boris, *Oil Nationalism and Imperialism*, (New Delhi: People's Publishing House, 1967).

Randell, Stephen J., *United States Foreign Oil Policy, 1919 – 1948*, (Kingston and Montreal: McGill – Queen's University Press, 1976).

Rouhani, Fuad, *A History of OPEC*, (New York: Prager Publishers, 1971).

Rybczynski, T.M., *The Economics of the oil crisis*, (London: Macmillan, 1976).

Sepro Joan E, and Jeffry A. Hart, *The Politics of International Relations*, (New York: St. Martin's Press, 5th edition, 1997).

Shaffer, Ed., *The United States and the Control of World Oil*, (New York: St Martin's Press, 1983).

Shafik, Nemat, ed., *Economic Challenges Facing the Middle Eastern and North African Countries: Alternative Futures*, (London: Macmillan Press Ltd, 1998).

Shafik, Nemat, ed., *Prospects for Middle Eastern and North African Economies: From to Boom to Bust and Back?*, (London: Macmillan Press Ltd., for Economic Research Forum for the Arab Countries, 1998).

Shojai, Siamack, ed., *The New Global Oil Market: Understanding Energy Issues in the World Economy*, (London: Praeger, 1995).

Shukri, Ghanem, *OPEC: The Rise and fall of an Exclusive Club*, (London: KPI, 1988}.

Sick, Gary G., and Lawrence G. Potter, rd., *The Persian Gulf at the Millennium: essays in Politics, Economy, Security and Religion,* (London: Macmillan Press Ltd., 1997).

Smith, V. K., *Scarcity and Growth Reconsidered,* (Baltimore, MD: John Hopkins University Press, 1981).

Tippe, Bob, *Where's the Shortage?-A non-technical Guide to Petroleum Economics,* (Oaklahoma: Penwell Books, 1993).

Tussing, A., and Bob Tippe, *The Natural Gas Industry: Evolution, Structure and Economics,* (Okalahoma: Penwell Publishing Company, 1995).

Visvanath, S. N., *A Hundred Years of Oil: A Narrative Account of the Search for Oil in India,* (New Delhi: Vikas Publishing House, 1990).

Wilkins, Mira, *The Emergence of Multinational Enterprise: American Business Abroad From The Colonial Era to 1914,* (Cambridge Mass: Harvard University Press, 1970).

Yergin, Daniel, *The Prize: The Epic Quest for Oil, Money and Power,* (New York: Simon & Schuster, 1991).

Yergin, Daniel, *The Prize: The Epic Quest for Oil, Money and Power,* (New York: Simon & Schuster, 1991).

Articles

"Reforms raise the stakes for investors", *MEED Special Report,* MEED, 15 January 1999, pp. 9-13.

"The Coming World Oil Crisis", *The Khaleej Times,* 16 June, 1998.

Al-Nasseri, HE Obaid Bin Saif, "OPEC's role in the Asia-Pacific oil supply in the aftermath of the economic crisis", *OPEC Bulletin,* October 1999, pp. 4-6.

Al-Ajmi, Fahed M., "Effects of Socio-political events on OPEC's market share stability", *Journal of Energy and Development,* 15 (2), Spring 1990, pp. 275-85.

Amirahmadi, Hooshang, "Oil at the turn of the 21st century", *Iranian Journal of International Affairs,* 8 (1), Spring 1996, pp.34-72.

Azhar, Mohd., "India and oil exporting countries: scope for energy cooperation", *OPEC Bulletin,* March 1996, pp. 4-6.

Bhattacharya, A., "Bridging the energy gap in Asia: Experience of strategic alliances/joint ventures in India", *Oil Asia,* April-Jume-Aug., 1997, pp. 10-12.

Chaudhury, Kiran Aziz, "The Price of Wealth: Business and State in Labour Remittance and Oil Economics", *International Organization,* Vol. 27, 1989, pp. 101-145.

Chhabra, Hari Sharan, "Oil Price War: Over-production is the reason of oil crisis", *World Focus Monthly Discussion Journal,* Vol. 10, No. 5, May 1989.

Chaturvedi, B.K., 'Domestic Resourcing of Energy, Gulf and Future of Global Energy, Paper Presented at the *National Seminar on India's energy security*, New Delhi: GSP, JNU, February 19-20, 2004.

Steevens, Paul, "Middle East Oil", *Middle East Economic Digest (MEED)*, Special Report, 16 January 1994, pp.3-8.

Ramcharan, H., "Oil production responses to price changes: an empirical application of the competitive model to OPEC and non-OPEC countries", *Energy Economics,* Vol. 24, No. 2, pp. 97-106, March, 2002.

Ewing, B. T., and others, "Volatility transmission in the oil and natural gas market", *Energy Economics,* Vol. 24, No. 2, pp. 525-538, March, 2002.

Krichene, N., "World crude oil and natural gas: a demand and supply model", *Energy Economics,* Vol. 24, No. 2, pp. 557-576, March, 2002.

Reddy, B. S., and P. Balchandran, "A Sustainable Energy Strategy for India Revisited", *Economic and Political Weekly (EPW),* December 28, 2002, pp. 5264-5269.

Bakhtiari, A.M.Samsam, "The price of oil", *OPEC Review,* Vol.xxiii. No.1, March 1999, p.5.

Lynch, Micheal C., "Oil Market Structure and Oil Market Behaviour", *Middle East Economic Survey* (MEES), 43:52, 25 Dec 2000/44: 1, 1 Jan 2001, p. D_1 – D_{11}.

Barnett, Steven, and Rolando Ossowski, "Operational Aspects of Fiscal Policy in Oil-Producing Countries," *IMF Working Paper* 02/177 (Washington: International Monetary Fund, 2002).

Fasano, Ugo, "With Limited Oil Resources, Oman Faces Challenges of Economic Diversification, Structural Reforms," *IMF Survey* (July 30, 2001a), pp. 254–57.

———,"Sluggish Growth, Declining Oil Resources Prompt Qatar to Diversify Economy Away from Oil," *IMF Survey* (November 26), pp. 382–84, 2001b,.

———,"With Open Economy and Sound Policies, the U.A.E. Has Turned Oil 'Curse' into a Blessing," *IMF Survey* (October 21), pp. 330–32, 2002a.

———,"Testing the Relationship between Government Spending and Revenue: Evidence from GCC Countries," *IMF Working Paper* 02/201 (Washington: International Monetary Fund, 2002b).

Fasano, Ugo, and others, "Monetary Union among Member Countries of the Gulf Cooperation Council", *IMF Occasional Paper* No. 221 (Washington: International Monetary Fund, 2003).

———, and Qing Wang, “Fiscal Expenditure Policy and Non-Oil Economic Growth: Evidence from GCC Countries”, *IMF Working Paper* 01/195 (Washington: International Monetary Fund, 2001).

———, and Zubair Iqbal, "Common Currency," *Finance & Development* (December), pp. 42–45, 2002.

Goyal, Rishi, “Non-Oil Growth, Competitiveness, and the Labor Market”, in *United Arab Emirates: Selected Issues and Statistical Appendix, IMF Country Report*, 2003.

Fesharaki, Fereiudin, and Yamaguchi Nancy, “Energy Supply and Demand Outlook in the Asia-Pacific Region”, *Link*, 34 (50), 26 July 1992.
Koyama, Ken, “Outlook for Oil Supply and Demand in Asia-Pacific Region and Role to be Played by Japan’s Oil Industry,” *Energy in Japan*, March 1995, No.132.

Fesharaki, Fereidun, Allen Clark and Duangjai Intarapravich, “Pacific Energy Outlook: Strategies and Policy Imperatives to 2010,” East-West Centre, Honolulu, Hawaii, 1995.

Srivastava, Leena, and R. Goswami, “The Indian Oil Experience: A Case Study”, in, *ECSSR (ed.), “Privatisation and Deregulation in the Gulf Energy Industry”*, (UAE: ECSSR, 1999).

Robert W. Fisher, “The Future of Energy,” *The Futurist*, September/October, 1997.

“The Suffering Gulf,” *The Economist*, October 24, 1998.

Zanoyan, Vahan,“A Relevant Framework for Understanding the Global Crude Oil Market”, in ECSSR, (ed.), *‘Gulf Energy and the World: Challenges and Threats’*, ECSSR, UAE, Abu Dhabi.

IMF, "IMF Financial Statistics", January 1997.

MEES, "Arab Countries Fail to Capture Proportionate Share of FDI", *MEES*, 45:11, 18 March 2002.

Sadek, Ali T, and Ali A Bolbol, "Capital Flows, FDI, and Technology Spillovers: Evidence from Arab Countries," *World Development Journal*, Vol. 29, No 12, 2001.

Singh, Jasjit, “Geopolitics of Energy and its Security”, in Jasjit Singh (ed.), *‘Oil and Gas in India’s Security’*, Knowledge World and Institute for Defence Studies and Analysis,(IDSA), New Delhi, p.13.

Bose, B. K., “Indian Oil Sector Transits into a Demanding Future-A Few Hindsights, Insights and Foresights,” *Oil Asia Journal*, January-March, 1999, p.6.

TERI/FACTS, "Gas Demand", *TERI*, (New Delhi: TERI, unpublished internal paper, 2003).

Rao, Saudamini, "The Indian Oil and Gas Sector Bracing for Deregulation", *Oil Asia Journal*, Mumbai, January-April-June 2001, pp. 25-54.

Acharya, K. K., and others, "Challenges in deregulated scenario", in Centre for High Technology, *Hydro-carbon Technology*, August 1998.

Odell, Peter R., "The Global Oil Industry: The Location of Production-Middle East Domination or Regionalization", *Regional Studies*, Vol. 31.3, pp. 311-322, 1997.

Weiner, R J, "Is the World Oil Market 'one great pool' ", *The Energy Journal*, 12 (3), pp. 95-108, 1991.

Chalabi, Fadhil J, "Gulf oil vs. the oil of the Caspian Sea", in ECSSR (ed.), *'Caspian Energy Resources: Implications for the Arab Gulf'*, ECSSR, UAE, 2000, Chap. 8, pp. 156.

"Oil Market Intelligence (OMI)", Petroleum *Intelligence Weekly*, London, December 1998.

Gately, Dermot, "A Ten year Retrospective: OPEC and the World Oil Market", *Journal of Economic Literature*, Vol. 22, no. 2 pp. 11-14, 1984.

Gately, Dermot, "Strategies for OPEC's Pricing and Output Decisions", *The Energy Journal*, Vol. 10, no. 3, 1995.

Tahmassebi, Cyrus H., "The Changing Structure of World Oil markets and OPEC's Financial Needs", *OPEC Bulletin*, March 1995.

"The Investment Requirements for the Development of the Arab Oil and Gas sector and Related Downstream Activities until the End of the Decade", Arab Petroleum Investment Corporation, presented at the Fifth Arab Energy Conference, Cairo, 7-10, May 1994, *MEES*, 45:12 27 May 1994.

Stevenson, Michael J., and Paul Suddaby, "Middle East Petroleum Sector Offering More Foreign Investment Opportunities", February 14, *OGJ Special*, 2000, pp. 34-40.

Jones, Mathew, "Enron and Elf in the Mid-East Venture", *Financial Times*, 2 March 2000, on the web, www.ft.com.

Rhodes, Anne, "UAE offsets moves westward", *OGJ*, Vol.98, No.36, 4 September 2000, p. 31.

"Deadline looms for IOCs gas proposals", *Middle East Economic Digest (MEED)*, Vol. 44, No. 22, 2 June 2000, p.8.

Bahgat, Gawdat, "The Geopolitics of Natural Gas", *OPEC Review*, September 2001, p. 278.

Pant, Girijesh, "The Changing Gulf Market and India: Trends and Prospects", in Pasha, A. K., (ed.), *'Perspectives on India and Gulf States'*, Détente Publishers, New Delhi, 1999, pp. 112-126.

MEED, "KPC to set up Indian Oil refinery", *MEED*, January 27 1995, p.21.

Roy Choudhury, Rahul, "Sea Power and Indian Security", *Brassey's*, London, 1995, p.89.

Majumdar, Manab, "*Symposium on Movement of Natural Persons*", 19 March 2003, Tokyo, for FICCI, New Delhi.

Sayeed, Ausaf, "India-Qatar: Synergy in the Oil & Gas Sectors", *http://www.indianembassy.gov.*

Siddiqui, Huma, "Anti-West Feelings Have Gulf Companies Turning To India", The *Financial Express*, January 22 2004.

Raja Mohan, C, 'Is India Loosing the Gulf to China', *The Hindu*, February 13 2003.

Lichtblau, John H., "Oil Import and National Security: Is there still a connection", *Petroleum Research Foundation*, New York, 1994.

Koyama, Ken, "Oil Supply Security in Asian Economies: Growing oil imports and their response measure", *Energy in Japan,* January 1998, Institute of Energy Economics (IEE), Japan.

Kemp, Geoffrey, "The Persian Gulf Remains the Strategic Price", *Survival,* Vol. 40, no. 4, winter 1998-99, pp. 132-49, International Institute for strategic Studies, Washington D C.

'Energy and Geopolitics: Addicted to oil', The Economist, December 13th 2001, on the site, http://webs.wichita.edu.

"Power to the People: A Survey of Energy", *The Economist,* 18 June 1994, p.14.

Gause, Gregory F., "The Gulf Conundrum: Economic Change, Population Growth, and Political Stability in the GCC States", *The Washington Quarterly,* 20:1, pp. 145-65, p. 146.

Mitchell, J. V., "Will Western Europe Face an Energy Shortage?" Strasbourg, *Energy Council of Europe*, 1997.

Morse, Edward L., and James Richard, "The Battle for Energy Dominance", *Foreign Affairs*, Mar./Apr., 2002, p. 16-31.

Franssen, Herman, "Arab-US Energy Needs in Perspective", *MEES*, 45:37, 16 September 2002, D1-D7.

David, S. R., "Saving America from the Coming Civil wars", *Foreign Affairs*, 78, pp. 103-16.

AFP (Agence France-Presse), "Gulf States can not Afford to Finance another war", *Jordan Times*, 16 February 1998, p.10.

Cordesman, Anthony H., 'Are Energy Wars Still Possible?', *Centre for Strategic and International Studies*, Washington, DC, February 11, 1999.

Aissaoui, Ali, "Gas-Exporting Countries: Towards Cartelization", *MEES*, 45:32, 12 August 2002, pp. D1-D3.

Gray, Dale, "Reforming the Energy Sector in Transition Economies: Selected Experience and Lessons", World Bank Discussion Papers, no.246, Washington D C, 1995.

'Oil, Technology and War in the next decade', Crustal Fluids GP/PE/GES 200, Spring Quarter, 1995/1996, http://srb.stanford.edu/nur/classes/otw.html.

Manning, Robert A., 'The Asian Energy Predicament', The International Institute for Strategic Studies, *Survival*, Vol. 42, No. 3, Spring 2000.

Fesharaki, Fereidun, "Energy and the Asian Security Nexus", *Journal of International Affairs*, Vol. 35, No. 1, Fall 1999, New York: Colombia University.

Dadwal, Shebonti Roy, "India's Energy Situation: Crisis in the Making", *Strategic Analysis*, IDSA, New Delhi, June 1997.

Dadwal, Shebonti Roy, "Energy Security", *Strategic Analysis,* July 1999, pp. 653-670.

Goswami, Rajnish, "India's oil needs: Scope for Gulf suppliers in the coming century", *Oil Asia Journal,* Nov.-Dec., 1998, pp. 31-39.

Hashan Ashraful, "Geo-politics of petroleum and Gulf security", *Regional Studies,* 11 (4), Autumn, 1993, pp. 28-46.

"Necessary Interdependence: Building the Asian Energy Infrastructure", *Look Japan,* August, 1998.

"Economic Liberalisation and the Oil sector in India", *Oil Asia Journal,* Oct.-Dec., 1992, pp. 91-94.

Neelanjana, Mitra, "Energy Policy Planning in India: Case of Petroleum and Natural Gas", *EPW,* 27 (35), 29th August 1992, pp.192-95.

