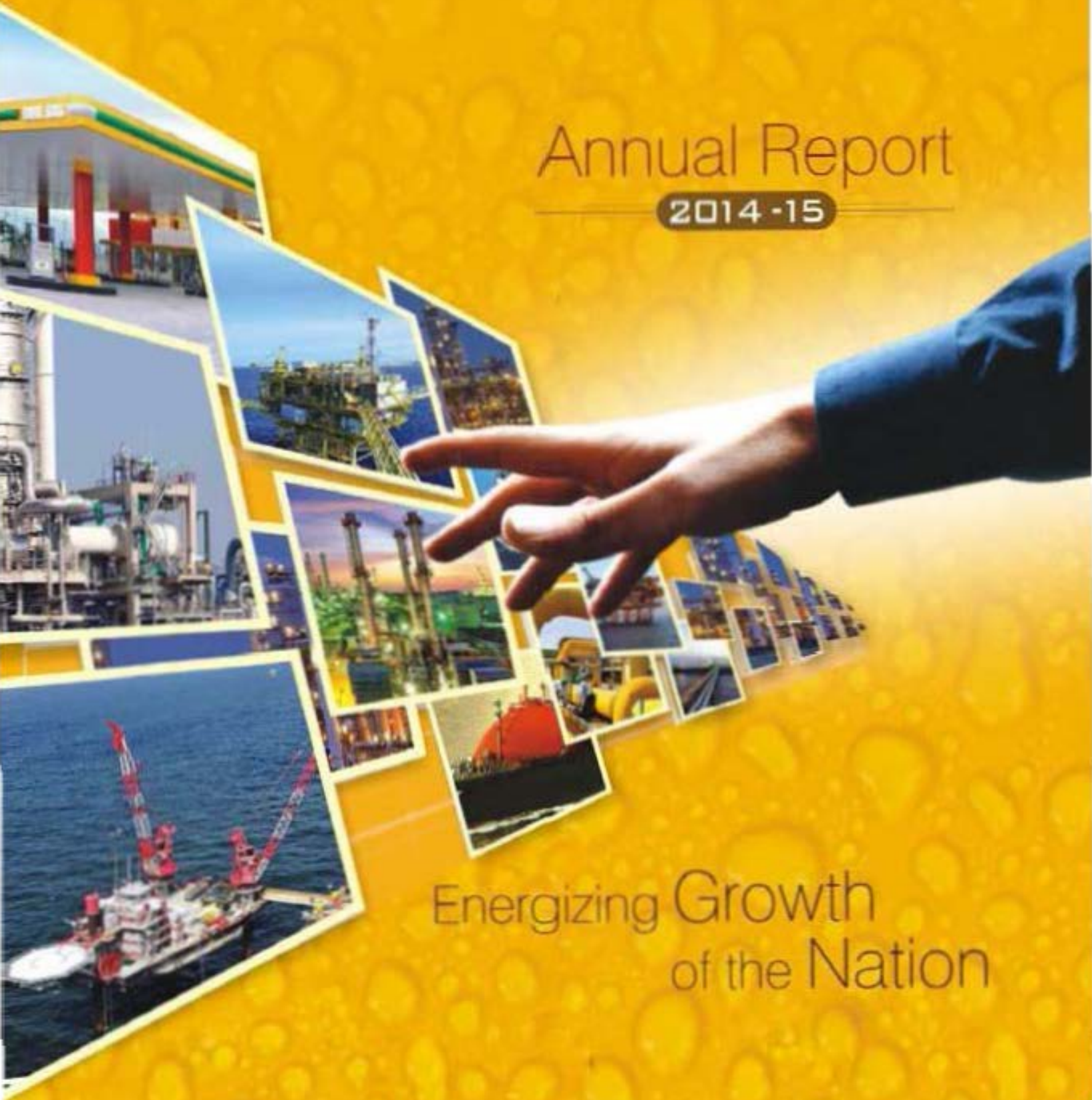
Annual Report

2014-15



Energizing Growth of the Nation

Government of India

Ministry of Petroleum and Natural Gas

Con

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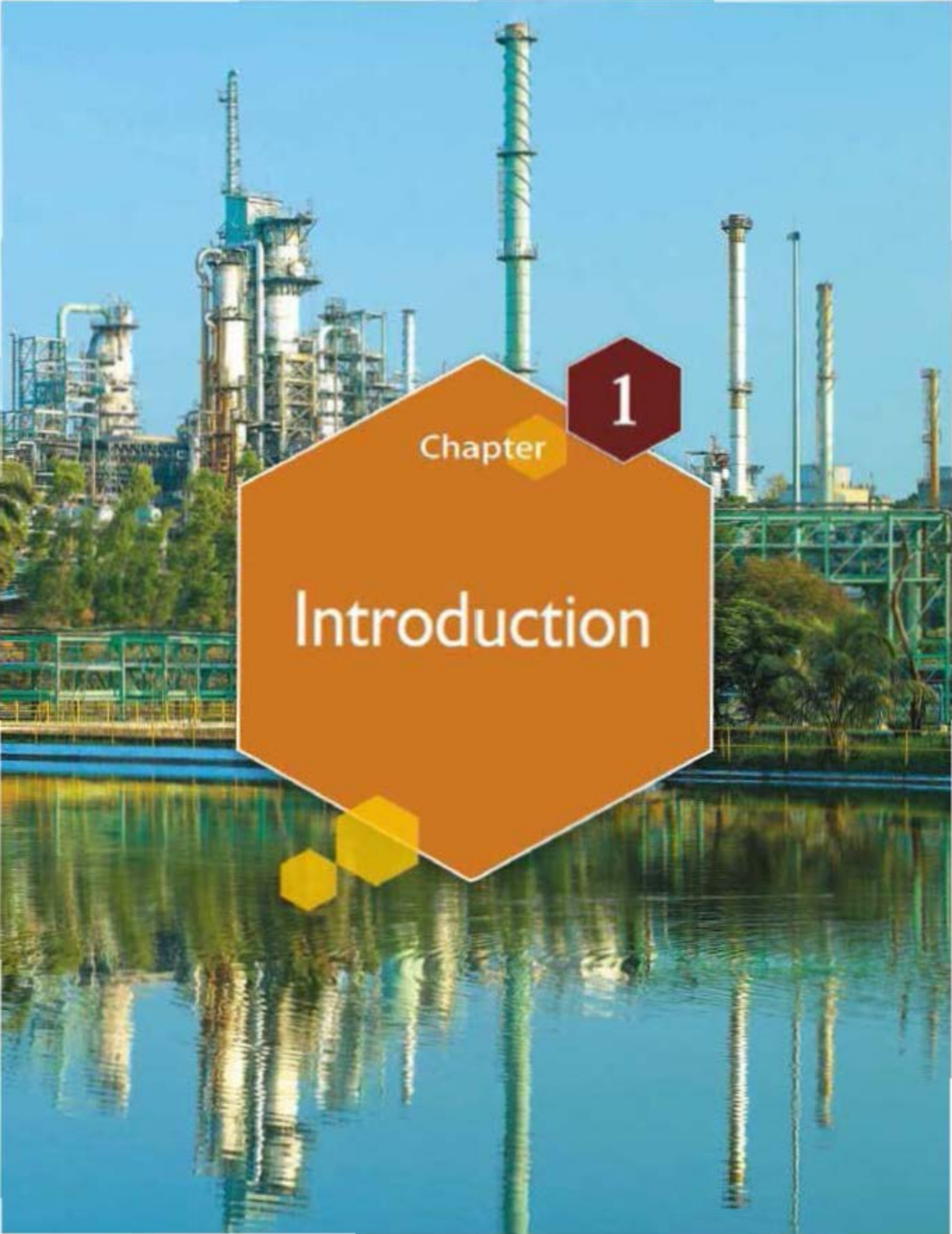


Chapter 1

Introduction

Introduction

1.1.1 Shri Dharmendra Pradhan has assumed the charge of Minister of State for Petroleum & Natural Gas (Independent Charge) w.e.f. 27.05.2014

1.1.2 Shri Saurabh Chandra, IAS (UP: 1978) continues to hold the charge of the post of Secretary in the Ministry of Petroleum & Natural Gas.

1.1.3 Dr. Subhash Chandra Khuntia, IAS (KN: 1981), earlier Additional Secretary & Financial Adviser in the Ministry has assumed the charge of the post of Special Secretary and Financial Advisor in the Ministry of Petroleum & Natural Gas with effect from 16.10.2014 in the rank and pay of Secretary.

1.1.4 Shri Ambrish Kumar, IES (1981) assumed charge of Senior Economic Advisor in the Ministry of Petroleum & Natural Gas with effect from 06.03.2014.

1.1.5 Shri Neeraj Mittal, IAS (TN: 1992) continues to hold charge of the post of Joint Secretary in the Ministry of Petroleum & Natural Gas.

1.1.6 Shri U.P. Singh, IAS (OR: 1985) and Shri Sandip Poundarik, IAS (BH: 1993) assumed charge of the post of Joint Secretaries in the Ministry of Petroleum & Natural Gas with effect from 29.09.2014 and 08.10.2014 respectively.

1.1.7 Smt. Archana S. Mathur, IES (1982) continues to hold charge of the post of Economic Advisor in the Ministry of Petroleum & Natural Gas.

1.1.8 Shri Alok Chandra, IES (1992) assumed charge of Advisor (IFD) in the Ministry of Petroleum & Natural Gas with effect from 29.05.2014.

1.2 PERFORMANCE OF PETROLEUM & NATURAL GAS SECTOR-SOME KEY MACRO-ECONOMIC TRENDS

1.2.1 Introduction:

The Indian economy is at a critical stage of development. The growth rate of Gross Domestic Product (GDP) is estimated to have increased by 5.5 percent during the first half of the current financial year recording highest growth in the past 2 years, with turnaround in 'Manufacturing' at 1.8%, 'Mining and quarrying' at 2% and 'Electricity, gas & water supply' at 9.5%.

The revival in growth of the industrial sector and softening of international fuel prices of fuel gas led to increase in demand for petroleum products by 3.9%

The Hon'ble President of India, Shri Pranab Mikherjee felicitated EIL as a new 'Navratna' CPSE at the SCOPE Meritorious Awards Presentation Ceremony organized by SCOPE and DPE on November 5, 2014 at Vigyan Bhawan, New Delhi

during April-December, 2014 over the same period last year. Given the limited domestic availability of crude oil and natural gas the country is compelled to import over 75% of its domestic requirement.

1.2.2 Ensuring Energy Security:

India's energy security is primarily about ensuring continuous availability of commercial energy at competitive prices to support its economic growth and meet the lifeline energy needs of its households with safe, clean and affordable forms of energy. The requirement of energy in the country is expected to rise with development and growth. For increasing energy security, efforts are being made towards increasing production and exploitation of all available domestic energy resources along with thrust on measures to increase energy efficiency and managing the demand through suitable fiscal and pricing policies.

Several measures have been taken to enhance supply of resources. In the recent past, the Ministry has rolled out an elaborate plan to reassess hydrocarbon resources in India's sedimentary basins by March, 2016. Also, projects have been approved to carry out survey works of all un-appraised sedimentary basins. Changes have been made in the production sharing contracts to instill confidence among the investors. The price of domestically produced natural gas has been revised upwards by 33.5% that is expected to encourage gas production without severely affecting consumers. A 15,000 km Gas Pipeline network is being implemented for completion of the Gas Grid. The Ministry is closely monitoring all the projects being implemented by oil & gas CPSES. As a result, 22 projects have been completed during the year till 31.12.2014 and another 15 projects are expected be completed by 31.03.2015. Several new oil & gas development projects have been approved recently.

There have been sustained efforts towards managing demand of petroleum products and ensuring availability of affordable fuel to the common people. The diesel prices have been deregulated on 18.10.2014, which is expected to result in better service delivery on account of increased competition. The scheme for direct transfer of LPG subsidy to consumers (PAHAL) was launched on 15.11.2014 in 54 districts, and since been extended to entire country with effect from 1st January, 2015. This is the largest cash transfer scheme in the world. The direct transfer of subsidy is expected to reduce the diversion of subsidized LPG cylinders for household cooking to the commercial and industrial sectors. Launch of 5 kg cylinders on 'cash & carry' basis is also expected to penetrate use of affordable and cleaner fuel to the deprived sections. Highest priority in supply of domestic natural gas has been allocated to piped natural gas (PNG) and compressed natural gas (CNG) in transport sector and there are elaborate plans to extend the PNG network on a Mission mode. Plans are afoot to open over 35000 retail outlets and 7000 LPG distributorships so that fuel is delivered to the remotest corner of the country.

There is an elaborate plan to expand the Piped Natural Gas network to one crore households in 5 years. The ministry has approved expansion of Corporate Social Responsibility (CSR) fund scheme for all Below the Poverty Line (BPL) households, including those living in urban areas. The Ministry in association with Petroleum Conservation Research Association has rolled out a Standards and Labeling programme for encouraging production of more efficient equipments. This is expected to improve the sustainable environment protection to a large extent.

In addition, the Government is also aggressively pursuing oil and gas opportunities overseas for strengthening the country's energy security. Oil companies are present in 25 countries and the total investment by oil CPSEs in assets abroad is in excess of $21 billion. Several engagements have been made with oil producing nations in the recent past to secure India's energy interests. A programme of cooperation in the oil and gas sector was signed between India and Russia in October, 2014. India also participated in the Steering Committee Meeting of TAPI in November, 2014 to discuss the pipeline project with other partner countries-Turkmenistan, Afghanistan and Pakistan. A Memorandum of Understanding was signed in November 2014 between India and Mozambique for cooperation in the field of oil and gas sector.

These concerted efforts are expected to enhance energy security of the nation. The status of production of crude oil and natural gas as well as production, trade and consumption of petroleum products has been briefly discussed in the following paragraphs. The detailed trends in the sector are elaborated in the respective chapters.

1.2.3 Crude Oil and Natural Gas Production:

The targeted crude oil production for the year 2014-15 was at 38.763 million metric tonnes (MMT) as against production of 37.788 MMT in 2013-14, showing an increase of about 2.58%. The crude oil

production during April-December, 2014 was at 28.172 MMT i.e. marginal decrease of 0.88% over production of 28.423 MMT achieved during the corresponding period last year. Apart from natural decline in the old and ageing fields, production of crude oil was affected due to less production from RJ-ON-90/1 related to operational problems in July, 2014. Rajahmundry and Cauvery assets' production was affected due to closure of wells owing to the GAIL pipeline incident. In Neelam–Heera asset, there was decreased crude oil production due to clamping of sub-sea lines. Prolonged bandhs and blockages in Assam also affected production from North Eastern region.

For the year 2014-15, production of natural gas was targeted at 36.62 Billion Cubic Meters (BCM), i.e. 3.43 % higher than production of 35.407 BCM in 2013-14. The natural gas production during April-December, 2014 was 25.332 BCM i.e. decrease of 5.12% over production of 26.698 BCM during corresponding period last year. This was mainly due to lower production in Bassein & Satellite fields, underperformance of 6 newly drilled wells in M&S Tapti, seizure of 1 well in KG-D6 and closure of non-associated gas wells of Rava during October 2014 due to GAIL pipeline incident near Tatipaka.

