Oil & Gas Energy Sector

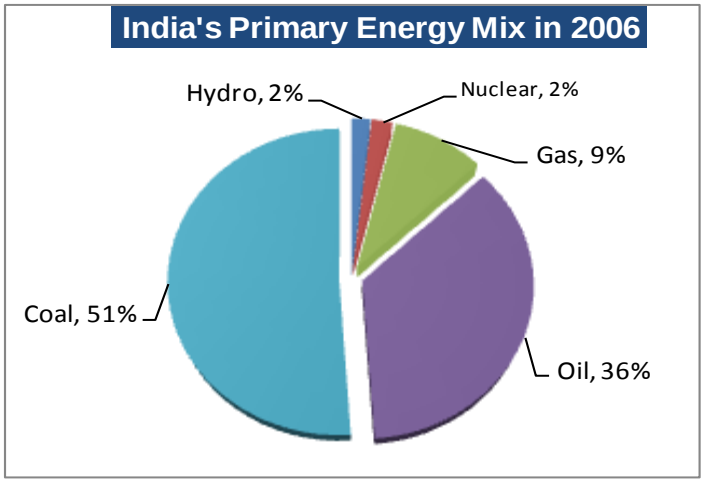
Energy is essential for living and vital for development. Affordable energy directly contributes to reducing poverty, increasing productivity and improving quality of life. Likewise lack of access to reliable energy is a severe impediment to sustainable social development and economic growth.

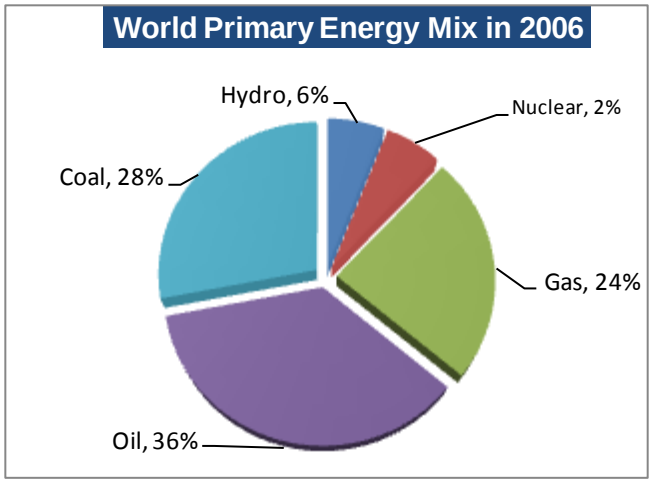
The oil and gas sector in India reveals robust growth in line with the growth of the Indian economy. With a GDP of USD 1.72 trillion, India is the world's fourth largest economy in Purchasing Power Parity (PPP) terms and the fifth largest energy consumer in the world. However, due to its high population of 1.21 billion, the per-capita consumption of most energy related products is extremely low. This shows that there is a huge scope for rapid expansion. The number of persons employed (including contract employees) in petroleum industry as on April 2010 are 1.30 lacs.

Petroleum products and natural gas together contributed 2.8 per cent (USD 30.8 billion) to the India's total GDP of USD 1089.3 billion in 2008–09. India lacks sufficient domestic energy resources and imports much of its growing energy requirements. India already imports over 70 percent of its crude oil requirements, with its oil import bill being close to USD 90 billion in 2008-09. In addition to pursuing domestic oil and gas exploration and production projects, India is also stepping up its natural gas imports, particularly through imports of liquefied natural gas.

Indian oil companies are present in around 20 countries worldwide. India's public sector enterprises have invested around Rs 64,832 crore (USD 14.5 billion) for acquiring oil and natural gas exploration and production assets abroad. In Refining, India is set to be a top exporter of petro-products in Asia, surpassing South Korea on account of growing refining capacities. India's exports of refined products stood at 0.95 million barrels per day (b/d) as of June 2011 and USD 4.6 billion worth of petroleum products were exported during July 2011.