Mohan, C. Raja, "Geopolitics and Energy Security", *Strategic Analysis,* 19(9), December 1996, pp. 1269-76.

Salameh, Mamdouh G., "The Geopolitics of oil in the Asia-Pacific Region and its strategic implications", *OPEC Review,* June 1997, pp. 125-130.

Steevens, Paul, "Asia's insatiable oil needs: Implications for the Gulf", *Oil & Gas Journal (OGJ),* 23 September 1998, pp. 29-36.

Yousefi, M.G., "The impact of oil export on the economy of OPEC countries: An empirical investigation", *The Indian Economic Journal,* Vol. 42, No. 3, January-March, 1995.

"Meeting the Challenge", *The Frontline,* Chennai, March 12, 2004, pp. 55-56.

Nayar, Vineet, "The Virtual Asset", *Business world* (Special Millennium Issue), 17 January, 2000.

Pant, Girijesh, "Indo-Gulf Economic Relations: A Profile", *International Studies,* 24, 3, (New Delhi: Sage Publications, 1987).

News Papers and Journals

Asian Energy News: Energy, Economy and Environment Press Review, CEERD, School of Environment Resource and Development, Asian Institute of Technology, Thailand, (Monthly Review).

Monthly Review of Indian Economy and Foreign Trade Review of India, Centre for Monitoring Indian Economy (CMIE), Mumbai.

Energy Policy, Elsevier Sciences Limited, United Kingdom.

International Oil and Gas Finance Review, Euro Money Publications, UK, 1999.

Middle East Economic Digest (MEED), UK.

Middle East Economic Survey (MEES), Nicosia, Cyprus.

Middle East International (monthly), London.

Natural Resource Forum, UN Journal.

Oil and Gas Journal (OGJ), Tulsa, Okalahoma.

Oil Asia, Mumbai.

OPEC Annual statistical Bulletin (Annual), Vienna: OPEC.

OPEC Bulletin (bi-monthly).

OPEC Review (quarterly journal), London: Blackwell Publishers for OPEC.

Oxford Energy Forum (quarterly journal), Oxford Institute for Energy Studies, Oxford.

Petroleum Economist, London.

Strategic Analysis and Strategic Analysis, New Delhi: Institute for Defence Studies and Analyses.

World Oil Market Report (monthly), Paris: IEA.

Tata Energy Data and Directory Yearbook (TEDDY), New Delhi: TERI.

TERI Information Digest on Energy (TIDE), (monthly).

TERI Newswire (monthly).

The International Studies, Journal of the School of International Studies, Jawaharlal Nehru University, New Delhi.

The Frontline, Chennai.

The India Today, New Delhi.

The Times of India, New Delhi.

The Hindu, New Delhi.

The Financial Times, New Delhi.

The Indian Express, New Delhi.

The Hindustan Times, New Delhi.

The Economic Times, New Delhi.

Website References

http://www.meadev.nic.in

http://www.hinduonnet.com

http://www.ikcc.org

http://www.eia.doe.gov.

http://www.iea.org

http://www.trade-india.com

http://www.indembassyuae.org

http://www.indiaonestop.com

http://www.cgijeddah.com

http://www.gasandoil.com

http://www.oilcrisis.com

http://www.let.leidenuniv.nl

http://www.nasscom.org/

Annexure

Annexure 1.1

A Brief History of Major Oil Companies in the Gulf Region

Amoco

1889: Standard Oil (Indiana) founded as subsidiary of Standard Oil Trust
1911: Standard Oil of Indiana founded with dissolution of Standard Oil
1910s: Standard Oil of Indiana purchases Pan American Petroleum
1914: Standard Oil of Indiana licenses "thermal cracking" process for producing gasoline to competing oil companies
1925: Standard Oil of Indiana acquires controlling interest in Pan American Petroleum and Transport Company
1932: Standard Oil of Indiana sells Venezuela operation to Jersey
1954: Pan American and Standard of Indiana merge, new company is called American Oil Company [Amoco]
1957: Begins joint venture with Iran independent of Iranian Oil Consortium
1958: Amoco signs agreement with Shah of Iran
1960s: Amoco Egypt Oil Company, Cairo, founded
1980s: Amoco Sharjah Oil Company, Sharjah, U.A.E., in partnership with UEA, produces natural gas and natural gas liquids in Sharjah
1990s: Amoco Oman Oil Company begins oil and gas exploration program
Corporate Offices: Amoco Corporation, 200 East Randolph Drive, Chicago, IL 60601-7125; phone: (312) 856-6111; e-mail: info@amoco.com.

Arco

1866: Atlantic Petroleum Storage Company founded
1870: Atlantic Petroleum Storage Company establishes Atlantic Refining Company (Atlantic)
1874: Atlantic sold to John D. Rockefeller's Standard Oil Trust
1905: Richfield Oil Corporation founded
1911: Standard Oil Trust dissolved under Sherman Antitrust Act, and Atlantic is spun off as independent company
1916: Sinclair Oil Corporation, founded by Harry F. Sinclair
1931: Richfield goes into receivership and Sinclair merges with Rio Grande Oil and Prairie Pipeline and Prairie Oil and Gas Companies
1936: Richfield Oil Corporation emerges from receivership
1952: Atlantic begins offshore Gulf Coast production
1963: Atlantic purchased the Hondo Oil & Gas Company
1966: Richfield Oil Corporation merges with Atlantic Refining Company, creating Atlantic Richfield Company [ARCO]
1968: ARCO partners with Exxon for Alaskan North Slope production
1969: ARCO acquires Sinclair Oil Corporation
1972: ARCO headquarters moves from New York City to Los Angeles
1977: ARCO acquires the Anaconda Company
1985: ARCO divests East Coast marketing and refining operations
1988: Tricentrol acquired by ARCO
1988: ARCO completes merger with Houston based Union Texas Petroleum Holding Inc
1989: ARCO forms anew publicly held company, Lyondell Petrochemical
1993: ARCO's U.S. oil and gas business restructured and divided into four business units—ARCO Permian, ARCO Western Energy, ARCO Long Beach, Inc., and Vastar Resources, Inc.
1994: Vastar Resources Inc. initiates a public offering of 17 million shares of its common stock
1996: ARCO signs Production Sharing Contract with Sonatrach, the Algerian state oil company, to undertake major Enhanced Oil Recovery project in Algeria's second largest oil field, Rhourde El Baguel
1997: ARCO and Russia's largest oil company, LUKOIL, sign joint venture agreement to invest in oil and gas projects in Russia and other countries
1998: ARCO subsidiary (Western Midway Co.) and a unit of Mobil Corporation reaches agreement to exchange oil and gas properties in California's San Joaquin Valley and the Gulf of Mexico; The California properties owned by Western Midway go to Mobil, while Mobil oil and gas properties in the Gulf go to Western Midway. Upon completion of the exchange, Western Midway will be sold to Vastar Resources Inc. (82.2% owned by ARCO)
1998: ARCO sells majority interest in ARCO Chemical Company and divests its coal assets in the U.S.

Corporate Offices: Arco Corporate Headquarters, 515 South Flower Street, Los Angeles, CA 90071, (213) 486-3511.

Ashland Oil

1924: Ashland Refining Company of Ashland, Ky., founded as a refining arm of Swiss Oil Company of Lexington
1930: Ashland Purchases Tri-State Refining
1931: Acquires Cumberland Pipeline Company's eastern Kentucky pipeline network
1936: Ashland Refining merges with Swiss Oil to form Ashland Oil & Refining Company
1946: Ashland Oil & Refining Company products first sold under the brand name "Ashland"
1948: Ashland and Allied Oil merge
1949: Ashland and Aetna Oil merge, Ashland acquires Kentucky retail marketing operation Freedom-Valvoline, including Valvoline Motor Oil brand and also acquires Southern Pipe Line Company
1950: Frontier Oil Refining of Buffalo, N.Y., and National Refining of Cleveland, Ohio, joins Ashland
1956: Acquisition of R. J. Brown Company of St. Louis.
1963: Ashland acquires United Oil
1966: Ashland acquires Warren Brothers Construction Company
1967: Ashland purchases ADM Chemical Group and forms Ashland
1969: Ashland forms Ashland Petroleum operating division and Arch Mineral
1970: Ashland changes name to Ashland Oil, Inc.
1970: Ashland acquires Northwestern Refining of St. Paul, Minn. and the Super America retail marketing chain
1971: Exploration and production activities are consolidated into Ashland Exploration
1975: Construction division is formed, and Ashland Coal is created
1991: Ashland acquires The Permian Corporation and merges with Scurlock Oil Company
1992: Ashland Chemical acquires most of Unocal's chemical distribution business, establishing the IC&S Division
1994: Ashland's Valvoline acquires Zerex
1995: Ashland changes company's name to Ashland Inc.
1997: Ashland signs agreements with Marathon to combine the refining, marketing and transportation assets of the companies. Ashland acquires 38 percent of Marathon Ashland Petroleum LLC
Corporate Offices: Ashland Inc. Headquarters, 1000 Ashland Drive, Russell, KY 41169, (606) 329-3333.

Chevron

1879: Pacific Coast Oil Company established
1900: Pacific Coast Oil purchased by Standard Oil, but remains separate operation
1906: Pacific Coast Oil consolidated with other Western US operations of Standard Oil into Standard Oil Company (California)
1911: Dissolution of Standard Oil Trust makes Standard Oil of California (Socal) independent
1926: Socal merges with Pacific Oil Company
1929: Socal establishes Bahrain Petroleum Company to hold Bahrain concession
1932: Bahrain Petroleum strikes oil in Bahrain
1933: Socal wins Saudi Arabia concession; Socal establishes California-Arabia Standard Oil Company, Casoc, to hold concession for Saudi Arabia
1933: Socal discoveries oil in Saudi Arabia
1936: Texaco joins with Standard Oil of California (later Chevron), to found the Arab-American Oil Company [Aramco]
1936: Texaco purchases half interest in Bahrain Petroleum and California-Arabian Standard Oil Company (Calarabian) from Socal
1936: California-Texas Company, Caltex, founded as a joint venture between Socal and Texaco as outlet for future oil production in Bahrain and Saudi Arabia
1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texas Oil, Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1961: Socal buys Standard of Kentucky
1974: Bahraini government acquires 60% interest in BAPCO
1980: Bahraini government acquires remaining interest in BAPCO
1984: Socal buys Gulf Corporation and after restructuring changes name to Chevron Corporation

1993: Chevron undertakes a joint venture with the government of the Republic of Kazakhstan forming a new company named Tengizchevroil
1993: Pennzoil Company assimilates Chevron
Corporate Offices: Chevron Corporation, 575 Market Street, San Francisco, CA 94105-2856, 415-894-7700.

Conoco

1875: Continental Oil and Transportation Company founded
1885: Continental Oil and Transportation Company reincorporated as Continental within the Standard Oil trust
1913: Continental Oil reincorporated after breakup of Standard Oil Trust
1917: Marland Oil Company founded
1929: Continental Oil Company merged with portions of Rocky Mountain (a former component of Standard oil) and Marland
Mid-1950s: Continental joins partnership with Marathon and Amerada, called Oasis Group
1981: Conoco becomes a wholly owned subsidiary of by E.I. Du Pont de Nemours & Company
1981: Conoco reorganized as Continental Group
Corporate Offices: Conoco Center, 600 North Dairy Ashford, Houston, TX 77079, P.O. Box 2197, Houston, TX, ZIP Code 77252, Phone: (281) 293-1000, Telex: 775347, Fax: (281) 293-1440.

Exxon

1882: Standard Oil of New Jersey formed by Standard Oil Trust
1888: Standard Oil of New Jersey establishes Anglo-American Oil Co. (predecessor of Esso Petroleum Co.) to market oil in the British Isles
1899: Standard Oil of New Jersey becomes a holding company for Standard Oil Interests, a subsidiary of Standard Oil
1898: Standard Oil of New Jersey gains control of Imperial Oil Limited of Canada
1928: Standard Oil of New Jersey acquires interest in Turkish (now Iraq) Petroleum Co.
1911: Standard Oil of New Jersey [Jersey] becomes independent with dissolution of Standard Oil Trust
1911: Humble Oil Company formed
1919: Jersey acquires majority ownership of Humble Oil
1930: Anglo-American acquired by Jersey
1933: Socony-Vacuum and Standard of New Jersey merge their Far East facilities and interests into a 50-50 venture called Standard-Vacuum Oil Co., or Stanvac
1947: Jersey affiliate, Imperial, strikes oil in Canada
1947: Anglo-Iranian, Jersey and Socony sign 20-year contract with Iran
1948: Jersey (30%) and Socony-Vacuum (10%) join Socal (30%) and Texaco (30%) in Aramco venture
1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texas Oil, Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1959: Jersey buys remainder of Humble Oil
1959: Jersey strikes oil in Libya
1960: Jersey begins to market gasoline under the brand name Esso
1960: Jersey purchases Monterey Oil
1961: Jersey buys Honolulu Oil
1962: Assets of Stanvac split between Jersey and Socony Mobil
1972: Jersey changes name to Exxon
1972: Iraq nationalizes Iraq Petroleum Company, of which Exxon is 12% owner
1972: Saudi Arabia, Abu Dhabi, Kuwait and Qatar acquire 25% interest in Exxon's production operations (in country), with right to increase stake to 51% by 1982
1980: Exxon buys Colony Oil Shale Project
1981: Exxon sells Esso Standard Libya to Libyan government
1982: Exxon ends Colony Oil Shale Project
1985: Exxon acquires 48% of Hunt Oil Company's production sharing agreement in North Yemen
1998: Exxon and Mobil announce plans for merger
Corporate Offices: 5959 Las Colinas Blvd, Irving, TX 75039-2298, Phone: 972-444-1000, Fax: 972-444-1882.

Getty

1928: Pacific Western Oil Corporation incorporated as a holding company for Edward L. Doherty and family which subsequently came under the control of J. Paul Getty

1930s: Rocky Mountain division of Pacific Western, a Getty subsidiary, begins oil exploration in Saudi Arabia
1933: Pacific Western wins Saudi Arabia concession
1949: Getty's Western Pacific Oil Corporation signs concession for Saudi half of the Neutral Zone with Saudi government
1956: All of J. Paul Getty's oil holdings organized under Getty Oil
1953: Getty acquires Tidewater Oil
1984: Texaco acquires Getty

Gulf Oil

1901: Guffey Oil founded
1901: Gulf Refining Company founded
1907: William Mellon reorganizes Guffey Oil and Gulf Refining under name of Gulf Oil Corporation
1922: Gulf Oil Corporation forms Eastern Gulf Oil Company
1928: Gulf joins Turkish Petroleum Company
1929: Gulf buys Paragon Refining Company
1934: Gulf sells its share of Iraq Petroleum Company to Socal
1934: Anglo-Iranian and Gulf Oil Corporation establish Kuwait Oil Company as a 50-50 joint venture to compete for Kuwait concession (which they obtain); Subsequent agreement establishes British control of KOC
1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texas Oil, Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1955: Acquires Warren Petroleum
1971: Gulf purchases 10% in Syncrude Canada Limited
1984: Chevron buys Gulf

Marathon

1887: Ohio Oil Company founded
1889: Ohio Oil Company purchased by J.D. Rockefeller subsequently consolidated into the Standard Oil Trust
1905: Marathon headquarters moved to Findlay, Ohio
1911: Standard Oil Company of Ohio [Sohio] separated from Rockefeller's "Standard Trust"
Mid-1950s: Sohio joins partnership with Continental and Amerada, called Oasis Group
1962: Ohio Oil Company renamed the Marathon Oil Company
1962: Marathon buys Plymouth Oil
1982: Marathon becomes a wholly owned subsidiary of United States Steel Corporation, which has since become USX Corporation
1991: USX issues separate shares of common stock to reflect the performance of its two major businesses (steel and oil) and reinstates Marathon's symbol (MRO) on major stock exchanges
1990: Marathon Oil Company headquarters moved to Houston
1997: Ashland signs agreements with Marathon to combine the refining, marketing and transportation assets of the companies; Marathon Ashland Petroleum LLC formed Ashland acquires 38 percent of Marathon Ashland Petroleum LLC

Mesa Petroleum

1956: After resigning as a geologist with Phillips Petroleum Co., T. Boone Pickens forms development and Production Company called Petroleum Exploration
1959: Altair Oil and Gas is established to conduct oil and gas exploration in Canada
1964: Petroleum Exploration, Inc., and Altair merge to form Mesa Petroleum Co.
1967: Mesa Petroleum Co. shares began trading on the American Stock Exchange
1969: In hostile takeover, Pickens merges larger Hugoton into Mesa
1979: Mesa sells holdings in Canada and the North Sea to reduce debt and buy additional Hugoton reserves; Mesa also creates the Mesa Royalty Trust
1983: Mesa forms Gulf Investors Group (GIG)
1984: Mesa repurchases nearly 90 percent of the GIG units in a $500 million public tender offer
1985: The Mesa Petroleum Company changes its name to the Mesa Limited Partnership
1986: Mesa purchases Pioneer Corporation
1988: MESA partnership acquires gas reserves from Tenneco Inc.
1991: Mesa Limited Partnership changes name to MESA Inc.