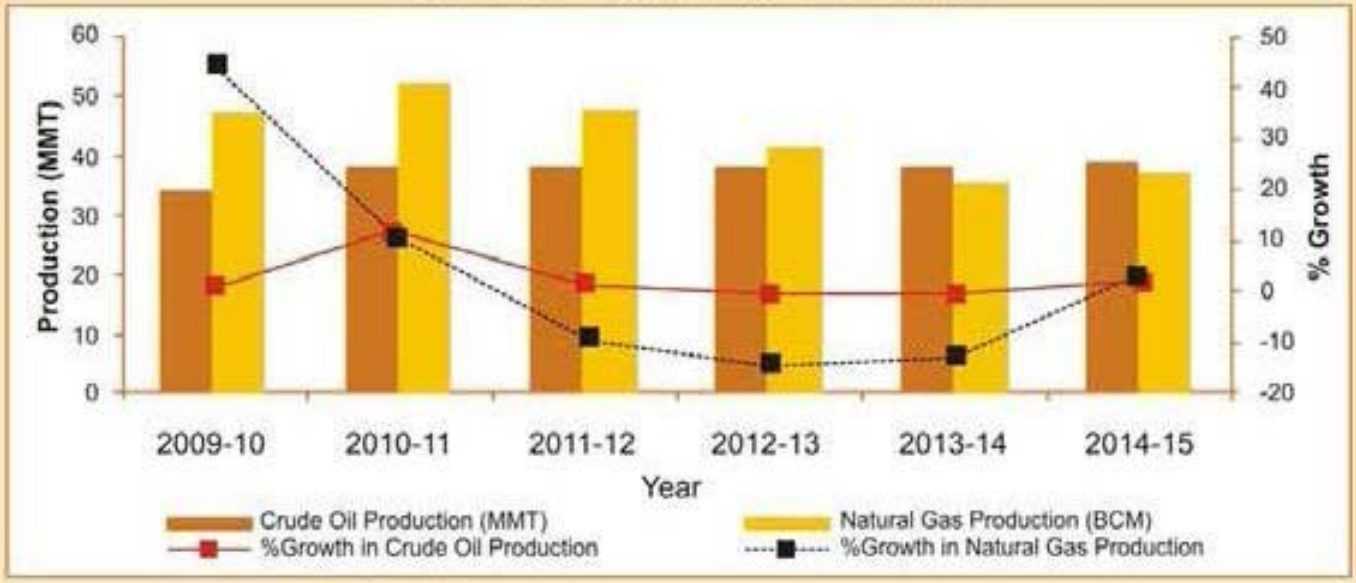
The trends in the production of crude oil and natural gas for the year 2009-10 to 2014-15 have been depicted below (details in APPENDIX-III):

Table - 1.1: Crude Oil and Natural Gas Production

Year	Crude Oil Production (MMT)	% Growth in Crude Oil Production	Natural Gas Production (BCM)	% Growth in Natural Gas Production
2009-10	33.690	0.54	47.496	44.61
2010-11	37.684	11.85	52.219	9.94
2011-12	38.090	1.08	47.559	-8.92
2012-13	37.862	-0.60	40.679	-14.47
2013-14*	37.788	-0.19	35.407	-12.96
2014-15**	38.763	2.58	36.620	3.43
2014-15 (Apr- Dec)*	28.172	-0.88	25.332	-5.12

*: Provisional **: Projected Production

Graph-1.1: Crude Oil & Natural Gas Production



1.2.4 Refining Capacity & Refinery Crude Throughput:

There has been considerable increase in refining capacity in the country over the years, although there was no capacity expansion during 2014-15, as of December 2014. The refining capacity stood at 215.066 MMTPA as on 01.04.2014. By the end of 12th Five Year Plan, refinery capacity is expected to reach 307.366 MMTPA. Refinery Crude Throughput (Crude Oil Processed) for the year 2014-15 is projected at 223.707 MMT as against 222.497 MMT in 2013-14, showing a marginal increase of about 0.54%. Crude throughput during April-December, 2014 was at166.687 MMT, marginally higher by 0.20% against166.362 MMT during April-December, 2013. The shutdown of HMEL's Bhatinda (GGS refinery) during June-September, 2014 owing to VGO Fire Incident in June 2014 affected the crude processing by the refinery during this period.

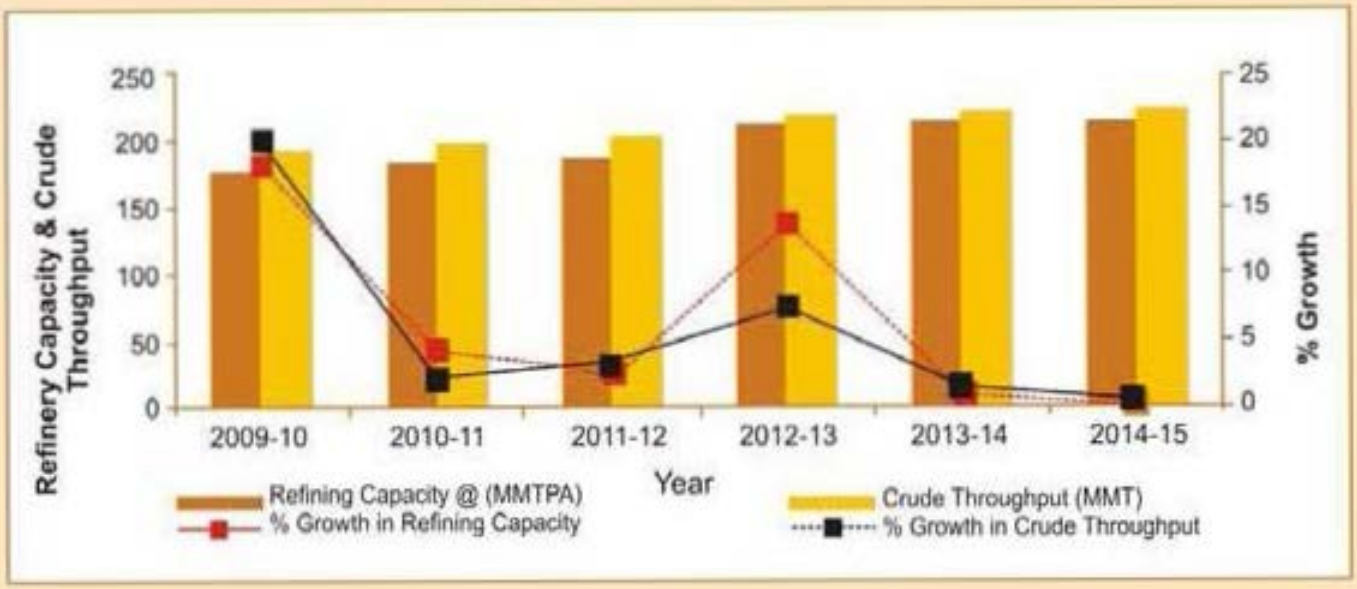
The trend in Refining Capacity and Crude throughput are depicted below (details in APPENDIX-IV).

Table -1.2 : Refinery Capacity & Refinery Crude Throughput (in terms of Crude Oil Processed)

Year	Refining Capacity @ (MMTPA)	% Growth in Refining Capacity	Crude Throughput (MMT)	% Growth in Crude Throughput
2009-10	175.956	18.12	192.768	19.90
2010-11	183.386	4.22	196.989	2.19
2011-12	187.386	2.18	204.121	3.62
2012-13	213.066	13.70	219.212	7.39
2013-14*	215.066	0.94	222.497	1.50
2014-15**	215.066	0.00	223.707	0.54

*: Provisional @: As on 1st April of initial year **: Projected Production

Graph-1.2: Refinery Capacity and Refinery Crude Throughput



1.2.5 Production and Consumption of Petroleum Products

The production of petroleum products is targeted at 219.353 MMT in year 2014-15 as against 220.756 MMT achieved in 2013-14. During April-December, 2014, production of petroleum products was at165.392 MMT i.e. increase of 0.17% over 165.110 MMT of production achieved during the corresponding period last year. The shortfall in production was mainly due to planned outages in IOCL-Panipat, Koyali & Bongaigaon refineries during April-July, 2014 and shutdown of HMEL's Bhatinda refinery during June-September, 2014.

During the year 2014-15, the consumption of petroleum products in India is estimated at 163.171 MMT with a growth of 3.14 % as compared to consumption of 158.197 MMT during 2013-14. The consumption of petroleum product during April-December, 2014 is 122.28 MMT i.e. 4.00 % higher than the same period of previous year.

Year-wise production and consumption of petroleum products since 2009-10 to 2014-15 are depicted below (details in APPENDIX-V and VI) :

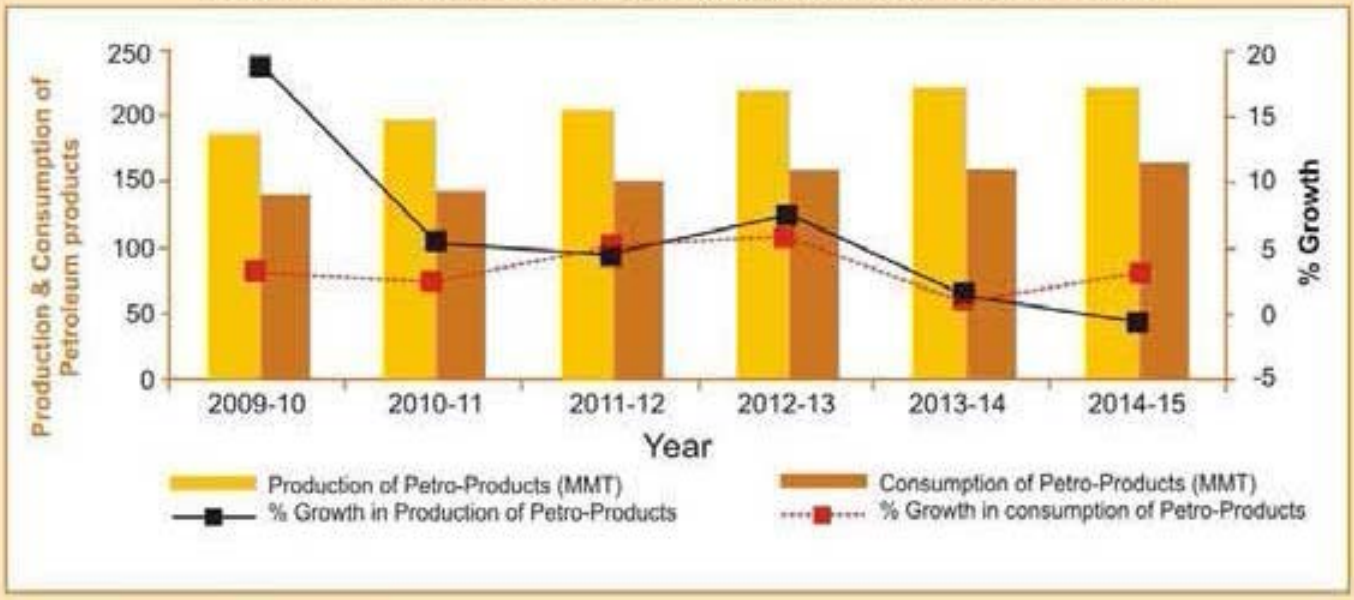
Table-1.3: Production and Consumption of Petroleum Products

Year	Production of Petro- Products (MMT)	% Growth in Production of Petro-Products	Consumption of Petro-Products (MMT)	% Growth in Consumption of Petro-Products
2009-10	184.610	18.99	137.808	3.15
2010-11	194.821	5.53	141.040	2.35
2011-12	203.202	4.30	148.132	5.03
2012-13	217.736	7.15	157.057	6.02
2013-14*	220.756	1.39	158.197	0.73
2014-15**	219.353	-0.64	163.171	3.14
2014-15 (Apr-Dec)*	165.392	0.17	122.28	4.00

*: Provisional **: Projected Production

Notes: 1. Production of petroleum products includes Production of Petroleum Products from Fractionators.
2. Consumption of Petroleum Products excludes refinery fuels and includes imports also.

Graph-1.3: Production and Consumption (indigenous sales) of Petroleum Products



1.2.6 Import of Crude Oil :

Import of Crude Oil during April-December, 2014 was 142.236 MMT valued at ₹ 5,81,751 crore which marked an increase of 0.22% in quantity terms and 10.22% decrease in value terms over the same period of last year. The decline in value terms is related to reduced crude oil prices by around 50% from June 2014 to December 2014. During the year 2013-14, the import of crude oil was 189.238 MMT valued at ₹ 8,64,875 crore.

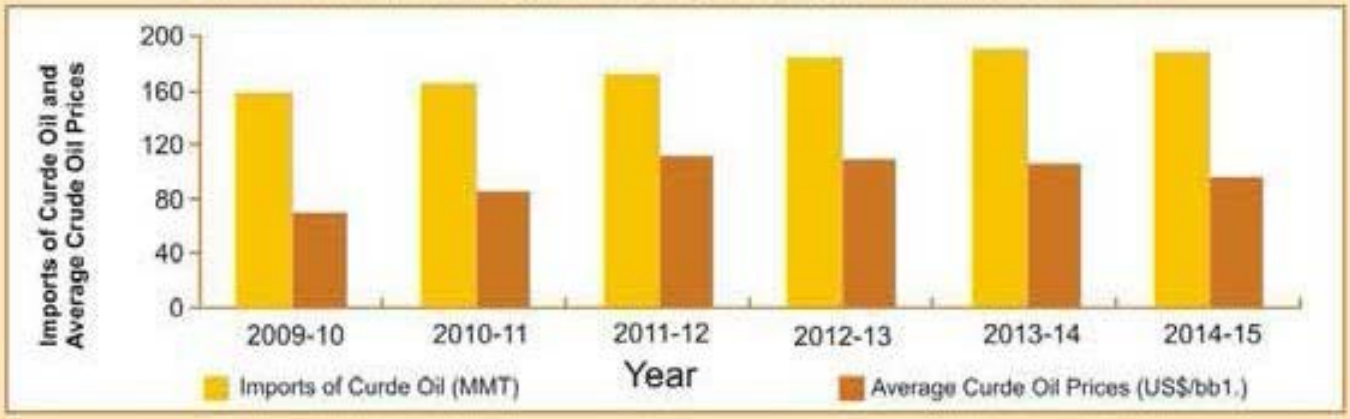
The average international crude oil price (Indian Basket) was US$94.69 /bbl during April-December, 2014 as compared to US$ 105.47/bbl in the same period of 2013-14, i.e. lower by 5.89% as compared to the same period last year. During the last 6 months, there is continuous declining trend in the price of crude oil in the international market. The price of Indian basket crude oil which was at $111.84/bbl on 19th June 2014, has continuously decreased thereafter to US$ 43.36/bbl on 14th January, 2015.The trend in growth of crude oil imports and crude oil international (Indian Basket) prices is shown in Table-1.4 & Graph- 1.4:

Table-1.4: Import of Crude Oil and average Crude Oil Prices

Year	Imports of Crude Oil (MMT)	% Growth in Imports of Crude Oil	Average Crude oil Prices (US$/bbl.)	% Growth in Average Crude oil Prices
2009-10	159.259	19.95	69.760	-16.53
2010-11	163.595	2.72	85.090	21.98
2011-12	171.729	4.97	111.890	31.50
2012-13	184.795	7.61	107.970	-3.50
2013-14*	189.238	2.40	105.520	-2.27
2014-15**	189.648	0.22	94.691	-10.26

*: Imports value is Provisional. **: Estimated Imports and Average Price April-December 2014.

Graph-1.4: Quantity of Crude Oil Imports and Average International Crude Oil Prices



1.2.7 Imports & Exports of Petroleum Products:

During April-December, 2014 imports of petroleum products were 14.979 MMT valued at ₹ 59,197 crore which shows an increase of 22.59% in quantity terms and 9.74% increase in value terms against the same period of previous year. The quantity of petroleum products imported during 2013-14 was 16.718 MMT valued at ₹ 74,605 crore.

During April-December, 2014 the exports of petroleum products were 48.921 MMT valued at ₹ 2,40,803 crore which shows a decrease of 7.04% in quantity terms and 14.64% decrease in value terms against the exports of 52.627 MMT valued at ₹ 2,82,087 crore for the same period of last year. During 2013-14, 67.864 MMT of petroleum products, valued at ₹ 3, 68,279 crore were exported.

During April-December, 2014 the import of LNG is 10.810 MMT valued at ₹ 46,712 crore which marked an increase of 9.89% in quantity terms and 19.44% increase in value terms against imports of 9.837 MMT valued at ₹ 39,108 crore for the same period of previous year. During 2013-14, 13.032 MMT of LNG, valued at ₹ 53,307 crore was imported.