India's energy basket has a mix of all the resources available including renewable. India's Primary Energy Mix in 2006 depict that more than 50% energy has generated from coal while 36% from oil. India is heavily dependence on coal which is not favorable on account of limited stocks of coal. In addition, coal is more polluting compared to other energy mix. The World Primary Energy Mix in 2006 depict that 36% energy has generated from oil whereas 28% from coal. The natural gas accounts for 9% of the Primary Energy Mix in India whereas it accounts for 24% of the World Primary Energy Mix.



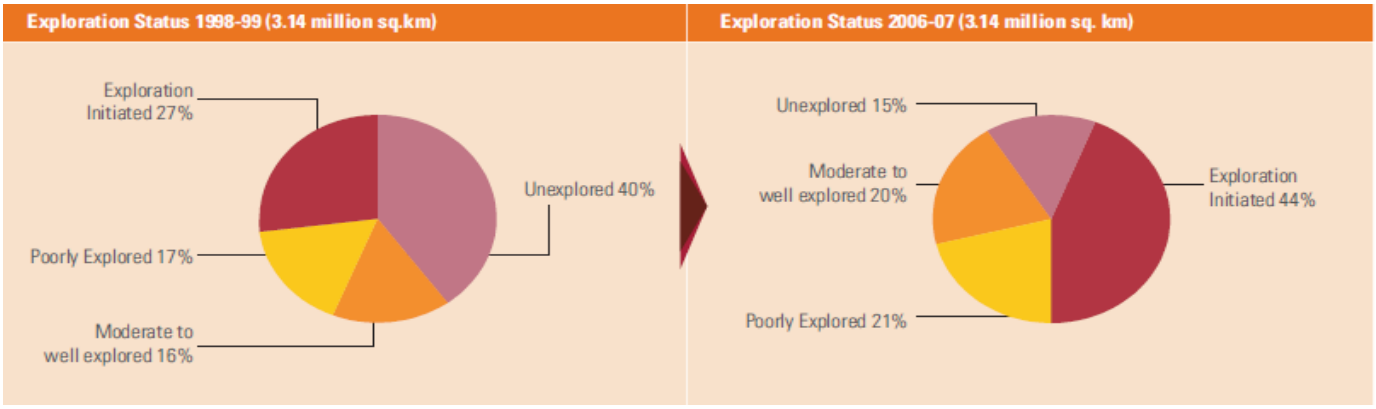


Source: Planning commission of India, BP Statistics

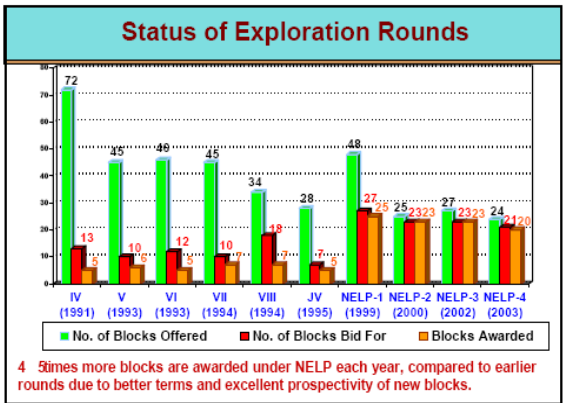
Key Policy Initiatives - NELP

The New Exploration Licensing Policy (NELP) was envisaged in 1997 and operationalized in 1999 by the Ministry of Petroleum and Natural Gas (MoPNG). The NELP was formulated to provide a level playing field to both the Public and the Private sector, through allocating acreages on the basis of open competitive bidding as opposed to the nomination basis as earlier. New Exploration Licensing Policy (NELP) implemented by government, permits 100 per cent FDI for small and medium sized oil fields via competitive bidding.