Mobil

1866: The Vacuum Oil Co. incorporated
1879: Standard Oil Co., headed by John D. Rockefeller, purchases a three quarter interest in Vacuum

1870: Rockefeller and four partners organize Standard Oil Company in Ohio
1882: Rockefeller organizes his various oil holdings into the Standard Oil Trust, with headquarters in New York
1882: Standard Oil of New York formed
1911: Standard Oil Company of New York (Socony) founded with dissolution of Standard Oil
1918: Socony purchases a 45% interest in Magnolia Petroleum Co.
1926: Socony purchases the properties of General Petroleum Corp. of California
1929: Vacuum acquires the Lubrite Refining Co., a refining and marketing company based in St. Louis
1930: Socony acquires White Eagle Oil & Refining Co.
1930: Vacuum acquires Wadhams Oil Corp., and the White Star Refining Co.
1931: Socony acquires all the assets of Vacuum Oil Co. and changes its name to Socony-Vacuum Corp.
1933: Socony-Vacuum and Standard of New Jersey merge their Far East facilities and interests into a 50-50 venture called Standard-Vacuum Oil Co., or Stanvac
1934: Socony-Vacuum Corp. changes its name to Socony-Vacuum Oil Co., Inc.
1947: Anglo-Iranian, Jersey and Socony sign 20-year contract with Iran
1948: Jersey (30%) and Socony-Vacuum (10%) join Socal (30%) and Texaco (30%) in Aramco venture
1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texaco and Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1955: Socony-Vacuum changes name to Socony Mobil Oil Company
1959: Magnolia Petroleum and General Petroleum merged with other domestic subsidiaries into Socony Mobil Oil Company; Two major operating divisions created within the company: Mobil Oil Co. for the U.S. and Canada, and Mobil International Oil Co. for the rest of the world (except the areas in which Stanvac had interests)
1960: Mobil Chemical Co. formed
1960: Mobil Petroleum Co. Inc. formed to oversee Socony Mobil's 50% interest in Stanvac
1962: Assets of Stanvac split between Jersey and Socony Mobil
1966: Socony Mobil Oil Co. changes name to Mobil Oil Corporation. Mobil Oil Co. becomes the North American Division; Mobil International becomes the International Division, with coordinating responsibility for Mobil Petroleum Co. Inc.
1971: Mobil enters joint venture with Iranian Oil Company
1972: Mobil's 11.875% stake in Iraq Petroleum Company is nationalized
1975: Mobil increases its share of Aramco from 10% to 15%
1976: Mobil completes acquisition of Marcor, the holding company for Montgomery Ward Department Stores
1976: Mobil Corporation formed as holding company
1979: Mobil sells 51% of its Turkish refinery to Turkish Petroleum
1984: Mobil acquires 100% of Superior Oil
1985: Yanbu Petrochemical Company (YANPET), a joint venture petrochemicals complex at Yanbu, Saudi Arabia plant begins operation; Mobil and Saudi Basic Industries Corporation (SABIC) are 50-50 partners in YANPET
1996: The Qatargas project, in which Mobil has a 10% interest, comes on line producing first LNG from Qatar
1996: Mobil commissions two new plants in Yemen and Syria
1997: Second Qatargas liquefaction train completed
1998: Exxon and Mobil announce plans for merger
Corporate Offices: 3225 Gallows Rd., Fairfax, VA 22037-0001, Phone: 703-846-3000, Fax: 703-846-4669.

Occidental Petroleum

1910: Cities Service Company formed
1920: Occidental Petroleum founded
1953: Cities Service Company obtains Dhofar province concession in Oman
1956: Armand Hammer buys Occidental Petroleum
1965: Cities Service Company begins marketing products under the brand name "CITGO"
1965: Occidental wins oil concession in Libya
1983: Occidental acquires Cities Service Company
1983: Occidental reorganized Cities' assets and sells newly formed "CITGO Petroleum Corporation" to Southland Corporation
1980s: Libya nationalizes 51% of Occidental's operation in Libya
1986: Occidental acquired the Midcon Corporation,

1994: Occidental Petroleum Corp. completes acquisition of Placid Oil Co., which was founded in 1936 by H.L. Hunt
1995: Occidental purchases 19% stake in Clark USA
1998: Occidental and Royal Dutch/Shell, Anglo-Dutch oil group complete a $ 1bn global asset swap
1998: Occidental sells Occidental Netherlands Inc. unit to TransCanada Pipelines Ltd.
Corporate Offices: Corporate Headquarters, Occidental Petroleum Corporation, 10889 Wilshire Boulevard, Los Angeles, California 90024-4201, (310) 208-8800.

Pennzoil

1889: South Penn Oil Company organized as a unit of Standard Oil Company
1916: Name "Pennzoil" trademarked by Pennsylvania Refining Company, a predecessor to Pennzoil
1954: Bill Liedtke, John Overby, and George Bush form Zapata Offshore Oil Company
1963: Pennzoil Company is formed through consolidation of South Penn Oil Company, STETCO Petroleum Corporation and Zapata Offshore Oil Company
1965: Pennzoil Company acquires United Gas Corporation
1993: Pennzoil Company assimilates Chevron
1994: Pennzoil Company signs oil development deal with Qatar
1995: Pennzoil Company agrees to concession agreement with Egypt for Gulf of Suez
1998: Pennzoil-Quaker State Company was formed with merger of Pennzoil and Quaker State
1998: Simultaneous with the Pennzoil-Quaker State merger, the Pennzoil Company's marketing, manufacturing and fast oil change businesses (Pennzoil Products Group) is spun off and renamed the PennzEnergy Company
Corporate Offices: Pennzoil, 700 Milam, Houston, TX 77002, (713) 546-4000.

Phillips Petroleum Company

1905: Phillips brothers begin oil exploration
1917: Phillips Petroleum Company founded by Frank Phillips
1922: Phillips forms the predecessor to what today is GPM Gas Corp
1925: Research and Development Group formed
1969: Phillips' Kenai LNG Plant begins operation
1985: Phillips successfully fends off hostile take-over attempts
1992: GPM Gas Corporation formed
Corporate Offices: 411 S. Keeler Ave., Bartlesville, OK 74004, Phone: 918-661-6600, Fax: 918-661-6279.

Shell

1833: Marcus Samuel starts import export business in London
1890: Royal Dutch Company launched
1892: Marcus commissions the first special oil tanker and delivers 4,000 tons of Russian kerosene to Singapore and Bangkok
1897: Samuel's company begins to operate under the name Shell Transport and Trading Company, Limited
1903: Shell and Dutch company N.V. Koninklijke Nederlandsche Maatschappij tot Explotatie van Petroleum-bronnen in Nederlandsch-Indië form the Asiatic Petroleum Company
1903: Royal Dutch and Shell group begins joint marketing campaign under name "British Dutch"
1906-1914: British Dutch Group acquires producing interests in: Romania (1906), Russia (1910), Egypt (1911), Venezuela (1913) and Trinidad (1914)
1907: Royal Dutch/Shell partnership is extended worldwide, with the creation of the Royal Dutch / Shell Group of Companies
1912: Trading in the US starts after the acquisition of the American Gasoline Company, an American marketing company
1912: Turkish Petroleum Company founded with 50% ownership by Turkish National Bank, 25% Deutsche Bank, 25% Royal Dutch/Shell
1915: Formation of the Shell Company in California
1918: Royal Dutch/Shell buys Mexican Eagle
1922: Shell Union Oil Corporation [later Shell Oil Company] formed to consolidate Shell interests in the US with those of the Union Oil Company of Delaware
1937: Shell, Total, and Partex form the consortium Petroleum Development (Oman and Dhofar) later, Petroleum Development Oman
1945-55: Exploratory drilling in Tunisia, Algeria, Nigeria, Trinidad and offshore in British Borneo; Production from the Iraq Petroleum Company increases dramatically
1949: In 1949 Royal Dutch shortens its corporate title the name "Shell"

1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texas Oil, Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1956: Shell discovers oil in the Sahara
1959: Joint Shell/Esso exploration company called N.V. Nederlandse Aardolie Maatschappij (NAM) discovers gas fields in Groningen in the Netherlands
1974: Omani government claims 25% interest Petroleum Development Oman
1975: Omani government raises its interest in Petroleum Development Oman to 60%
1979: Shell acquires Belridge Oil
1984: Shell buys minority interest (30%) in Shell Oil US
Mid-1980s: Royal Dutch/Shell buys remaining 31% of Shell Oil U.S.A. (the remainder that it did not yet own)
1998: Shell Oil Co., Texaco Inc. and Saudi Aramco initiate joint venture combining their eastern U.S. refining and marketing assets under the name Motiva Enterprises LLC, paralleling a joint venture launched by Shell and Texaco under the name Equilon Enterprises LLC for their Midwest, Southwest and West Coast downstream assets; Shell to own 35% of Houston-based Motiva, while Texaco and Aramco will each own 32.5%
1998: Occidental and Royal Dutch/Shell, Anglo-Dutch oil group complete a $ 1bn global asset swap
Corporate Offices: Shell Oil, One Shell Plaza, Houston, TX 77002, Phone: 713-241-6161, Fax: 713-241-4044. Royal Dutch/ Shell Group, 2596 HR The Hague, The Netherlands, Phone: +31-70-377-3395, Fax: +31-70-377-4848.

Sun Company Inc.

1886: Robert Pew founds Sun Oil Company
1901: New Jersey Oil and Gas incorporated
1968: Sun buys Sunray (DX)
1971: Sun Oil Company reorganized and renamed Sun Company Incorporated
Corporate Offices: Ten Penn Center 1801 Market Street, Philadelphia Pa 191031699, Telephone: 215-977-3000.

Texaco

1897: Joe Cullinan founds Texas Fuel Company
1903: Joe Cullinan and Arnold Schlaet found The Texas Oil Company in Beaumont, Texas
1906: Texas Oil Company registers the trademark name, "Texaco"
1930s: Texas Oil Company joins with Standard Oil of California (later Chevron), to found the Arab-American Oil Company [Aramco]
1936: Texas Oil Company purchases half interest in Bahrain Petroleum and California-Arabian Standard Oil Company (Calarabian) from Socal
1936: Texas Oil Company joins with Standard Oil of California (later Chevron), to found the Arab-American Oil Company [Aramco]
1936: California-Texas company, Caltex, founded as a joint venture between Socal and Texas Oil Company as outlet for future oil production in Bahrain and Saudi Arabia
1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texas Oil, Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1956: Texas Oil Company acquires Regent Oil, a British company
1959: Texas Oil Company purchases the Paragon group of companies
1959: Texas Oil Company adopts the name Texaco for all of its businesses
1962: Texaco acquires White Fuel Corporation
1964: Purchases Superior Oil Company Venezuela
1984: Texaco acquires Getty Oil Company
1988: Texaco Forms Star Enterprise, a 50/50 joint venture with Saudi Refining Inc., to refine, distribute and market Texaco-branded products in the Eastern U.S.
1995: Texaco and Norsk Hydro formed a joint venture, Hydro Texaco, to market petroleum products throughout Scandinavia
1998: Texaco acquires Monterey Resources, a California based independent oil and gas producer
1998: Texaco and Shell Oil form downstream alliance in the Western U.S.
1998: Shell Oil Co., Texaco Inc. and Saudi Aramco initiate joint venture combining their eastern U.S. refining and marketing assets under the name Motiva Enterprises LLC, paralleling a joint venture launched by Shell and Texaco under the name Equilon

Enterprises LLC for their Midwest, Southwest and West Coast downstream assets; Shell to own 35% of Houston-based Motiva, while Texaco and Aramco will each own 32.5%
Corporate Offices: Texaco Inc., 2000 Westchester Ave., White Plains, NY 10650, (9140 253-4000.

Union Oil (Unocal)

1890: Union Oil formed in California by merger of Hardison & Stewart Oil Company, the Sespe Oil Company, and the Torrey Canyon Oil Company
1917: Union purchases Pinal-Dome Oil Company
1922: Shell buys 25% of Union Oil of California
1922: Shell Union Oil Corporation formed to consolidate Shell interests in the US with those of the Union Oil Company of Delaware
1965: Union acquires Pure Oil
1983: Union Oil changes name to Unocal
1992: Ashland Chemical acquires most of Unocal's chemical distribution business, establishing the IC&S Division
Corporate Offices: 2141 Rosecrans Ave., Ste. 4000, El Segundo, CA 90245, Phone: 310-726-7600, Fax: 310-726-7817.

British Petroleum (Anglo-Persian Oil)

1886: Burmah Oil founded in Scotland
1901: Shah of Iran signs concession agreement with William D'arcy
1904: Burmah Oil signs agreement to supply oil to British Admiralty
1905: Burmah Oil and D'arcy oil merged into Concession Syndicate
1908: Oil struck in commercial quantities in Iran
1909: Anglo- Persian Oil formed and Burmah Oil buys majority (97%) of shares in initial public offering
1914: British government becomes majority stockholder in Anglo- Persian Oil
1918: Anglo- Persian Oil purchases British Petroleum from British Government, which in turn had seized the company form Deutsche Bank during W.W.I.
1932: Shah cancels Anglo-Persian concession
1933: Anglo-Persian wins back Iran concession
1934: Anglo-Iranian and Gulf Oil Corporation establish Kuwait Oil Company as a 50-50 joint venture to compete for Kuwait concession (which they obtain); Subsequent agreement establishes British control of KOC
1935: Anglo-Persian renamed Anglo-Iranian Oil Company Ltd.
1947: Anglo-Iranian, Jersey and Socony sign 20-year contract with Iran
1951: Mossadegh nationalizes Anglo-Iranian assets in Iran and founds National Iranian Oil Company (NIOC) to administer nationalized assets
1954: Anglo-Iranian re-named British Petroleum, previously the name of one of its subsidiaries
1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texas Oil, Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1962: British Petroleum begins commercial development in Abu Dhabi
1966: British Petroleum begins commercial development in Libya
1969: British Petroleum signs agreement with the Standard Oil Company of Ohio, which became effective in January 1970; According to the agreement Standard takes over BP's leases in Alaska; In return, BP acquires 25% of Standard's equity, a stake that would rise to a majority holding in 1978
1970: BP sells 33% of El Bunduq oilfield to a Japanese consortium in exchange for access to Japanese markets
1972: BP sells 33% of Abu Dhabi Main Areas Ltd. to Japanese oil company
Mid-1980s: BP buys 53% of Sohio, Sohio becomes BP's American arm, eventually buying all of the outstanding stock
1987: British government sells of its stock in BP
1987: British Petroleum acquires remaining stock of Sohio as well as British company Britoil
1987: Sohio merged with other BP interests to form BP America
1988: Kuwait Investment Office holding of BP stock reaches 21.6%
1989: British government forces reduction in KIO holding to 9.9% of BP stock
1998: BP announces merger with Amoco, new company will operate under the name BP Amoco p.l.c.
Corporate Offices: Britannic House, One Finsbury Circus, London EC2M 7BA, UK, Phone: +44-171-496-4000, Fax: +44-171-496-4630.