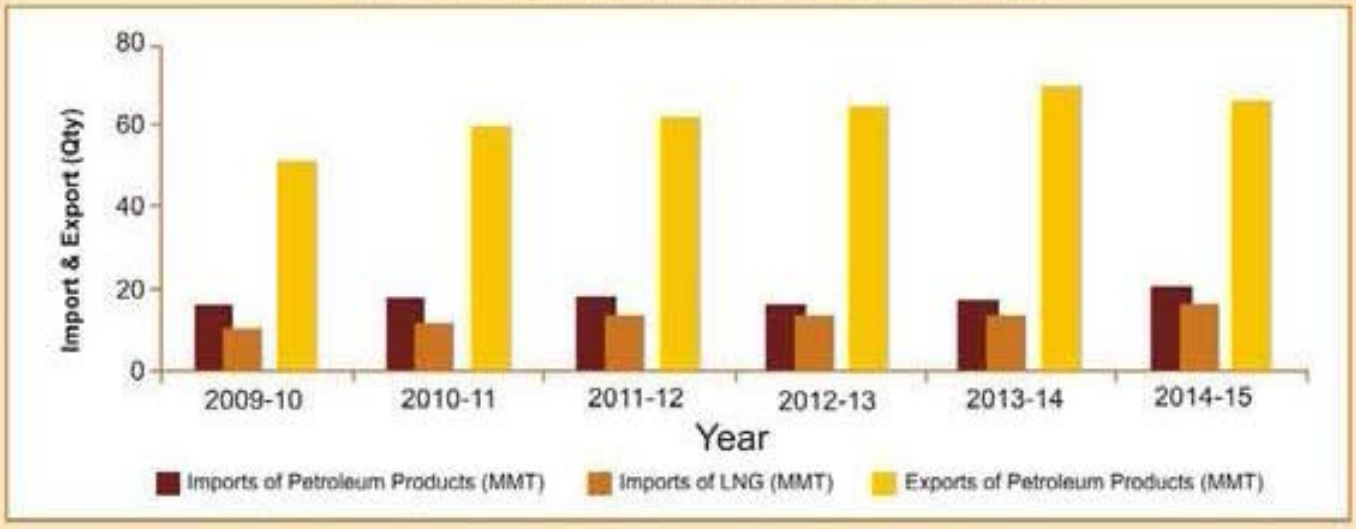
The trends in quantity of petroleum products and LNG imports & exports are depicted below in Table-1.5 & Graph-1.5 (details in APPENDIX-VII):

Table-1.5: Imports & Exports of Petroleum Products

Year	Imports of Petroleum Products (MMT)	% Growth in Imports of Petroleum Products	Exports of Petroleum Products (MMT)	% Growth in Export of Petroleum Products	Imports of LNG (MMT)	% Growth in Imports of LNG
2009-10	14.665	-21.10	51.155	31.35	9.148	13.50
2010-11	17.379	18.51	59.077	15.49	9.931	8.56
2011-12	15.849	-8.80	60.837	2.98	13.214	33.06
2012-13	15.774	-0.48	63.408	4.23	13.136	-0.60
2013-14*	16.718	5.99	67.864	7.03	13.032	-0.79
2014-15**	19.972	19.46	65.228	-3.88	14.413	10.60

*: Provisional **: Estimated

Graph-1.5: Trend in Imports & Exports of Petroleum Products



Ms. Radhika Devi, AO II of NEISO, Indian Oil honoured as 'Brand Ambassador' for Vocational Training by Hon'ble Prime Minister of India Shri Narendra Modi in 2014

1.2.8 Equity Oil and Gas from Abroad:

ONGC Videsh Limited (OVL) has produced about 5.486 Million Metric Tons (MMT) of oil and 2.871 BCM of gas during the year 2013-14 from its assets abroad in Sudan, Vietnam, Venezuela, Russia, Syria, Brazil, South Sudan and Colombia. During the current year, for the period of April 2014 to December 2014, production of crude oil is 4.135 MMT and Natural gas production is 2.417 BCM. The targeted crude oil & natural gas production in 2014-15 is about 5.184 MMT & 2.630 BCM respectively.

1.2.9 Foreign Direct Investment Inflows:

In order to attract Foreign Direct Investment (FDI) in the sector, the FDI policy has been further liberalized. FDI for petroleum refining by CPSEs has been allowed with 49% foreign equity under the automatic route instead of approval through Foreign Investment Promotion Board. Year-wise FDI inflows under petroleum & gas sector is given in Table-1.6 below. It may be observed that inflow of FDI in petroleum and natural gas has varied considerably over the years that could at least partly due to the bulkiness of investment in the sector. The highest FDI inflow was received in 2011-12 at ₹ 9,955 crore contributing almost 6% of total FDI inflow in the economy.

Table -1.6: Year wise FDI inflows under Petroleum & Gas Sector

Year	FDI Inflows				Annual Growth (%)			
	All Sector (in Million)		P&NG Sector (in Million)		All Sector (in Million)		P&NG Sector (in Million)	
	₹	US$	₹	US$	₹	US$	₹	US$
2009 -10	1231196.45	25834.41	12969.02	265.53	-13.80	17.71	-20.60	-23.98
2010 -11	973203.93	21383.05	25431.41	556.43	-20.95	17.23	96.09	109.55
2011 -12	1651455.31	35120.80	99551.66	2029.98	69.69	64.25	291.45	264.82
2012 -13	1219067.30	22423.58	11925.66	214.80	-26.18	36.15	-88.02	-89.42
2013 -14*	1475177.76	24299.33	6783.90	112.23	21.01	8.37	-43.12	-47.75
2014 -15 (Apr-Dec)*	1276083.47	21044.68	67497.03	1022.01	-	-	-	-

1.2.10 Plan Outlay for Ministry of Petroleum & Natural Gas:

The actual Plan Expenditure in 2013-14 was ₹1,07,092.38 crore against Budget Estimate (BE) of ₹ 79,052.16 crore. Budget Estimates (BE) of the Ministry of Petroleum & Natural Gas in 2014-15 was ₹ 80,677.82 crore. This comprised ₹ 43.00 crore as GBS and ₹ 80,634.82 crore of Plan investment through I&EBR of oil & gas CPSEs in year 2014-15. Against this, ₹ 44,443.99 crore has been utilized during April-December, 2014 by the oil & gas CPSEs. Budget Estimates of the Ministry of Petroleum & Natural Gas in 2014-15 in details are given in the APPENDIX-VIII.

1.2.11 Strategic Crude Oil Storage:

1. Taking into account the energy security concerns of India, the Government has decided to set-up Strategic Crude Oil Storage of 5 Million Metric Tonnes (MMT) at three locations in the country viz. Visakhapatnam (1.0 MMT), Mangalore (1.5 MMT) and Padur (2.5 MMT). The capacity of Visakhapatnam site was subsequently enhanced to 1.33 MMT. Thus, ISPRL is creating storage of 5.33 MMT. HPCL was permitted to use 0.3 MMT additional capacity, on proportionate cost sharing basis. Thus, the total Strategic Crude Oil Storage capacity is 5.03 MMT.
2. The proposed Strategic Crude Oil Storages are in underground rock caverns. A Special Purpose Vehicle, namely Indian Strategic Petroleum Reserve Limited (ISPRL), was incorporated as a wholly owned subsidiary of Indian Oil Corporation Ltd (IOCL) in June 2004 and later pursuant to a decision taken by the Government, it was made a wholly owned subsidiary of the Oil Industry Development Board (OIDB). Release/sale of the strategic crude oil from the reserves will be through an Inter Ministerial Empowered Committee chaired by Secretary MoP&NG and comprising of six other secretaries as members. The release of crude oil will be authenticated by the Committee, in the event of any natural calamity or disruption in supplies or any unforeseen global event leading to scarcity of supplies/abnormal increase in prices, as may be decided by the Empowered Committee.
3. The overall progress made in the construction of strategic crude oil reserve project at Mangalore and Padur on February, 2015 are 99.05% and 96.0% respectively. The Vishakhapatnam rock cavern storage facility is ready to receive crude oil. The other two facilities at Mangalore and Padur are expected to be ready by October, 2015.
4. As per the CCEA approval, the funds for the filling of the reserves are to be provided by Government of India. ISPRL has also been asked to explore the feasibility of facilities being made available to other countries/ multinational companies for storage of crude oil.

1.2.12 Non-Conventional Energy:

Ethanol Blended Petrol:

The programme for ethanol blended petrol was launched in January 2003. In November 2012, it was decided that the procurement price was to be determined between the Oil Marketing Companies (OMCs) and supplies of ethanol. The pricing mechanism adopted by Public Sector OMCs of linking it to the Refinery Transfer Price of petrol had drawbacks. In December 2014, the Government took a decision to procure ethanol at a fixed delivered price ranging between ₹ 48.50 to ₹ 49.50 per litre (including all taxes and transportation cost), depending upon the distance of distillery from the depot/installation of the OMCs. Ethanol production from non-food feedstocks, other than molasses, has also been allowed to be procured, subject to meeting the relevant BIS Standards.

1.2.12 New and Renewable Energy:

The12th Plan envisages development of Renewable and un-conventional energy sources to the tune of 5 million tons of oil equivalent (MTOE) by Oil CPSEs. Accordingly, oil CPSEs have taken various Renewable Energy projects on Solar and Wind Energy and Non-Conventional Energy projects on CBM, Basin Centered Gas (BCG), Underground Coal Gasification (UCG), etc. till date.

Oil Marketing Companies like Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd and Hindustan Petroleum Corporation Ltd are progressively using solar energy for lighting their retail outlets. So far, 2140 of their retail outlets have been powered by solar energy. The target is to increase the number to 7200 retail outlets by 31st March, 2017. The expenditure incurred on solarization of one retail outlet ranges from ₹10 lakh to ₹ 25 lakh and these companies are developing a model to provide soft loans to dealers to fund this investment.

Shri Dharmendra Pradhan, Hon'ble Minister of State (Independent Charge), Petroleum & Natural Gas, Government of India laid foundation stone for Indane LPG Bottling Plant in Gorakhpur

1.2.13 Fuel Conservation Campaign:

In view of the growing demand for petroleum products in the country and our dependence on imported crude oil, the Ministry of Petroleum and Natural Gas launched a 'Nationwide Mega Campaign' on 1st October, 2013 in association with Petroleum Conservation Research Association (PCRA) and Oil Marketing Companies to generate awareness among consumers to conserve precious petroleum products, with special focus on transport sector. The objective of this campaign is to motivate the consumers in cities and towns to minimize their fuel bills so as to help the nation in reducing oil imports

Standards & Labeling programme is another key initiative undertaken by Ministry through PCRA . Under this programme, fuel efficient equipment meeting stipulated standards are being awarded Star Rating (1 to 5) by the Bureau of Energy Efficiency (BEE), under the Ministry of Power. Star Rated appliances are fuel efficient resulting in substantial saving of scarce petroleum products. PCRA in association with BEE, has till now launched the Programme for domestic LPG Stove, Diesel Engine Driven Monoset pump for Agricultural purposes (2-10 H.P) and Diesel Generator Sets (upto 19 KW). This programme would encourage vendors to manufacture more fuel efficient equipment for consumers leading to reduced consumption of fuel.

1.2.14 Achievement at a glance

a) To ensure that the benefits of developmental programmes reach the last intended beneficiary without leakages and impediments, ***Direct Benefit Transfer Programme is*** being implemented with renewed vigour. The biggest Direct Cash Transfer programme in the world, ***PAHAL***, for transfer of LPG subsidy, has been extended across the country from 1st January, 2015, so far covering 75% of the user-households.

b) The petroleum sector has seen major reforms. Diesel prices have been deregulated and are now market driven. The price of petrol has also been decreased by more than Rs. 17 per litre. The Government has put to rest all speculation regarding the long pending issue of revising gas prices and put in place a prudent policy in national interest. The ethanol policy has been revised to promote use of ethanol in petrol and help sugarcane farmers.

c) The Ministry of Petroleum & Natural Gas has unveiled a series of intiatives under the "Swachh Bharat" Mission. The campaign aims at creating awarencess among the masses by involving personalities from various fields, industry and state governments. As part of this drive, public sector companies have taken up construction of 19,200 school toilets. Work has already begun for construction of 1,304 toilets of which 43 got completed so far. Toilets in schools are expected to reduce drop-out rate among girl students. The oil marketing companies have also initiated action to provide clean toilets at retail outlets.

d) As a result of intensive review and monitoring, as on 28th February, 2015, 27 major projects of state owned oil companies/joint venture companies worth Rs. 78,630 crore have already been completed.

e) There are 7 on-going projects being undertaken by state-owned upstream companies with an estimated cost of Rs. 2547 crore in North-Easteran states for upgradation of existing infrastructure including crude oil pumping stations, tank farms, gas gathering stations and oil & gas pipelines. This is in addition to 5 projects costing Rs.1275.22 crore completed during the year 2014-15. Hon'ble Prime Minister Shri Narendra Modi dedicated the Unit II of ONGC Tripura Power Plant at Palatana, Tripura, on December 1, 2014, to the Nation. The 726.6 MW gas-based power plant of ONGC Tripura Power Company, having two independent units of 363.3 MW each, is one of the biggest Clean Development Mechanism (CDM) projects of the world. The total investment in the project is about Rs. 10,000 crore which is the single largest investment ever in the entire North Eastern Region.

Chapter 2

Exploration & Production

Exploration & Production

2.1 PREAMBLE

2.1.1 With increasing socio-economic development of the country there will be a growing demand for energy. Current hydrocarbon demand is much more than the domestic crude oil and natural gas production. India is the 4th largest consumer of energy after China, USA and Russia. The country is dependent on imports for about 78% of its crude oil requirement and to the extent of about 33% in case of natural gas. A large amount of foreign exchange goes into import of crude oil and Liquefied Natural Gas (LNG) in order to meet the energy needs of people of India. To bridge the gap between energy supply and demand, it is imperative to accelerate the exploration and production activities in the country.

2.1.2 The Exploration and Production sector has been opened up after implementation of New Exploration Licensing Policy (NELP) and Coal Bed Methane (CBM) Policy. These policies provide a level playing field to the private investors by giving the same fiscal and contract terms as applicable to National Oil Companies (NOCs) for the offered exploration acreage.

2.1.3 In the upstream sector, the two Upstream National Oil Companies (NOCs) viz., Oil and Natural Gas Corporation Limited and Oil India Limited play a dominant role with a total share of about 71% in oil and gas production in the country. Presently, ONGC produces nearly 59.4% of indigenous crude oil and 65.6% of country's gas production, while OIL's share is 9.2% of indigenous crude oil and 8.1% of gas production. The share of Private/JV companies in oil and gas production is 31.5% and 26.3% respectively.

2.1.4 The Directorate General of Hydrocarbons (DGH) was established under the administrative control of Ministry of Petroleum and Natural Gas by Government of India Resolution in 1993. The objective of setting up DGH was to promote sound management of the Indian oil and natural gas resources vis-a-vis environment protection, safety, technological and economic aspects of petroleum activity. In addition, DGH has been entrusted with certain responsibilities concerning the Production Sharing Contracts for Discovered fields/Exploration blocks, promotion of investment and monitoring of E&P activities.

2.2 SEDIMENTARY BASINS IN INDIA

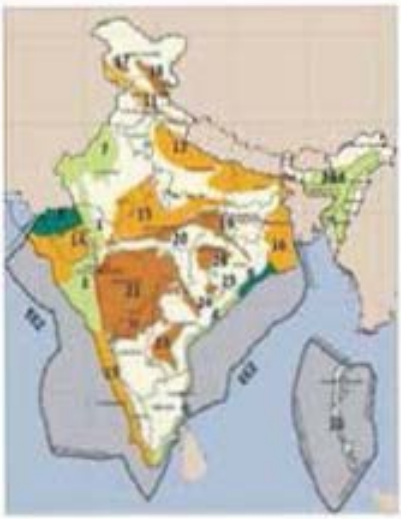
2.2.1 India has 26 sedimentary basins covering an area of 3.14 million square kilometres. The sedimentary basins of India, onland and offshore up to the 400m isobath, have an aerial extent of about 1.84 million sq. km. In the deepwater beyond the 400m isobath, the sedimentary area has been estimated to be about 1.30 million sq. km.