Pre NELP **Post NELP**



Source: DGH



The achievement of the NELP rounds can be exact through the increased exploration activities. The proportion of unexplored acreages has witnessed a significant drop. Pre NELP, the unexplored area was 40% of the total sedimentary area of 3.14 MM. Sq. Km in 1998-99. Post NELP, the unexplored area has reduced from 40% in 1998-99 to 15% in 2006-07. On account of deceleration in the unexplored area, the explored initiated area has increased from 27% in 1998 -99 to 44% in 2006-07. Interestingly, the number of oil and gas discoveries has increased from 9 in 2000-01 to 16 in 2002-03. Under the eighth round of New Exploration Licensing Policy (NELP-VIII), Government has signed 31 production sharing contracts on June 30, 2010. There are 8 deepwater blocks, 11 shallow water blocks and 12 onland blocks which are in the states of Assam (2), Gujarat (8), Madhya Pradesh (1) and Manipur (1).

Refining and Marketing

India is self sufficient in the Refining and Marketing Sector. India has the world's sixth largest refining capacity (2.56 million barrels per day) representing ~ 3% of world capacity. The Refining and Marketing sectors provide highest number of employment. About 34036 employees are working in Refining while 41387 in Marketing sectors.

India has 20 refineries of which 17 are in the public sectors and remaining 3 are in the private sectors. In the year 2003-04, the refining capacity was 116.97 million tonnes per annum (MTPA) while the demand for the product was 105.20 MTPA. The refining capacity has increased from 116.97 MTPA in 2003-04 to 137.07 MTPA in 2006-07 whereas the demand for the product has increased from 105.20 MTPA in 2003-04 to 120.40 MTPA in 2006-07. In April 2010, the refining capacity has increased to 184.39 MTPA from 177.97 MTPA in April 2009. The total refinery crude throughput in 2009-10 was 160.03 million metric tonnes (MMT) which is 0.46% lower than 160.77 MMT crude processed in 2008-09.

Year	Refinery crude throughput (MMT)
2009–2010	160.03
2008–09	160.77
2007–08	156.10
2006–07	146.55
2005–06	130.10
2004–05	127.41

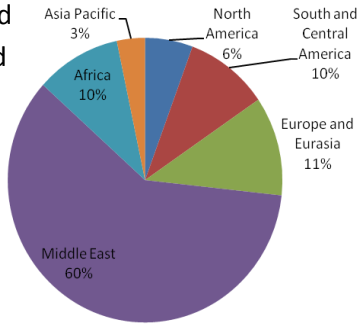
Source: MoPNG

The total sale of petroleum products by companies was 138.2 MMT in 2009–10, which was 3.6 per cent higher than 133.4 MMT in 2008-09. IOC had the highest retail outlets at 51 per cent, followed by HPCL at 25 per cent and BPCL at 24 per cent. The total number of retail outlets of public sector oil marketing companies (OMCs) increased to 36,462 in April 2010 from 34,948 in 2009.

Demand & Supply overview of Crude Oil and Natural Gas

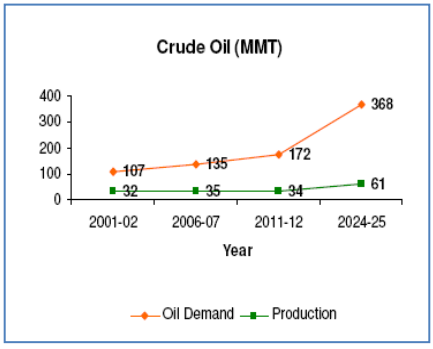
Energy sources like Crude Oil, Natural Gas, Coal etc are non renewable. At the end of 2008, the Middle East region has recorded highest percentage of oil reserve which stood at 60% of the total world oil reserves. Europe & Eurasia, South & Central America and Africa region has recorded ~ 10% of the total world oil reserves. North America and Asia pacific region has recorded 6% and 3% world oil reserves respectively. Interestingly, the Middle East region has recorded the oil reserves of ~ 350 bn barrels in 1980 against ~ 1260 bn barrels in 2008.