Elf Aquitaine

1941: Societe Nationale des Petroles d'Aquitaine (SNPA) incorporated at the initiative of the French government
1966: French government merges gas and oil interests into Enterprise de Recherches et d'Activities Petrolieres (ERAP), giving ERAP majority ownership of SNPA
1974: ERAP begins onshore and offshore exploration in Iran
1976: ERAP is reorganized and increases share of SNPA ownership to 70%
1976: ERAP changes name to Societe Nationale Elf Aquitaine, known as Elf Aquitaine Group
Corporate Offices: Elf Aquitaine, Inc. 444 Madison Avenue - 20th floor, New York - NY 10022, USA, **Tel:** (1) 212 922 30 04, **Fax:** (1) 212 922 30 74.

Ente Nazionale Idrocarburi (ENI)

1953: Enrico Mattei founds Ente Nazionale Idrocarburi [ENI] as a conglomeration of 36 subsidiaries including AGIP, with government sanction
1956: Signs 50-50 oil cooperation deal with National Iranian Oil Company
1970-75: Founds Agip (Qatar) Ltd,
1980s: Libya gains control of 50% of ENI Libya
1981: Enoxy, a joint ENI Occidental petrochemical and mining venture founded
1985: ENI wins contract to construct pipeline in Iraq
1986: ENI wins portion of a pipeline contact for Yemen
1992: ENI transformed into Joint Stock Company traded on Italian and NYSE
Corporate Offices: Piazzale Enrico Mattei 1, 00144 Rome, Italy, Phone: +39-0-6-59-822-624 Fax: +39-0-6-59-002-141.

Iraq Petroleum Company

1912: Turkish Petroleum Company founded with 50% ownership by Turkish National Bank, 25% Deutsche Bank, 25% Royal Dutch/Shell
1914: Turkish Petroleum Company reorganized, with Anglo-Persian holding 50%, Deutsche Bank and Shell each holding 25%
1914: Ottoman Grand Vizier promises Mesopotamian concession to Turkish Petroleum Company, but final concession agreement is not signed
1922: CFP joins Turkish Petroleum Company
1925: Turkish Petroleum Company gains oil concession in Iraq
1928: Gulf joins Turkish Petroleum Company
1928: Royal Dutch/Shell, Anglo-Persian, CFP, Exxon, Mobil, Atlantic Richfield, Gulf Oil Corporation, Standard Oil of Indiana [Amoco], and Participations and Explorations Corp., establish a joint venture called the Near East Development Company; The Near East Development Company signs "Red Lines Agreement" binding participating companies to cooperate with Turkish Petroleum Company in any ventures in Turkey, the Levant, Iraq and Arabian Peninsula (Atlantic, Gulf, and Standard eventually sell their shares to other participants)
1929: Turkish Petroleum changes name to Iraq Petroleum Company
1932: Mosul Petroleum Company formed to hold northern portion of IPC's Iraq concession
1938: Basrah Petroleum Company formed to hold southern portion of IPC's Iraq concession
1939: IPC establishes Abu Dhabi Petroleum Company Ltd. (ADPC) to hold Abu Dhabi concession
1939: British government seizes IPC shares held by CFP
1966: Iraq revokes portions of IPC concession and nationalizes these concessions
1972: Iraq nationalizes remaining IPC concessions
1973: Iraq nationalizes assets of foreign assets in Basrah Petroleum Company.

National Iranian Oil Company

1951: Iran nationalizes National Iranian Oil Company
1954: Consortium of oil companies, including British Petroleum, Jersey, Socony, Texaco and Socal, Gulf, Royal Dutch/Shell Group, Iricon Agency Ltd., Richfield Oil Corp., Signal Oil and Gas, Aminoil, Sohio, Getty, Atlantic Oil, Tidewater Oil, San Jacinto Petroleum Corp., and CFP form the Iranian Oil Participants Ltd. (IOP). IOP then negotiates agreement with Iranian government and for oil production in Iran
1973: Oil Services Company of Iran (Osco) formed by NIOC to take over operations of IOP
1957: National Iranian Oil Company signs deal with ENI for oil production
1971: Mobil enters joint venture with National Iranian Oil Company

1990: National Iranian Oil Company signs agreement to import about 200,000 barrels a day of gas oil and kerosene from Bahrain, Qatar and Abu Dhabi refineries ending embargoes established during the Iran-Iraq war.

Kuwait National Petroleum Company

1934: Anglo-Iranian and Gulf Oil Corporation establish Kuwait Oil Company as a 50-50 joint venture to compete for Kuwait concession (which they obtain); Subsequent agreement establishes British control of KOC
1934: Sheikh Ahmed grants 75-year concession to KOC
1951: KOC oil concession extended for additional 17 years
1960: Kuwait National Petroleum Company established as a shareholder company owned by the government and the private sector
1968: KNPC commissions Shuaiba Refinery, the world's first all hydrogen refinery
1974: Kuwaiti government acquires 60 ownership of KOC
1975: KNPC becomes a fully state-owned company
1980: Kuwait Petroleum Corporation created, KNPC becomes fully owned by KPC; KNPC takes charge of the three oil refineries; Mina Al-Ahmadi, Mina Abdulla and Shuaiba, in addition to the LPG plant in Mina Al-Ahmadi
1981: Kuwait Oil Company purchases the Santa Fe International Corp., of California
Corporate Offices: Head Office, P.O. Box 70 Safat, 13001 Safat – Kuwait, Telephone: Buildings 1 & 2: (+965) 2420121/2425553, Emad Center: (+965) 2436333, Behbehani Building: (+965) 2449401, Fax: (+965) 2433839.

Saudi Aramco

1933: King Abdul Aziz Bin Abdul Rahman Al-Saud signs agreement authorizing Standard Oil of California (Socal) to explore for oil in what is now the Eastern Province of the Kingdom
1933: Saudi government signed a concession agreement with the Standard Oil Company of California, predecessor of today's Chevron
1938: Commercial oil production begins in Saudi Arabia
1944: Calarabian a joint venture of Socal and Texaco changes name to Arabian – American Oil Company [Aramco]
1948: Jersey and Socony-Vacuum join Socal and Texaco in Aramco venture
1949: Saudi Arabia builds Tapline through northern Saudi Arabia, Syria, Jordan and Lebanon to the Mediterranean
1973: Saudi Arabian Government begins purchasing Aramco's assets from its shareholders, Socal (later Chevron), Texaco, Exxon and Socony-Vacuum (Mobil)
1975: Aramco initiates work to design, build and operate twin industrial cities at Jubail on the Gulf and Yanbu on the Red Sea
1980: Saudi Government acquires 100 percent of Aramco's shares, although Aramco partners continue to operate and manage Saudi Arabia's oil fields
1985: Yanbu Petrochemical Company (YANPET), a joint venture petrochemicals complex at Yanbu, Saudi Arabia plant begins operation; Mobil and Saudi Basic Industries Corporation (SABIC) are 50-50 partners in YANPET
1988: Royal decree establishes the Saudi Arabian Oil Company [Saudi Aramco] to take over the management and operations of Saudi Arabia's oil and gas fields from Aramco
1988: Saudi Aramco forms a joint venture with Texaco called Star Enterprise; under the agreement, a Saudi Aramco subsidiary acquires a 50 percent share in Star's three refineries in the United States
1991: Saudi Aramco acquires a 35 percent interest in SangYong Oil Refining Company, South Korea's third-largest refiner and leading lubricant manufacturer,
1993: Royal decree merges all of the Kingdom's state-owned refining, product-distribution and marketing operations, as well as the Government's half-interest in three joint-venture refineries into Saudi Aramco
1994: Saudi Aramco enters joint venture with the Philippine National Oil Company (PNOC) purchasing a 40-percent stake in Petron Corp
1996: Saudi Aramco acquires a 50 percent interest in Motor Oil Hellas and Avin Oil, the refining and distribution affiliates of Greece's Vardinoyannis Group
1998: Shell Oil Co., Texaco Inc. and Saudi Aramco initiate joint venture combining their eastern U.S. refining and marketing assets under the name Motiva Enterprises LLC, paralleling a joint venture launched by Shell and Texaco under the name Equilon Enterprises LLC for their Midwest, Southwest and West Coast downstream assets; Shell to own 35% of Houston-based Motiva, while Texaco and Aramco will each own 32.5%
Corporate Offices: PO Box 5000, Dhahran 31311, Saudi Arabia, Phone: +966-3-875-4915, Fax: +966-3-873-8490.

Total Oil (CFP)

1924: Foundation of the French Compagnie Francaise Des Petroles (CFP), which assumes French shares of Turkish Petroleum Company
1927: Discovery of the first oil field near Kirkuk in Iraq
1954/5: Creation and registration of the trademark TOTAL, and foundation of the first companies marketing TOTAL products
1954: Consortium of oil companies, including British Petroleum, Exxon, Socony, Texas Oil, Socal, Gulf, Royal Dutch/Shell Group, and CFP form the Iranian Oil Participants Ltd. (IOP) and negotiate agreement with Iranian government and for oil production in Iran
1956: Discovery of the Hassi-Messaoud oil field and Hassi R'Mel gas field, in the Algerian Sahara
1960: CFP absorbs the OFP (Omnium Francais Des Petroles) group
1970: French Petroleum Company of Canada founded. The company is renamed Total Petroleum (North America) later that year
1973: First listing of CFP shares on the London Stock Exchange
1978: CFP signs an agreement with Abu Dhabi covering development of the Upper Zakum field and production of butane and propane as well as the condensates associated with the oil produced by ADPC (GASCO)
1980: TOTAL acquires Vickers Petroleum Corp., expanding TOTAL's presence in the United States
1985: CFP changes company name from CFP to TOTAL CFP
1985: TOTAL CFP acquires all United States hydrocarbon assets of Lear Petroleum Partners
1987: TOTAL CFP acquires hydrocarbon assets held by TIPCO in the United States as well as those of Francarep Italia, and divests of all refining assets and most of the Group's marketing interests in Italy
1988: TOTAL CFP acquires CSX OIL & GAS in the United States
1991: TOTAL CFP changes company name to TOTAL
1991: Reduction of the French government's direct share holding in TOTAL from 31.7% to 5.4%
1995: TOTAL signs agreements for establishing the Yemen gas liquefaction project and a development contract for the Iranian offshore fields Sirri A and E
1996: Divestment by the French State of a further 4% of TOTAL's capital, reducing the government's stake to 0.97%; TOTAL signs a production-sharing agreement for development of Algeria's Tin Fouyé Tabankort field
1998: TOTAL announces details of its development plans for Iran's giant South Pars gas field in coordination with the National Iranian Oil Co.
Corporate Offices: TOTAL 24, Cours Michelet, 92069 Paris La Défense Cedex, France, phone: 33 (0)1 41 35 40 00 (Switchboard), fax: 33 (0)1 41 35 28 27.

American Independent Oil Company (AMINOIL)

1947: Consortium of Phillips, Ashland, Signal Oil and Gas, J.S. Abercrombie, Sunray Mid-Continent Oil Co., Globe Oil and Refining Co., and Pauley Petroleum Inc formed to bid on Neutral Zone concession; Consortium is named American Indepenuent Oil Company [Aminoil]
1948: Aminoil wins Neutral Zone concession from Kuwait
1970: Aminoil acquired by R. J. Reynolds Industries, Inc.

Eastern and General Syndicate

1919: Major Frank Holmes establishes Eastern and General Syndicate
1925: Eastern and General Syndicate wins al-Hasa Concession
1925: Eastern and General Syndicate awarded oil concession in Bahrain

Standard Oil Company

1870: John D. Rockefeller and Henry Flagler found Standard Oil
1882: Rockefeller organizes his various oil holdings into the Standard Oil Trust, with headquarters in New York
1886: Standard Oil founds Natural Gas Trust
1901: Standard establishes regional affiliate, Republic Oil
1907: Standard establishes Standard Oil of California
1911: Standard dissolved under court order, creating Standard Oil of New Jersey (Exxon), Standard Oil of New York (Mobil), Standard Oil California] (Chevron), Standard Oil of Ohio (Sohio, arm of BP), Standard Oil of Indiana (Amoco), Continental Oil (Conoco), Atlantic (ARCO)

<u>Major Oil Companies Operating In the Gulf Region (By Country)</u>

Bahrain

<u>State Companies:</u>
The Bahrain National Oil Company (BANOCO), wholly owned by the Bahrain Government, and is the holding company for the Bahrain Petroleum Company (BAPCO)
<u>Joint Ventures:</u>
Bahrain National Gas Co. (Banagas) is owned 75% by the government of Bahrain, 12.5% by Caltex, and 12.5% by the Arab Petroleum Investment Corp.
Bahrain Aviation Fueling Co. (Bafco) is the aviation refueling service at Bahrain International Airport. It is owned by Banoco, 60%; Caltex 27%; BP, 13%.
<u>Original Concession Holders</u>:
Bahrain Petroleum Co. Ltd., an equal partnership of Texas Oil Co. and Socal, also offshore concession granted to Continental Oil Co.
Continental Oil Co. of Bahrain, Continental Oil Co., Pure Oil Middle East Inc. (Union Oil of California)
<u>Major Foreign Oil Company Involvement</u>:
Harken Oil, of Grand Prairie, Texas, who is backed in part by Bass Enterprise Production Company of Fort Worth, Texas Harvard University, a major shareholder in Harken through an affiliate, and George W. Bush.

Iran:

<u>State companies</u>:
National Iranian Oil Company (NIOC) - oil and gas exploration and production, refining and oil transportation; National Iranian Gas Company (NIGC) – manages gathering, treatment, processing, transmission, distribution, and exports of gas and gas liquids; National Petrochemical Company (NPC) - handles petrochemical production, distribution, and exports.
<u>Original Concession Holders</u>:
Anglo Persian Oil Company, replaced in 1954 by *Iranian Oil Participants Limited,* a joint venture of British Petroleum, Jersey, Socony, Texaco and Socal, Gulf, Royal Dutch/Shell Group, Iricon Agency Ltd., Richfield Oil Corp., Signal Oil and Gas, Aminoil, Sohio, Getty, Atlantic Oil, Tidewater Oil, San Jacinto Petroleum Corp., and CFP
Iran Pan American Oil Co., American International Oil Co. (Standard Oil of Indiana)
Iranian Offshore Petroleum Co., Tidewater Oil, Superior Oil, Sunray DX, Cities Service, Kerr-McGee, Atlantic Richfield, Skelly Oil
Lavan Petroleum Co., Atlantic Richfield, Murphy Oil, Sun Oil Co., Union Oil of California
<u>Major Foreign Oil Company Involvement</u>:
Gazprom
Petronas
Shell
Total
<u>Recent Developments:</u>
(Concluded at least negotiations with):
Elf Aquitaine
Japex, the state-owned Japanese Exploration and Production Co.,
PetroCanada
Ultramar (Canada)
The U.S. Treasury has allowed two American companies (Chevron, Coastal) to import Iranian crude

Iraq:

<u>State companies</u>:
The Oil Ministry oversees the nationalized oil industry through the Iraq National Oil Company (INOC). Autonomous companies under INOC include: State Company for Oil Projects (SCOP) - design and engineering of upstream and downstream projects; Oil Exploration Company (OEC) - exploration; Northern Oil Company (NOC) and Southern Oil Company (SOC) - upstream activities in northern/central and southern Iraq, respectively; State Organization for Oil Marketing (SOMO) - crude oil sales and OPEC relations; Iraqi Oil Tankers Company (IOTC)

Original Concession Holders:
Iraq Petroleum Company (Mosul Oil Company and Basrah Oil Company), Royal Dutch/Shell, Anglo-Persian, CFP, Exxon, Mobil, Atlantic Richfield, Gulf Oil Corporation, Standard Oil of Indiana [Amoco], and Participations and Explorations Corp., under auspices of the Near East Development Company.
Recent Developments:
U.S. previously operating in Iraq includes Haliburton, Howe-Baker Engineering Inc., Mobil Oil, and Pullman-Kellogg.
Iraq's State Oil Marketing Organization (SOMO), -- pending U.N. approval --is in discussions with: U.S. companies Coastal Corp., Phoenix, Chevron Corp. and Mobil Corp.
Iraq has current contracts with Coastal, Russian Sidanco and France's Total S.A.
The Oil Daily reports that Shell, BP, Chevron, and Coastal are among the companies interested in buying Iraqi crude