2.2.2 The Indian sedimentary basins have been broadly divided into four categories and deep water based on their degree of prospectivity as presently known which is as given in table 2.1 as under :

Table 2.1: Categories of Indian sedimentary basins

Type of basins	Area (Sq. KM)	Hydrocarbons Prospectivity	Basins/ Region
Category I (7 Basins)	532500	Established commercial production	Cambay, Assam Shelf, Mumbai offshore, Krishna Godavari, Cauvery, Assam Arakan Fold Belt and Rajasthan
Category II (3 Basins)	182000	Known accumulation of hydrocarbons but no commercial production as yet	Kutch, Mahanadi-NEC & Andaman-Nicobar
Category III (6 Basins)	660000	Indicated hydrocarbon shows that are considered geologically prospectivity.	Himalayan Foreland, Ganga, Vindhyan, Saurashtra, Kerala-Konkan-Lakshadweep & Bengal
Category IV (10 basins)	461200	Uncertain potential which may be prospective by analogy with similar basins in the world.	Karewa, Spiti-Zanskar, Satpura-South Rewa-Damodar, Narmada, Decan Syneclise, Bhima-Kaladgi, Cuddapah, Pranhita-Godavari, Bastar, Chhattisgarh
Deepwater	1299000	-	East & west cost from 400 m water depth to EEZ
Total	**3134700**		

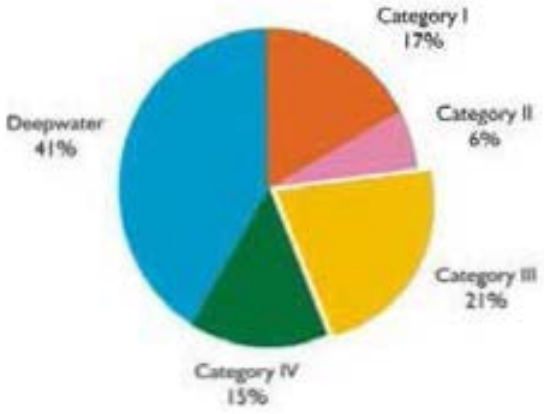
2.2.3 The crude oil & natural gas are produced in the country from 7 basins under category-I and deepwater areas. In category-II basins, hydrocarbon discoveries have been made but commercial production is yet to commence. The distribution of total Indian sedimentary area of 3.14 million square kilometre under different categories and deepwater is presented in graph 2.1:



Indian Sedimentary Map of India

3.14 million Sq. Km

Graph - 2.1 : Category-wise Distribution of Sedimentary basins in India



2.3 ESTIMATED CONVENTIONAL HYDROCARBON RESOURCES

2.3.1 Conventional Hydrocarbon Resources

The prognosticated conventional hydrocarbon resources in 15 sedimentary basins and deepwater areas of the country are of the order of 28.1 billion tonnes (oil and oil equivalent of gas). The basin-wise details are presented in table 2.2 :

Table 2.2: Estimated Hydrocarbon Resources in India

Basin	Offshore (mmt)	Onland (mmt)	Total (mmt)
Mumbai	9190	-	9190
Assam-arakan Fold Belt	-	1860	1860
Cambay	-	2050	2050
Upper Assam	-	3180	3180
Krishna-godavari	555	575	1130
Cauvery	270	430	700
Rajasthan	-	380	380
Kutch	550	210	760
Andaman-nicobar	180	-	180
Kerala-konkan	660	-	660
Saurashtra Offshore	280	-	280
Ganga Valley	-	230	230
Baengal	30	160	190
Himalayan Foreland	-	150	150
Mahanadi	100	45	145
Deep Water	7000	-	7000
Total	**18815**	**9270**	**28085**

2.3.2 As on 1.04.2014, In-place hydrocarbon volume of 10,936 million tonnes of oil and oil equivalent gas could be established through exploration by ONGC, OIL and Private/JV companies. About 61% of resources are under "yet to find category". Out of 10,936 MMT of oil and oil equivalent gas of in-place volumes, the ultimate reserves which can be produced are about 4097 MMT of oil and oil equivalent gas since inception. The balance recoverable reserves are of the order of 2071 MMT of oil and oil equivalent gas. The break-up of hydrocarbon reserves explored by ONGC, OIL and private/JV companies in the country as on 01.04.2014 are as under :

Table 2.3

	In-place Reserves			Ultimate Reserves			Balance Recoverable Reserves		
	Oil (MMT)	Gas (BCM)	Total (MMTOE)	Oil (MMT)	Gas (BCM)	Total (MMTOE)	Oil (MMT)	Gas (BCM)	Total (MMTOE)
Onland	3359.82	1439.60	4799.42	895.37	693.13	1588.50	378.19	454.51	832.70
Offshore	3590.13	2546.47	6136.60	1026.16	1482.34	2508.50	361.70	877.43	1239.13
Total	**6949.95**	**3986.07**	**10936.02**	**1921.53**	**2175.47**	**4097.00**	**739.89**	**1331.94**	**2071.83**

MMT-Million Metric Tonne, BCM-Billon Cubic Metre, MMTOE-Million Metric Tonne of oil equivalent

2.3 Unconventional Hydrocarbon Resources

CBM Resources

2.3.3 The estimated Coal Bed Methane (CBM) resources are of the order of 2600 Billion Cubic Metres (BCM) or 91.8 Trillion cubic feet (TCF) spread over in 11 states in the country. The state-wise details of CBM resources are as under:

Table 2.4: Coal Bed Methane Resources in India

Sl. No.	State	Estimated CBM Resources (BCM)
1	JHARKHAND	722.08
2	RAJASTHAN	359.62
3	GUJARAT	351.13
4	ORISSA	243.52
5	CHATTISGARH	240.69
6	MADHYA PRADESH	218.04
7	WEST BENGAL	218.04
8	TAMILNADU	104.77
9	ANDHRA PRADESH	99.11
10	MAHARASHTRA	33.98
11	NORTH EAST	8.50
	Total CBM Resources	**2599.48**

Round the clock vigil on ONGC's Offshore Platform in the Western Offshore

2.3.4 Recoverable CBM Reserves : Recoverable CBM reserves of about 280.3 BCM (9.90 TCF) have been established by different operators as on 01.01.2014. Block wise reserves are given below:

Table 2.5 : Recoverable Coal Bed Methane Reserves as on 1.1.2014

S. No.	Block Name	Operator	Reserve Established (BCM)	State
1	SP(East)-CBM-2001/I	RIL	48.86	Madhya Pradesh
2	SP(WEST)-CBM-2001/I	RIL	55.50	Madhya Pradesh
3	Raniganj (South)	GEECL	54.37	West Bengal
4	RG(East)-CBM-2001/I	ESSAR	60.88	West Bengal
5	Raniganj (North)	ONGC	7.36	West Bengal
6	NK-CBM-2001/I	ONGC	9.63	Jharkhand
7	BK-CBM-2001/I	ONGC	30.02	Jharkhand
8	Jharia	ONGC	14.72	Jharkhand
	Total		**280.34**	

2.3.5 Shale Gas / Oil Resource :

It is estimated that a number of sedimentary basins (Gangetic plain, Gujarat, Rajasthan, Andhra Pradesh & other coastal areas) in India, including the hydrocarbon bearing ones – Cambay, Assam-Arakan & Damodar – have large shale deposits. Various agencies have made different estimates of shale gas and oil in the Indian sedimentary basins.

i. M/s Schlumberger: 300 to 2100 TCF of shale gas resource for the country.

ii. Energy Information Administration (EIA), USA in 2011: 290 TCF of shale gas in 4 basins (Cambay Onland, Damodar, Krishna Godavari Onland & Cauvery Onland).

iii. Energy Information Administration (EIA), USA in 2013: 584 TCF of shale gas and 87 billion Barrels of shale oil in 4 basins (Cambay Onland, Damodar, Krishna Godavari Onland& Cauvery Onland).

iv. ONGC: 187.5 TCF of shale gas in 5 basins (Cambay Onland, Ganga Valley, Assam & Assam Arakan, Krishna Godavari Onland & Cauvery Onland.

v. Central Mine Planning and Design Institute (CMPDI): 45 TCF of shale gas in 6 sub basins (Jharia, Bokaro, North Karanpura, South Karanpura, Raniganj & Sohagpur).

vi. United States Geological Survey (USGS) has also estimated technically recoverable shale gas resources of 6.1 TCF in 3 basins (Cambay Onland, Krishna Godavari Onland & Cauvery Onland). Further, USGS has indicated that these basins have also potential for shale oil.

2.3.6 Gas Hydrate Resources

The gas hydrates are at R&D stage world over. Various agencies have made different gas hydrate resource estimates which are as under :

- Earlier studies have prognosticated gas hydrate resources of 1894 TCM for India
- Department of Energy, USA in February, 2012 published that around 933 trillion cubic feet (TCF) is the concentration of gas hydrate in sands within the gas hydrate stability zone.
- National Geophysical Research Institute (NGRI) studies indicate 51.56 billion Cubic metre of gas in 2.47 x 10 ^ 9 m^3 of gas hydrate sediments for the localized area of study.
- National Institute of Oceanography (NIO) have indicated a resource estimate of about 16.5 million cubic meters from a gas hydrate bearing sediment over an area of 0.98 km^2.

2.4 CRUDE OIL PRODUCTION

2.4.1 The crude oil production in 2014-15 upto December 2014 about 28.171 Million Metric Tonne (MMT) by ONGC, OIL and Private/ JV Companies. About 68.5% of crude oil was contnbuted by ONGC and OIL under nomination regime and the remaining 31.5% of crude oil production came from Private/JV companies under PSC regime.

2.4.2 In 2014-15, the share of offshore crude oil production was about 50.2%. The remaining crude oil production was from 6 States viz., Andhra Pradesh (0.7%), Arunachal Pradesh (0.2%), Assam (12.1%), Gujarat (12.5%), Rajasthan (23.7%) and Tamil Nadu (0.6%). The details of crude oil production in 2014-15 upto December 2014 and the previous 5 years are given in table 2.6

Table 2.6: State-wise Crude Oil Production Trends (Thousand Metric Tonnes)

State/Source	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15 (upto Dec)
Onshore						
Andhra Pradesh	303	305	305	295	297	184
ArunachalPradesh	129	116	118	120	111	60
Assam	4743	4724	5025	4603	4709	3403
Gujarat	5962	5904	5778	5332	5061	3534
Rajasthan	447	5149	6553	8593	9180	6679
Tamil Nadu	238	233	246	238	226	176
Total Onshore	**11822**	**16431**	**18025**	**19441**	**19584**	**14036**
Share of PSUs	11059	11031	11231	15005	10171	7301
Share of Private/JV companies	733	5400	794	863.	9413	6735
Offshore						
Share of PSUs	17154	16972	10328	15017	15541	12108
Share of Private/JV companies	4529	4262	3733	2804	2003	2027
Total Offshore	**21683**	**21254**	**20061**	**18421**	**18204**	**14135**
Grand Total	**33505**	**37685**	**38086**	**37862**	**37788**	**28171**

Natural Gas Production

2.4.3 The Natural gas production in 2014-15 upto December 2014 about 25.319 Billion Cubic Metre (BCM) or 92.1 MMSCMD by ONGC, OIL and Private/ JV Companies. About 73.7% of natural gas production was contsiuted by ONGC and OIL under nomination regime and the remaining 26.3% of natural gas production came from Private/JV companies under PSC regime.

2.4.4 The share of offshore natural gas production in 2014-15 was about 74%. The remaining natural gas production including CBM came from 10 States viz., Andhra Pradesh (1.5%), Arunachal Pradesh (0.1%), Assam (8.9%), Gujarat (4.6%), Rajasthan (3.4%), Tamil Nadu (3.6%), Tripura (3.3%), Jharkhand (0.01%), Madhya Pradesh (0.01%) and West Bengal (0.6%). The details of Natural gas production in 2014-15 upto December 2014 the previous 5 years are given in table 2.7

Table 2.7: State-wise Natural Gas Production Trends (MMSCMD)

State/Source	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15 (upto Dec)
Onshore						
Gujarat	6.7	6.2	6	5.6	4.5	4.2
Assam	7.4	7.4	8	8	7.9	8.2
Andhra Pradesh	4.1	3.8	3.7	3.4	3.2	1.4
Tamil Nadu	3.2	3.1	3.5	3.3	3.6	3.3
Tripura	1.5	1.7	1.8	1.8	2.3	3
Rajasthan	0.7	1.2	1.6	1.9	2.7	3.1
"ArunachalPradesh"	0.1	0.1	0.1	0.1	0.1	0.1
"CBM-WB, MP,Jharkhand"	0.1	0.1	0.2	0.3	0.4	0.62
Total Onshore	23.8	23.5	24.9	24.3	24.7	23.92
Share of PSU	22	21.5	23	22.2	21.8	20.5
"Share ofPrivate/JV"	1.7	2	1.9	2.2	2.9	3.42
Offshore						
Share of PSU	47.9	48.2	48.1	49.6	49.2	47.5
"Share ofPrivate/JV"	58.5	71.4	57.3	37.5	23.1	20.7
Total Offshore	106.4	119.6	105.4	87.1	72.3	68.2
Grand Total	130.2	143.1	130.3	111.4	97	92.1

Coal Bed Methane (CBM) Production

2.4.5 Commercial production of CBM in India has already commenced w.e.f. July 2007 in Raniganj (South) block in West Bengal operated by Great Eastern Energy Corporation Limited (GEECL). Current CBM production in the Raniganj (South) block is about 0.35 MMSCMD. Additionally, Raniganj (East) block operated by Essar Oil Limited is producing at the rate of 0.22 MMSCMD and Jharia operated by ONGC is producing at the rate of 6200 SCMD.

2.5 HYDROCARBON POTENTIAL OF INDIAN SEDIMENTARY BASINS

2.5.1 Indian sedimentary basins need intensive exploration efforts for enhancing crude oil & natural gas production in the country. The Hydrocarbon potential has been witnessed where ever exploratory inputs have been expanded. The following facts are important to understand the potential of hydrocarbons in the country :

- 48.04% of the country's sedimentary area has been appraised. This means, more than half of the Indian sedimentary basins have the undiscovered potential of hydrocarbons.
- Total prognosticated hydrocarbon resources are estimated at about 28,000 million tonnes in the sedimentary basins of the country, out of which 11,543 MMT in-place reserves have been established by ONGC, OIL and Private/JV companies as on 1st April, 2014, which means that about 59% hydrocarbon reserves are yet to be discovered.
- Exploration work carried out under NELP shows that every fifth block is a hydrocarbon discovery block under NELP. 46 hydrocarbon discovery blocks have emerged out of 203 blocks till NELP-VII where E&P inputs were provided.

2.5.2 From the above, it can be concluded that Indian sedimentary basins have ample hydrocarbon potential for future exploration and production.

2.6 APPRAISAL STATUS OF INDIAN SEDIMENTARY BASINS

2.6.1 As per the India Hydrocarbon Vision 2025, 100% of the Indian sedimentary area is to be appraised. As of now, about 48.04% area has been appraised. About 4% of sedimentary basinal area has been declared as "NO GO" area by Ministry of Defence/MOEF.

2.7 BLOCKS AWARDED FOR EXPLORATION & PRODUCTION

2.7.1 The National Oil Companies, viz. ONGC and OIL, are carrying out hydrocarbon exploration and production (E&P) activities in the country since there inception. As a consequence of liberalization in the Petroleum Sector in the 1990s, participation of Indian and foreign companies in the exploration and development activities have supplemented the efforts of the national oil companies, thus narrowing the gap between supply and demand.

2.7.2 Government of India has signed production sharing contracts for 28 discovered blocks and 28 exploration blocks under the pre-NELP regime and 254 blocks under NELP regime with National Oil Companies and private (both Indian and foreign)/ Joint Venture companies as licensee for blocks. At present out of 310 exploration blocks awarded so far under various bidding rounds (Discovered Field, Pre-NELP & NELP), 135 blocks/fields are operational. 17 blocks under nomination are being operated by ONGC and OIL. Petroleum Exploration Licenses (PEL) for exploration & production of crude oil and natural gas were granted under four different regimes over a period of time:

1. **Nomination Basis:** Petroleum Exploration License (PEL) was granted to National Oil Companies viz. Oil and Natural Gas Corporation Ltd (ONGC) and Oil India Ltd. (OIL) on Nomination basis prior to implementation of NELP.
2. **Pre-NELP Discovered Field:** Petroleum Mining Lease (PML) was granted under small / medium size discovered field Production Sharing Contract (PSCs) during 1991 to 1993 where operators of blocks were private companies and ONGC/OIL has participating interest.
3. **Pre-NELP Exploration Blocks:** 28 Exploration Blocks were awarded to private companies between 1990 and prior to implementation of NELP where ONGC and OIL have the rights for participation in the block after hydrocarbon discoveries.
4. **New Exploration Licensing Policy (NELP) - 1999 onwards:** Under NELP, exploration blocks were awarded to Indian Private and foreign companies through international competitive bidding process where National Oil Companies viz, ONGC and OIL are also competing on equal footing.

2.7.3 Out of total 310 blocks (including Pre-NELP & NELP),

140 exploration blocks have been relinquished and 25 blocks are under process of relinquishment. Currently E&P activities in 135 blocks are in progress. The PSC regime-wise details of operational and relinquished blocks are given in table 2.8 :

Table 2.8: Blocks awarded under Production Sharing Regime

Bidding Round	Operational	PEL Awaited	Under Relinquishment	Relinquished	Grand Total
Field	27	-	-	1	28
NELP I	4	-	-	20	24
NELP II	4	-	-	19	23
NELP III	7	-	-	16	23
NELP IV	6	-	1	13	20
NELP IX	10	7	1	1	19
NELP V	5	-	2	13	20
NELP VI	16	-	6	30	52
NELP VII	20	1	9	11	41
NELP VIII	24	1	6	-	32
Pre-NELP	12	-	-	16	28
Grand Total	**135**	**10**	**25**	**140**	**310**

2.7.4 The pace of exploration for oil and gas has increased after the introduction of NELP regime. The 254 awarded blocks are located in onland (111), offshore shallow water (62) and deepwater (81) areas. As a result of exploratory activities, several unexplored and poorly explored areas, in particular offshore and deepwater areas have been appraised through geophysical surveys and exploratory drilling.

