SYNERGY

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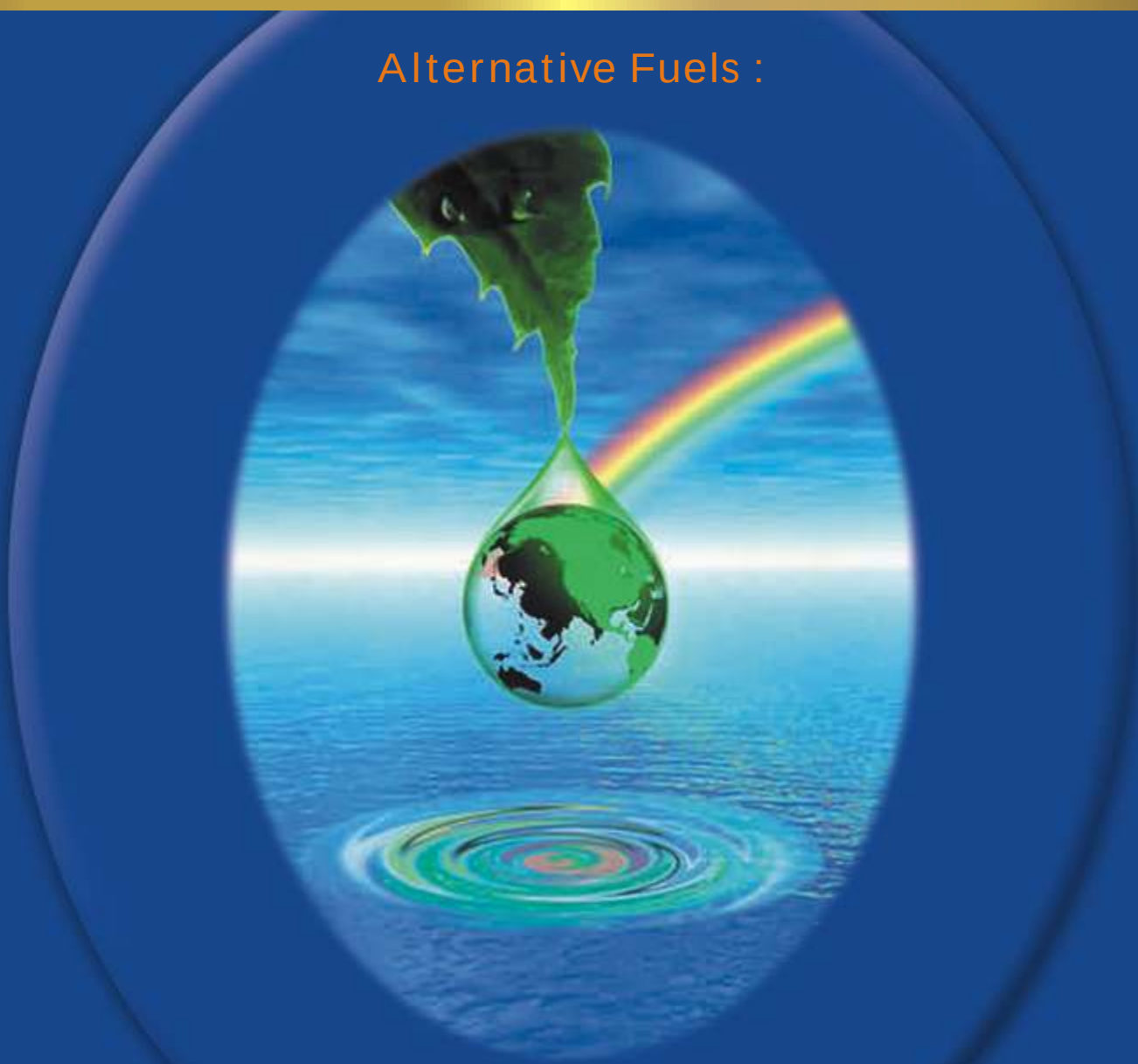
Alternative Fuels :



The Resource for Future Energy...

OIL's Vision

To be a vibrant, responsive, knowledge based competitive E & P Company with global presence, and a selective presence across the oil and gas value chain in India, maximizing shareholders' value, respecting stakeholders' aspirations and caring for the environment.

Here I am, each day
unveiling fresh possibilities.
Possibilities to Innovate.
Possibilities to achieve and
possibilities to
empower human lives.
That's what defines me.
An ever-evolving,
ever-improving entity,
striving incessantly to permeate
scientific innovation
into life for the
benefit of mankind.
I am OIL.

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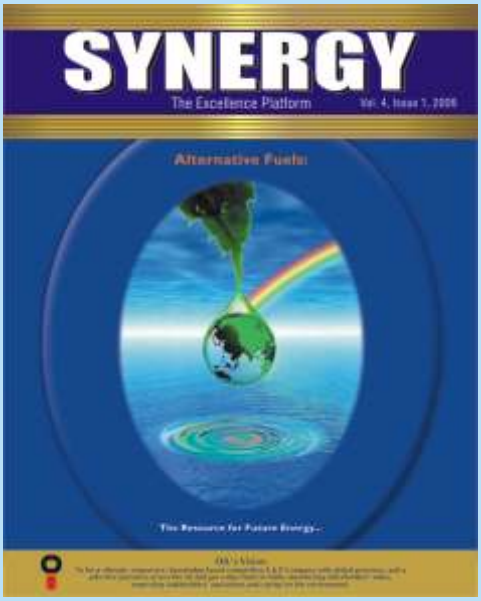


CONTENTS

Editorial

Dear Readers,

The oil industry worldwide is in the midst of a hurricane. The price of oil is affecting most economies, and even the G8 ministers have echoed their "concern about the risks of rising energy prices and what they do to growth."

Will the price of oil now fall from oversupply or will the demand of oil fall as price continues to rise?

Adding to the woes is the geopolitical situation around the world. The vote against Iran on nuclear issues, after IAEA voted on the involvement of UN Security Council has further hardened the price of oil. Fears of UN slapping tough sanctions on Iran, the 4th largest exporter of oil, will have deep repercussions. The tussle over the price of gas between Russia and Ukraine resulted in the shut down of gas supplies to Europe briefly. There is definitely a storm brewing in the tea cup, and, the oil importing countries will be badly hit.

In this issue we have included articles on oil politics, oil from shale as an alternate source of energy, an article on positioning of a brand by none other than the founder editor of Synergy, Ms. Renee S B Jhala, and, supply of gas in the North East. To offset the use of fossil fuels, alternate sources of energy will now definitely be high on the agenda of developing countries. A few of the emerging alternatives are coal gasification (Coal Bed Methane / Underground coal gasification), Hydrogen, Ethanol and Bio-Diesel. We shall try and include articles on these in our issues in future.

Our readers have appreciated the last issue of Synergy and we sincerely hope that we keep receiving your feedback on how to improve the journal further. In our last issue we had included a quiz for our esteemed readers. We are disappointed that we did not receive any entry in the competition. We would request our readers to participate as we have some good prizes to be won.

Lastly, I would like to thank the authors of the articles for their contribution. Happy Reading!

With best wishes

Arvind Jaini

Energy Independence

"Vision for the Oil sector, I believe, has to aim at providing to the nation at least 50% of its annual Oil and Gas need. Since we are dealing with fossil material resources, it may not be possible to meet this requirement fully from conventional Oil exploration and extraction alone."

Extract from address to the Nation on the eve of the 59th Independence Day-2005

Today on this 59th Independence Day, I would like to discuss with all of you another important area that is "Energy Security" as a transition to total "Energy Independence." Energy is the lifeline of modern societies. But today, India has 17% of the world's population, and just 0.8% of the world's known oil and natural gas resources. We might expand the use of our coal reserves for some time and that too at a cost and with environmental challenges. The climate of the globe as a whole is changing. Our water resources are also diminishing at a faster rate. As it is said, energy and water demand will soon surely be a defining characteristic of our people's life in the 21st Century.

Energy Security rests on two principles. The first, to use the least amount of energy to provide services and cut down energy losses. The second, to secure access to all sources of energy including coal, oil and gas supplies worldwide, till the end of the fossil fuel era which is fast approaching. Simultaneously we should access technologies to provide a diverse supply of reliable, affordable and environmentally sustainable energy.

As you all know, our annual requirement of oil is 114 million tonnes. Significant part of this is consumed in the Transportation Sector. We produce only about 25% of our total requirement. The presently known resources and future exploration of oil and gas may give mixed results. The import cast today of oil and natural gas is over Rs. 120,000 crores. Oil and Gas prices are escalating; the barrel cost of oil has doubled within a year. This situation has to be combated.

Energy Security, which means ensuring that our country can supply lifeline energy to all its citizens, at affordable costs at all times, is thus a very important and significant need and is an essential step forward. But it must be considered as a transition strategy, to enable us to achieve our real goal that is - Energy Independence or an economy which will function well with total freedom from oil, gas or coal imports. Is it possible?

Hence, Energy Independence has to be our nation's first and highest priority. We must be determined to achieve this within the next 25 years i.e. by the year 2030. This one major, 25-year national mission must be formulated, funds guaranteed, and the leadership entrusted without delay as public-private partnerships to our younger generation, now in their 30's, as their lifetime mission in a renewed drive for nation-building.

– by Hon'ble president Dr. A.P.J. Abdul Kalam Azad

Speech by former CMD of OIL, Mr. R. K. Dutta delivered in London at the International Petroleum Week 2006, organised by the Energy Institute

Shri R.K. Dutta became CMD of Oil India Limited in May 2002 and retired from the services on 28th February 2006.

It is indeed a great honour and privilege to participate in the Peter Ellis Memorial Conference and be part of a gathering of the most distinguished members of the international petroleum fraternity in this great city of London.

The theme of the conference is very apt – 'The Changing Roles of the International and National Oil Companies in meeting Global Demands' and having worked four decades in a National Oil company in India I would like to briefly dwell on the role of NOCs in the energy business before I come to the specific topic of the Route Map of Indian Supply and Demand.

Role of NOCs in Energy Business :

With continued industry restructuring, globalisation, evolution of technology and spiralling oil prices, the role of the National Oil Companies in protecting and enhancing the economic interests of their countries, has tremendously increased in importance, specially in developing countries like India.

Today the full or majority ownership of half of the top 50 oil companies worldwide are with the national governments. A ranking of international oil companies, using six operational criteria - oil and gas reserves, production, refining capacity and product sale showed that five of the top ten were the National Oil Companies of Saudi Arabia, Mexico, Venezuela, China and Iran. In terms of oil and gas reserves, nine and eight, respectively, out of the top ten were National Oil Companies.

The wholly government-owned National Oil Companies hold 72% of the worldwide proven oil reserves and 55% of gas reserves. They account for 48% and 22% of the global production of oil and gas respectively.

There is a perception among many that the NOCs tend to be lethargic and overburdened with bureaucracy and red-tape, in reality there are many successful NOCs, of all sizes, which are efficient, technology-driven and capable of reasonably quick decision-making, while operating within the priorities and policies of their governments to protect and enhance national interests.