Kuwait:

State Companies:
Subsidiaries of Kuwait Petroleum Corp. include: Kuwait Oil Co. (KOC), Kuwait National Petroleum Co., Petrochemical Industries Co. (PIC), Kuwait Oil Tanker Co., Kuwait Foreign Petroleum Exploration Co. (Kufpec), and Kuwait Petroleum International (KPI, London)
Original Concession Holders:
Kuwait Oil Co. Ltd., subsidiary of BO (Kuwait) Ltd., and Gulf Kuwait Co., Kuwait Shell Development Co. Ltd., owned by Royal Dutch/Shell Group
For Kuwaiti portion of Neutral Zone:
Offshore: *Arabian Oil Company Limited*, Japan Petroleum Trading Co. Ltd.
Onshore: *American Independent Oil Co.*, joint venture of Phillips Petroleum, Signal Oil and Gas, Ashland, J.S. Abercrombie, Sunray Mid-Continent Oil Co., Globe Oil and Refining Co., and Pauley Petroleum Inc.
Major Foreign Oil Company Involvement:
British Petroleum Co. Plc
Chevron
Getty Oil Co.
Gulf Oil
Japan's Arabian Oil Co. (AOC)
Mobil Corp.
Royal Dutch/Shell,
Shell International Petroleum Co. Ltd.
Texaco
Total

Oman:

State companies:
Petroleum Development Oman Ltd. (PDO) controls all oil resources. Oman Oil Company (OOC) is the overseas investment arm of the Ministry of Petroleum, until recently headquartered in Houston and headed by John Deuss
Joint Ventures:
Petroleum Development Oman Ltd. (PDO) controls all oil resources. PDO is a partnership between the Omani government (60%), Shell Petroleum Co. Ltd. (34%), Total-CFP (4%), and Partex (Oman) Corp. (2%)
CXO Ltd. Is a joint venture of Oman Oil Co. Ltd. and Caltex
Original Concession Holders:
Petroleum Development (Oman) Ltd., Shell Group, CFP, Participations and Explorations Corp., and John W. Mecom
Mecom-Pure-Conoco, John W. Mecom, Pure Oil, Continental Oil
Major Foreign Oil Company Involvement:
There are two American concessionaires: Occidental/Gulf and Amoco. Ashland Oil manages Oman's sole refinery, and U.S. firms lift Oman's crude.

Qatar:

State Companies:

The Qatar General Petroleum Corporation (QGPC)
Joint Ventures:
QGPC owns 65% of Qatar Liquefied Gas Co. (QatarGas) the rest of the interest is divided among France's Total SA. (10%), Mobil Qatar Gas Inc. (10%), Mitsui & Co. Ltd. (7.5%), and Marubeni Corp. (7.5%)
QatarGas Upstream, partners are Total, 20%, Mobil 10%, and Mitsui and Marubeni, 2.5 each
QGPC holds 66.5% of Ras Laffan LNG Co. (RasGas); Mobil 26.5 ; the Japanese companies Itochu Corp. and Nissho Iwai, respectively, 4% and 3%
Qatar Vinyl Co. (25.5% QGPC, 31.9% Qapco, 29.7% Norsk Hydro, and 12.9% Elf Atochem)
Qatar Fuel Additives Co. (50% QGPC, 20% Chinese Petroleum Corp., 15% Lee Chang Yung Chemical Industry Corp., and 15% International Octane Ltd.)
Original Concession Holders:
Continental Oil Co. of Qatar, Continental Oil Co., Pure Oil Middle East Inc. (Union Oil of California)
Anglo Saxon Petroleum Company, Shell
Major Foreign Oil Company Involvement:
ARCO Qatar Inc., (as operator for a consortium of Germany's Wintershall A.G. and Preussag A.G., British Gas Co., and Gulfstream Resources Canada Ltd. of Calgary)
Chevron Over-seas Petroleum (Qatar) Ltd. and its partner Magyar Olaj Gazi (MOL), the Hungarian Oil & Gas Co. Ltd.
Elf Petroleum Qatar.
Enron
Maersk Oil Qatar Co.
Marubeni
Methanex Corp. (Vancouver)
Mitsui
Mobil Oil Qatar
Mobil, MOL
Occidental Petroleum of Qatar Ltd..
Pennzoil Qatar Oil Co.
Phillips Petroleum Co.
Royal Dutch Shell
Wintershall

Saudi Arabia:

State Companies:
Saudi Aramco
Samarec
Petromin
Petromin Lubricating Oil Refining Co. (Luberef), [Mobil Oil Corp. holds a minority interest in this company]
Petromin Lubricating Oil Co.,
Saudi Arabian Basic Industries (Sabic)
Original Concession Holders:
Arabian American Oil Company, Socal, Texas Oil, Jersey, Socony-Vacuum
For Saudi portion of Neutral Zone: Getty Oil Co., Japan Petroleum Trading Co.
Joint Ventures:
Star Enterprise (U.S.) Saudi Refining Inc. (50%), Texaco (50%);
Ssangyong Oil Refining Co. (S. Korea) Saudi Aramco (35%), Ssangyong (65%); Luberef - Mobil (30%) and Petrolube - Mobil (29%)
Samref, an export fuels company- Mobil is a 50% shareholder
Subsidiaries: Aramco Services Co. (Houston), Aramco Overseas Co. (Netherlands), Saudi Petroleum International Inc. (New York), Saudi Petroleum Overseas Ltd. (London/Tokyo)
Major Foreign Oil Company Involvement:
Mobil
Shell

UAE:

State Companies:
Abu Dhabi National Oil Company (ADNOC) has controlling interest in 21 domestic oil and natural gas companies.

Joint Ventures:
Abu Dhabi Co. for Onshore Oil Operations (ADCO) is held by ADNOC (60%) and a consortium comprising British Petroleum (BP) (9.5%), Shell (9.5%), Total (9.5%), Exxon (4.75%), Mobil (4.75%), and Partex (2%).
Abu Dhabi Marine Operating Company (ADMAOPCO) is held by ADNOC (60%) and a consortium comprising BP (14.7%), Total (13.3%), and Japan's Jodco (12%).
Zakum Development Company (ZADCO) is operated by ADNOC (88%) and a consortium (12%) comprising BP, Jodco, and Total

Original Concession Holders:
Union Oil Co., venture of Union Oil Co. and Southern Natural Gas Co.
Abu Dhabi Marine Areas Ltd., BP, CFP, Continental
Dubai Marine Areas Ltd., Continental Oil, BP, CFP, Deutche Erdol AG, Sun Oil Co.
Phillips-AGIP-Aminoil, joint venture of Phillips, AGIP, and Aminoil

Major Foreign Oil Company Involvement:
BP
Caltex Petroleum Corp.,
Miutsui & Co. Ltd.
Parrex
Pennzoil
Shell Gas BV
Total

Source: Eric V. Thompson, "Petroleum Archives Project", Arabian Peninsula and Gulf Studies Program, University of Virginia.

Annexure-1.2
World Oil Market and Oil Price Chronologies: 1970 - 2002

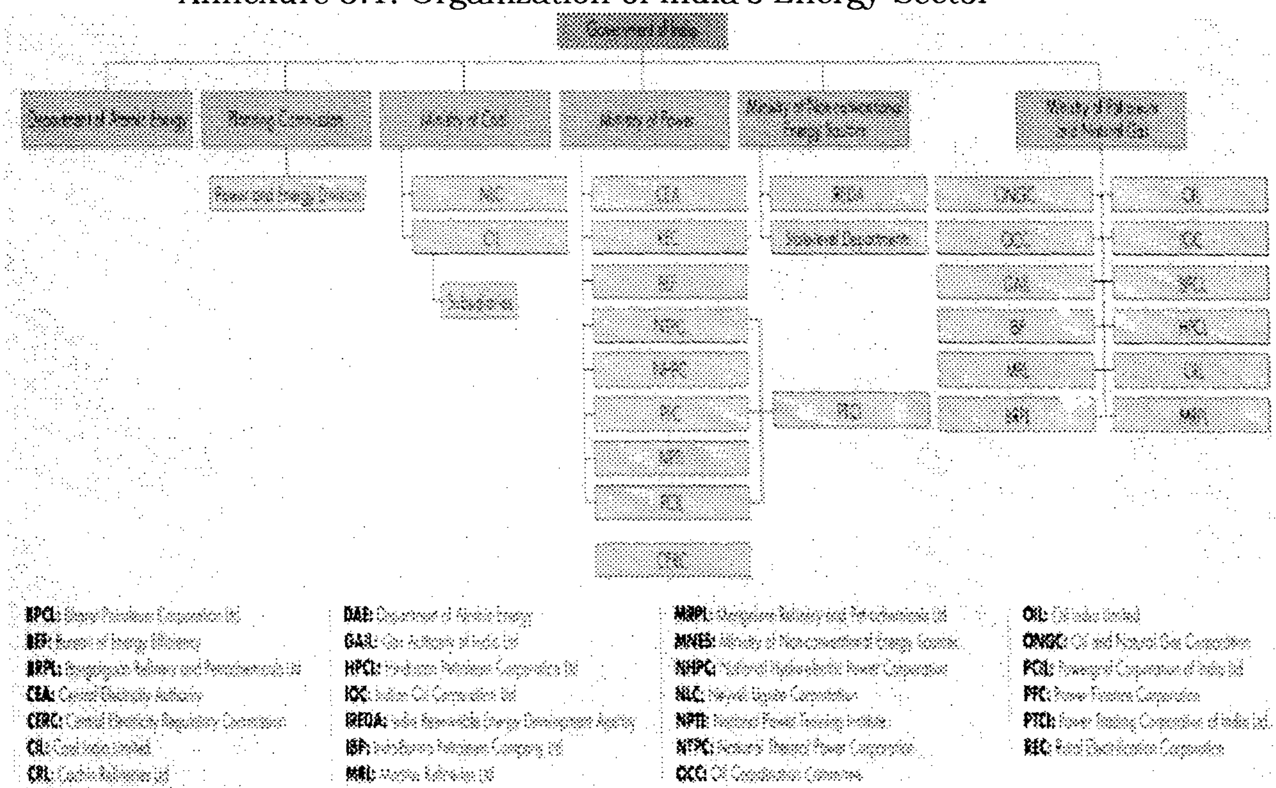
- OPEC begins to assert power; raises tax rate & posted prices
- OPEC begins nationalization process; raises prices in response to falling US dollar.
- Negotiations for gradual transfer of ownership of western assets in OPEC countries.
- Oil embargo begins (October 19-20, 1973).
- OPEC freezes posted prices; US begins mandatory oil allocation.
- Oil embargo ends (March 18, 1974).
- Saudis increase tax rates and royalties.
- US crude oil entitlements program begins.
- OPEC announces 15% revenue increase effective October 1, 1975.
- Official Saudi Light price held constant for 1976.
- Iranian oil production hits a 27-year low.
- OPEC decides on 14.5% price increase for 1979.
- Iranian revolution; Shah deposed.
- OPEC raises prices 14.5% on April 1, 1979.
- US phased price decontrol begins.
- OPEC raises prices 15%.
- Iran takes hostages; President Carter halts imports from Iran; Iran cancels US contracts; Non-OPEC output hits 17.0 million b/d.
- Saudis raise marker crude price from 19$/bbl to 26$/bbl.
- Windfall Profits Tax enacted
- Kuwait, Iran, and Libya production cuts drop OPEC oil production to 27 million b/d.
- Saudi Light raised to $28/bbl

- Saudi Light raised to $34/bbl
- First major fighting in Iran-Iraq War
- President Reagan abolishes remaining price and allocation controls
- Spot prices dominate official OPEC prices
- US boycotts Libyan crude; OPEC plans 18 million b/d output
- Syria cuts off Iraqi pipeline
- Libya initiates discounts; Non-OPEC output reaches 20 million b/d; OPEC output drops to 15 million b/d
- OPEC cuts prices by $5/bbl and agrees to 17.5 million b/d output
- Norway, United Kingdom, and Nigeria cut prices
- OPEC accord cuts Saudi Light price to $28/bbl
- OPEC output falls to 13.7 million b/d
- Saudis link to spot price and begin to raise output
- OPEC output reaches 18 million b/d
- Wide use of netback pricing
- Wide use of fixed prices
- Wide use of formula pricing
- OPEC/Non-OPEC meeting failure
- OPEC production accord; Fulmar/Brent production outages in the North Sea
- Exxon's Valdez tanker spills 11 million gallons of crude oil
- OPEC raises production ceiling to 19.5 million b/d
- Iraq invades Kuwait
- Operation Desert Storm begins; 17.3 million barrels of SPR crude oil sales is awarded
- Persian Gulf war ends
- Dissolution of Soviet Union; Last Kuwaiti oil fire is extinguished on November 6, 1991
- UN sanctions threatened against Libya
- Saudi Arabia agrees to support OPEC price increase
- OPEC production reaches 25.3 million b/d, the highest in over a decade
- Kuwait boosts production by 560,000 b/d in defiance of OPEC quota
- Nigerian oil workers' strike
- Extremely cold weather in the US and Europe
- U.S. launches cruise missile attacks into southern Iraq following an Iraqi-supported invasion of Kurdish safe haven areas in northern Iraq.
- Iraq begins exporting oil under United Nations Security Council Resolution 986.
- Prices rise as Iraq's refusal to allow United Nations weapons inspectors into "sensitive" sites raises tensions in the oil-rich Middle East.
- OPEC raises its production ceiling by 2.5 million barrels per day to 27.5 million barrels per day. This is the first increase in 4 years.
- World oil supply increases by 2.25 million barrels per day in 1997, the largest annual increase since 1988.
- Oil prices continue to plummet as increased production from Iraq coincides with no growth in Asian oil demand due to the Asian economic crisis and increases in world oil inventories following two unusually warm winters.
- OPEC pledges additional production cuts for the third time since March 1998. Total pledged cuts amount to about 4.3 million barrels per day.
- Oil prices triple between January 1999 and September 2000 due to strong world oil demand, OPEC oil production cutbacks, and other factors, including weather and low oil stock levels.
- President Clinton authorizes the release of 30 million barrels of oil from the Strategic Petroleum Reserve (SPR) over 30 days to bolster oil supplies, particularly heating oil in the Northeast.
- Oil prices fall due to weak world demand (largely as a result of economic recession in the United States) and OPEC overproduction.
- Oil prices decline sharply following the September 11, 2001 terrorist attacks on the United States, largely on increased fears of a sharper worldwide economic

downturn (and therefore sharply lower oil demand). Prices then increase on oil production cuts by OPEC and non-OPEC at the beginning of 2002, plus unrest in the Middle East and the possibility of renewed conflict with Iraq.

- OPEC oil production cuts, unrest in Venezuela, and rising tension in the Middle East contribute to a significant increase in oil prices between January and June.
- A general strike in Venezuela, concern over a possible military conflict in Iraq, and cold winter weather all contribute to a sharp decline in U.S. oil inventories and cause oil prices to escalate further at the end of the year.