2.8 AWARDED NELP BLOCKS

2.8.1 Under NELP, Production Sharing Contracts (PSCs) for 254 exploration blocks have been signed for blocks awarded in onland, shallow water and deepwater areas. The details of the nine NELP bidding rounds are given in table 2.9 :

Table 2.9 : Exploration Blocks awarded under 9 rounds of NELP

Parameter	NELPI	NELPII	NELPIII	NELPIV	NELPV	NELPVI	NELPVII	NELPVIII	NELPIX
No. of Blocks Offered	43	25	27	24	20	55	57	70	34
No. of Blocks Bid for	28	23	24	21	20	52	45	36	33
No. of Bids Received	45	44	52	44	69	165	181	76	74
No. of blocks awarded	25	23	23	21	20	52	44	34	19
No. of PSCs signed	24	23	23	20	20	52	41	32	19

2.8.2 NELP bidding rounds have attracted many private and foreign companies in addition to PSUs. Before the NELP, a total of 35 E&P Companies (5 PSUs, 15 Private and 15 Foreign) were working in Nomination and Pre-NELP regime. After the conclusion of nine rounds of NELP bidding, the total number of companies has increased to 117 (11 PSUs, 58 Private and 48 foreign Companies as Operators and Non-operators/Consortium Partners).

2.8.3 IOCL, GAIL, BPCL and their subsidiaries like Bharat Petro Resources Ltd (Subsidiary of BPCL) and Prize Petroleum Company Limited (Subsidiary of HPCL), have participated in various NELP bidding rounds and have been awarded exploration blocks in India. In addition to the CPSEs, Gujarat State Petroleum Corporation Ltd. (GSPC) has participated in various NELP bidding rounds and have been awarded exploration blocks in India.

2.8.4 Under the nine rounds of NELP bidding held so far, the committed exploration investment is about US$ 11.73 billion. As against this an investment to the tune of US$ 14.25 billion has been expended by the contractors for exploration activities, mainly 2D/3D seismic survey and exploratory drilling in the awarded blocks. In addition, about US$ 9.42 billion has been incurred by the contractors for carrying out development activities mainly, drilling and setting up of production facilities. The details of NELP investments are given in table 2.10:

Table 2.10: Investment under NELP (US$ Million)

NELP Committed Investment			Actual Investment as on 01.04.2014	
NELP Rounds	Exploration Investment Commitment	Actual Exploration Investment	Actual Development Investment	Total Investment
NELP-I	4,412	4,412	7760	12,173
NELP-II	824	824	33	857
NELP-III	3,309	3,309	1626	4,935
NELP-IV	622	622	-	622
NELP-V	199	199	-	199
NELP-VI	2,081	2,081	4	2084
NELP-VII	828	828	-	829
NELP-VIII	2,157	2,157	-	2,157
NELP-IX	65	65		65
Total	**14,496**	**14,496**	**9,424**	**23,921**

2.9 AWARDED CBM BLOCKS

2.9.1 In order to harness CBM (Coal Bed Methane) potential in the country, CBM blocks were offered through international competitive bidding for exploration and production of CBM in the country for the first time in May 2001. So far, Government has awarded 30 CBM blocks under four rounds of bidding to National, Private & Joint Venture Companies. In addition, 2 CBM blocks were awarded on nomination basis and one block through Foreign Investment Promotion Board (FIPB) route. These CBM blocks are in the states of Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh Maharashtra, Odisha Rajasthan, Tamil Nadu and West Bengal

2.10 PETROLEUM EXPLORATION LICENCE (PEL) AND PETROLEUM MINING LEASE (PML)

2.10.1 PEL is granted for a period of 7 years in onland and shallow water areas and for 8 years in deepwater and frontier areas for exploration activities as per PSC provisions under NELP. Petroleum Mining Lease (PML) is awarded for 20 years for producing Hydrocarbons as per The Oilfields Regulation & Development Act, 1948 and P&NG Rules, 1959.

2.10.2 Under Nomination regime, ONGC and OIL are operating 17 PEL and 376 PML blocks covering an area of 103084 Sq. Km. The basin-wise details of PEL/PML operated by ONGC and OIL are given in table 2.11:

Table 2.11: Basin-wise operative PEL & PML under Nomination Regime as on 31.12.2014

Company / Operator	Basin	PEL		PML		Total	
		No.	Area (Sq.Km.)	No.	Area (Sq.Km.)	No.	Area (Sq.Km.)
OIL Nomination	Rajasthan	-			-		24602460
	Assam -Ara ka n	5	1239	20	4546	25	5785
	Totlal -OIL	5	1239	22	5006	27	6245
ONGC Nomination	Assam-Arakan	6	2556	64	5451	70	8006
	Cambay			162	5786	162	5786
	Cauvery		-	33	3611	33	3611
	Saurashtra	1	16557			1	16557
	Himalayan Foreland	1	1828			1	1828
	Krishna Godavari	1	1190	54	6213	55	7403
	Kutch			4	lb/3	4	lb/3
	Mumbai	2	16487	32	30395	34	46882
	Rajasthan	-		5	885	5	885
	Vindhyan	1	4208	-	-	1	4208
	Total -ONGC	**12**	**42826**	**354**	**54013**	**366**	**96839**
	Grand Total	**17**	**44064**	**376**	**59019**	**393**	**103084**

2.10.3 Private/JV companies are operating 161 PEL and 48 PML blocks covering an area of 3,08,012 Sq. Km. The basin-wise details of PEL/PML operated by private/JV companies are given in table 2.12:

Table 2.12: Basin-wise PEL & PML with Pvt./ Joint Venture Companies as on 31.12.2014

Basin	PEL		PML		Total	
	No.	Area (Sq.Km.)	No.	Area (Sq.Km.)	No.	Area (Sq.Km.)
Andaman-Nicobar	7	38127	-	-	7	38127
Rajasthan	8	16981.26	4	3287.17	12	20268.43
Assam-Arakan	21	19252	2	62.75	23	19314.75
Bengal	3	11733	-	-	3	11733
Cambay	58	11156.43	33	1014.35	91	12170.78
Cauvery	14	52080	1	81	15	52161
Ganga	1	2552	-	-	1	2952
Kerela Konkan	1	19234	-	-	1	19234
Krishna Godavari	14	20735.5	5	1479.38	19	22214.88
Kutch	5	6267	-	-	5	6267
Mahanadi	6	41771	-	-	6	41771
Mumbai	18	45051	3	2678	21	47729
Saurashtra	2	5542	-	-	2	5542
Vindhyan	3	8927	-	-	3	8927
Grand Total	**161**	**299409.2**	**48**	**8602.65**	**209**	**308011.8**

2.11 MINIMUM WORK PROGRAMME (MWP) UNDER PSC REGIME

2.11.1 Minimum Work Programme (MWP) comprises the details of exploration activities like 2D & 3D seismic survey, Gravity Magnetic survey, Geo chemical surveys, processing & interpretation etc., along with drilling of exploratory wells. The basin-wise exploratory inputs since inception in NELP and Pre-NELP blocks as on 31.12.2014 are as under :

Table 2.13: Exploratory Inputs under PSC Regime as on 31.12.2014

Basin	2D Seismic (LKM)	3D Seismic (Sq. KM)	Exploratory (Nos)
Andaman-Nicobar	26767	12686	6
Rajasthan	15175	13871	285
Assam-Arakan	5246	2004	26
Bengal	5247	4573	5
Cambay	14939	9483	227
Cauvery	64727	44560	43
Deccan Syneclise	476		
Ganga	6476	1573	7
Himalayan-Foreland	810	-	1
Kerela Konkan	50091	14233	8
Krishna Godavari	74571	71393	151
Kutch	3063	6983	10
Mahanadi	59542	63181	37
Mumbai	21748	26176	41
Pranhita Godavari	195		1
Satpura-South Rewa-Damodar	2050	304	2
Saurashtra	16037	12179	15
Vindhyan	3345	369	3
Grand Total	**370505**	**283570**	**868**

2.12 EXPLORATORY EFFORTS BY PSUs UNDER NOMINATION REGIME

2.12.1 ONGC and OIL have carried out 3,79,955 line kilometre (LKM) of 2D seismic survey, 52,615 Sq. Km of 3D seismic survey and drilled 6287 exploratory wells since inception as on 31.12.2014. The details of exploratory efforts in terms of 2D, 3D seismic and exploratory wells are given in table 2.14:

Table 2.14: Exploratory Inputs by ONGC and OIL as on 31.12.2014

S. No.	Company	Cumulative exploratory efforts as on 1.1.2015		
		2D SEISMIC (LKM)	3D SEISMIC (SQ. KM)	Exploratory WELLS (NOS.)
1	ONGC- Nomination	346034	40847	5948
2	Oil India Ltd. -Nomination	33921	11768	339
	Total	**379955**	**52615**	**6287**

2.13 EXPLORATORY EFFORTS BY PRIVATE/JV COMPANIES UNDER PSC REGIME

2.13.1 Indian Private Companies have carried out 1,03,860 line kilometre (LKM) of 2D seismic survey, 1,07,167 Sq. Km of 3D seismic survey and drilled 265 exploratory wells since inception as on 31.12.2014. The company-wise details are given in table 2.15 :

Table 2.15: Exploratory Inputs by Indian Private Companies as on 31.12.2014

S. No.	Company (Operator)	Cumulative exploratory efforts as on 1.1.2015		
		2D Seismic (LKM)	3D Seismic (SQ. KM)	Exploratory Wells (NOS.)
1	Adani Welspun Exploration Ltd.	-	1195	1
2	Essar Oil Ltd.	4503	949	20
3	Esveegee Steel (Gujarat) Pvt. Ltd.	-	203	-
4	Focus Energy Ltd.	6886	5540	92
5	Geo Enpro	52	114	2
6	Hindustan Oil Exploration Company Limited.	626	1495	11
7	Interlink Petroleum Ltd.	-	64	2
8	Jay Polychem (India) Ltd.	-	136	2
9	Jubilant Oil & Gas Private Limited.	416	642	16
10	Mercator Petroleum Private Limited.	741	163	2
11	Omkar Naturals Resources Pvt. Ltd.	350	83	-
12	Reliance Industries Ltd.	90015	96451	116
13	Selan Expl. Tech. Ltd.	166	132	1
	Private Total	**103860**	**107167**	**265**

2.14 EXPLORATORY EFFORTS BY FOREIGN COMPANIES UNDER PSC REGIME

2.14.1 Foreign Companies have carried out 63,209 line kilometre (LKM) of 2D seismic survey, 21,709 Sq. Km of 3D seismic survey and drilled 249 exploratory wells since inception as on 31.12.2014. The company-wise details are as under :

Table 2.16: Exploratory Inputs by Foreign Companies as on 31.12.2014 since inception

S. No.	Company (Operator)	2D Seismic (LKM)	3D Seismic (SQ. KM)	Exploratory Wells (NOS.)
1	BHP Billiton Pty. Ltd.	12806	-	-
2	British Gas Exploration and Production (India) Ltd.	1376	5187	15
3	Cairn Energy India Pty Ltd.	20122	6853	225
4	Canoro Resources Ltd.	338	40	2
5	ENI (India) Ltd.	5141	3170	1
6	Geo-Global Resources Inc.	476	-	-
7	Geo-Petrol International Inc.	206	-	-
8	Hardy Exploration & Production (India) Inc.	518	722	4
9	Heramac Ltd.	21	35	1
20	Naftogaz	291	363	6
11	Niko Resources Limited.	161	1277	23
12	OAO Gazprom	2108	530	3
13	Oilex-NL Holdings Ltd		178	1
14	Petrogas	598	2358	3
15	Premier Oil North East India.	233	-	1
16	Santos International Operations Pty. Ltd.	17253	3644	-
	Foreign Total	**61661**	**24357**	**285**

2.15 EXPLORATORY EFFORTS BY CENTRAL & STATE PSUs UNDER PSC REGIME

2.15.1 CPSEs Companies have carried out 2,04,984 line kilometre (LKM) of 2D seismic survey, 1,52,045 Sq. Km of 3D seismic survey and drilled 318 exploratory wells since inception as on 31.12.2014. The company-wise details are as under:

Table 2.17: Exploratory Inputs by PSUs as on 31.12.2014 since inception

S. No.	Company (Operator)	2D Seismic (LKM)	3D Seismic (SQ. KM)	Exploratory Wells (NOS.)
1	Bharat Petro Resources Ltd	21	171	0
2	GAIL (India) Limited.	0	500	0
3	Gujarat State Petroleum Corporation Ltd.	3,118	7,545	85
4	Indian Oil Corporation Ltd.	0	277	8
5	National Thermal Power Corporation	0	165	0
6	Oil and Natural Gas Corporation Ltd.	1,95,864	1,36,257	208
7	Oil India Ltd.	3,931	6,826	15
3	Prize Petroleum Company Ltd.	2,050	304	2
	Total	**2,04,984**	**1,52,045**	**318**

2.16 HYDROCARBON DISCOVERIES IN 2014-15

2.16.1 ONGC, OIL and Private/JV companies have made 27 hydrocarbon discoveries. The company-wise details of hydrocarbon discoveries made in 2014-15 upto December, 2014 provisionally are given in table 2.18 :

Table 2.18 : Hydrocarbon Discoveries in 2014-15 upto December 2014

S. No.	Company	Crude oil Discovery	Natural Gas Discovery	Total
1	ONGC	8	4	12
2	OIL	4	-	4
3	Cairn India	9	-	9
4	Focus Energy	-	1	1
5	Jay PolyChem	-	1	1
	Total	**21**	**6**	**27**

2.17 HYDROCARBON DISCOVERIES IN NELP BLOCKS

2.17.1 So far a total of 135 hydrocarbon discoveries (46 crude oil and 89 natural gas) have been made under the NELP regime in 46 blocks. The details of Company-wise hydrocarbon discoveries made are given in table 2.19 :

Table 2.19 : Hydrocarbon Discoveries in NELP Blocks

Sl. No.	Company (Operator)	Oil Discovery	Gas Discovery	Total Discoveries
1	ONGC	14	31	45
2	Oil India Ltd.	1	1	2
3	Gujarat State Petroleum Corporation Ltd.	14	10	24
4	Reliance Industries Ltd.	12	39	51
5	Jubilant Oil and Gas Pvt. Ltd.	2	4	6
6	Focus Energy Ltd.	-	1	1
7	Cairn India Ltd.	2	-	2
8	Niko Resources Ltd.	-	2	2
9	Naftogaz	1	-	1
10.	Jay Polychem India Pvt Ltd.	-	1	1
	Total	**46**	**89**	**135**

2.17.2 Currently 22 NELP hydrocarbon discoveries are under development. The details of hydrocarbon discoveries which are likely to be put on production in next five years are given in table 2.20 :

Table 2.20

Sl. No.	Discovery Name	Block Name	Operator	Location	Oil / Gas	Tentative time production likely to commence	Envisaged Oil & Gas Production
1	KG-8, KG-17, KG-15	KG-OSN-2003/1	GSPC	KG Basin Onland	Gas	2014-15	Initially 1 MMSCMD, peak 5 MMSCMD by 2016-17
2	D-2, D-6, D-19, D-22	KG-DWN-98/3	RIL	KG Basin Deepwater	Gas	2016-17	10MMSCMD
3	D-34	KG-DWN-98/3	RIL	KG Basin Deepwater	Gas	2016-17	13MMSCMD
4	SE-2, 3,4, 5,8 & 10	CB-ONN-2002/3	GSPC	Cambay Basin onland	Oil	2014-15	Initial Oil= 189 BOPD Peak Oil= 189 BOPD
5	Karan Nagar- 1	CB-ONN-2004/1	ONGC	Cambay Basin onland	Oil	2014-15	Initial Oil= 16 BOPD Peak Oil= 47 BOPD
6	West Patan-3	CB-ONN-2002/1	ONGC	Cambay Basin onland	Oil	2015-16	Initial Oil= 20 BOPD Peak Oil= 75 BOPD
7	ENP, ENS,EEU	CB-ON/3	Essar	Cambay Basinonland	Oil	2015-16	Initial Oil= 95 BOPD Peak Oil= 185 BOPD
8	Nadiad-1	CB-ONN-2001/1	ONGC	Cambay Basin onland	Oil	2015-16	75 BOPD
9	Vadatal-1	CB-ONN-2004/21	ONGC	Cambay Basin onland	Oil	2015-16	Initial 405BOPD Peak 745BOPD
10	Gulf-A	CB-OS-1	ONGC	Cambay Basin Shallow Water	Oil	2015-16	Initial 474 BOPD Peak 1104 BOPD

2.18 NATIONAL DATA REPOSITORY (NDR)

2.18.1 A National Data Repository (NDR) is being set up to populate all the geoscientific data available in the country. The NDR is expected to be operational by 1st March, 2016 which will also assist in implementation of an Open Acreage Licensing Policy (OALP). Once NDR becomes operational, the companies can view geoscientific data from anywhere in the world and firm up an opinion regarding prospectivity of the blocks prior to bidding for the block. When OALP comes into existence bidding rounds can be organized round the year instead of irregular frequency as at present and also operators can choose their area of interest. This will enhance the exploration activity in the country. Work for setting up of NDR is under progress and hardware and software have been commissioned and after trials, data uploading has been started.