Now I come to the Asian perspective including South-East Asia :

For driving growth, energy, especially oil, gas and coal plays a major role. Of this oil is the major source for energy with its share of 38% in the primary energy mix which is expected to remain the same in 2020.The share of natural gas is likely to go upto 28% from the current level of 24% in the world energy mix. The worldwide distribution of these non-renewable natural resources is very uneven. The oil resources required to meet the world's growing demands are likely to be concentrated in mainly three regions : the Middle East, Russia and Africa with the Middle East region continuing to play a central role.

In the 18th and 19th centuries the global economic agenda was

mainly shaped by Europe. During the 20th century it was the United States and in this century, Asia, led by the fast growing economies of India and China is expected to play the key role. The Asian region, accounts for more than one half of world's population. The per capita energy consumption in India and China in comparison to USA, OECD, and Japan is among the lowest. The developing nations of Asia have a GDP growth rate of about 6-7% annually and are expected to continue at this rate for next 10-15 years.

The large size of population, the continual increase in the standard of living with the resulting rise in consumption of energy, limited reserves of oil and gas, make the developing nations of Asia highly import dependent for energy. India in particular, with a population of over one billion, which is about 17% of the world population, has a mere 0.5% of world's oil reserves. India has one of the lowest per capita energy consumption of 346 kgoe as compared to the average world's per capita consumption of 1599 kgoe.

The fast growing Indian economy is expected to be among the top ten economies of the world in the next decade. This will mean increasing import dependence to meet energy requirements. Today, India is the world's fifth largest energy consumer and in the near future will surpass Japan to become the fourth largest. India is also the sixth largest consumer of petroleum products and is expected to be the fourth largest by 2010 surpassing Germany and South Korea. China averaging growth rate of about 8-9% during the last decade has the largest growth in energy consumption and it will continue to be the second largest consumer of petroleum products.

Thus, the growth in Asian demand particularly from china and India is expected to strongly influence the global oil/gas supply-demand and price scenario.

I will now focus on the specific theme of Route Map of Indian Supply and Demand :

Historical Perspective

In the last 50 years, the oil & gas sector in India has taken giant strides to meet the growing energy needs of the Indian economy. Starting from its exploration and production operations at Digboi in the State of Assam where the oldest operating refinery in the world is located, India has a long history of successful operations in the upstream and downstream petroleum and natural gas sector covering the entire gamut of services and core activities. The country has built up a large petroleum industrial network encompassing every facet of the oil & gas business including exploration, production, refining, transportation and marketing.

When, the late 80s and 90s saw less and less discoveries, change in geopolitics, high demand for energy, the government finally, starting from 1991, began loosening state control over the energy sector by implementing phased programs for deregulating coal, oil and gas prices by 2002-03 and encouraged participation by International Oil Companies (IOCs).

Today, estimated to be a US$ 90 billion industry, the oil and gas industry is the largest contributor to the State exchequer in India with its share of approx. US$ 14 billion.

Oil supply and Demand :

During the year 2004-05 India produced about 34 MMT oil. More than 50% of this production volume comes from the offshore fields of Mumbai high and the rest from Upper Assam, Cambay, Krishna-Godavari basin, and Cauvery basin. It accounts for only 30% of the total crude demand. It had to import about 96 MMT oil which works out to 1.9 MMBPD.

Based on the past decade's domestic production trend and number of discoveries, the crude oil production projection for 2025 is around 55 MMTPA, while the growth of crude oil demand is estimated to be around 365 MMTPA. Thus, India's energy vulnerability will further accentuate with dependence on import growing from the current level 70% to 85% by 2025.

New initiatives to bridge the gap :

a) Boosting domestic oil finds and production :

The sedimentary basins of Indian onland and offshore upto 200 M isobaths have an aerial extent of about 1.79 million sq. kms. So far 26 basins have been recognised and they have been divided into 4 categories depending upon their degree of prospectivity. In deep waters beyond 200 M isobaths the sedimentary area has been estimated to be 1.35 million sq. kms. The total sedimentary area of Indian basin thus works out to be 3.14 million sq. kms.

The prognosticated hydrocarbon resources inclusive of deep water are estimated at around 28 billion tonnes of oil and oil equivalent of gas out of which initial in-place reserves of 8.25 billion tonnes oil and oil equivalent of gas have been established. The sedimentary area in India having commercial production of hydrocarbons constitutes only about 20% of the total area of 3.14 million sq. kms and no commercial production is available, from the balance of around 80% of the area, which includes the vast deep water, and other frontier areas of the country.

Realising the need for massive investment both financial and technological in the oil & gas sector various policy reforms and

reviews have been undertaken by successive governments in New Delhi over the last 15 years. These efforts culminated, in 1999, with the publication of the Hydrocarbon Vision 2025. The main thrust area as defined in this vision for the E&P sector is –

- Intensify Exploration and Production efforts in the producing basins;
- Expand exploration efforts so as to achieve 100% coverage of all sedimentary basins within a specified period;
- Optimise production of the discovered reserves;
- Step up Research & Development efforts inducting state of the art technology and safeguarding the environment.

Towards this strategy, the Government came up with a New Exploration Licensing Policy (NELP) in 1999 which was formulated to provide an attractive and level playing field to new entrants including foreign companies in the E&P sector. The national oil companies namely Oil & Natural Gas Corporation (ONGC) and Oil India Limited (OIL), which had access to most of the acreage had to leave them after a fixed period in case of non discovery, for open bidding. No new acreage would be given to NOCs on nomination basis henceforth. At the same time, to share the risk, the Government has adopted a policy to encourage Indian NOCs to hunt for oil independently / through alliance with other Indian and or IOCs in India. All this was done to make the industry more efficient, infuse capital and bring in the latest technology & skill. There is freedom to market domestically the new finds at competitive prices from the acreages acquired through bidding. Foreign direct investment (FDI) up to 100% is permitted in exploration blocks. Presently, the Government regulates the functioning of the upstream sector through the office of the Director General of Hydrocarbon (DGH) for carving out blocks, monitoring of production sharing contracts, issuing of licenses etc.

To develop the indigenous resources, five rounds of bidding based on the NELP have brought in a number of private national and international players. Today we have 14 international overseas oil Companies operating in India supplementing the efforts of Indian national and private companies. Particular mention may be made of the Scotland-based Cairn Energy PLC, which first arrived in the Indian sub continent in 1994, already has number of oil & gas discoveries to its name, 12 of which are in Rajasthan.

Such discoveries coupled with those of Reliance Industries in the KG Basin of new reserves, where none were thought to exist has led to the new thinking : 'there is plenty of oil and gas to be found in Indian sedimentary basins'.

To boost domestic production from existing fields, one of the strategies undertaken by ONGC and OIL is to boost the recovery rates from the present average level of 28-30% to 40%, through intensification of IOR, extensive use of 3D seismic surveys and using an integrated multidisciplinary approach. These strategies have been formulated with the help of internationally renowned experts and are already showing results in ONGC's Mumbai high and OIL's Nahorkatiya oilfields.

b) Equity oil and gas from overseas :

Even as all efforts continue to locate new oil and gas sources within India, efforts have also been made to acquire equity oil abroad to meet the spiraling demand and supply gap.

OVL, Oil India Ltd, Indian Oil Corporation and Gas Authority of India Ltd., (GAIL), have ambitious plan to invest in E&P assets worldwide. Even Reliance, a major private player, has begun its own hunt for oil and gas abroad. On a long term basis, India plans to source one fourth of its oil requirement through international efforts by 2020. India Hydrocarbon Vision 2025 targets accessing 60MMTPA through equity oil from abroad by 2025.

ONGC Videsh Ltd., a subsidiary of the State-owned Oil & Natural Gas Corporation Limited, which already has a presence in 14 countries with committed investments so far of US$ 5 billion, has acquired 20% participating interests in Russia's Sakhalin-I, 25% in the Greater Nile Project and Block 5A and 5B in Sudan, participating interest in Vietnam and other oilfields in Iran, Iraq, Syria and Libya etc. Currently, nearly 5 MMTPA of oil & gas is available to OVL from its overseas ventures. However, if India is to achieve at least 25% of crude oil imports through the equity route a five-fold increase is required. This calls for more aggressive efforts and recognizing this the Government of India have recently allowed the Oil India Limited, another upstream national oil company in India to aggressively pursue opportunities overseas either in consortium with Indian Oil Corporation Limited or other major downstream oil companies all of which are Fortune 500 Companies. Oil India Limited in a very short period of 2-3 years already have a presence in 4 countries viz., Libya, Iran, Sudan and Cote d'Ivoire and is likely to have presence in a few more countries very soon.

The bidding for equity oil abroad has often been fiercely competitive as have been our experience in Kazakhstan & Nigeria and it is now our endeavor to try and join hands with our competitors rather than try and outbid them as ONGC and CNPC have recently done in successfully bidding jointly for the producing assets of Petro Canada in Syria.

To help the NOCs secure equity oil and gas, the Ministry of Petroleum & Natural Gas, under the able leadership of the Minister of Petroleum and senior diplomats from the Ministry of External Affairs are extending a helping hand. Towards this, India's efforts in bringing together Asian oil ministers under one roof and continuous engagement through dialogue has brought a new thinking for oil and gas rich countries to look towards India for a long term supplier-consumer relationship. The just concluded Asian Oil Ministers meet in Delhi in December 2005, has reinforced this initiative of the Government.

Gas Supply and Demand :

The 19th Century was the Century of coal; the 20th century was dominated by crude oil, while 21st Century is going to be the Century of natural gas. The gas demand as mentioned earlier is expected to increase manifold in the next 10-20 years. The gas supply is expected to be met through domestic production, import of LNG, gas imports through pipeline and through utilization of other emerging sources of natural gas.

As of now Natural gas continues to be in short supply. India produced about 32 BCM of natural gas and imported about 6 MMTOE during 2004-05. As per 'Hydrocarbon Vision 2025', the demand for natural gas will grow to about 391MMSCMD in 2025 rising from 150 MMSCMD in 2002. Being a cleaner fuel the demand for gas is increasing from the sectors such as fertiliser, power, steel, sponge iron and for CNG/LNG facilities in major cities.

The major policy initiatives taken by the Government to bridge the gap include :

a) Intensification of exploration through NELP Bidding rounds : In November 2002, a discovery of 200 Billion SCUM gas was made by Reliance Industries in the KG Basin off the coast of Andhra Pradesh. This was one of the biggest gas discoveries in the world in that year and was followed by a series of significant discoveries in the same basin leading to an intensification of exploration activity with the hope of further major potential discoveries. The development plan of Reliance discoveries has a potential of 40 MMSCMD with an investment of US$ 2.4 billion and production by 2007-08.

b) Encouragement to import LNG : Long-term contracts have been signed for LNG imports. Two major LNG terminals one at Dahej and another at Hazira have been commissioned. The terminal at Dahej has been designed to handle a capacity of 5 MMTPA initially, which is equivalent to 20 MMSCMD of natural gas, with a provision for expansion up to 10 MMTPA. The terminal at Hazira is the largest of Shell's and Total's ventures in India and has a capacity of 5 MMTPA of LNG. In line with market expansion, the terminal is expected to subsequently achieve a throughput capacity of 10 MMTPA. Another regassification project at Kochi is expected to be commissioned in the near future. The re-gassified LNG is being committed to diverse industries like power, fertiliser, and transport and also to households in different states in northern and western India.

c) Other sources to bridge gap : Coal Bed Methane, gas hydrates and underground coal gasification are the other emerging sources of natural gas. As many as 16 contracts for exploration and production of Coal Bed Methane have been signed with committed investment of US$ 149 million out of which US$ 21 million have already been spent. Production of CBM is expected to commence by 2007. An amount of US$ 46.3 million has been earmarked to facilitate R&D under the National Gas Hydrate Programme while ONGC has signed an MoU with the Skochinsky Institute of Russia for commercialisation of natural gas through underground coal gasification.