Annexure 3.1: Organization of India's Energy Sector



ANNEXURE 3.2: GROWTH OF INDIAN PETROLEUM INDUSTRY AT A GLANCE

Parameters	Unit	1997-98	1998-99	1999-00	2000-01	2001-02
1.Reserves@(Balance Recoverable)						
(i) Crude Oil	Mn.Tonnes	747	716	660	703	732
(ii)Natural Gas	Bn.Cub.Mtr.	692	675	648	760	763
2.Consumption						
(i) Crude Oil (in terms of refinery crude throughput)	Mn.Tonnes	65.17	68.54	85.96	103.44	107.27
(i) Petroleum Products (excl.RBF)		84.29	90.56	97.09	100.07	98.55
3.Production						
(i) Crude Oil	Mn.Tonnes	33.86	32.72	31.95	32.43	32.03
(ii)Petroleum Products		61.31	64.54	79.41	95.61	100.00
4.Imports & Exports						
(i) Gross imports:						

(a) Qty : Crude Oil		34.49	39.81	57.80	74.10	78.71
Pol.Products	Mn.Tonnes	22.97	23.77	16.61	9.27	7.01
Total (a) by IOC		57.46	63.58	74.41	83.37	85.72
(b) Value: Crude Oil		15872	14917	40028	65932	60397
Pol.Products	Rs.Crores	14309	12276	14186	12093	7249
Total (b) by IOC		30181	27193	54214	78025	67646
Pol.imports as per DGCI&C		30341	26919	45421	71497	66770
(ii)Exports:@@						
(a) Qty : Crude Oil		-	-	-	-	-
Pol.Products	Mn.Tonnes	2.38	0.72	0.75	8.37	10.07
Total (a)		2.38	0.72	0.75	8.37	10.07
(b) Value : Crude Oil		-	-	-	-	-
Pol.Products	Rs.Crores	1266	306	698	7672	8219
Total (b)		1266	306	698	7672	8219
(iii)Net Imports						
(a) Qty: Crude Oil		34.49	39.81	57.80	74.10	78.71
	Mn.Tonnes	20.59	23.05	15.86	0.90	-3.06
Total (a) by IOC		55.08	62.86	73.66	75.00	75.65
(b) Value: Crude Oil		15872	14917	40028	65932	60397
Pol.Products	Rs.Crores	13043	11970	13488	4421	-970
Total(b) by IOC		28915	26887	53516	70353	59427
(iv) Unit Value of Crude oil imports(gross)	RS./MT	4602	3747	6925	8898	7673
5.India's Total exports	Rs.Crores	130101	139753	159561	203571	207746
6.Pol.Imports as percentage of India's total exports						
(i) Gross imports	%	23.2	19.5	34.0	38.3	32.6
(ii) Net imports		22.2	19.2	33.5	34.6	28.6
7.Contribution of oil sector to Centre/State Resources						
(i) Royalty from crude oil		1800	1708	2049	2272	-
(ii) Royalty from Gas		415	437	547	608	-
(iii) Oil Development Cess		2838	2751	2716	2728	-
(iv) Excise &Custom duties	Rs.Crores	20973	21513	32662	35912	36377RE
(v) Sales Tax		12758	13490	18106	23375	-
(vi) Dividend		1055	2243	2587	3482	-
(vii)Corporate Tax/Others		1925	2621	3863	5345	-
8.Natural Gas						
(i)Gross Production	Mn.Cu.Mtrs.	26401	27428	28446	29477	29714
(ii)Utilisation		24522	25716	26885	27860	28037

@: As on 1st Jan. of first year.
E: Estimated.
@@: Includes supplies of Pol.products to Nepal
*: Provisional.
$: Excludes royalty & cess paid/payable by private/JVCs.
P: Projected.

Annexure 3.3

CATEGORIZATION OF SEDIMENTARY BASINS

Category*	Basin	Basinal Area (Sq.Km.) Onland	Offshore	Total
Upto 200m ISOBATH				
I	Cambay	51,000	2,500	53,000
	Assam Shelf	56,000	----	56,000
	Bombay Offshore	----	116,000	116,000
	Krishna Godavari	28,000	24,000	52,000
	Cauvery	25,000	30,000	55,000
	Assam-Arakan Fold Belt	60,000	----	60,000
	Rajasthan	126,000	----	126,000
	SUB. TOTAL	**346,000**	**172,500**	**518,500**
II	Kutch	35,000	13,000	48,000
	Andaman-Nicobar	6,000	41,000	47,000
	SUB. TOTAL	**41,000**	**54,000**	**95,000**
III	Himalayan Foreland	30,000	----	30,000
	Ganga	186,000	----	186,000
	Vindhyan	162,000	----	162,000
	Saurashtra	52,000	28,000	80,000
	Kerala-Konkan-Lakshadweep	----	94,000	94,000
	Mahanadi	55,000	14,000	69,000
	Bengal	57,000	32,000	89,000
	SUB. TOTAL	**542,000**	**168,000**	**710,000**
IV	Karewa	3,700	----	3,700
	Spiti-Zanskar	22,000	----	22,000
	Satpura-South Rewa-Damodar	46,000	----	46,000
	Narmada	17,000	----	17,000
	Decan Syneclise	273,000	----	273,000
	Bhima-Kaladgi	8,500	----	8,500
	Cuddapah	39,000	----	39,000
	Pranhita-Godavari	15,000	----	15,000
	Bastar	5,000	----	5,000
	Chhattisgarh	32,000	----	32,000
	SUB. TOTAL	**461,200**	----	**461,200**
TOTAL		**1,390,200**	**394,500**	**1,784,700**
	DEEP WATERS			
	(Kori-Comorin 85° E Narcodam)	----	----	1,350,000
GRAND TOTAL		----	----	**3,134,700**

*Categorization based on the prospectivity of the basin as presently known. The four recognized categories are basins which have:-

I. Established commercial production.
II. Know accumulation of hydrocarbons but no commercial production as yet.

III. Indicated hydrocarbon shows that are considered geologically prospective.

IV. Uncertain potential which may be prospective by analogy with similar basins in the world. This categorization will necessarily change with the results of further exploration.

Annexure 3.4: Summary of New Significant Discoveries

National Oil Companies

During the year under review, the NOCs viz. ONGC and OIL, made 9 significant hydrocarbon discoveries of which 6 are onland and 3 offshore. Both the organisations more or less attained their targets of oil and gas production.

Five of the onland discoveries: Baghjan, Matimekhana, North Makum, Banamali and Laipling Gaon were in Upper Assam, south of the Brahmaputra. The first three were by OIL in Paleocene-Ecocene sands while the latter two were by ONGC with production from Oligocene sands. The sixth onland discovery was by ONGC at Chinnewala Tibba in the Rajasthan basin. Initial testing in Lower Cretaceous sands flowed gas at about 0.20 MMSCMD with condensate.

All the three offshore wells during the year were drilled by ONGC. Two of them, GS-49 and GS-KW drilled in very shallow waters of the K.G.Basin, tested commercial oil and gas. The significance of this discovery is that it highlights the prospectivity of the land sea transition zone. The third well, Vasai West, in the Mumbai offshore basin was completed as an oil and gas producer from the Middle Eocene/Early Oligocene in a structure about 15 kms. west of Bassein field. Preliminary estimates indicate about 20 MMT in-place oil and OEG. A delineation well is presently under testing.

Private / JV Companies

Many hydrocarbon discoveries have been made, both in the NELP and Pre-NELP blocks awarded to Pvt./JV companies in the past 2 ½ years, in three major areas : Krishna-Godavari offshore, Gulf of Cambay and onland Rajasthan.

In deep-water block KG-DWN-98/2, Cairn Energy Pty. Ltd. (CEIL) made three important discoveries: Annapurna, Padmavati and Kanaka Durga. While the first tested gas, the other two tested oil. The consortium of Reliance Industries Ltd. (RIL) and Niko Resources Ltd., made a spectacular series of gas discoveries in their deep water block KG-DWN-98/3 through the drilling and testing of Dhirubhai wells 1,2,3 and 4. In fact, the Dhirubhai-1 discovery was the world's largest gas discovery in 2002. These four wells drilled in merely 20% of the block and they have already established gas reserves of about 12-14 TCF. Therefore, even more impressive discoveries can be expected from the rest of the block.

In the Gulf of Cambay block CB-OS/2, operated by Cairn Energy, four hydrocarbons bearing structures: Lakshmi, Gauri, Ambe and Parvati were discovered. The Lakshmi field has been on regular gas production at the rate of 3.0 MMSCMD since November, 2002. Two of the other fields, Gauri and Ambe, have tested commercial oil and/or gas but the potential of the Parvati field is yet to be fully established.

In block CB-ONN-2000/2 of onland Cambay basin, Niko Resources struck natural gas in Bheema Well No.1. This is the first block awarded under NELP-II to establish substantial hydrocarbon potential, and that too in a very short span of 15 months from the signing of the PSC. In this block, the operator has already reported many more discoveries of natural gas.

In the Rajasthan onland block RJ-ON-90/1 in the Barmer-Sanchor basin, Cairn successfully completed a well on Prospect H (Saraswati Prospect) Drill-stem testing established commercial oil of 41° - 42° API. Another well in the same block tested both oil and gas. In block RJ-ON-90/5 of the Bikaner-Nagaur basin, Nanuwala Well No.1, completed by the Essar-POGC consortium, reported presence of light oil having 35° API. This is a welcome find in an area noted for heavy oils at Baghewala-1.

Source: India - Petroleum Exploration and Production Activities - 2002 – 2003--- http://www.dghindia.org/pet33b.html

Annexure 3.5: India's Petroleum Refineries

Refinery	Owner	Location City	State	Capacity (b/d)
Reliance	Reliance Petroleum Ltd. (RPL)	Jamnagar	Gujarat	540,000
Koyali	IOCL	Koyali	Gujarat	185,100
Mangalore	Mangalore Refinery and Petrochemicals Ltd. (MRPL)	Mangalore	Karnataka	180,000
Vizag	HPCL	Visakhapatnam	Andhra Pradesh	164,250
Kochi	Kochi Refineries Ltd.	Ambalamugal	Kerala	152,000
Mathura	IOCL	Mathura	Uttar Pradesh	156,000
Manali	CPCL	Chennai	Tamil Nadu	130,660
Mumbai	HPCL	Mumbai	Maharashtra	130,085
BPCL	BPCL	Mumbai	Maharashtra	120,000
Panipat	IOCL	Panipat	Haryana	120,000
Barauni	IOCL	Barauni	Bihar	65,800
Haldia	IOCL	Haldia	West Bengal	61,000
Numaligarh	Numaligarh Refineries Ltd.	Numaligarh	Assam	60,000
Bongaigaon	BRPL	Bongaigaon	Assam	27,110
Guwahati	IOCL	Guwahati	Assam	19,920
Digboi	IOCL	Digboi	Assam	11,700
Cauvery	CPCL	Cauvery Basin	Tamil Nadu	10,000
Tatipaka	ONGC	Tatipaka	Andhra Pradesh	2,000

Sources: Ministry of Petroleum and Natural Gas, GOI.

Annexure 3.6: Investment opportunities in the petroleum sector

Under the new investment policy for different sectors announced in July 1991 for facilitating the inflow of foreign capital and to encourage entrepreneurs to invest in and to encourage entrepreneurs to invest in India, a number of policy initiatives have been taken by the Government of India, such as:

- Equity participation in commercial and industrial ventures has been freed from all restrictions and foreign companies can now invest up to 100% of equity in different activities in the petroleum sector.
- Rupee convertibility on the Current account.
- Deregulation and delicensing of various petroleum products in the country.
- Gradual decontrol of pricing and distribution.
- Freedom to form JVCs for the development of infrastructure and for marketing and refining activities.
- The procedure for obtaining industrial licenses has been greatly simplified. For obtaining industrial license, applications are to be submitted to the Secretariat for Industrial Approvals (SIA), Department of Industrial Policy & Promotion, Ministry of Industry, Udyog Bhavan, and New Delhi-110011.

- Approvals will normally be available within 6 to 8 weeks of filing the application. Empowered committees have been constituted to accord various approvals under a fast time-bound schedule.
- Under the New Industrial Policy, proposals for foreign investment need not necessarily be accompanied by foreign technology agreements.

All such proposals, including those proposing investments by NRIs or for 100% export oriented units, are considered for approval by the foreign Investment Promotion Board (FIPB). In case of composite proposals, i.e., proposals seeking other industrial approvals like industrial licenses, technical collaboration, etc. alongside approval for foreign investment, the FIPB provide composite clearance.

Pricing

The country has traditionally operated under an Administered Pricing Mechanism for petroleum products. This system is based on the retention price concept under which the oil refineries, oil marketing companies and the pipelines are compensated for operating costs and are assured a return of 12% post-tax on net worth. Under this concept, a fixed level of profitability for the oil companies is ensured subject to their achieving their specified capacity utilization. Upstream companies, namely ONGC, oil and GAIL, are also under retention price concept and are assured a fixed return.

The administered pricing policy of petroleum products ensures that products used by the vulnerable sections of the society, like kerosene, or products used as feedstock for production of fertilizer, like naphtha, may be sold at subsidized prices.

Gradually, the Government of India is moving away from the administered pricing regime to market-determined, tariff-based pricing. Free imports are permitted for almost all petroleum products except petrol and diesel. Free imports are permitted for almost all petroleum products except petrol and diesel. Free marketing of imported kerosene, LPG and lubricants by private parties is permitted. It is contemplated that in a phased manner, all administered price products will be taken out of the administered pricing regime and the system will be replaced by a progressive tariff regime in order to provide a level playing field for new investments in a free and competitive market.

The Exim Policy

Imports
Importation of all petroleum products is permitted under the Open General Licensing Scheme, Except for the following:

- Crude Oil
- Motor Spirit
- Diesel
- ATF
- FO
- Bitumen
- Imports permitted under freely tradable Special import Licenses.

Exports
Exports of the following products are canalized through Indian Oil Corporation Ltd.
- ATF
- Bitumen
- Crude Oil
- Diesel
- Kerosene
- LPG
- Motor Spirit

- Naphtha
- Raw Petroleum Coke

All other products can be freely exported.

Annexure 3.6
GCC Countries: Recent Key Structural Reforms

Financial Sector

Bahrain	Issued the first Islamic government bills to complement the working of the Islamic financial institutions; took steps toward improving prudential regulations for Islamic banking; ratified anti-money laundering legislation in 2001; and enforced Bahrain Stock Exchange rules and regulations.
Kuwait	Adopted a foreign investment law allowing foreigners to own and trade shares of joint-stock companies listed on the Kuwait Stock Exchange, subject to specific limits.
Oman	Expanded repossession facilities to the inter-bank market; implemented a capital market law to restructure the Muscat Securities Market into three separate bodies dealing with regulations, trading and exchange, and depository registration; and adopted a new banking law in 2000. The central bank has reactivated the issuance of certificates of deposits to manage liquidity, and implemented measures to reduce the risk of over-lending to individuals, corporations, and their related parties. Oman has taken steps toward full compliance with the Financial Action Task Force (FATF) recommendations on money laundering and combating the financing of terrorism. The central bank is also strengthening risk-management assessment.
Qatar	Removed interest ceilings on local currency deposits in February 2001; strengthened bank supervision, resulting in tightening of nonperforming loan criteria; and introduced a new scheme to enhance liquidity management. Under this scheme, commercial banks can deposit their excess liquidity with, or borrow from, the central bank at rates determined by the central bank, which are fixed on a daily basis.
Saudi Arabia	Allowed foreigners to trade on the stock market through open-ended mutual funds and approved a new capital markets law to deepen the financial markets and strengthen the stock market. Enforced recommendations in line with FATF guidelines relating to the prevention of money laundering.
United Arab Emirates	Established formal stock markets in 2000, and regulatory body for capital markets; enacted a new Securities Law to address volatility and malpractices that plagued security markets in 1997 and 1998, and adopted comprehensive anti-money laundering legislation along with combating the financing of terrorism in January 2002. The central bank is implementing a comprehensive pilot risk-management module for banks.