2.19 SHALE GAS/SHALE OIL

2.19.1 Shale Gas can emerge as an important new source of energy in the country. India has several Shale formations which seem to hold Shale Gas and oil. The Shale Gas formations are spread over several sedimentary basins such as Cambay, Gondwana, Krishna-Godavari and Cauvery onland.

2.19.2 The Government issued "Policy Guidelines for Exploration and Exploitation of Shale Gas and Oil by National Oil Companies (NOCs) under Nomination regime" on 14th October, 2013. Under this Policy, the right to exploration and exploitation of Shale Gas & Oil will lie with the NOCs holding Petroleum Exploration License (PEL)/Petroleum Mining Lease (PML) granted under the nomination regime.

2.19.3 ONGC has commenced drilling of one well in Cambay basin in Gujarat for shale gas/Shale Oil exploration. Currently, there is no commercial production of shale gas in the country.

2.20 GAS HYDRATE

2.20.1 Gas Hydrate is at R&D stage world-wide. To meet the challenges of exploring gas hydrate, MoPNG and DGH have signed MoUs with various agencies for sharing of knowledge and scientific data, details of which are as below :

i) MoU with USGS,
ii) MoU with US-DOE,
iii) MoU with US-MMS (now called US-BOEM)
iv) MoU with JOGMEC, Japan
v) MoU with GFZ-POTSDAM, Germany
vi) MoU with IFM-GEOMAR, Germany

Current Status

a) The National Gas Hydrate Programme (NGHP) carried out Expedition-01 in 2006, that established presence of significant quantities of Gas Hydrate in the KG, Mahanadi and Andaman basins.

b) NGHP Expedition 02 aims at identifying sites. Expedition 02 will consist of LWD (Logging while drilling), Coring and wire line logging programme at 20 sites in the deep water KG & Mahanadi basins. The task of identifying locations has been completed. The task of carrying out the drilling and coring programme under the NGHP Expedition-02 has been assigned to ONGC. Expenditure of NGHP Expedition-02 will be shared by 50% funds from OIDB, 20% from ONGC and 10% each from OIL, GAIL and IOCL. ONGC will be executing the expedition.

c) Expedition 03 aims at carrying out pilot production testing of at least one site in the Indian deep-water environment. However, the success of Expedition-03 depends on the success of NGHP Expedition-02.

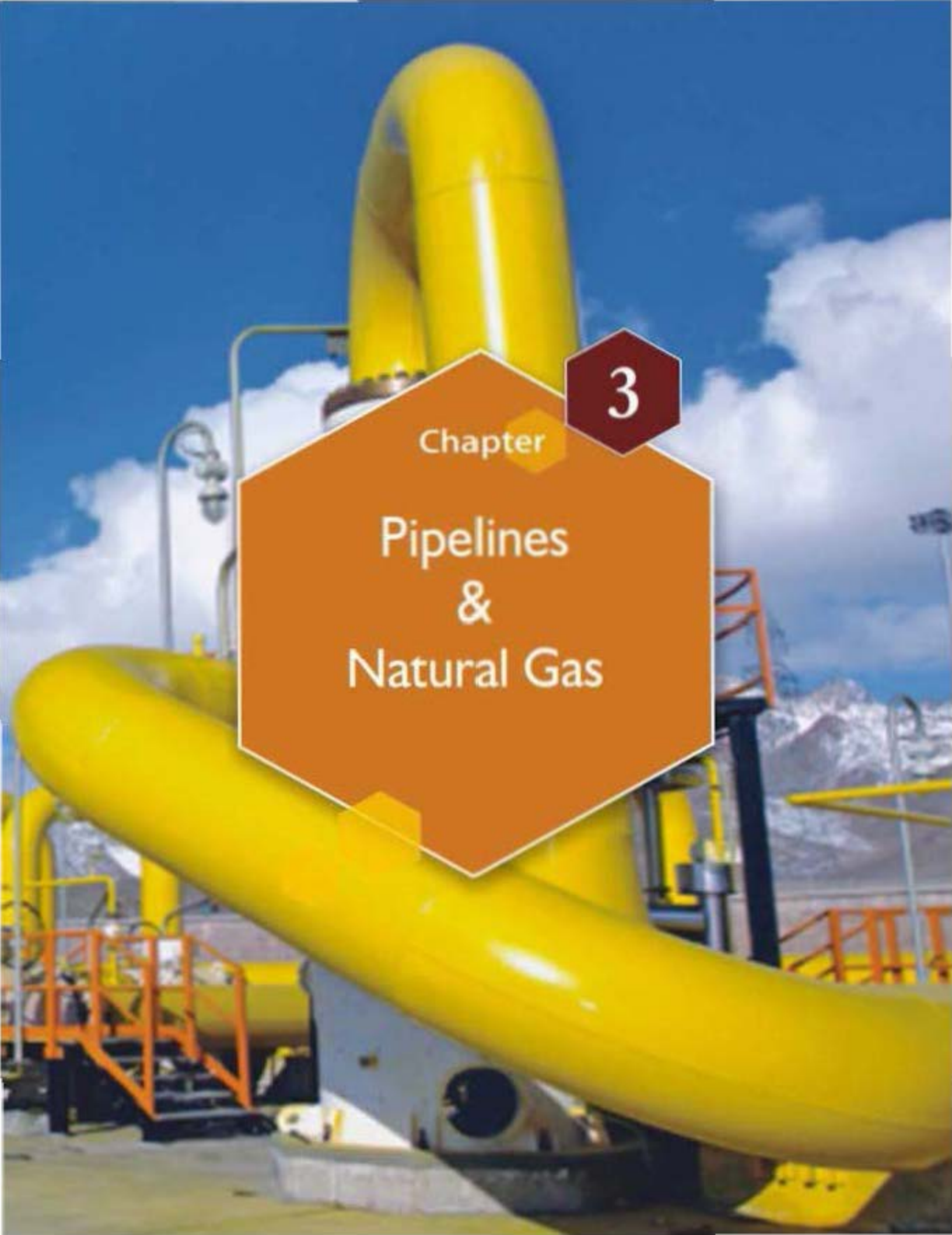
2.21 POLICY INITIATIVES TO BE TAKEN FOR ENHANCING CRUDE OIL & GAS PRODUCTION

2.21.1 Keeping in view the growing requirement of energy in the country, the Government of India has adopted a multi-pronged strategy for providing momentum to exploration and production afferts in the country. The major steps taken in this regard are:

(i) Offering of exploration blocks in Indian sedimentary basins through New Exploration Licensing Policy (NELP)
(ii) Development of alternate sources of hydrocarbon such as- Coal Bed Methane (CBM) and Shale Gas
(iii) Research & Development for new sources such as- Gas Hydrate
(iv) To carry out E&P operations in safe and environment friendly manner

2.21.2 The following new policy initiatives have been identified to be taken by the Government for enhancing domestic crude oil & natural gas in the country:

- Uniform Licensing Policy (ULP)
- Open Acreage Licensing Policy
- Appraisal of the Indian Sedimentary Basins through Public Funding



Chapter 3

Pipelines & Natural Gas

Pipelines & Natural Gas

3.1 Gas production and supply position

As per BP statistical review 2014, India is the fourth largest energy consumer in the world with oil and gas constituting about 37.24 percent of primary energy consumption, of which 29.46 % is from crude oil and 7.78 % is from natural Gas. Coal constitutes around 54.51% of total energy consumption in the country.

The World Average primary energy consumption growth rate (CAGR) for 2000-13 has been 2.41%, as compared to Asia Pacific's rate of 5.39% and India's rate of 5.52%. Cleary India is leading the pack.

The growth rate (CAGR) of Natural Gas in the world has been 2.55%, Asia Pacific at 6.26% and India at 5.26 %. Natural gas constitutes only 7.78% of total primary energy consumed in India during 2013, compared to 23.73% in the world, 11.17% in Asia Pacific, 29.61% in USA. As can be seen from above the share of natural gas in total primary energy basket is substantially low in India in comparison to world and Asia Pacific, which means the share of natural gas in India's primary energy basket is going to increase in future.

The total daily average domestic gas production during 2014-15- H1 (April-2014 to September-2014) was around 91.77 MMSCMD and supply was 74.79 MMSCMD. Total consumption of natural gas in the country was around 119.34 MMSCMD which consist of 74.79 MMSCMD (62.67% of total consumption) of domestic gas and 44.55 MMSCMD (37.33% of total consumption) of imported R-LNG. The sector wise supply during 2014-15 (H1) is given in table 3.1:

Table- 3.1 : Sector-wise supply during 2014-15 (H1)

(MMSCMD)

Sector	Domestic	R-LNG	Domestic +R-LNG
Fertilisers	26.77	15.05	41.82
Gas Based LPG plants for LPG extraction	2.68	0.16	2.84
Power	25.37	3.43	28.80
CGD for CNG & PNG (Dom, Ind, Commercial)	9.07	7.45	16.52
TTZ	1.00	0.10	1.10
Small consumers having allocation less than 50,000 SCMD	2.80	1.78	4.58
Steel	1.16	1.46	2.62
Refineries	1.52	11.28	12.80
Petrochemicals	1.93	1.79	3.72
Others	1.28	2.05	3.34
Internal consumption - pipeline system	1.21	0.00	1.21
Total	74.79	44.55	119.34

3.2 ALLOCATION OF DOMESTIC GAS:

In order to comply with court judgement and to ensure the clean environment and to promote piped natural gas (PNG) in a mission mode,Ministry has issued guidelines dated 3.2.2014 and 20.8.2014 according to which highest priority is accorded to meet full requirement of CGD entities for CNG (transport) and PNG (domestic) segments through domestic gas. Fertilizer (for use in Urea), power, LPG extraction are other priority sectors for allocation of domestic natural gas.

3.3 PROJECTED PRODUCTION OF DOMESTIC GAS

Indian natural gas market has gone through a number of changes, which have helped attract investments and catalyse new demand and supply. These include a progressive movement towards market based pricing, discoveries from the early NELP rounds, formation of Petroleum and Natural Gas Regulatory Board (PNGRB), significant new infrastructure in the form of trunk pipelines, LNG terminals and city gas networks. Regulatory and policy changes in the downstream consuming sectors such as power, automobile fuels and fertilizers have also catalysed the gas market. The demand is further set to rise on the back of segments such as power, CGD and industrial users. A healthy demand from the users is necessitating higher imports as well as investment in supporting infrastructure. The growth in Natural Gas demand offer huge opportunities in the Indian natural gas industry. LNG imports into the country and development of downstream markets to ensure off-take will remain at the core of the changes in the natural gas sector in the near future.

As per the projection the domestic gas production in the country is going to increase from 97.01 MMSCMD during 2013-14 to 150.62 MMSCMD by 2018-19. The details of which are given in table 3.2 :

Table- 3.2 : Domestic gas production in the country (MMSCMD)

	Actual	Projected				
Company	2013-14	20114-15	2015-16	2016-17	2017-18*	2018-19**
ONGC	63.79	65.75	69.01	76.04	86.30	96.38
OIL	7.19	7.78	8.47	8.49	8.77	10.96
PSC Regime	26.02	24.62	22.39	28.41	38.02	39.53
Total Production	**97.00**	**98.15**	**99.87**	**112.95**	**133.09**	**146.87**

* Including ONGC NELP production of 4.66 MMSCMD
** Including ONGC NELP production of 12.05 MMSCMD

The projection of demand as made by the working Group on Petroleum & Natural Gas Sector for the 12th five years plan (2012-17) is a s under :

Table- 3.3 : Year-wise and sector wise demand & natural gas (MMSCMD)

Sector	2014-15	2015-16	2016-17	2017-18	2018-19
Power	171	189	207	225	243
Fertilizer	113	113	113	113	113
City Gas	24	39	46	47	50
Industrial	22	25	27	28	32
Petrochemicals / Refineries / Internal Consumption	67	72	72	72	76
Sponge Iron / Steel	8	8	8	9	9
Total Demand	**405**	**446**	**473**	**494**	**523**

However, the demand of gas is highly price sensitive as actual demand during 2012-13 and 2013-14 were 134.28 mmscmd and 121.13 mmscmd respectively against Working Group projection of 293 mmscmd and 371 mmscmd respectively.

In order to enhance the availability of natural gas in the country, the Government has taken several steps which, inter- alia, include the following:

i. Intensification of domestic Exploration & Production (E&P) activities through New Exploration Licensing Policy (NELP) rounds;
ii. Shale Gas Policy framework;
iii. Research and development of Gas Hydrate resources in the country;
iv. Import of Liquefied Natural Gas (LNG) from various countries;
v. Transnational pipelines viz., Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline;
vi. Clearance for exploration and development of some NELP blocks where the same was held up by various agencies; and
vii. Exploration in the Mining Lease Area has been allowed with certain conditions;
viii. Acquisition of Overseas Oil and Gas assets is being pursued in order to enhance energy security for the country.

3.4 REGASIFICATION INFRASTRUCTURE IN THE COUNTRY

LNG is a commodity imported under Open General License (OGL) policy of Government of India and any importer desirous of the importing LNG can import at Terminals where there is available capacity. LNG is imported into the country on long and medium/short term and spot basis. The import of LNG on term basis is done to meet the deficit in the country due to shortage of supply from domestic production, whereas the procurement of LNG on spot basis is done from time to time to meet the short term demand-supply gap and also to serve peak requirement of customers which are not met through term tie- ups.

As on date, LNG re-gasification capacity in the country is 22.24 MMTPA. The terminal wise details are given in table 3.4

Table- 3.4: Terminal wise details of LNG re-gasification capacity

Location of LNG terminal	Owner of the Terminal	2014-15 Existing Capacity	2015-16 Projected Capacity	2016-17 Projected Capacity
Dahej	Petronet	11	11	11
Hazira	Hazira LNG	5	5	5
Kochi	Petronet	5	5	5
Dhabol	GAIL	1.24	2.5	2.5
Total Capacity (MMTPA)		**22.24**	**23.5**	**23.5**
Total capacity (MMSCMD)		**80.064**	**84.6**	**84.6**

*The increase in capacity from 5 to 7.5 MMTPA will become available at the end of year 2016-17.

In addition, Regasification terminal for a capacity of 35.5- 36.5 MMTPA in eastern and western coast of India are also being planned by different entities. The development of these projects purely depends on techno commercial feasibility.

3.5 PRESENT & FUTURE PIPELINE INFRASTRUCTURE:

Pipeline infrastructure is prerequisite for connecting demand centers with the sources of gas. At present, the country is having about 15,000 Km long existing pipeline infrastructure (including Spur lines) which is under operation. In order to complete the gas grid across the country, an additional 15,000 km of pipelines are required. It is important to note that out of this 15000 Km, PNGRB/GoI has already authorized entities to construct about

11,900 Km long pipelines and for about 1200 Km long pipeline bidding process is underway. For completion of Gas Grid, 2,500 Km is identified for development through PPP mode.

In order to complete the National Gas Grid, this Ministry has identified 3 pipeline sections of the total length of about 2,500 Km for implementation through PPP mode with Viability Gap Funding (VGF). This Ministry has approved a pipeline section (Ranchi-Talcher-Paradip) for implementation through PPP mode as pilot project.

For the purpose of monitoring the progress on the development of Gas Grid, the entire additional 15,000 Km pipeline sections have broadly been categorized under the following four categories:

Category 1:

There are three (03) pipelines with combined length of 2753 Km under this category. The authorizations to construct these pipelines have already been granted either by Central Government or PNGRB.

Category 2:

Under this category, there are four (04) pipelines having combined length of 6,931 km which were authorized by PNGRB in year 2011 & 2012. Construction work on these pipelines could not commence due to absence of anchor load customers.