Trans National Gas Pipeline :

One of the most significant challenges before India is the setting up of trans-national pipelines that would economically carry natural gas from supply points thousands of kilometers away and reach India by crossing different countries. India has before it three specific pipeline proposals :

a) The Myanmar-Bangladesh-India Pipeline;

b) The Iran-Pakistan-India Pipeline; and

c) The Turkmenistan-Afghanistan-Pakistan-India pipeline.

All the three pipelines are attractive techno-economic proposals and have the capacity of not only meeting the energy requirements of the countries through which they pass but also to transform their relationships by ushering in an era of regional co-operation.

Downstream Sector :

The refining capacity of the country, which was 62.0 MMTPA in 1996-97, has more than doubled to 128 MMTPA as on date and from an importer of refined products, India has become an exporter. In fact we exported 18 MMT of product last year earning US$ 6.66 billion, which is about one fourth of what we spent on importing of crude oil & petroleum products. Efforts are on to embark on construction of export oriented refineries. The present refining capacity of 128 MMTPA is estimated to increase to 210 MMTPA by 2011 through commissioning of 4 new refineries and expansion of existing refineries. The surplus

capacity will be utilised for export purposes. An investment of US$ 15 billion has been planned for setting up of new refineries, expansion & modernisation and fuel quality improvement by 2010.

Opportunities in Oil and Gas Sector in India :

With the total anticipated investment of approximately US$ 110-120 billion in the Indian oil and gas industry over the next 20 years, the oil and gas sector provides attractive opportunities for both the national oil companies as well as the international oil companies. These opportunities as I see are as under :

Upstream :

- New Exploration Licensing Policy bid rounds;
- Enhanced Oil Recovery Projects;
- Oilfield Services;
- Deep Water Exploration & Drilling;
- Leveraging the strength of Indian National Oil Companies for overseas acreages;
- Farm-in opportunities in India;
- Participation in Coal Bed Methane bidding rounds.

Midstream :

- Participation in gas pipelines additional about 10,000 kms of gas pipelines are expected to be laid in the country requiring an investment of US$ 8 billion;
- City Gas Projects;
- Underground Coal Gasification and national gas hydrates programme;
- Participation in LNG projects.

Downstream :

- Participation in proposed refineries and upgradation of capacities of existing refineries;
- Utilising our skilled manpower for cost effective operations and maintenance;
- Planned product pipelines covering a distance of 13,000 kms, involving an investment of US$ 5 billion;
- New retail outlets;
- New terminals, depots and LPG infrastructure.

Hence, there lies an enormous opportunity in the oil and gas sector both for the national oil companies and the international oil companies. Today, we have three national oil companies operating in the upstream sector and 3 in the downstream sector with their subsidiaries. The efforts of these national oil companies are being supplemented by number of international oil companies and the private companies, British Gas, British Petroleum, Cairn Energy, Exxon Mobil, Gazprom Russia, E&I Italy, Reliance Industries, Essar Oil etc. to name a few.

Thus, to maintain long-term profitability and strengthen the competitive edge of companies, India has embarked upon a restructuring and disinvestment process and steps have been taken to establish necessary regulatory frameworks for the hydrocarbon sector.

With the third largest pool of technical manpower, developed basic and communication infrastructure, mature financial markets, developed banking system and a commitment to the economic reforms process, the NOCs and IOCs have ample opportunity to share in the country's path of progress on the fast track of development. India provides large investment opportunities and the foreign investor will find a stable macro-economic, legal and fiscal environment in a country which has followed a democratic tradition during its 58 years of Independence.

Conclusion :

I have briefly outlined the oil and gas scenario in India and a wide range of opportunities available in our country in this sector. There are significant investment opportunities for both domestic and foreign investors in India in the hydrocarbon sector. I have a firm belief that appropriate alliances and associations amongst national oil companies and international oil companies can create good synergies for tapping the hydrocarbon potential of India.

I on behalf of Oil India Limited offer and seek value addition to and from interested national oil companies and international oil companies to jointly successfully tap emerging opportunities in India and across the globe.

I would now like to conclude by thanking our hosts, the Energy Institute for their warm hospitality and providing an opportunity to all of us to meet and deliberate on important issues of common interest. Participation in the conference has indeed been an enriching experience for me. I thank you all for your patient hearing. May I wish the organizers a very successful International Petroleum Week, 2006!

Thank you.

Geopolitics of oil

Talmiz Ahmad

Talmiz Ahmad joined the Indian Foreign Service in 1974. During the last 30 years, he has acquired a special interest in the countries of the Gulf and the Arabian Peninsula, having been posted early in his career in Kuwait, Baghdad and Sana'a, and later as Consul General in Jeddah. He has also been posted at the Indian Consulate General in New York (1984-87); in the Indian High Commission in London (1991-94), and as Deputy High Commissioner in Pretoria, South Africa (1994-97).

After having been the Official Spokesman of the Ministry of External Affairs in 1997, Mr. Ahmad served as Joint Secretary (Gulf/Haj) in the Ministry of External Affairs between 1998-2000. He was appointed the Ambassador of India to Saudi Arabia in 2000, and served there for three and a half years, after which he became the Indian Ambassador to the Sultanate of Oman in July 2003.

He joined the Ministry of Petroleum and Natural Gas as Additional Secretary responsible for International Cooperation, in April 2005.

Mr. Talmiz Ahmad has a special interest in political Islam and Isalamic affairs in general, as also the politics of West Asia. He has published a monograph titled : "An Introduction to Contemporary Islamic Groups and Movement in India." His book titled : "Reform in the Arab World External Influences and Regional Debates," was released in July 2005. Since joining the Petroleum Ministry, he has been frequently writing and commenting on energy-related matters.

ENERGY is the fuel that drives the economy and makes possible the annual growth rates essential for ensuring economic development. Most of the world's energy comes from hydrocarbons (oil and gas) which account for 65% of the world's energy requirements. While oil accounts for 42% in the global energy mix, the other sources of global energy are coal (24%), natural gas (22%), nuclear energy (6%) and renewable and non-conventional sources (7%). World energy demand increased by 95% over the last 30 years and is expected to rise by 60% over the next 20 years. During this period, the demand for oil will increase by 42% while the demand for gas will increase by 97%.

In recent years the most significant development in the consumption of hydrocarbon fuels is the anticipated increase in Asian demand. In fact, there has been a consistent increase over the last few decades : between 1970-94, Asian energy demand increased by 400%, with demand for oil increasing by 274%; world demand growth during this period was only 63%. Now, Asian requirement of oil is expected to increase from 30 million barrels per day currently to 130 million barrels per day in 2020.

The bulk of this increase will be accounted for by China and India, together responsible for 35% in the world's incremental consumption of energy. A country, which was self-sufficient in hydrocarbons till 1993, will be importing 40% of its requirements by 2010; ten years later in 2020, its consumption of oil will be 9.5 million barrels per day, with import dependency rising to over 60%.

Let us now take a look at the supply side. World oil reserves are estimated at 1.35 trillion barrels; they are 2.3 trillion barrels if oil sands and shales are taken into account. The Persian Gulf provides the bulk of the world's oil : just five countries of the

Gas processing plant of OIL in Rajasthan

Gulf (Saudi Arabia, Iraq, Iran, Kuwait and the UAE) have about 70% of the world's reserves. By 2020, this region will produce 55.5 million barrels per day, a two-and-a-half times increase over 1991. The share of Gulf oil exports in world export will increase from 42% in 1995 to 59% in 2020. Not surprisingly, world dependence on Gulf oil is likely to increase significantly. This is particularly true in respect of Asia. Asian countries already depend upon the Gulf for 75%-80% of their requirements.

A part of the gas processing plant at Dandewala

The other significant sources of international oil are the Caspian Sea region and Western and Central Africa. The Caspian region came to international attention in the context of hydrocarbons only after the break-up of the Soviet Union. The IEA suggests that proven Caspian oil reserves are between 15-40 billion barrels, while possible reserves are between 70-150 billion barrels. Thus, this region is not expected to provide production beyond 5% of world demand in 2020.

Similarly, Sub-Saharan Africa, with Nigeria as the traditional producer and with new discoveries in Angola, Sudan, Ivory Coast, Chad, Equatorial Guinea and Ghana, accounts for 12% of world production but has just 8.3% of world reserves. Sub-Saharan output is expected to increase from 3.8 million barrels per day to 6.8 million barrels per day in 2008, and to 9 million barrels per day in 2030.

Natural gas, being a 'clean' fuel, is increasingly seen as the fuel of the 21st century. Between 1980 and 2003, the share of gas in the world energy mix rose from 18% to 22%. The demand for gas is expected to increase at 2.4% per annum till 2020, when it will constitute 25% of the world energy mix and consolidate its position as the number two fuel in the world's energy mix. Since 1980, proven world gas reserves have increased at 3.6% per annum, with volume tripling from 77 trillion cm^3 to 179 trillion cm^3 in 2004.

The location of gas is more diversified than oil : OPEC has 50% of world reserves (as against 75% of oil); the FSU states have 32% of world reserves (against 10% of oil), while the OECD has 10% of gas against 7% of oil. Three-fourths of world reserves are in Russia, Central Asia and the Gulf. The principal gas producers today are Russia, Iran and Qatar. Qatar had begun investments in LNG facilities over ten years back, and is presently reaping the benefits as the world's major supplier of LNG. However, the principal supplier to Western Europe is Russia, which provides gas through transnational pipelines. Russia is already the largest supplier of gas to Europe; by 2030, it will meet 50% of Europe's needs.

On the supply side, the prognosis relating to gas is quite comfortable : present resources can meet current demand for 60 years. With new discoveries, reserves could meet demand for 150 years at present rate of consumption. According to industry forecasts, international trade in natural gas is expected to increase significantly in coming years, accounting for one-third of world output, reaching 1.35 trillion cm^3 per year by 2020. This increased trade will cover both LNG and piped gas. International trade in LNG is expected to grow by 7% p.a. till it becomes 38% of gas trade by 2020. Piped gas carried by trans-national pipelines will grow to become 50% of international trade by 2020.

The problem pertaining to gas is not with the reserves; it has to do with the need for fresh investments over the medium-term to develop new fields, albeit in the traditional areas where production in the old fields is declining. It is estimated that investments of about $1-1.2 trillion would be required over the next 10 years to develop the potential to meet global requirements.

Given the importance of hydrocarbons for the economic development and prosperity of nations, oil is obviously more than just a chemical product : it is an international commodity which affects and is affected by international politics. It is therefore not surprising that the stronger nations of the world, through their companies, have attempted to dominate the exploration, production, transportation and refining of oil. Indeed, in global politics over the last 60 years, control over oil

has been a significant factor in determining the political and military positions of the major producer and consumer countries of the world. Some instances are examined in the following paragraphs.