Foreign Direct Investment

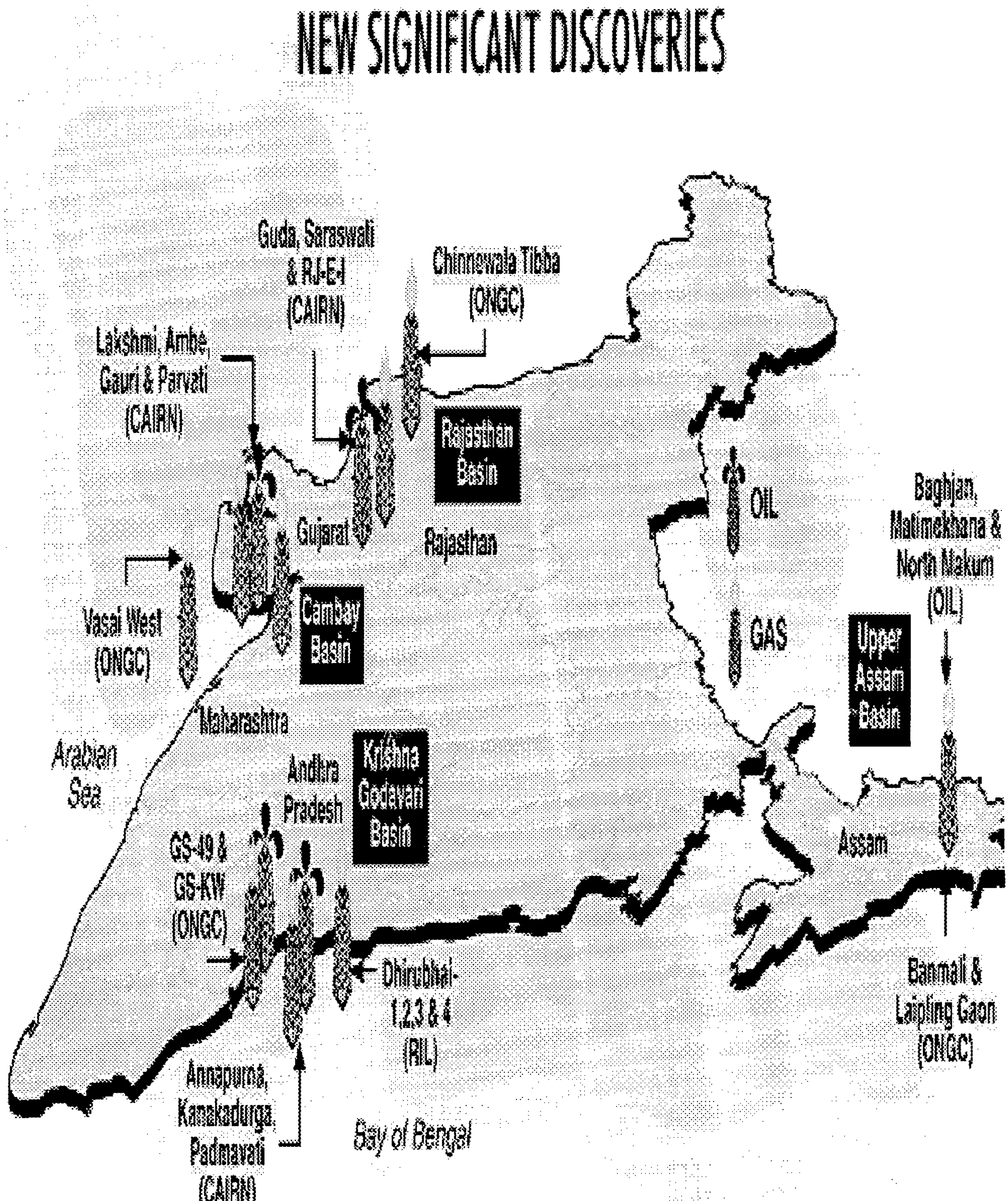
Bahrain	Eased rules on non-GCC firms to own buildings and lease land; established a one-stop shop to facilitate licensing procedures; and permitted foreign ownership to increase from 49 to 100 percent of businesses in all but a few strategic sectors (e.g., oil and aluminum).
Kuwait	Passed a law allowing foreigners to own 100 percent of Kuwaiti companies and reduced corporate taxes from 55 percent to 25 percent. Established Foreign Investment Capital Office to process foreign direct investment applications.
Oman	Allowed 100 percent foreign ownership of companies in most sectors; reduced income tax disparity between Omani and foreign companies by raising the single rate for the former from 7.5 percent to 12 percent and lowering the rates for the latter from 15–50 percent to 5–30 percent; redefined "foreign" company as one with more than 70 percent foreign ownership instead of currently 49 percent; and allowed foreign, non-GCC, firms to own buildings and lease land. Opening up the service sector to full foreign ownership in line with WTO agreements, starting in 2003 with the information technology sector.

Qatar	Allowed 100 percent foreign ownership in agriculture, industry, health, education, and tourism sectors, and streamlined investment approval procedures. Reduced maximum corporate tax from 35 percent to 30 percent.
Saudi Arabia	Enacted a new Investment Law and established the associated investment authority (SAGIA) to facilitate foreign direct investment processing, including the establishment of a one-stop shop. Allowed for 100 percent foreign ownership of business in most sectors, including gas, power generation, water desalination, and petrochemicals. Cut the highest corporate income tax on foreign investment from 45 percent to 30 percent. Permitted non-Saudis to own real estate for their business or residence, except in the two holy cities.
United Arab Emirates	Launched several new free trade zones intended to establish the emirate as a global center for trade in gold bullion, research and development of technology, and financial activities. Relaxed restrictions for foreign investment in specific real estate projects.
	State Enterprise Reform and Privatization
Bahrain	Privatized the Public Slaughter House and the capital's waste collection and incineration. Other privatizations are under way, including the public transport company (bus) and tourism facilities. The telecommunications and postal services sectors are being liberalized.
Kuwait	The privatization law, approved by the Finance Committee of the National Assembly, established a comprehensive framework for large-scale privatization, identified areas and modes of privatization, and set up a pricing mechanism and safeguards against job losses. The government plans to offer for sale to the private sector most of the 62 public sector entities still under its control.
Oman	The power sector is at the forefront of privatization efforts, with three power plants now under construction by foreign investors under a build-own-operate basis. Existing government power plants are being restructured for their future privatization. Oman has also recently privatized the management of airport services. Other services to be privatized in the near future include water distribution, waste water network, postal services, and telecommunications. The government also plans to gradually sell its participation in the few remaining non-oil public companies listed in the local stock market.
Qatar	Partially privatized the Telecommunications Company at end-1998. Corporatized the electricity and water sector and sold most of the government's power generation plants to Qatar Electricity and Water Company, which is majority-owned by the local private sector. Construction is under way of the first independent power and water plant, which is majority-owned by a foreign developer. Sold 60 percent of the government's stake in a recently created company—spun off from Qatar Petroleum—to take over the local distribution of gasoline.
Saudi Arabia	Announced in June 2002 a new privatization strategy under which autonomization of management would be followed by deregulation (corporatization) and ultimately private ownership. Twenty sectors are presently identified for privatization, including telecommunications, electricity, industrial parks, postal services, water, railroad, education, and air transportation. Saudi Arabia has recently privatized 30 percent of the Saudi Telecommunications Company. Eight regional electricity companies have been merged into the Saudi Electricity Company, and a regulatory authority was established to set tariff rates and regulate market access to new entrants.
United Arab Emirates	Embraced utility privatization, embarking on new power projects through joint ventures with foreign investors, and selling some existing assets.
	Labor Market Reform
Bahrain	Recently developed a new National Employment Strategy that includes providing fiscal subsidies for training nationals in the private sector and financial aid for the unemployed. Introduced measures to improve general education standards, and vocational and technical training programs, and

	increased employment quota of Bahrainis in small and medium-sized companies while abolishing the "free visa" system to expatriate labor force.
Kuwait	Established Manpower and Government Restructuring Program (MGRP) in July 2001 to implement the labor law, provide unemployment benefits to unemployed Kuwaiti nationals, and provide training and facilitate employment of Kuwaiti nationals in the private sector. Approved, in September 2002, quotas for the proportion of Kuwaitis that private companies must employ; companies that fail to meet this target would be subject to a fine and sanctions such as exclusion from bidding for government contracts.
Oman	Introduced measures to improve vocational and technical training programs, and set a uniform minimum wage for Omanis at RO 100 (plus RO 20 as transportation allowance) instead of the previous two-tiered (skilled/unskilled) minimum wage. The authorities are also modernizing the educational system at all levels. A new ministry of manpower was created in 2002 and a new labor law adopted in May 2003.
Qatar	Formally ended the policy of automatic employment for Qatari graduates. Now assists job seekers by maintaining information on job openings and by counseling and training. Established a department in the ministry of civil service with responsibility for this function.
Saudi Arabia	Created the Human Resources Development Fund (HRDF)—with financial participation of the private sector—to provide training of Saudi labor force in skills required by the private sector, and development of a database for matching and placement of Saudi workers in the private sector.
United Arab Emirates	Established the National Human Resource Development and Employment Authority to help improve skills of U.A.E nationals looking for jobs; and established a national labor market database to facilitate nationals' job searches.

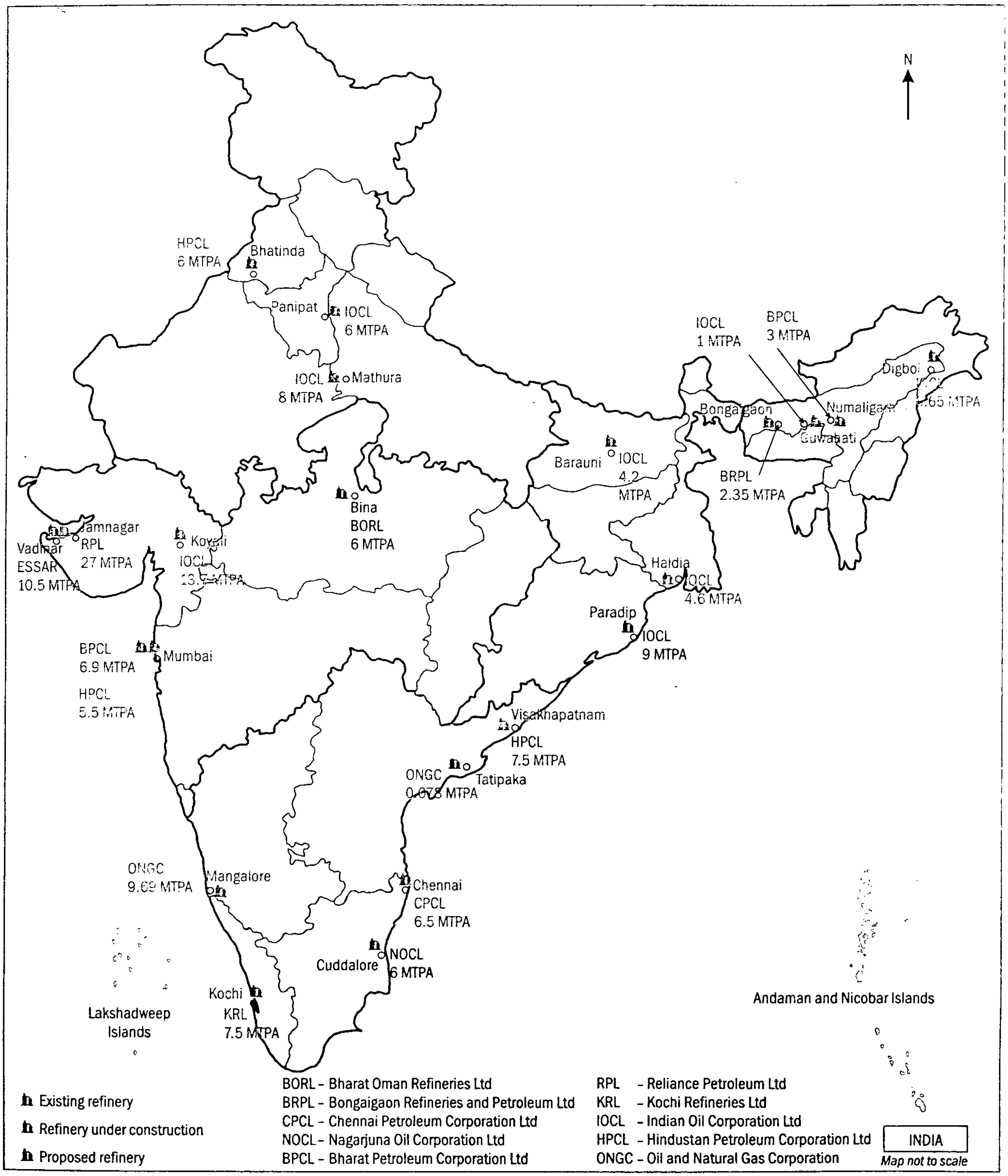
Source: Fasano and others (2003).

Map 3a: New Significant Discoveries of Oil and Gas in India

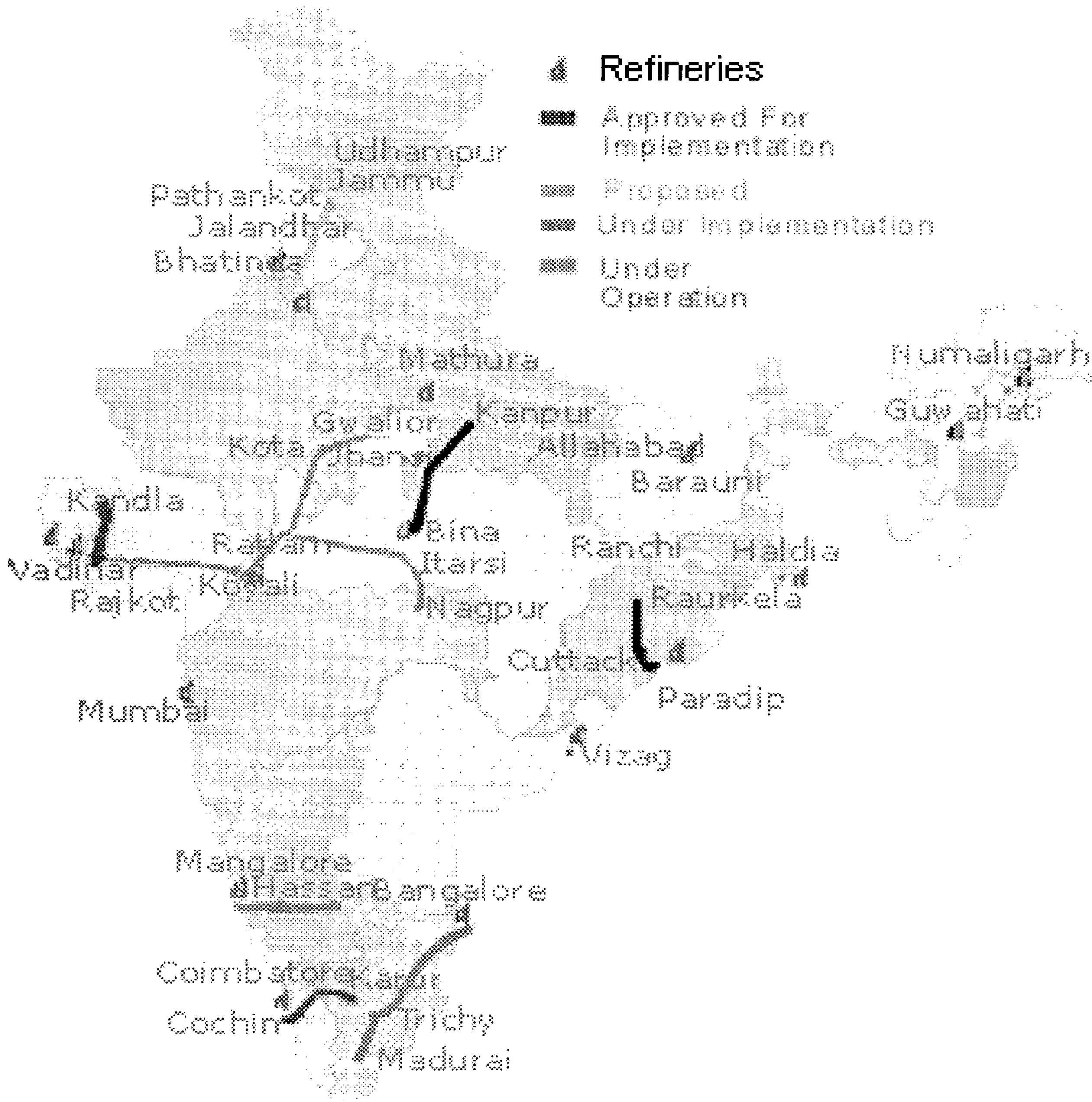


Source: Indian Express 25th Jan 2004.