Category 3:

Under this category, there are five (05) pipeline sections with about 4,000 Kms length. Out of these identified 5 pipelines, PNGRB has granted authorization for one pipeline section and second pipeline section is under bidding process. The remaining three (03) pipeline sections are identified by MoPNG for implementation through PPP mode with Viability Gap Funding (VGF).

Category 4:

This category consists of the pipeline sections where physical construction work is either in progress or stalled. Total length of these pipeline sections is 1765 Km.

3.6 CITY GAS DISTRIBUTION (CGD):

During 2014-15, CGD sector had consumed 16.52 MMSCMD (9.07 MMSCMD of domestic gas and 7.45 MMSCMD of R-LNG) natural gas, out of which 7.86 MMSCMD (47.58%) had been consumed for Compressed Natural Gas (CNG) in transport sector, 1.23 MMSCMD (7.45%) for Piped Natural Gas (PNG) supplied to house holds and rest 7.43 MMSCMD (44.97%) for PNG (commercial and industrial). With an intent to meet the full requirement of CGD entities for CNG (transport) and PNG (domestic) segments, MoP&NG has framed suitable policy guidelines on 3rd February, 2014 and 20th August, 2014 to ensure supply of sufficient quantity of domestic gas to GAIL for supplying to CGD entities The domestic gas is supplied to meet 100% requirement of CNG (transport) and PNG (domestic) segments based on last six monthly consumption data by the respective CGD entity. This is a step to encourage the faster promulgation of PNG connections and usage of environment friendly fuel (CNG) in transport segment. Further, this Ministry vide guidelines dated 20th August, 2014 has also allowed GAIL to supply 10% over and above the 100% requirement of CGD entities to meet the fluctuation in demand of CGD sector (CNG transport & PNG domestic) between the two revision periods. The above domestic gas is being supplied at uniform base price to all CGD entities by GAIL.

Government of India has also enacted the Petroleum and Natural Gas Regulatory Board Act, 2006, under which the Petroleum & Natural Gas Regulatory Board (PNGRB) has been established which inter alia grants authorization for City or Local Area Natural Gas Distribution (CGD) networks in accordance with the provisions of the said Act and the PNGRB (Authorizing Entities to Lay, Build, Operate or Expand City or Local Natural Gas Distribution Networks) Regulations, 2008. Depending on the natural gas pipeline connectivity/ gas availability and feasibility, PNGRB includes the Geographical Areas (GAs) in a

phased manner in the bidding rounds for grant of authorization to develop CGD networks. PNGRB has currently covered 14 GAs under 4th round of CGD bidding, which is under process, for grant of authorization to develop CGD networks. PNGRB has further decided to cover 41 Districts/GAs having natural gas pipeline connectivity at present under the 5th/6th rounds of CGD bidding. PNGRB has identified another 30 Districts/GAs which could have natural gas pipeline connectivity and could be covered in subsequent bidding rounds. In order to make available CNG to Public in the areas which are not yet authorized for development of CGD networks, PNGRB has been granting NOC/ Permission to set up daughter booster CNG dispensing stations as per internal guidelines of PNGRB.

The Ministry is also formulating guidelines relating to grant of rights to entities for sale of CNG as transportation fuel through CNG Stations. The intent of the envisaged guidelines is to promote setting up of several CNG stations in various cities/towns across the country, including along highways, and also to foster competition amongst eligible entities in the CNG segment, analogous to that in liquid transportation fuel (MS, HSD and ATF) segment. This would lead to faster rollout of large number of CNG stations across the nation.

3.7 PIPED NATURAL GAS COVERAGE

Under the Petroleum & Natural Gas Regulatory Board (PNGRB) Act, the Regulatory Board grants the authorization to the entities for developing a City Gas Distribution (CGD) network (including PNG network) in a specified Geographical Area (GA) of the country. A CGD network is the interconnected network of pipelines for supply of gas to domestic, industrial or commercial premises and CNG stations situated in a specified GA. Geographical Area earlier used to be a demarcated area for developing networks. However, now PNGRB in the 4th round of bidding and in future rounds has decided to keep geographical area (GA) as the area covered under revenue district. The CGD entity is an interested party authorized by PNGRB to carry out development of CGD networks. One CGD entity is eligible to bid/operate in multiple Geographical Areas.

At present, 23 city gas distribution entities are operating in 47 Geographical Areas in 12 States and Union Territories of the country. More than 27.3 lakh households are using piped natural gas supplies while 950 filling stations supply compressed natural gas to 22 lakh vehicles in the country. The networks also cater to the demand of 28,000 industrial and commercial gas customers. The Ministry is working on a plan to connect one crore households through PNG network in 5 years in those GAs.

Revised Guidelines relating to pricing of gas produced from small/isolated fields.

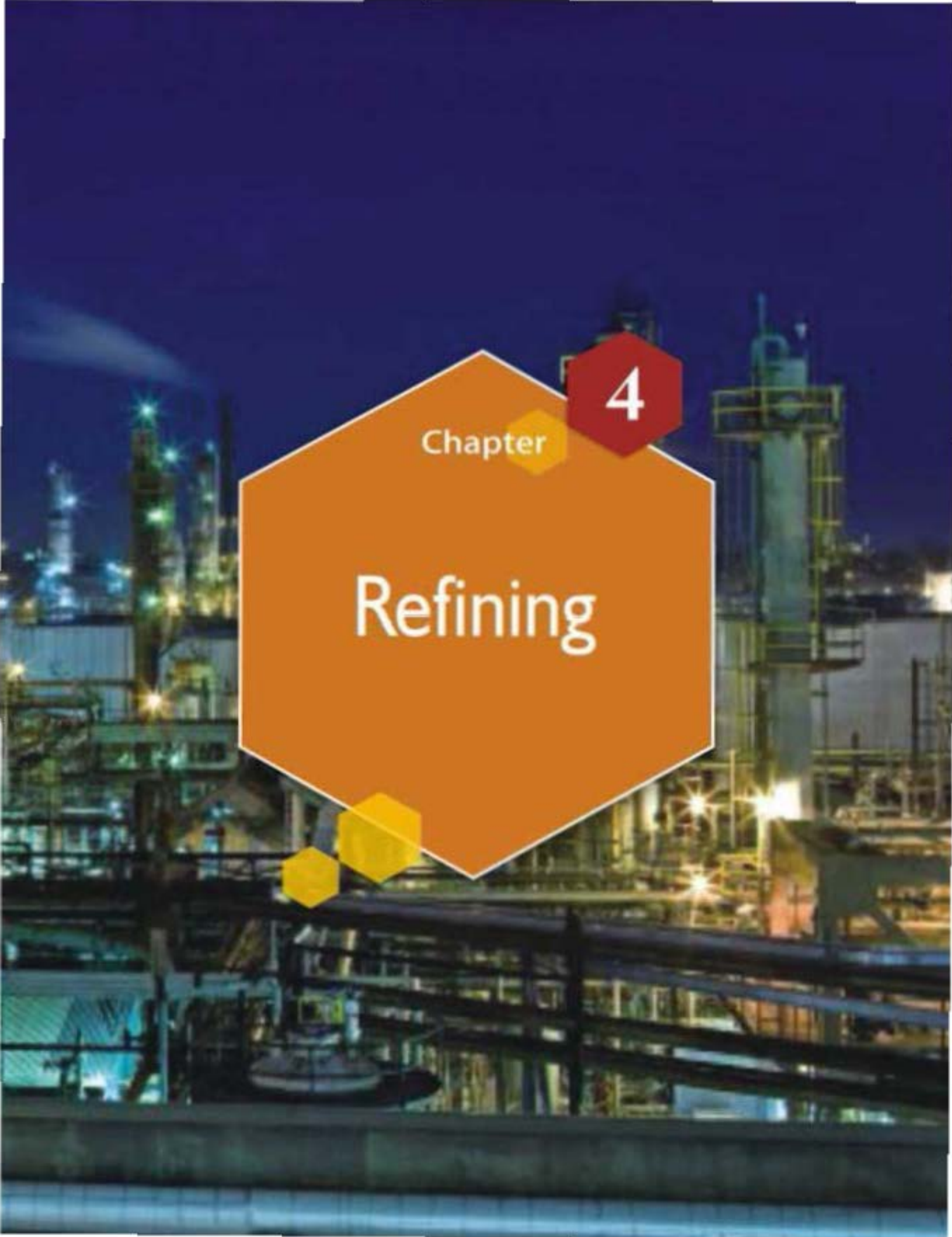
Provision in Guidelines dated 8.7.2013	Revised Guidelines
i. Suppliers to existing customers from small/isolated fields shall continue as per their APM Allocations or the fallback non- APM allocations or both and shall be restricted at a level equal to the average supply made to such customers in the last six months. Revised Gas Supply Agreement for these quantities shall be finalized by the NOCs within 30 days. Gas supplies shall be made to the existing customers based on this level subject to availability of gas. NOCs shall charge the notified APM price for supplies made against APM allocation and at non-APM price, as notified by the Government from time to time, for the balance supplies (supply level frozen now minus the supply of APM gas)	i. With new gas pricing guidelines, 2014 there is no distinction between APM and non-APM pricing and there is uniform price for gas produced by NOCs from nomination and NELP blocks. Therefore, the supplies made by NOCs to existing customers (without calling for bids) would be at the price worked out as per these guidelines (presently US $ 5.05 GCV and as revised from time to time.
.ii In case of additional availability of gas after providing for gas supplies to the existing customers as indicated at (i) above, and for any new production from the small/isolated fields, supply of gas will be decided through open competitive bidding.	ii. In case of new supplies or where the duration of existing contracts have been completed the price would be determined by NOCs by calling bids through an open competitive bidding process.
iii. The bids shall be based on the price and shall be awarded to the highest bidder. In oreder tro ensure higher monetization NOCs shall fix a minimum reserve price equal to the price of non-APM gas for the particular region, as notified by the Government from time to time.	iii. The bids NOCs shall be based on the price and shall be awarded to the highest bidder. The reserve price for these bids would be equal to the price notified on the basis of New Domestic Gas Pricing Guidelines, 2014 at the time of calling of bids.

3.8 JAGDISHPUR HALDIA NATURAL GAS PIPELINE PROJECT

The pipeline was authorized by the Ministry in the year 2007. However, the construction work could not be initiated due to absence of anchor load customers. The authorized entity (GAIL) has planned to synchronize the project with gas tie ups/booking of anchor load customers from fertilizers, power and industrial sectors. The Hon'ble Prime Minister on 21" August,2014 has announced the early construction of JHPL pipeline project. Subsequently, GAIL has issued tender for commencement of the survey of the pipeline and the survey work is likely to completed by March 2015. The pipeline project is linked with the revival of fertilizer plants.

3.9 COAL BED METHANE

India has the fourth largest proven coal reserves in the world and holds significant prospects for exploration and exploitation of coal bed methane (CBM). Under the CBM policy, 33 exploration blocks have been awarded in Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal. Of the total available coal-bearing area of 26,000 sq. km for CBM exploration in the country, exploration has been initiated in about 17,000 sq.km. The estimated CBM reserves in the country are about 92 trillion cubic feet (TCF), of which only 9.9 TCF has so far been established. Commercial production of CBM in India has now become a reality with current production at about 0.60 million metric standard cubic metre per day (MMSCMD).



Chapter 4

Refining

Refining

4.1 REFINING CAPACITY

4.1.1 The Indian refining industry has established itself as a major player globally. India is emerging as a refinery hub and refining capacity exceeds the demand. The country's refining capacity has increased from a modest 62 Million Metric Tonnes Per Annum (MMTPA) in 1998 to 215.066 MMTPA at present, comprising of 22 refineries - 17 under public sector, 2 in Joint Venture (JV) and 3 under private sector.

The capacity wise details of the refineries are given in table 4.1

Table 4.1 Capacity wise details of Refineries

Sr. No.	Refinery Location and year of commissioning	Name of the Company	Name Plate Capacity (MMTPA)*
		PSU Refineries	
1	Digboi -1901#	Indian Oil Corporation Limited	0.650
2	Guwahati -1962		1.000
3	Barauni-1964		6.000
4	Koyali-1965		13.700
5	Bongaigaon-1974		2.350
6	Haldia-1975		7.500
7	Mathura-1982		8.000
8	Panipat -1998		15.000
9	Mumbai-1954	Hindustan Petroleum Corporation Limited	6.500
10	Visakhapatnam-1957		8.300
11	Mumbai-1955	Bharat Petroleum Corporation Limited	12.000
12	Kochi-1963		9.500
13	Manali-1965	Chennai Petroleum Corporation Limited	10.500
14	Nagapattinam-1993		1.000
15	Numaligarh-2000	Numaligarh Refinery Ltd.	3.000
16	Mangalore-1996	Mangalore Refinery and Petrochemical Limited	15.000
17	Tatipaka, AP-2001	Oil and Natural Gas Corporation	0.066
		Total	**120.066**
		Joint Venture Refineries	
18	Bina-2011	Bharat Oman Refinery Ltd.	6.000
19	Bathinda-2012	HPCL Mittal Energy Ltd.	9.000
		Total	15.000
		Private Sector Refineries	
20	DTA, Jamnagar-1999	Reliance Industries Limited	33.000
21	SEZ, Jamnagar-2008	Essar Oil Limited	27.000
22	Vadinar-2006		20.000
	Total		**80.000**
	Grand Total		**215.066**

(# Refinery was set up at Digboi in 1901 by Assam Oil Company Ltd and later on IOCL took over the refinery on 14.10.1981.)

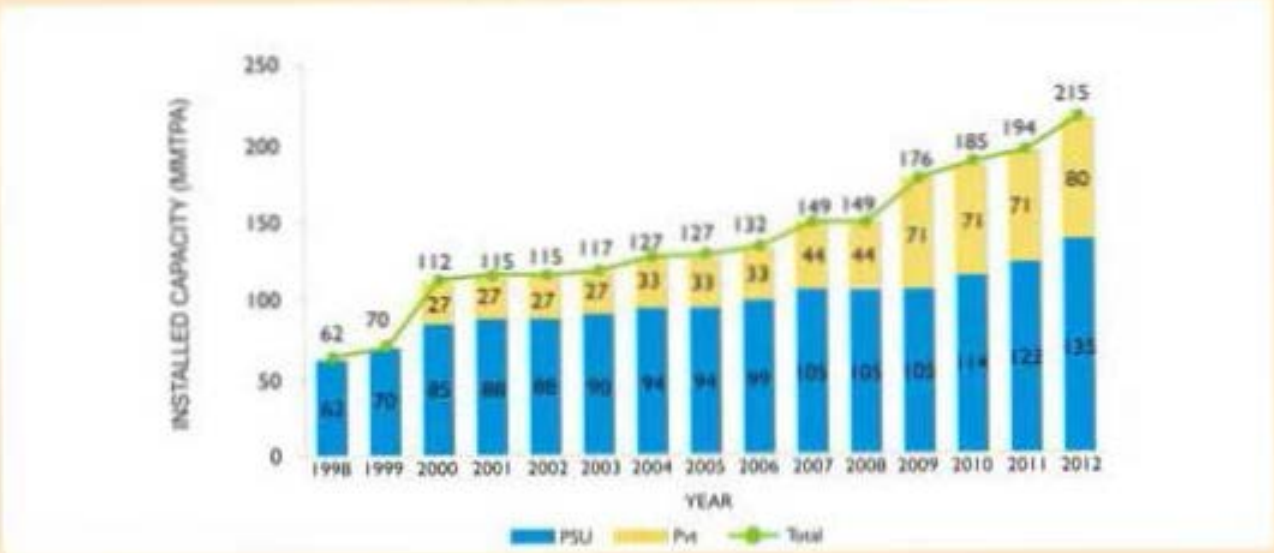
[*MMTPA-Million Metric Tonne Per Annum.]

4.1.2 The refining capacity is not only sufficient for domestic consumption but has a substantial surplus for export of petroleum products. Since 2001-02, India is a net exporter of petroleum products. During 2014-15 (up to Nov, 2014), the country had exported 43.136 MMT of Petroleum products worth US Dollars 37.285 billion (provisional). India is the largest exporter of petroleum products in Asia since August 2009.