The territorial boundaries of Iraq are the result of oil. Having secured control over Mesopotamia under the League of Nations mandate, the British had initially planned to take over only the Basra and Baghdad provinces of the old Ottoman empire since this gave them control over the land and sea routes to India. However, the Northern province of Mosul was

hurriedly added once oil was discovered in that region, the accession being formalised at the 1920 San Remo Conference.

It is not surprising that Iraq, with the world's second largest oil reserves (11% of world reserves), should find itself in the vortex of post-Cold War politics. Francisco Parra, the international authority on oil politics, has pointed out that the Gulf War of 1990 was perhaps the world's first oil war. It originated from a quarrel between Iraq and Kuwait over oil rights at their border. Then, Iraq's occupation of Kuwait gave the former control over 20% of the world's total oil reserves. Finally, the undoing of this oil-related situation was the principal motive force behind the US-led war to compel Iraq to vacate its occupation of Kuwait.

The current situation relating to Iraq, i.e., the war of 2003, regime-change, and continued US military occupation of the country, is the result of a complex web of US political and strategic interests in West Asia in which oil is a dominant factor. The neo-conservatives (neocons), agenda for West Asia, now dominant in the US Administration, is aimed at promoting 'a renaissance based on democracy and economic freedom' to wean the Arab people, particularly the youth, from the bane of Islam-based extremism and violence.

The idealistic grand design of the neocons coincides with the position of the more traditional Republicans for the attainment of US interests in West Asia with regard to control over Gulf oil. This is based on the following considerations :

1. The strategic importance of the Persian Gulf is likely to grow significantly in the next 20 years in view of its oil reserves. With supplies in many other regions, especially the United States and the North Sea, nearly exhausted, oil from Saudi Arabia and Iraq will become ever more critical. By 2020, the Gulf, with increases in production capacity in Saudi Arabia and Iraq, will supply between 54% and 67% of the world's crude, making the region vital to US interests.

2. US strategists are not worried primarily about America's own oil supplies : for decades, the United States has worked to diversify its sources of oil with Venezuela, Nigeria, Mexico, and other countries growing in importance. But, for Western Europe and Japan, as well as the developing industrial powers of eastern Asia, the Gulf is all-important. Thus, whoever controls it will maintain crucial global leverage for decades to come. As a US commentator has frankly concluded : "Controlling Iraq is about oil as power rather than oil as fuel. Control over the Persian Gulf translates into control over Europe, Japan, and China. It's having our hand on the spigot."

The 60 year old strategic partnership between Saudi Arabia and the United States has been based on the fact that the Desert Kingdom has the world's largest oil reserves (25%). In this partnership the United States was required to provide security to the kingdom, and the kingdom on its part was expected to maintain steady oil supplies to meet the substantial US crude requirements.

For most of this period, the relationship has worked for mutual benefit. The kingdom, and led by it, OPEC, have maintained steady supplies of oil in the market. Specifically, Saudi Arabia has regularly intervened in the oil market to maintain supplies at times of crises such as the Iran-Iraq war, the Iraqi occupation of Kuwait, the period following 9/11, and more recently, the US-led war on Iraq in 2003. Even during periods of high oil prices caused by real and imagined international anxieties, the

Saudi kingdom has played an effective role as a swing producer in stabilising supplies and prices.

The events of September 11 posed the first serious challenge to the Saudi-US relationship even as the neocons and other anti-Saudi elements in the US establishment seized the opportunity to malign the kingdom and question its status as the US's strategic partner and friend. However, the logic of 'oil politics' has ensured that the relationship would not only survive the serious challenge posed by 9/11, but appears to be asserting the enduring value of its underpinnings based on the kingdom's unique status in the world of oil.

Despite its relatively modest potential, the Caspian region continues to be of enduring value to the West as an alternative source of supply with considerable untapped potential. US policy in Central Asia is aimed at isolating Iran, limiting Russian influence in the region, and bringing this region within its sphere of influence. Towards this end, since the early 1990s, the US has pursued a robust policy of engagement with the newly independent Central Asian republics. Over the last five years, US total investment in the region has reached $30 billion, buttressed by a significant military presence. The Baku-Tblisi-Ceyhan (BTC) pipeline set up in adverse political, financial and environmental conditions, is an enduring example of the success of this effort.

The United States has also actively supported the Turkmenistan-Afghanistan-Pakistan pipeline aimed at bringing Turkmenistan gas to Pakistan and possibly India. The United States supported this project even when Afghanistan was in the throes of civil war and its territory was dominated by the marauding Taliban. Later, with the departure of the US energy company, UNOCAL, from the scene, the lead role in promoting this project has been taken over by the Asian Development Bank. This project is likely to have more geopolitical and economic complications than the BTC project since doubts have been raised not only about the gas reserves at the Daulatabad field in Turkmenistan but also the possible legal commitment of these reserves to the Russian company Gazprom.

However, the US is not the sole role-player in this region : EU countries, China and India are also in pursuit of their interests as they seek to diversify their energy sources. Iran, with a long border along the Caspian Sea, is also active in the region as it seeks to negotiate the best share for itself of the Caspian Sea reserves.

The *Hydrocarbon Vision 2025*, published by the Government of India in February 2000, set out in stark terms India's energy security predicament : its crude oil self-sufficiency declined from 63% in 1989-90 to 30% in 2000-01. The situation is only likely to get worse in the future: India's demand for oil is expected to increase from 122 million tonnes in 2001-02 to 196 million tonnes in 2011-12, and 364 million tonnes in 2024-25. Domestic production during this period would increase from 26 million tonnes to 52 million tonnes in 2011-12, and to 80 million tonnes in 2024-25. In 2024-25, crude oil self-sufficiency would be a mere 15%. The situation relating to gas is equally grim.

In response to this negative scenario for India's energy security, the *Vision 2025* document has set out an elaborate action plan for the acquisition of hydrocarbon resources required by the country to meet its economic requirements. It provides for a robust effort to expand domestic production of oil and gas through the liberalisation of the oil sector, encouragement to the entry of private Indian and foreign companies, investments in technology and R&D, and so on.

An important component of this effort is the external dimension which is made up of the following : (*i*) acquisition of assets abroad : this consists of two approaches : (a) acquiring equity participation in developed fields, and (b) obtaining exploration and production (E&P) contracts in different parts of the world; (*ii*) entering into long-term LNG supply contracts; (*iii*) pursuing transnational gas pipeline proposals; and (*iv*) promoting partnerships with foreign entities in the downstream sector, both in India and abroad.

India has been pursuing this strategy over the last few years. These efforts have acquired a sharper impetus in the last year and a half, with Petroleum Ministery attaching the highest importance to robust foreign engagement across the hydrocarbon value chain from Alberta to Australia.

The Indian hydrocarbon strategy has already begun to yield some positive results. We have a 25% equity participation in a

producing field in Sudan, which provides India with three million tonnes of oil per annum. We have also secured E&P contracts in Sakhalin (Russia), Vietnam, Iran, Myanmar and Cuba. Along side these successes, there have also been well publicised setbacks, when our companies failed to acquire assets in Angola, Ecuador and Kazakhstan.

It is important to point out that India's external hydrocarbon strategy is being implemented in a highly competitive international environment which is made up of international and national oil majors contending vigorously for assets in the few new areas in which they are available, i.e., in the Caspian, in Western and Central Africa, and in some parts of Latin America, while consolidating their presence in the Gulf. Again, this effort is currently being mounted in an oil market that has seen prices reach new heights, in-turn generating a frenzied environment, with international companies offering billions of dollars for assets that have acquired an enhanced and even undue value because of the high oil prices.

The scramble for oil resources poses a unique challenge to Indian oil diplomacy in that it requires us to explore new engagements or, alternatively, to imbue traditional political relationships with a new, hydrocarbon-related value. Taking into account the geopolitical situation and the competitive edge that informs the global hydrocarbon scenario, some of the major challenges to Indian oil diplomacy are examined in the following paragraphs.

Clearly, the Persian Gulf region has and will continue to occupy a central position in India's quest for energy security. However, the hydrocarbon resources of this region will be sought not just by India but also by other Asian and even European countries. The USA too will import a substantial portion of its requirements from the Gulf, even though it has been attempting to diversify its resources to Latin America, Africa and Europe.

The Gulf region has unfortunately been in the vortex of considerable instability and insecurity for more than 25 years. Despite of this environment of instability and violence, the region has generally been able to maintain the oil and gas supplies required by the world. However, from a geopolitical perspective, we cannot ignore the possibility of large scale violence which could seriously disrupt supplies. This also raises questions relating not only to the security of the hydrocarbon facilities and the regimes that control them but also the safety of maritime carriers and the freedom of the sea lanes, particularly the Straits of Hormuz, the Suez Canal and Bab-al-Mandab.

Hence, prudent energy security policies require that sources of supply be diversified. In this context, it is noteworthy that Nigeria has now emerged as the number two supplier of oil to India, though these supplies are based on spot purchases rather than term contracts as is the case with supplies from the Gulf. On these lines, India is also actively looking for assets, both in terms of equity participation and E&P contracts in Central Asia, West and Central Africa and Latin America. We have had some modest success in acquiring stakes in blocks in Nigeria, and are pursuing proposals in Angola, Kazakhstan, Cuba and Venezuela.

India is also an active player in the LNG market. So far, two agreements for supply of five million tonnes of LNG have been finalised with Qatar and Iran. However, given India's huge requirements and proposals to set up additional LNG terminals along both the West and East coasts, India has already conveyed to both these countries and to other suppliers its need for increased supplies.

Pipeline construction in progress

Transnational oil and gas pipelines are not only able to transport large quantities of hydrocarbons across hundreds, and even thousands of kilometres, but, given their reach and range and the terrain they traverse, they also have significant geopolitical implications and even the ability to influence bilateral relationships and regional cooperation scenarios. The Baku-Tblisi-Ceyhan (BTC) pipeline seems to be a manifestation of US attempts to exclude Russia and Iran from the Central Asian hydrocarbon calculus. However, this policy is unlikely to succeed over the medium-term as Central Asia will seek to reach the lucrative markets of Asia through pipelines across Russia and Iran.

Kazakhstan on its part had already indicated its interest in utilising its hydrocarbon potential to firm up engagements with all its neighbours : if it has appeased the Americans by participating with its oil in the BTC pipeline, it has also participated with the Russians in the Aktau-Novorossisk pipeline, and with the Chinese in the 2000 km. long Kazakhstan-China pipeline, currently under construction. The outlet for Kazakh oil to the Persian Gulf, through Iran, was the first project considered by the Kazakhs, in the late 1990s, and had to be put on the backburner under US influence. There are indications that this project could be revived as a gas pipeline project to take advantage of the huge market for Kazakh gas in South Asia.