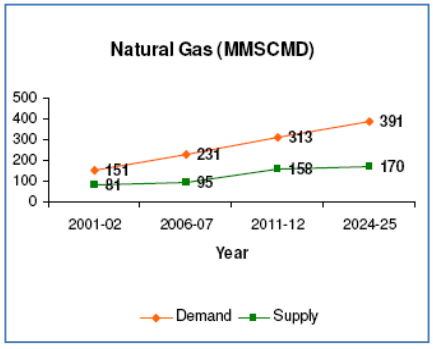
World Oil Reserves (2008)



Source: BP Statistical Review 2009

The chart highlights yawning demand and supply gap of Crude Oil and Natural gas in India. In the year 2001-02, the oil demand was 107 MMT while the production potential was just 32 MMT. The demand for the oil has increased from 107 MMT in 2001-02 to 172 MMT in 2011-12 and it is projected to increase upto 368 MMT in 2024-25. But the production potential has simply increased from 32 MMT in 2001-02 to 34 MMT in 2011-12. The enormous gap between demand and supply poses a serious problem. Hence long term measures are essential to solve the problems.



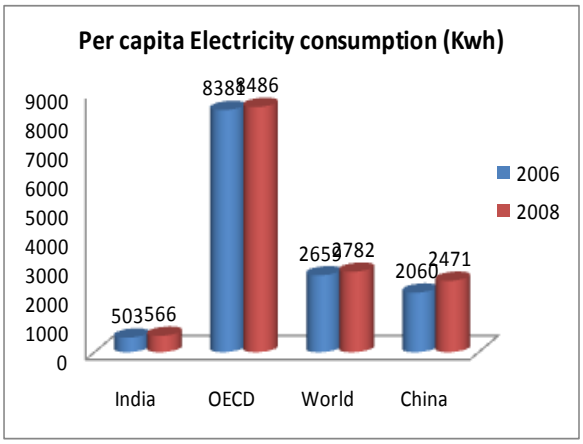


Source: DGH

In the year 2001-02, the demand for the natural gas was 151 million standard cubic metres per day (MMSCMD) whereas the supply was 81 MMSCMD. In 2011-12 the demand for gas has reached to a level of 313 MMSCMD while the supply is just 158 MMSCMD. The demand is double than supply. As supply decrease, the prices of crude oil will increase.

India's per capita consumption of energy

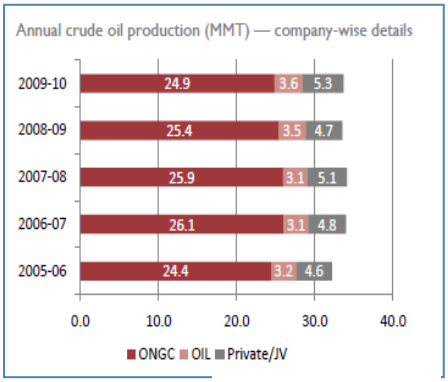
India's per capita consumption of energy is extremely low as compared to other countries and the world. The chart depicts the figure of per capita electricity consumption in India, OECD, World and China for the year 2006 and 2008. The per-capita electricity consumption in India stands at just 566 Kilowatt-Hour (KwH) per year which is less than a huge 8486 KwH in the OECD. The world stands at 2782 KwH while China at 2471KwH per year. The per capital electricity consumption in China has increased by 20 % in 2008 compared to the year 2006. The data shows that there is an immense potential in India for the growth of energy consumption.