MAP 3b: Refineries in India with details

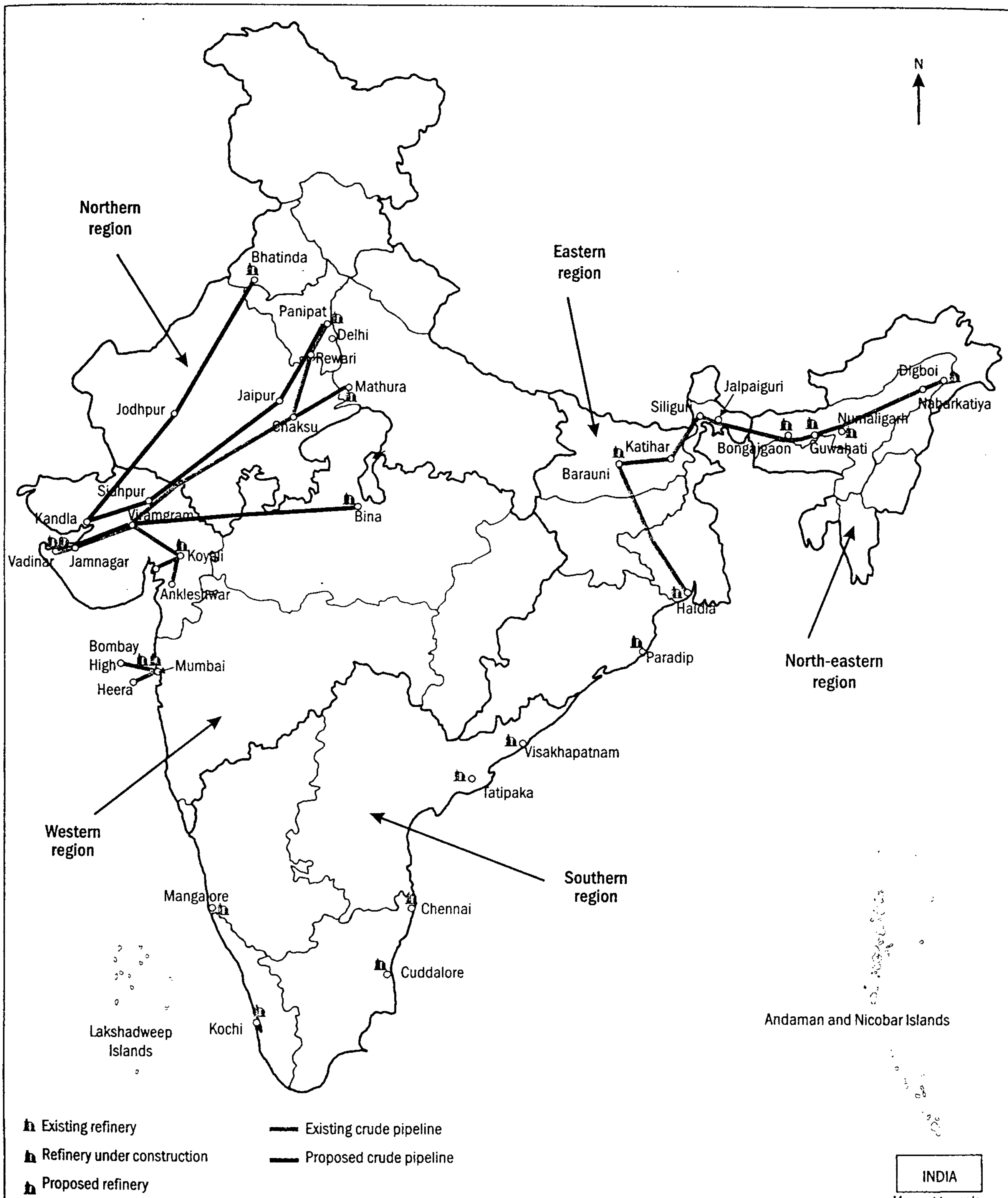


MAP 3c: India's Oil Product Pipelines

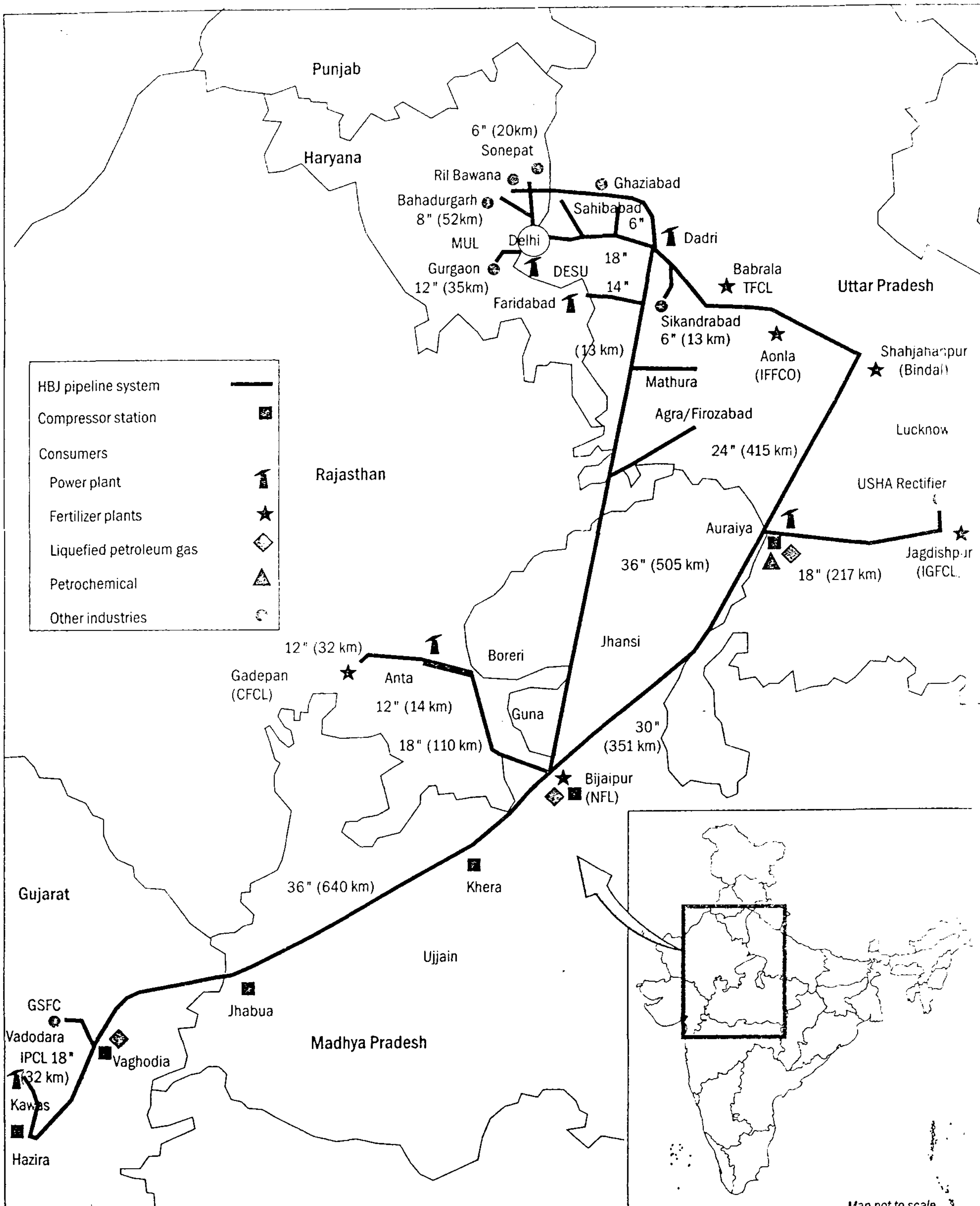


Source: TERI, New Delhi, 2003.

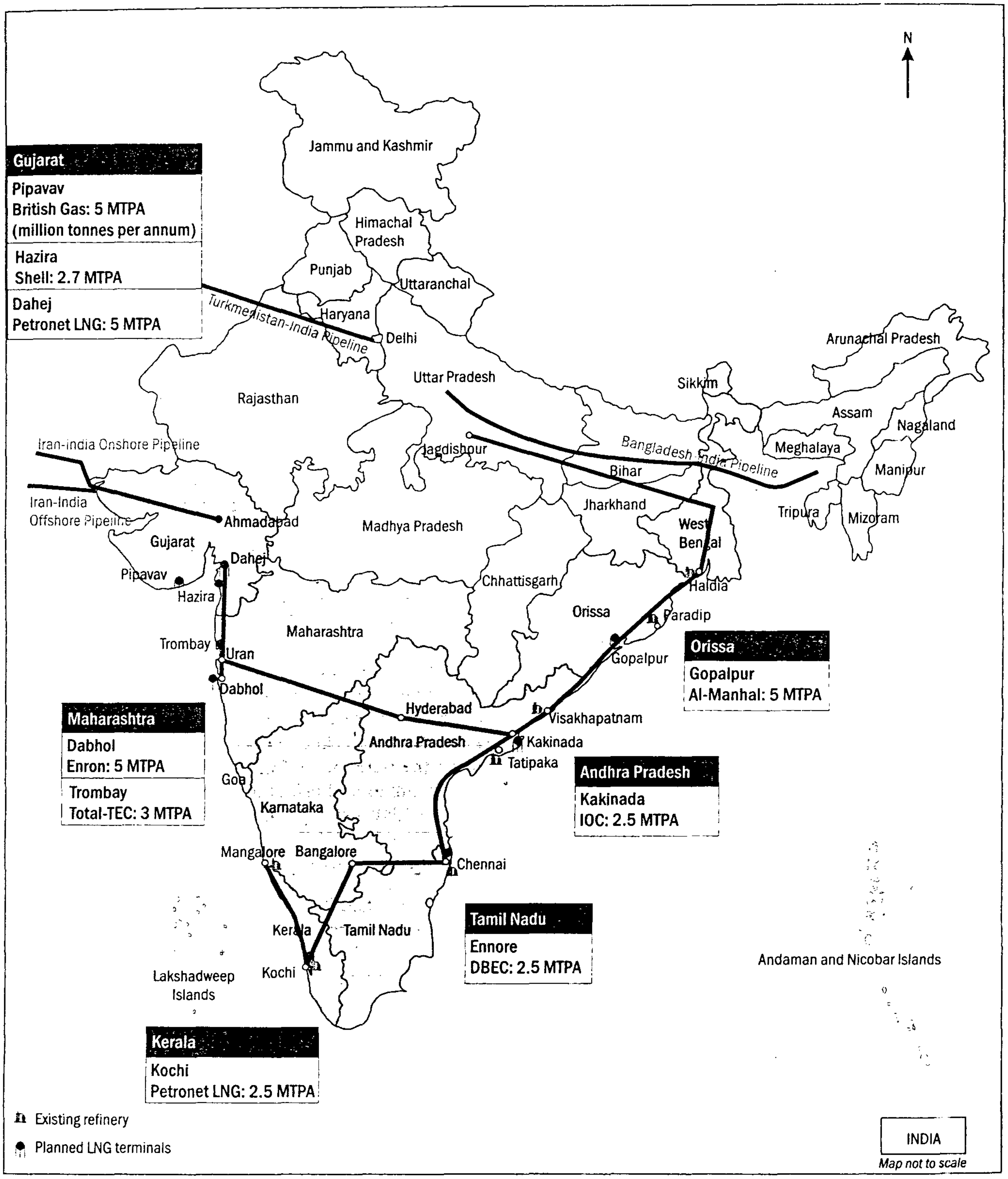
MAP 3d: Crude Pipelines: Existing and Proposed



MAP 3e: HBJ Transmission System



MAP 3f: Prominent LNG Terminals (Dec 2002), Proposed Gas Import Pipelines and National Gas Grid



Annexure 5.1: India's imports from Saudi Arabia (Selected Commodities) (In US$ Million)

Commodities	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
Salt; Sulphur; Earths & Stone; Plastering Materials, Lime & Cement.	25.93	9.56	8.16	25.61	21.29	10.46	9.12
Mineral Fuels, Mineral Oils & Products of their Distillation; Bituminus Substances ; Mineral Waxes.	1464.37	1396.93	1570.33	2154.97	267.06	171.75	193.60
Inorganic Chemicals; Organic or Inorganic Compunds of Precious Metals, of Rare-Earth Metals, or Radi. Elem & of Isotopes.	30.74	38.35	37.18	46.52	114.82	41.91	47.52
Organic Chemicals	117.29	116.04	59.48	77.38	131.38	121.77	117.28
Fertilisers.	51.67	29.55	19.76	24.96	3.36	1.91	1.70
Plastic & Articles thereof.	74.20	63.89	41.52	39.70	29.48	41.60	49.32
Pulp of Wood or of other Fibrous Cellulosic Material; Waste & Scrap of Paper or Paperboard.	12.22	12.07	7.05	12.45	10.53	6.01	9.33
Copper & Articles thereof.	11.16	11.57	13.64	5.21	2.99	6.19	3.63
Natural or cultured Pearls, Precious or Semiprecious Stones, Pre metals, Clad with Pre metal and artcls thereof; Imit. .Jewellery; Coin.	1.74	8.20	13.32	0.05	5.30	12.65	18.49
Raw hides and skins (other than) furskins and Leather	5.52	4.62	3.39	5.28		15.41	16.57
Aluminium & Articles thereof	3.85	2.55	5.59	3.46		13.56	21.02

SOURCE: Ministry of Commerce, Government of India

Annexure 5.2: India's Exports to Saudi Arabia (Selected Commodities) (In US$ million)

Commodities	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
Meat & Edible Meat Offal.	8.97	8.01	9.19	9.77	7.09	0.14	0.86
Edible Fruit & Nuts; Peel or Citrus Fruit or Melons	17.72	16.77	20.10	22.46	33.78	23.44	35.12
Coffee, Tea, Mate & Spices.	19.55	21.87	25.19	25.27	19.19	15.11	16.45
Cereals.	253.36	289.64	362.27	293.28	187.48	262.36	227.24
Residues & Waste from the Food Industries; Prepared Animal Foder	14.31	26.54	3.55	0.77	0.59	0.33	1.69
Cotton.	16.59	20.55	20.1	18.33	14.43	9.59	9.65
Man-Made Filament.	13.46	15.38	12.51	12.44	19.11	20.80	39.29
Man-Made Staple Fibres.	13.94	21.34	13.92	15.79	18.35	22.84	25.01
Articles of Apparel & Clothing Accessories, Knitted or Crocheted.	9.23	13.40	19.17	25.89	26.04	26.68	29.10
Articles of Apparel & Clothing Accessories, not Knitted or Crocheted.	21.35	33.92	48.94	71.72	84.51	86.96	101.40
Nuclear Reactors, Boilers, Machinery & Mechanical Appliances; Parts thereof.	14.54	19.04	22.25	13.55	20.21	24.86	34.68
Electrical Machinery & Equipment & Parts thereof; Sound Recorders & Reproducers, Television Image & Sound Recorders & Reproducers & Parts.	16.03	7.61	8.56	8.39	16.95	14.51	23.72
Articles of Iron or Steel	8.58	11.63	14.52	15.53	20.21	30.91	26.82
Iron & Steel	5.56	23.93	24.66	22.74	18.07	16.06	31.99
Plastic & Articles thereof.	6.93	9.38	8.75	10.05	10.63	18.13	18.53
Organic Chemicals	5.97	8.87	8.85	17.33	16.75	19.51	22.24
Tobacco & Manufactured Tobacco Substitues	8.34	6.22	9.00	8.15	9.39	5.69	8.02
Natural or Cultured Pearls, Precious or Semiprecious Stones, Pre.metals ,Clad with Pre.metal & Artcls thereof; Imit. Jewlry; Coin.	5.74	6.76	16.59	8.11	6.06	4.42	5.58
Essential Oils & Resinoids; Perfumery, Cosmetic or Toilet Preparations.	4.19	4.88	6.13	8.36	7.53	7.59	10.28
Articles of Leather, Saddlery & Harn; Travel Goods, Handbags & similar Cont .Articles of Animal Gut (other than Silk-Wr)	5.17	4.71	5.97	5.47	7.53	6.55	6.20

SOURCE: Ministry of Commerce, Government of India