Pipelines have had certain curious implications for India's quest to diversify its sources. Thus, the BTC pipeline, aimed at carrying Caspian oil to Europe, has also raised the possibility of Caspian oil being shipped to India from Ceyhan, either through the Suez Canal (in case of small shipments) or through the newly revived Ashkelon-Eilat pipeline in Israel which, through an arrangement of double shipment from Ceyhan to Ashkelon and then from Eilat by crude carrier to India, has for the first time made Caspian oil available to India.

In case the plan for a sub-sea pipeline from Ceyhan to Israel via Turkish Cyprus was realised, then India and other Asian countries would be able to obtain Caspian oil at Eilat on the Red Sea. Similarly, if the proposed pipeline from Alexandria to the Red Sea were to be implemented, India would be able to obtain access to oil from North Africa, particularly Algeria and Libya, which today can reach India only by going round most of the African continent.

In order to meet its gas requirements, India is vigorously pursuing gas pipeline projects both on its eastern and western land frontiers. The Iran-Pakistan-India pipeline is expected to bring to India nearly 90 MMCMD of gas which will be utilised to fuel power and fertiliser projects in North and North Western India. In the East, the Myanmar-Bangladesh-India pipeline will not only bring Myanmar gas, but would also possibly carry Tripura gas to India, and Bangladesh gas from its eastern part where it is produced to the western part where it is required.

India has also agreed to participate in the Turkmenistan-Afghanistan-Pakistan pipeline, initially as an observer. Taking into account concerns relating to Turkmenistan reserves at Daulatabad, India proposes to suggest to participating countries that Daulatabad be seen not just as the sole source of gas in the project but as the junction to which gas from neighbouring countries, such as Uzbekistan, Kazakhstan,

Steam generation unit at Digboi

Azerbaijan and, possibly, Russia could be injected.

All these pipeline proposals, being trans-national in character and involving neighbouring countries with complex histories in terms of bilateral relations, are fraught with political and security related problems that would need to be addressed. If these projects are to be realised, we must first accept that they are extremely important, indeed critical, for India's energy security interests. Once this is understood, international best practice can readily yield arrangements that would be put in place in regard to all aspects of the projects technical, financial, commercial and legal, that would serve to insulate the projects from the vagaries of day-to-day politics and provide the desired level of comfort to our policy-makers.

As noted above, the contemporary international hydrocarbon environment is highly competitive, pitting corporations and nations against each other in ruthless contention. It involves billions of dollars of financial flows and, on occasion, even extra-legal skulduggery. At the same time, this is also a period of unprecedented opportunity, with high oil prices opening up exploration and production prospects and compelling producer and consumer countries to pursue investments in the downstream sector. India's long term interests lie in putting together alliances and partnerships that would bring together different capabilities in joint proposals.

Drilling in progress in Assam

MOP & NG over the last year, has engaged across the globe carrying the message of partnership and synergy in place of wasteful and unnecessary contention. Some of the more significant interactions have been with Russia; the Central Asian countries of Kazakhstan, Uzbekistan and Azerbaijan; and Turkey and Romania, that constitute a link between Central Asia and Europe. They have also engaged with Norway, Nigeria, Angola, some Latin American countries, and most recently China. These diplomatic engagements have confirmed that the countries concerned are anxious to cooperate and that they see in India a worthy partner, given its human capital and technical capabilities.

The proposed cooperation ranges across the hydrocarbon value chain, and includes prospecting in each other's territories, as also exchange of R&D, technology, safety norms and training. Beyond the bilateral aspect, it includes the possibility of Indian and foreign national companies working together on specific projects in third countries, particularly in the Gulf, the Caspian, Africa and Latin America.

These proposed engagements involve refreshing traditional relationships with a new hydrocarbon-related content such as the proposed links with Russia and Romania; or replacing old suspicions with the new building blocks of cooperation, understanding and friendship with countries such as Pakistan, Bangladesh and China. It also has the potential of expanding India's diplomatic penetration across continents to new areas such as Norway, Latin America and countries of North and West Africa that have traditionally been at the margins of India's diplomatic consciousness, and imbuing them with a new importance and urgency.

In recent years, oil-related think-tanks have engaged in a debate on whether supply of hydrocarbons has 'peaked' so that the next few years will see a steady decline in supplies, with consequent implications for prices, economic development programmes and heightened political contentions. However, the emerging view is that hydrocarbon resources are available to meet demand over the next 30-50 years. Historically, though predictions of 'peak oil' have been made from time to time, global production has regularly increased to meet demand. As

Daniel Yergin has pointed out, new technologies have made it possible for oil companies to find new sources of oil and extract oil from old sources. According to a survey released by him recently, between 2004-2010 world oil supplies will increase by 16 million barrels a day, well over the likely demand increase.

However, there is no room for complacency since new oil will be available in physically challenging areas such as the deep sea or frozen terrain or environmentally sensitive locations. Again, it will require rather huge investments for its extraction, amounting cumulatively to about $5 trillion up to 2030, at the rate of $ 20 billion per annum.

To meet the global demand for OIL we need an integrated global effort to pool together the world's human, financial and technological resources to explore and develop these difficult and sensitive areas in a spirit of cooperation based on considerations of mutual benefit.

India took the first significant step in promoting this cooperation at regional level by convening a Round Table in New Delhi in January 2005 of the four principal Asian oil-consuming countries - China, Japan, Republic of Korea and India - getting into dialogue with the principal oil-producing countries of West Asia and South East Asia. The eleven assembled ministers agreed on the importance of this first dialogue between Asian consumers and producers, and, in a consensual statement, identified substantial commonality of interest as also areas of cooperation. They also recognised that for the interests of the Asian consumers and producers to be pursued effectively, the knowledge-base of Asian countries would have to be expanded even as the Asian producers and consumers develop policies and programmes linked with promoting crisscross investments in each others' hydrocarbon sectors as also in the areas of conservation, efficiency and environment protection.

This regional dialogue has thrown up a number of specific areas for cooperation. These include : reform of the Asian oil markets, promotion of crisscross investments in hydrocarbons between producers and consumers, development of strategic reserves, development of the Asian gas pipeline grid, development and transfer of R&D and technology and development of capabilities to promote energy conservation and efficiency and environment-friendly fuels. The ministers have agreed to meet annually to pursue their consensual plan of action.

Separately, in order to complement the earlier Round Table, India has now taken the initiative to bring together the four principal Asian oil-consuming countries in dialogue with oil-producers of North and Central Asia, including Russia, Kazakhstan, Uzbekistan, Azerbaijan, Turkmenistan and Turkey, in November 2005.

There is now a slow but steady acceptance that national energy security interests are best served by pursuing policies of cooperation so that energy resources can be harnessed efficiently for regional and global development. The oil market is already integrating in significant ways : there is a clear trend in favour of oil companies integrating across the hydrocarbon value-chain, from exploration to production to transportation, to refining and to petrochemicals. E&P proposals in producer countries are increasingly being linked to refinery proposals and, on occasion, to other infrastructure development proposals such as roads, railways, mining and port development projects. Hurricane Katrina, by damaging US facilities across the entire supply system in the region, has redefined energy security to mean, as Yergin has noted, "the security and integrity of the whole supply chain and infrastructure from production to consumer." Above all, the surge in global demand for hydrocarbons represents, again in Yergin's words, "the success of globalisation - the best global economic performance in a generation."

The challenge before India is to understand the impact of these myriad developments and effect the required adjustments in our politics and policies and, above all, in our mindset, so that we can effectively respond to and participate in these global trends.

Oil Shales in North East India

C. Ratnam

Chudamani Ratnam was born in 1933 and was educated at Delhi University. He was awarded an Assam Oil Co. scholarship to study at the Imperial College, London, where he specialised in petroleum exploration and development. After completing his studies in London he joined the erstwhile Assam Oil Co. which after nationalisation became Oil India Limited. During his career he served in various parts of India, both onshore and offshore, as well as internationally in Pakistan, Bangladesh, Myanmar and U.K. (North Sea). Since retirement he has been involved in an advisory capacity with both the public and private sector oil industry. He has written and lectured extensively on energy related matters.

Oil shales are a kind of rock, having a high content of carbonaceous organic matter, which when heated, for example in a retort (diagram1), exude hydrocarbon oils. Under natural subsurface conditions over a period of millions of years the same rocks generate crude oil which accumulate in oil fields. In North East India, the presence of such rocks in the subsurface can be logically inferred as they are the source of prolific oil fields which are under production for more than a century. However investigations by Oil India Ltd., and others, have shown that similar rocks with most of their oil generating potential still preserved are present at the surface over a large area in Upper Assam, Arunachal Pradesh and Nagaland and could in all probability form a very large source of crude oil in the future. A production of nearly 100 mtpa for a 100 years is not beyond imagination.

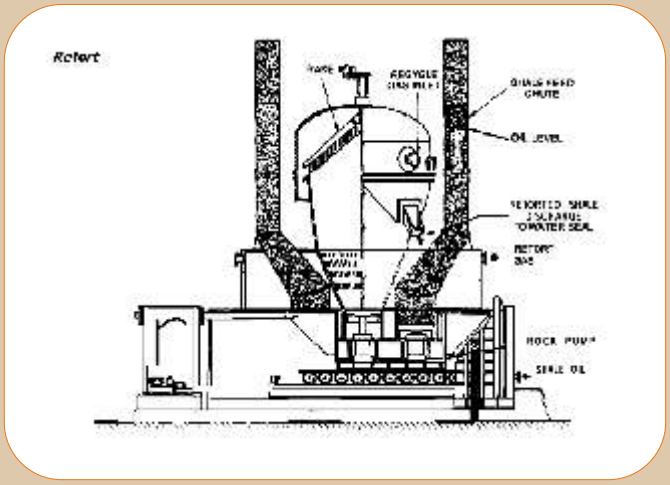


Diagram 1 : Cross Sectional diagram of a retort

The USA has the world's largest known deposits of oil shale and were producing about 50,000 barrels per day, with government subsidy, for a few decades just after World War II. They set up a task force to review the results and the report is available to the public. The report, which is an excellent model of what a report should be, was technically favourable, but at the then prevailing crude prices could not justify the project commercially. Currently Estonia, Brazil and China have ongoing commercial shale oil production. In earlier centuries Scotland, France, etc. also had small but significant commercial shale oil production.

Recent volumes of Synergy have highlighted a number of topics of considerable importance to India which need to be examined on a top priority basis. The most important of these is the fact that the worlds oil seems to be running out and even imports may no longer be an available option within a period which could be as short as ten to twenty years. Closer home, there are indications that Oil India itself could be running out of reserves soon, so much so, that an employee of say thirty years of age may not have any oil to produce long before he or she retires. The impact of loss of royalty, loss of job opportunities, etc. on the concerned states will be enormous. It is therefore incumbent on persons of the potentially affected age group, as a matter of self interest, to ensure that alternative sources of energy are pursued with immediate effect. While exploration abroad is a laudable venture there is no guarantee of success.

In this context "Synergy" has drawn attention to alternative sources of energy which need to be implemented .The first of these is coal to oil conversion on which Oil India has already done some pioneering work but the pace of progress leaves much to be desired. The in-place coal resources of N.E. India are in excess of 3 billion tonnes and much of this could be recovered leading to a reserve of nearly 2 billion tonnes of oil which in turn could support an annual production of 30 mtpa for many decades. This target must be approached on a war footing.