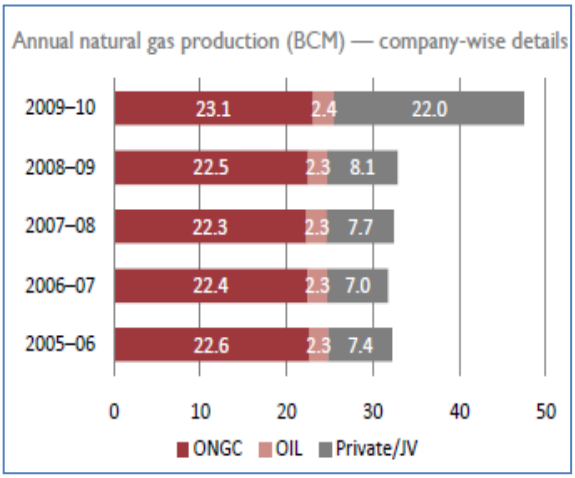
Source: IEA

Exploration and Production (E&P) in India

The total production of **crude oil** stood at 33.8 MMT in 2009–10 against 33.6 MMT in 2008-09. Out of the total domestic crude oil production in 2009–10, the Oil & Natural Gas Corporation (ONGC) and Oil India Ltd (OIL) reported for 74 per cent and 11 per cent respectively while the remaining share is held by private/joint venture (JV) fields. The chart depict that the contribution of Private / JV is increasing y-o-y except in 2008 -09. Offshore production reported for 65 per cent of domestic annual crude oil production whereas the remaining share of 35 per cent was reported by onshore production for 2009–10.



Source: MoPNG



Source: MoPNG

The total production of **natural gas** stood at 47.5 billion cubic metres (BCM) in 2009-10 which is 44 per cent more than the previous year's production of 32.9 BCM. In last 5 years, ONGC and OIL recorded more or less similar annual production of natural gas. The Private/JV field recorded highest contribution in 2009 -10 compared to the previous 4 years data.

This was mainly on account of commencement of gas production at Reliance's KG basin. In 2009-10, out of the total annual gas production, the offshore gas production recorded for 81 per cent while the remaining share of 19 per cent was recorded by onshore production.

Crude pipeline capacity in India

The total capacity and length of the crude oil pipelines recorded at 92.64 MMTPA and 6,235 kms respectively as on April 1, 2010. ONGC holds 47 per cent of the crude pipeline capacity in India with a 673 kms long pipeline network. IOCL holds 43.6 per cent of the crude pipeline capacity in India with its 4,366 kms long network of crude pipelines. Remaining share of the crude pipeline capacity is held by OIL which owns the 1,193 km long Duliajan-Digboi-Bongaigaon-Baraunipipeline having a capacity of 8.4 MMTPA.

Name of the pipeline	Capacity (MMTPA)	Length (km)
OIL - Duliajan-Digboi-Bongaigaon-Barauni	8.4	1,193
IOCL - Salaya-Mathura-Panipat Pipeline	21	1,870
IOCL - Haldia-Barauni/Paradip Barauni	11	1,302
IOCL - Mundra-panipat	8.4	1,194
ONGC-Mumbai High-Uran	15.63	204
ONGC-Heera-Uran	11.5	81
ONGC-Kalol-Nawagam-Koyali	8.54	129.31
ONGC-MHN-NGM	2.26	77
ONGC-CTF, Ank to Koyali (AKCL)	2	94.8
ONGC-Lakwa-Moran	1.5	18
ONGC-Geleki-Jorhat	1.5	48.47
ONGC-NRM to CPCL	0.74	6
ONGC-KSP-WGGS to TPK refinery	0.08	13.5
ONGC-GMAA EPT to S. Yanam unloading terminal	0.09	4
Total	92.64	6,235

Source: MoPNG

Coal Bed Methane (CBM)

India remain heavily dependent on coal for about half of its primary commercial energy requirements with the other half being dominated by oil and gas put together. In order to utilize huge coal reserves and the methane gas trapped in coal seams, the Government developed a Policy for Coal Bed Methane in 1997. The first round of CBM was held in 2001, on the lines of NELP, with competitive bidding deciding the award of acreages. The Key players in the sector have been Arrow Energy, Gas Authority of India Ltd. (GAIL), ONGC, Great Eastern Energy Corporation etc.

Energy Conservation

Timely actions by the Government through policy interventions have provided a favourable climate to foster rational use of energy. From being a tool to stabilize the temporary disruptions caused by the oil crisis, energy conservation has now become a vital issue. Enhancement of energy efficiency is a universally accepted development goal. Energy efficiency and conservation occupy a central position in the national strategy. A rupee invested in energy efficiency will save more energy than a rupee invested in energy supply.

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