Additionally biodiesel and alcohol have more or less proved to be more than viable sources of fuel. It has been estimated that India has a potential to produce 350 mtpa of biodiesel. Most of this would come from semi arid waste land without impinging on agricultural production. However, a significant part of Assam's land is given over to tea cultivation, a beverage for which there are other options. Assam could turn over the tea gardens to biodiesel and alcohol producing crops and with its high fertility could be a major source of liquid fuels within a matter of years. The tea industry has amply demonstrated its management and scientific skills. It is unfortunate that an attempt in Oil India around 1992 to investigate alcohol production was allowed to die a premature death due to lack of vision. Co-processing, about which Oil India has aquired some knowledge, of coal and biodiesel is an exciting possiblity. Over

Photo 1 : Excavators at work in the mines

a slightly longer term provided that steps are initiated without delay, oil shales would provide an additional source of liquid fuels to meet growing demand.

The oil industry uses a laboratory equipment, under the proprietary name of RockEval, which is capable of measuring the organic content and oil yield of rock samples. Both ONGC and OIL have more than one unit which are primarily being used to estimate source rock potential for conventional crude. However, if a surface sample of rock is analysed the results will indicate shale oil potential. RockEval results amongst other information contain two parameters : a) S1 which indicates the existing hydrocarbon content and b) S2 which indicates the additional hydrocarbon yield on further heating, both expressed in milligrams of oil per gram of rock.

OIL and a UK based consultant as part of a general study of hydrocarbon prospects in the Upper Assam Valley in 1990-91, carried out RockEval analyses, of both subsurface, i.e. well, and surface rock samples from Upper Assam and adjoining areas of Arunachal Pradesh. It is possible that ONGC also carried out similar studies. OIL and its consultant's analysis of a representative number of surface shale samples resulted in S1 values of about 5.5mg/g and S2 of 75.5mg/g, i.e. a total hydrocarbon potential of 81mg/g. This corresponds to a yield of 95 litres of oil per tonne of rock and compares favourably with yields from known oil shales elsewhere in the world. OIL published a paper on it's findings. Well data from an ONGC publication indicate the following for Barail shales; S1 of about

2mg/g and S2 of about 95mg/g, which is even more favourable than OIL results.

The rocks which can be characterised as oil shales are part of the Barail and Disang geological formations of North East India. They are present over the area covered by the Naga and Patkai Hill ranges, i.e. over an area about 300 by 50 kms. Assuming a mineable depth of about 500 metres this total rock volume works out to around 7500 cubic kms, equivalent to a rock weight of 150 billion tonnes. This results in an in-place shale oil reserve of greater than 15 billion tonnes. At current crude oil prices there are no limitations on technology to extract almost all this oil, though there could be some severe environmental and more importantly, demographic constraints.

The technology for mining and extracting the shale oil is not new to India. At the lignite mines in Neyvelli (Tamil Nadu) in a dramatic way one can see both the mining and processing technology at work. Here about 120 metres of overburden are stripped by giant excavating machinery(photo 1) to expose the lignite seams. In other countries stripping down to 500 metres has been commercialised. However, a specific advantage to be noted is that in North East India the economic mineral i.e. oil shale, is at the surface and extends downwards for many kilometres. A part of the lignite production in Neyvelli is fed to retorts where high value liquid hydrocarbons, such as phenol, are obtained. Similar retorts are in operation in various coalfields of India.

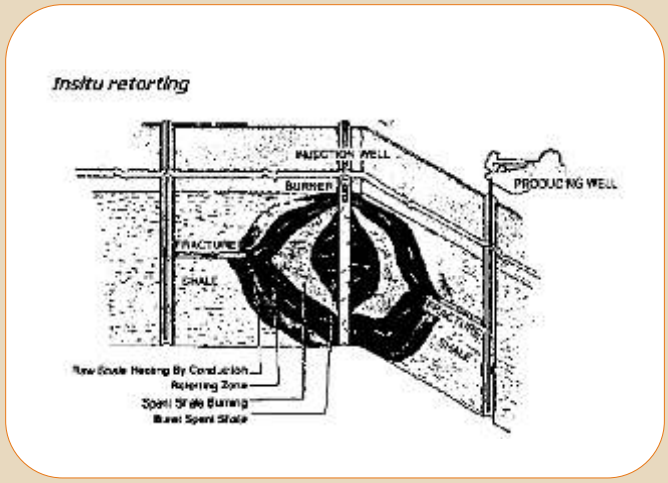


Diagram 2 : Cross Sectional diagram of a retort

An alternative or supplemental method of shale oil extraction has also been tried succesfully in some countries. This involves insitu retorting (diagram 2) and has no surface complications. However, the recoveries are probably not as effective. Further, studies including field trials are required under Indian conditions. The use of mini atom bombs to improve recoveries has also been proposed.

Various organisations worldwide are hard at work to tackle the problems of alternative sources of energy. India cannot afford to lag behind. This is the challenge facing the youth of this country.

"What if we train our people and they leave?"
Wrong Question
Zig Ziglar says We should always ask
"What if we do not train our people and they stay?"
Training is an investment : we should always train our people to reap rich dividends

OIL's initiative to develop gas network for distribution of CNG and PNG in North Eastern region

Samir Das

After passing Bachelor of Engineering in Mechanical discipline, Samir Kr. Das joined Oil India Limited in November 1984 as a graduate engineering trainee (GET) in Pipeline Division. He worked in all the sections of the pipeline including project cell before being transferred to the Strategic & Corporate Planning department in field head quarter at Duliajan. He was involved in the implementation of OIL's Strategic & Corporate Plan formulated just few years back with the help of consultant IBM BCS.

Natural Gas – A Fuel of Choice

Natural gas (NG), with all its environment friendly qualities and multiple application potential across a large number of sectors, automatically becomes a fuel of choice for a very large segment of the World population. The major advantages of NG are :

Economical Fuel – Compressed Natural Gas (CNG) is significantly more economical compared to traditional automotive fuels. While Piped Natural Gas (PNG) brings about 20% cost benefit in energy terms for the industrial sector, it presents a saving opportunity of almost 17% on the monthly fuel bill in the domestic segment. At the same time, the maintenance cost is also lower for vehicles and equipment using Natural Gas as fuel.

Cleaner Fuel – It is now an established fact that Natural Gas is a clean fuel as it creates lesser amount of pollutants on burning compared to traditional fossil fuels.

Efficient Fuel – Natural gas as a fuel is highly efficient. When the entire cycle of production, processing, transport and end-use is considered, Natural Gas is delivered to the consumers with superior energy efficiency (about 90%, compared to about 27% for electricity).

Safer Fuel – Being less inflammable and less volatile compared to other fuels, Natural Gas is safer to handle.

Gas Scenario – International Vis-à-vis National

Considering the inherent advantages of NG as fuel, the use of NG has gained a substantial momentum throughout the world. By basic concepts of world petroleum geology and basic understanding of specific basins, recoverable conventional oil and gas exist in ultimate quantities approximating 2300 billion barrels of oil and 12,000 trillion cubic feet of gas in the world. While Saudi Arabia leads in crude reserves, countries like Russia, Iran and Qatar tops the order in gas reserve statistics. Gazprom (Russia) tops the list of companies holding largest gas reserve worldwide.

The demand for gas is growing rapidly and largely lies in US, Europe, developing countries in Asia, etc. The United States is undoubtedly the key market for NG; currently accounting for one-quarter of the natural gas consumed in the world every day and is projected to grow by 23 percent by 2025. One quarter of total gas consumed in Europe comes from Russia through pipeline. Gas provides about one-quarter of the total energy for the US economy. In Europe, the figure is 20 percent and rising,

mostly with gas piped from Russia, which has 30 percent of the world's known reserves and probably a lot more. Qatar and Iran share another 25 percent of global reserves in the vast North Field/South Pars field in the southern Gulf. Saudi Arabia and the United Arab Emirates with sizeable reserves come next in the order.

The international trade in gas delivered by pipeline and tanker is expected to rival the scale and complexity of today's petroleum market. With multiple form of transportation facilities of gas and its increasing use as prime fuel in the world the world gas price will become as important for world economies as the world oil price.

In India, however NG has always been utilised as a substitute fuel. Till recently exploration of gas fields was given a less priority compared to crude oil and a change in scenario occurred only after Reliance struck huge gas reserves in KG basin. The reasons for low popularity of natural gas as a fuel in the country may be several poor infrastructure to deliver the gas at the consumers point, lack of interest shown by the consumers for utilisation of gas as prime fuel, lack of adequate knowledge about benefits of using natural gas in terms of cost and environmental implications, etc.

The Government realised the widening gap between production and demand of domestic crude oil & natural gas and formulated India Hydrocarbon Vision 2025, a step forward to secure the energy need of the nation. This vision document focuses on increasing the share of natural gas in the primary energy basket from the current level of 8% (present world average 24%) to about 20% by year 2025. To achieve this objective, there will be a need to increase the availability of NG to a level of around 391 MMSCMD. The country's projected energy requirement will be of the order of around 720 MMTOE by the year 2025.

Production Scenario

The production of the Natural Gas in India is anticipated around 32 BCM for the year 2005-06. However this total production makes up for only around 60% to 65% of the registered requirement of this commodity. Contribution of ONGC & OIL towards the total production is around 25.5 BCM where as the balance comes from private players and import of LNG. The expectations are that, by December 2007, Gujarat State Petroleum Corporation (GSPC) will start injecting 10 MMSCMD of gas into the market which may go up eventually to 40 MMSCMD and even higher. Reliance will also

start producing 30-40 MMSCMD by December 2008. LNG import is also projected for a quantum jump in view of power sector requirement.

Demand Scenario

Regarding the demand, gas producers and marketers have four distinct customer segments i.e. Power, Fertiliser, Industrial use and Retail. The Retail segment caters to the needs of residential, automotive, commercial and small industrial users. The two biggest customer segments are the power plant operators and fertiliser manufacturers account for almost 68 percent of all consumption. The industrial use segment is currently receiving around 28 percent of current supply. The rest of the consumption is accounted for by the "Retail" segment.

The retail segment is currently very small but growing very fast, because of efforts of existing companies like Gujarat Gas Company Limited (GGCL), Indraprastha Gas Limited (IGL) and Mahanagar Gas Limited (MGL). The growth is further activated with the entry of new players like BPCL, HPCL and the Adani group. In order to reduce pollution, the directives of the Supreme Court, which insisted the use of gas in public transportation system, also played a key role in the growth of NG Retail segment. As a result, in the last few years, this segment has more than doubled in size. This customer group will grow further in the next few years as infrastructure expands in existing markets and develops in new regions. The present requirement of around 120/130 MMSCMD of NG is likely to increase up to 190 MMSCMD by the year 2008 and up to 230/240 MMSCMD by the year 2012.

CNG & PNG Application

Natural gas as a vehicle fuel has a long and established record in Europe, Canada, New Zealand, Australia and in USA. Other leading user countries of NG as vehicular fuel are Argentina, Brazil, Italy, Pakistan, USA, China and Ukraine and countries like Japan, Mexico, Malaysia, Bangladesh are also recognising the benefits of CNG and plan to expand its use. In Italy, about a quarter of a million vehicles are running on CNG. In Pakistan more than 4.5 lakh vehicles have been converted to CNG technology from petrol, which is around 25 percent of the total vehicles in the country and government plans to raise it to 50 percent. The first locomotive in the world powered with gas has also started to operate in Peru, managed by Ferrocarril Central Andino company.

In India, GGCL is the first and largest private sector gas distribution company with more than 140,000 customers. GGCL pioneered the concept of CNG for the Indian transportation sector with the launch of its project in Surat in early 1993. Besides running CNG filling station, Gujarat Gas has a Transmission and Distribution network of approximately 1800 km which is spread over the cities of Surat, Ankleshwar and Bharuch. It feeds 2.2 MMSCMD of natural gas to domestic (3.17%), commercial (0.56%) and industrial customers (96.27%).

IGL was incorporated on 23rd December 1998, with the mission to provide a safe and clean fuel to the national capital territory of Delhi. The total number of CNG dispensing stations in Delhi currently stands at 137 while the total number of compressors commissioned 136 and the number of CNG vehicle surpassing the mark of one lakh. Delhi became the first city in the world to shift its public transport system from petrol and diesel to CNG completely. Following its switch over to CNG, the city has managed to cut down 40% of its particulate emissions. Buoyed by its success in Delhi, IGL is planning expansion in Faridabad and Gurgaon.

MGL was established in 1995 to construct gas distribution system in Mumbai. The company's compressed natural gas currently powers 48,507 taxis, 99,207 auto rickshaws and 145 BEST buses across the city through its network of 115 CNG stations (564 dispensing points) with a total installed compression capacity of 13,63,200 kg per day which will be enhanced slowly and steadily. MGL currently supplies around 1.45 MMSCMD gas to more than 3.6 lakhs customers and is trying to expand its Mumbai operations for gas distribution network in the adjoining areas of Mumbai, including Navi Mumbai, Thane, Mira Road, Bhayander and Pune.

GAIL, a central PSU and promoter of IGL & MGL, in its effort for the distribution of CNG and PNG in other cities in India started forming

joint ventures with downstream marketing companies like IOCL, BPCL, HPCL, etc. The cities covered are Lucknow, Agra, Kanpur, Allahabad, Vijayawada, etc. Similarly, in Agartala, GAIL has joined hands with Tripura Natural Gas Company for supply of CNG. BPCL, another promoter of IGL, is attempting to enter in this business in Pune and Indore. Taking a cue from the success of CNG in Delhi and Mumbai as well as the Supreme Court mandate to switch over to CNG for 11 most polluted cities, there is a rush to grab pole position in the new markets, with private and public sector players struggling to tie up gas linkages and lobbying for permission from state governments and municipal authorities. As per the recent Gujarat Government Policy, Gujarat Adani Energy Ltd (GAEL) has been awarded the rights to set up the gas distribution network in Vadodara and Ahmedabad and accordingly GAEL is targeting all the user segments industrial, commercial and domestic. On the other hand, MOP & NG is on the verge of setting up of a board to regulate the gas sector including city gas distribution network.

The CNG was priced till recently at Rs. 16.83 per kg, Rs. 19.71 per kg and Rs. 20.34 per kg by IGL, MGL and GGCL, respectively. The price of CNG is recently increased to Rs. 18.00 per kg in New Delhi by IGL.

A broad cost benefit analysis using CNG vis-a-vis other traditional fuel is given below to understand the economics.

(Cost in Rs. per km run)

Type of Vehicle	Diesel	Petrol	LPG	CNG
Bus	8.85			5.14
Truck	9.00			5.14
Taxi/Car	2.20	2.90	1.85	0.86
Auto-Rickshaw		1.76	1.10	0.51

OIL's Initiative

Although the Nation's first discovery of hydrocarbon took place in Assam, there has not been any significant effort till date towards utilisation of the natural gas within the region except in the areas in close vicinity of the oil and gas fields.

With a number of towns that have sizeable population base, Assam provides a potentially large market for natural gas as a domestic fuel and with the expected growing demand in

A Tea Garden - OIL supplies gas to the tea processing industry

Power, Industrial & city gas distribution sector; Assam has the potential to become one of the largest market for natural gas. Considering its proximity to Myanmar, Bangladesh & other nearby countries known for their huge gas reserves, Assam becomes an attractive destination for the strategic investors.

Keeping this in mind OIL has initiated a project along with Assam Gas Company Limited (AGCL) for transportation of natural gas from its traditional base in the Upper Assam to other parts of the region and make the same available as industrial, commercial, domestic and vehicular fuel. In the initial phase it is planned to make the gas available up to Guwahati and later on expand the network based on potential demand for the product.

With this strategic intention, OIL, being a major E&P player operating in the North East, joined hands with AGCL known for their gas transportation business in this part of the country to take up this project. Both the companies entered into an MoU on 22nd March 2005 to form joint venture for creating necessary infrastructure for transportation of natural gas to Guwahati and distribute the same in the form of CNG & PNG at Guwahati and in en-route places. Possibly one oil marketing company will be invited to join the JV as a partner to utilise their strength in terms of infrastructure and marketing expertise as specified in the MoU. All the necessary pre-project activities initiated through an interim arrangement (steering committee & project team) with in-house resources (OIL & AGCL) till the formation of JV to progress the project as per the timeline.

The required infrastructure such as trunk pipeline to be laid from Numaligarh to Guwahati with necessary facilities to transport gas to Guwahati and development of distribution network (city grid) within Guwahati city and in en-route places (priority wise) to distribute CNG & PNG along with other facilities like CNG station, District Regulating Station (DRS), Meter Regulating Station (MRS), Gate Station, etc. will be created under this project. AGCL has taken charge for laying a gas pipeline with necessary facilities from Duliajan to Numaligarh to transport gas (1.0 MMSCMD) to NRL. The same pipeline which will be designed to carry more gas will be hooked up with the proposed gas pipeline to be constructed from Numaligarh to Guwahati. The activity chart for the project has been prepared jointly with AGCL with a target to complete the project within 27 months so that the precious commodity "gas" can be delivered to Guwahati city in the year 2008. The success of the project depends largely on the support of the state government and other concerned statutory authorities. OIL and AGCL plan to bring in the highest safety standard and

Oil Collecting Station at Duliajan

state of the art technology in to the whole set up so that it becomes a model set up for other players. As a part of the activity plan continuous awareness programme will be taken up jointly by OIL & AGCL to educate the public on safe uses of natural gas and its forthcoming benefits.

To secure the energy need of the nation, Government of India, in one of its strategic initiatives actively pursuing the possibility of bringing gas to India from Myanmar (A1 & other blocks) through a pipeline. If this pipeline can be routed through the north east an energy corridor can be built right from the north east to other part of the country. The proposed gas pipeline (Duliajan to Guwahati) can be hooked up with the national gas grid for better utilisation of the infrastructure, in case the above pipeline routed through north east.

Conclusion :

Natural Gas is the cleanest burning of the fossil fuels and is finding increasing favour globally in the struggle against the harmful emissions of greenhouse gases. Over the last 20 years, natural gas consumption has grown by more than 50 percent and is now the primary choice for power generation. More than half of the power stations operating around the world are gas-fired.

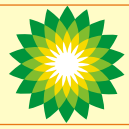
Compressed Natural Gas has been accepted as an alternative fuel by the public at large in India. The stage is set for expanding the network to other cities. The success of CNG Expansion Program would depend on many factors. The key factors being the economy of CNG vis-à-vis other conventional fuels, adherence to safety guidelines and the Government Support. At the end of the day, it will be the quality of the fuel and economics which determine the commercial success of auto fuel. The emphasis would be on fuels with lowest emissions.

Finally, the noble initiative undertaken by OIL along with AGCL to distribute PNG & CNG at Guwahati and en-route places by creating the energy corridor is expected to generate substantial interest within the corporate business houses of the country at large and the state in particular and will impact the socio-economic status of this region. The project requires whole hearted support and sponsorship of the government (Central as well as State) so that the initiatives undertaken by OIL and AGCL can be transformed to a reality.

LAUGHTER TIMES ...

Q. Mind Benders:

Here is a *quiz* for our *readers*. Send in your answers to the editor or e-mail them to : ajaini@oil.delhi.nic.in.
3 winners will be given attractive prizes.

Q.1. IDENTIFY THE LOGOS. a)  b) 

Q.2. WHICH MANAGEMENT GURU WHO HAS A BACKGROUND IN MEDICINE WROTE A BOOK CALLED THE MECHANISM OF MIND?

Q.3. TOP GEAR LAUNCHED RECENTLY BY WORLDWIDE MEDIA LTD, IS A JOINT VENTURE BETWEEN BENNETT COLEMAN & CO LTD. AND WHICH ORGANISATION / COMPANY?

Q.4. WHICH FAMOUS PUBLICATION DEVISED THE BIG MAC INDEX?

Q.5. RETAIL GIANT WAL-MART IS KNOWN FOR ITS WORLDWIDE STRATEGY OF EDLP. EXPAND EDLP?

Q.6. WHICH MANAGEMENT GURU BECAME KNOWN FOR HIS PIONEERING RESEARCH ON NATIONAL AND ORGANISATIONAL CULTURES?

Q.7. WHICH CLOTHING BRAND WAS THE FIRST BRAND TO INTRODUCE THE CONCEPT OF FASHION STORE BY DAY AND BAR BY NIGHT IN INDIA?

Q.8. WHICH COMPANY EMPLOYEES HUNDREDS OF THOUSANDS OF AMERICAN TEENAGERS TO POPULARISE A NEW LAUNCH?

Q.9. PROJECT TEJASVANI IS AN INITIATIVE BY WHICH COMPANY TO EMPOWER ITS WOMEN EMPLOYEES?

Customer sensitive corporate values boost business

Renee S B Jhala

Renee Sakhambari Borooah Jhala, founder editor of Synergy in 1988, is Managing Director of Shining Emotional Surplus Pvt. Ltd. (www.shininguniverse.com), an international management consultancy on corporate transformation, branding, retail design and product design.

People drive corporations, but what drives people? It's their attitude, behaviour, action and their promised delivery. Work inherently happens within this framework that comprise the values or principles an organisation uses to run its business.

What essentially are values? They are attitudinal behaviour that determine how we act to put our offerings in the marketplace. Starting from the top management, a group of people within the company must believe these to be basic tenets to be practised in day-to-day life for the company's business success. They get transferred to other employees through demonstration and believable success stories, so as to drive home the point that by practicing them, values help people and help grow business. Every value has to be translated into behaviour, because anything that cannot be seen, people do not believe.

I was working in Wipro when Shining, the international management consultancy I am now associated with, drew up a set of corporate values for repositioning Wipro Corporation. Let me illustrate how Wipro now practices these values for inducing employee bonding and acquiring profitable growth.

Repositioning Wipro

Semantically, the name Wipro does not mean anything. In 1996 when Shining started work with Wipro, every division saw itself to be different in spirit; there was no concept linking

them, no branding coherency across businesses. Every division had its own mission, and neither Wipro Corporation nor its identity was aspirational.

Shining's interactions with different Wipro stakeholders such as employees, the distribution channel, shareholders and customers fleshed out Wipro's hidden positive attributes, as well as the mismatch between corporate and customer need. Over the years Wipro had communicated many things, but in the competitive scenario, what had the customer picked up? Extracting this insight would help transform the corporation.

Shining's proprietary and patented P&P (Perceived & Potential value) research revealed that Wipro had diligent and sincere employees who kept their commitment, but customers perceived the company as disparate parts. Shining discovered, and then magnified, the business essence of Wipro which spanned from essential to intelligent, ranging from consumer products upto technology. So repositioning Wipro meant providing a message rich corporate identity with corporate values that would link all of Wipro's diversified businesses.

The customer sensitive values identified were *Human Values* as the attitude of Wipro employees, *Integrity* as their behaviour, their action would involve *Innovative Solutions* and delivery to customers would be *Value for Money.* Shining created the core concept of *Applying Thought* (Wipro is process oriented + thinks for you) that signifies being ahead of time. Creating coherency driver across business divisions was the strategic leapfrog for Wipro. The four Values would converge on Wipro's Corporate Promise of *Applying Thought*. The recommendation was for Wipro's Information Technology business to lead the corporation as an engine, while the other businesses would be the wagons of the locomotive.

What is a corporate identity?

A corporation's ability to connect with its stakeholders comes from its visible corporate identity, or the identity of its products or services. A customer's desire to experience a branded product starts from the product's identity. Organisations very often do not understand the difference between a business oriented identity and a graphic logo. When an identity communicates the organisation's core beliefs and values with energy, people get inspired and develop an attachment to the brand. The business brand identity must have strong rational and functional support that serves the deeper subconscious need of the customer.

The brightness of Wipro's rainbow flower manifests the corporation's value of *Integrity*, while the rainbow's fresh appearance after the storm reflects *Human Values*. Everyone can relate to the rainbow because it's in Nature. It's rare, but when it appears everyone can see it. This simplicity and rareness comprises *Value for Money*. The central part of the flower denoting digital complexity reflects Wipro's action value of *Innovative Solutions*.

Customer interactions through research confirmed that Wipro's new identity in 1998 transformed the corporation into a young, vibrant diversified group with a single personality. Customers said *Applying Thought* means that Wipro thinks for the customer's well being, is strong in R&D and thinks out-of-the-box. The flower symbolises that Wipro cares for the environment, its center shows the binary computer age, science and technology, while its petals reflect the softness of human values. Customers saw the rainbow flower as feminine, *Applying Thought* as having a masculine feel, and Wipro in the center complements both with the colours of life. Wipro has now become an aspirational brand. This identity is a semiotic one infused with nostalgia, reflecting customer connect that grows with time.

The first time people see an identity, it must provoke them so that an interest develops. When IBM was internationally established and reputed as a gigantic IT company, Apple Computers suddenly appeared in the 1970s with a provoking

product bearing apple for an identity. Those who thought it irrelevant to connect a computer and an apple missed its semiotic connotation. The apple was already associated with the genius of Newton's Theory of Gravitation. In the Bible, an apple was the symbol that provoked Eve to indulge in pleasure. Such semiotic brand appeal intrigues, creating curiosity and relevance in the customer's subconscious mind.

When IBM was seen to be the literal sum of all the technical greatness of its computer system, Apple took the route of invention through the emotional path of history. If customer understanding of an identity is very prosaic, it loses its charm and becomes mundane, like monotonous chores of a conjugal relationship on the rocks.

Shining's framework for customer sensitive corporate alignment

Whether an organisation is B2B (business to business) like Oil India or B2C (business to customer) like FMCG companies, the practice of values helps achieve a customer sensitivity driven organisational culture. The focus on customers is manifested in products, services and solutions offered, and the brand value acquires competitive premiumness.

The attitude of employees is organisational philosophy that's built on socio-cultural observation in a deeper manner, with curiosity to discover the fast moving trends of end-customers.

Employees' behaviour is their conduct that coherently incorporates the organisational promise in every employee's interaction. It is learning from the flow of customer understanding.

The action is the output of employees which results in a sustainable "Emotional Surplus" experience for customers. Emotional Surplus is a differentiating business strategy that aligns corporations to deliver rational, functional and emotional connectivity with customers. It sustainably delivers a value beyond the customer's expectation by touching the subconscious mind where competitors cannot reach.

In an organisation's promise delivery, all deliverables for customers and stakeholders are proactively woven through the coherency driver which drives the attitude, behaviour and action of all employees.

The results of Shining's promise to enable growth for clients has been exceptional. In 50 years of existence upto 1996, Wipro had achieved sales of Rs. 1158 crores, profit before tax (PBT) of Rs. 47 crores, operating margin of 9.2% with the share price being Rs. 26 (adjusted for stock splits and bonus). Since Shining's intervention, Wipro corresponding results in 2005 are Rs. 7235 crores in sales, PBT of Rs. 1757 crores, 26% operating margin and Rs. 671 per share.

Shining's clients from diverse verticals have achieved similar growth results. FMCG major Britannia has within 10 years of Shining's intervention increased sales from Rs. 519 to Rs. 1588 crores, PBT from Rs. 30 to 242 crores, operating margin from 6 to 12% while the share price increase was Rs. 169 to Rs. 849. Shining changed the name of its B2B chemicals client Vam Organics to Jubilant Organosys with excellent results. Within 5 years Jubilant's sales went up from Rs. 454 to Rs. 1175 crores, PBT from Rs. 11 to Rs. 164 crores, operating margin from 15% to 20% and share price from Rs. 74 to Rs. 864.

Driving corporate values is not a project, it is a slow process like osmosis. Being without values is like a kite cut loose, there is no business foundation. Values give self-confidence, and comprise the basic tool that leads to corporate visioning for quantum growth.

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Let's learn...

What are the navratnas, miniratnas?

CLOSER LOOK

It was in 1997 that the Union government came up with navratnas and miniratnas schemes for its central public sector enterprises (CPSEs). The objective was to give the well-performing CPSEs greater functional and financial autonomy and help them become globally competitive. Now, as part of its efforts to further improve the performance of CPSEs, the Centre has refined the two schemes.

What is the total number of CPSEs?

In 1951, there were only five PSEs with a total investment of Rs. 29 crore. Their number peaked at 240 in 1994-95. But of late, their number has come down, owing to the privatisation of some CPSEs and merger of others. According to available data, 227 CPSEs recorded a turnover of Rs. 5.44 lakh crore and a net profit of Rs. 32,000 crore during 2002-03. They contributed Rs. 82,000 crore to the central exchequer and paid about Rs. 14000 crore as dividend.

What is a Navratna?

In 1997, the government identified 11 big and profit-making CPSEs as navratnas. It was decided that their Boards would be given enhanced powers to help them become global players. The enterprises were BHEL, BPCL, GAIL, HPCL, IPCL, MTNL, NTPC, IOC, ONGC, SAIL and VSNL. IPCL and VSNL were later privatised.

As part of the restructuring process, the navratna boards were professionalised. More non-official, part-time professional directors were appointed. As for functional autonomy, the navratnas were allowed to invest upto Rs. 200 crore in a project without government approval. This was subject to a ceiling of 5% or 15% of net worth (whichever is lower) for all projects put together. This limit has now been enhanced to Rs. 1,000 crore and ceilings have been increased to 15% and 30%, respectively.

What is a Miniratna?

The government has also given financial and operational autonomy to other CPSEs, described as miniratnas, based on certain criteria. Enterprises that had made profits continuously in the previous three years and earned a net profit of over Rs. 30 crore in one of the three years were categorised as Miniratna-I, CPSEs that had made profits during the past three years and had a positive networth were included in the Miniratna-II category.

As for financial autonomy, Miniratna-I companies, subject to certain conditions, were allowed to invest upto Rs. 100 crore in a project wihtout government approval. The limit for Miniratna-II companies was Rs. 50 crore. These limits have now been raised to Rs. 500 crore and Rs. 250 crore, respectively. Other conditions too have been relaxed.

Why were the Navratna and the Miniratna schemes introduced?

Before the economic liberalisation in 1991, most CPSEs enjoyed some kind of monopoly and state patronage. But with the dismantling of the licence raj, sectors reserved for the public sector were opened to the private sector. Also, foreign investment was allowed in the reserved sectors.

In this changed scenario, it became imperative for CPSEs to jettison their bureaucratic ways and take decisions in real time. The then industry minister, Murasoli Maran, came up with the Navratna and Miniratna schemes to help the CPSEs become professional business entities and be able to compete with their counterparts in the private sector. Primarily, these schemes were intended to empower the CPSEs with greater functional and financial autonomy.

What are some of the other powers given to navratnas and miniratnas?

The government, unlike it's original stipulation, has decided not to strip CPSEs of their navratna and miniratna status even after extending government guarantee to their borrowing programmes. It has also delegated the power for mergers and acquisitions to them, subject to certain restrictions.

As far as capital expenditure is concerned, the limit in the case of Miniratna-I companies has been raised from Rs. 300 crore (subject to the ceiling of net worth) to Rs. 500 crore. The limit for Miniratna-II companies has been increased from Rs. 150 crore to Rs. 250 crore.

We await your comments & feedback at ajaini@oil.delhi.nic.in

OIL BAGS 2nd BLOCK IN LIBYA

Oil India Limted in consortium with Indian Oil Corporation Ltd. (IOC) has bagged Block No. 102(IV) under the last Libyan EPSA IV round 2. The participating interest of OIL is 50%, and OIL is the operator of the block. The Block having an area of 2710 Sq Km is located in the Sirte Basin, the most oil prolific sedimentary basin of Libya. Incidentally, the block shares some common boundary with Block 86, which the consortium had won earlier.

The consortium won the block under stiff competition from various other international oil companies. The consortium paid a signature bonus of US $ 3,001,001 against the minimum fixed bonus of US $ 3,000,000.

Based on energy consumption of 2004, the projected growth rate by IEA 2005 shows that by 2025 India will be the fourth largest energy consumer.

Table : Energy Consumption of top 8 energy consuming regions & countries (MMTOE) - 2025

Million tones oil equivalent	Oil	Natural Gas	Coal	Nuclear Energy	Hydro & Other Renewable	Total	Per Cent share in World
USA	1,255.5	763.3	771.4	200.1	81.8	3,072.1	19.9
Western Europe	708.6	557.8	178.9	183.2	136.1	1,764.7	11.4
China	777.7	169.9	2,011.0	80.5	149.7	3,189.0	20.7
Russian Federation	168.5	494.6	130.5	50.1	46.3	890.1	5.8
Japan	241.5	88.7	120.8	81.5	33.6	566.1	3.7
India	245.7	82.1	344.0	23.7	41.6	737.1	4.8
Canada	122.7	122.0	40.8	31.1	113.4	430.1	2.8
South Korea	137.5	60.9	89.2	48.7	3.3	339.6	2.2
Total of Above	3,657.8	2,339.5	3,686.7	698.9	605.9	10,988.7	71.2
TOTAL WORLD	5,593.3	3,901.9	4,210.8	785.5	941.9	15,433.5	
Percent share in World	65.4	60.0	87.6	89.0	64.3	71.2	
Energy Mix	36.2	25.3	27.3	5.1	6.1		

Source : IEA 2005

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