4.2. REFINING CAPACITY ADDITION OVER THE YEARS

4.2.1 The graphical representation of the refining capacity addition over the years is shown in Graph 4.1

Graph 4.1 : Refining Capacity addition over the years



4.3 EXPANSION OF EXISTING REFINERIES

4.3.1 The capacity expansion planned during the 12th Five Year Plan is tabulated in table 4.2

Table 4.2 : Expansion planned during the 12th five year plan

S.No.	Name of the Company	Location of the Refinery	Increase in Capacity (MMTPA)
		Public Sector Refineries	
1	Indian Oil Corporation Limited (IOCL)	Koyali, Vadodara, Gujarat	4.300
2	Indian Oil Corporation Limited (IOCL)	Haldia, West Bengal	0.500
3.	Indian Oil Corporation Limited (IOCL)	Mathura, Uttar Pradesh	3.000
4	Hindustan Petroleum Corporation Limited (HPCL)	Mumbai, Maharashtra	1.700
5	Hindustan Petroleum Corporation Limited (HPCL)	Visakhapatnam, Andhra Pradesh	6.700
6	Bharat Petroleum Corporation Limited (BPCL)	Mumbai, Maharashtra	1.500
7	Bharat Petroleum Corporation Limited (BPCL)	Kochi, Kerala	6.000
8	Chennai Petroleum Corporation Limited (CPCL)	Manali, Tamil Nadu	0.600
9	Numaligarh Refinery Limited (NRL)	Numaligarh, Assam	5.000
10	Mangalore Refinery & Petrochemicals Limited (MRPL)	Mangalore, Karnataka	3.000
		Total	**32.300**
		Joint Venture Refineries	
11	Bharat Oman Refinery Limited (Bharat Petroleum Corporation Limited & Oman Oil Company, Joint Venture), Bina	Bina, Madhya Pradesh	3.000
		Total	**3.000**
		Private Sector Refineries	
12	Essar Oil Limited (EOL); Private Sector	Jamnagar, Gujarat	18.000
		Total	**18.000**
		Grand Total	**53.300**

NRL's Refinery illuminates the landscape at night

4.4 NEW REFINERIES

4.4.1 New grassroot refineries that are under implementation and coming up in the near future are given in table 4.3 :

Table 4.3

S.No.	Name of the Company	Whether PSU or JV or Private	Location of the Refinery	Capacity (MMTPA)	Expected date of Commissioning
1	Indian Oil Corporation Limited (IOCL)	PSU	Paradip, Orissa	15.000	March, 2015 onwards
2.	Hindustan Petroleum Corporation Limited (HPCL)	PSU	Barmer, Rajasthan	9.000	Last quarter of 2017
	TOTAL			**24.000**	

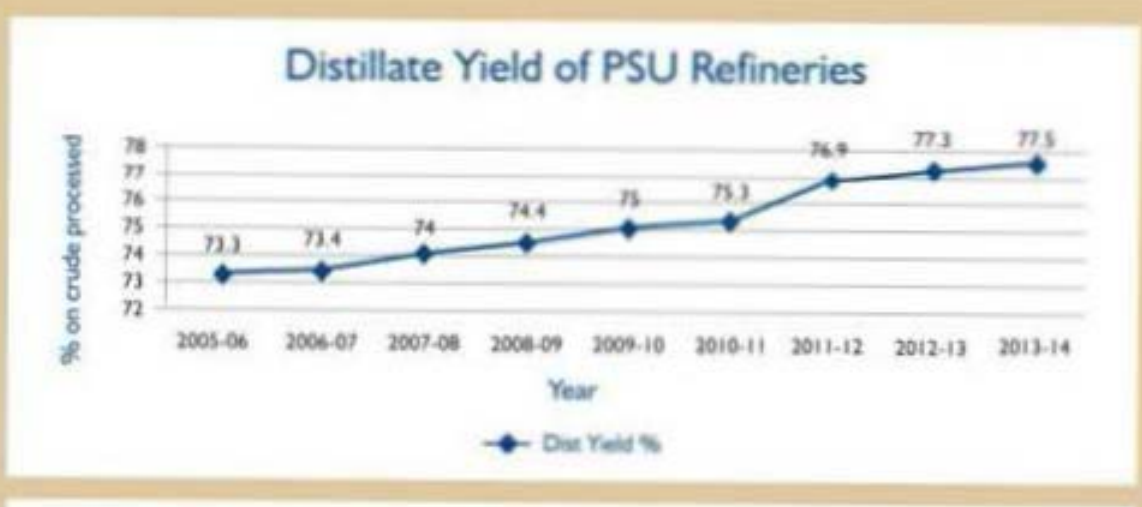
4.5 REFINERY PERFORMANCE IMPROVEMENT

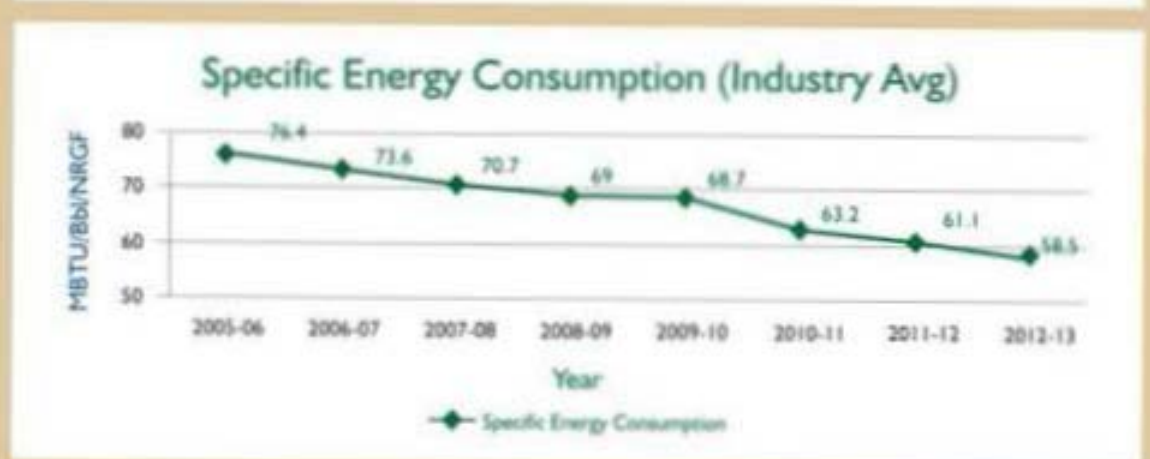
4.5.1 Indian public refineries are equipped with modern technologies and continuously uprgrade the technologies in line with the International trend and as per the requirement. Indian refineries have accorded top priority to reduce the energy consumption through various energy conservation measures.

4.5.2 The Centre for High Technology (CHT) carried out a Performance Benchmarking Study of 15 public sector Refineries through M/s Solomon Associates for two consecutive cycles 2010-11 and 2011-12. The study reports involved comparison of various Key Performance Areas (KPAs) and parameters like energy efficiency index, volume expansion index, operational availability, process utilization, maintenance & personnel index, operational costs, margins, transportation fuel, production costs etc, with Indian as well as regional peers. The results of these studies have shown wide performance gaps between Indian CPSE refineries and the best performing Asian and Global refineries. Most of the CPSE refineries are in the last quartile in terms of performance in respect of key parameters. Industry level Group is working to improve these KPAs.

4.5.3 Further, adoption of modern technologies by Indian refineries and energy conservation measures has helped in increasing the distillate yield, quality upgradation of petrol/diesel and reduction in specific energy consumption (MBTU/Bbl/NRGF - MBN). The industry average distillate yield (% wt. on crude) has improved from 73.3 % in 2005-06 to 77.7 % in 2013-14. Similarly the industry average MBN has come down from 76.4% in 2005-06 to 58.6% in 2013-14 as depicted in graph 4.2.

Graph 4.2





4.6. AUTO FUEL POLICY

4.6.1 Auto Fuel Policy-2003

The Govt. of India constituted a Committee of Experts on 13th September, 2001 under the chairmanship of Dr. R. A. Mashelkar, DG, CSIR to recommend an Auto Fuel Policy for the country. The Committee recommended a road map for upgradation of fuel quality in the country apart from other recommendations. The road map and the action taken by the Ministry in implementation of the same are tabulated in table 4.4.

Table 4.4 : Auto Fuel Policy- Road map and Action taken

S.No	Road Map	Action Taken
1	Supply of Euro-III standard auto fuels in 13 identified cities & BS-II standard auto fuels in rest of the country w.e.f. 1.4.2005	Due to production, import & other logistics constraints, the actual implementation was phased over six months for different states / locations i.e. up to September 2005.
2	Supply of BS-IV auto fuels (MS/HSD) in NCR & 13 identified cities from 01.04.2010	Implemented w.e.f. 01.04.2010 in NCR-Delhi (comprising of 108 towns, of which 17 are class I cities), Mumbai, Chennai, Kolkata, Bangalore, Kanpur, Agra, Pune, Surat, Ahmedabad, Hyderabad, Lucknow & Sholapur
3	Supply of BS-III auto fuels (MS/HSD) in the rest of the country from 01.04.2010	As per the revised approval of the Government, implemented in a staggered manner between April 01, 2010 and September 22, 2010 due to production and logistic issues involved.

The Ministry of Petroleum & Natural Gas has decided to go beyond Auto Fuel Policy recommendations & to expand BS-IV auto fuels to 50 more cities by March 2015 with preference to most polluted cities, state capitals and cities with million plus population, subject to logistic constraints. Supply of BS-IV fuels have already been expanded to following 26 cities till 2013-14.

(i) 7 cities i.e. Puducherry, Mathura, Vapi, Jamnagar, Ankleshwar, Hissar & Bharatpur in 2011-12.

(ii) 6 cities i.e. Silvasa, Daman, Diu, Aligarh, Rae Bareilly & Unnao in April to October 2012.

(iii) 4 cities i.e. Karnal, Kurukshetra, Yamunanagar & Valsad on 1st March, 2013.

(iv) 3 cities i.e., Medak, Nizamabad and Mehbub Nagar on 5th July, 2013.

(v) 6 cities i.e Vrindavan, Kosi Kalan, Hindaun city, Dholpur, Ahmednagar, Mahabaleshwer on 1st January, 2014

The remaining 24 cities will be supplied BS-IV Auto Fuels w.e.f 15th March, 2015.

4.6.2 Auto Fuel Vision and Policy 2025

The Ministry of Petroleum and Natural Gas vide order dated 19th December, 2012 has constituted an Expert Committee for drafting the Auto Fuel Vision and Policy-2025 under the Chairmanship of Shri Saumitra Chaudhuri, Member, Planning Commission, with the following terms of reference:-

(I) Recommend roadmap for auto fuel quality till 2025 for the country, taking into account achievement under the last Auto Fuel Policy, emission reduction of in-use vehicles, growth of vehicles and supply and availability of fuels;

(ii) Recommend suitable mix of auto fuels including gas and its specifications considering :

a. availability of infrastructure and logistics of fuel supplies;

b. processing economics of auto fuels;

c. improvement in quality of fuel vis-à-vis improvement in vehicle engine technology

(iii) Recommend vehicular emission norms for various categories of vehicles and roadmap for their implementation;

(iv) Recommend use of alternate fuels to minimise impact on environment;

(v) Recommend fiscal measures for funding requisite upgradation of oil refineries, logistics and removal of inter-fuel pricing distortions.

The Committee has recently submitted its report to the Government. The report has been circulated among all Union Ministries & Departments/State Govts./UTs for eliciting their comments. It has also been planned to extend the supply of BS-IV Auto Fuels in the entire country by 1st April, 2017 in a phased manner.

4.7 BRIEF DESCRIPTION OF THE REFINERIES

Public Sector Refineries

IOCL Refineries

4.7.1 Digboi Refinery (Assam)- Indian Oil Corporation Limited (IOCL) :

Digboi Refinery was commissioned in 1901 by Burmah Oil Company Ltd. (later Assam Oil Company Ltd.). Indian Oil Corporation Ltd. took over the Refinery and marketing management of Assam Oil

Company Ltd. with effect from 14th October, 1981 and created a separate division. This division had both Refinery and Marketing operations.

The present capacity of the Refinery is 0.650 MMTPA. The crude refining capacity utilisation of the refinery was 100.2 % in 2013-14.

Digboi refinery is the oldest operating refinery in the world and produces premium grade Paraffin wax and micro-crystalline wax.

4.7.2 Guwahati Refinery (Assam)-Indian Oil Corporation Limited (IOCL):

Guwahati Refinery was commissioned in January, 1962 with design capacity of 0.75 MMTPA. The refinery was set up in collaboration with Romania.

The present capacity of the Refinery is 1.00 Million Metric Tonnes Per Annum (MMTPA). The crude refining capacity utilisation of the refinery was 101.9 % in 2013-14.

Guwahati refinery was first refinery in the Public Sector. It was the first refinery to install "Indmax Unit", a novel technology developed by IOCL R&D Centre for upgrading heavy ends to LPG, motor spirit and diesel oil in 2003.

4.7.3 Barauni Refinery (Bihar)-Indian Oil Corporation Limited (IOCL):

Barauni Refinery was commissioned in July, 1964. The refinery was set up in collaboration with the then Soviet Union.

The present capacity of the Refinery is 6.00 MMTPA. The crude refining capacity utilisation of the refinery was 108.0 % in 2013-14.

The refinery, which was originally designed for processing indigenous Assam crudes, was subsequently revamped and expanded and is now capable of processing imported crudes.

4.7.4 Koyali Refinery (Gujarat)- Indian Oil Corporation Limited (IOCL):

Koyali Refinery was commissioned in October 1965. The refinery was set up in collaboration with former Soviet Union.

The present capacity of the Refinery is 13.700 MMTPA. The crude refining capacity utilisation of the refinery was 94.6 % in 2013-14.

Koyali refinery commissioned the country's first Hydrocracker Unit for conversion of heavier ends of crude oil to high value superior quality kerosene/ATF and Diesel. It also has the world's largest single train Linear Alkyl Benzene (LAB) plant which marked Indian Oil's entry into Petrochemicals.

4.7.5 Bongaigaon Refinery (Assam)- Indian Oil Corporation Limited (IOCL):

Bongaigaon Refinery & Petrochemicals Ltd. (BRPL) was incorporated on 20th February, 1974, as a fully owned Central Government company. BRPL became a subsidiary of Indian Oil Corporation Ltd. in March 2001. BRPL was amalgamated with the holding company, Indian Oil Corporation Limited effective from 25th March, 2009.

The present capacity of the Refinery is 2.350 MMTPA. The crude refining capacity utilisation of the refinery was 99.1 % in 2013-14.

BRPL which was originally processing Assam crudes is now capable of processing imported crudes. It also has a Petrochemical Complex consisting of Xylene, Di-Methyl Terepthalate (DMT) and Polyester Staple Fibre (PSF) Units.

4.7.6 Haldia Refinery (West Bengal) -Indian Oil Corporation Limited (IOCL):

Haldia Refinery was commissioned in January, 1975. The fuel sector of the refinery was built with French Collaboration and the Lube Sector with Romanian Collaboration.

The present capacity of the Refinery is 7.500 MMTPA. The crude refining capacity utilisation of the refinery was 106.0 % in 2013-14.

Haldia refinery is the only refinery of Indian Oil producing Lube Oil Base Stocks. Catalytic Dewaxing Unit commissioned in March 2003 to produce API Group-II lube base stock was first of its kind in the country.

4.7.7 Mathura Refinery (Uttar Pradesh)-Indian Oil Corporation Limited (IOCL):

Mathura Refinery was commissioned in January, 1982. The primary units of the refinery were designed by USSR.

The present capacity of the Refinery is 8.000 MMTPA. The crude refining capacity utilisation of the refinery was 83.0 % in 2013-14 (lower planned shutdown for undertaking major FCC revamp jobs).

It is first Green Refinery of Indian equipped with elaborate environment monitoring system and ecological park. It also uses natural gas to control SO2 emissions from the refinery.

4.7.8 Panipat Refinery (Haryana)- Indian Oil Corporation Limited (IOCL) :

Panipat Refinery was commissioned in 1998.

The present capacity of the Refinery is 15.000 MMTPA. The crude refining capacity utilisation of the refinery was 100.7 % in 2013-14.

Panipat refinery is the most modern refinery of Indian Oil Corporation Ltd. The Purified Terepthalic Acid (PTA) plant is the largest in the country. The commissioning of Panipat Naphtha Cracker Unit, Mono ethylene Glycol (MEG) unit, Poly propylene (PP) unit, Linear Low density Poly Ethylene (LLDPE) and High density Poly ethylene (HDPE) units etc. heralded Indian Oil's entry into Plastics Industry.

HPCL Refineries

4.7.9 Mumbai Refinery (Maharashtra)- Hindustan Petroleum Corporation Limited (HPCL)

Mumbai Refinery was first incorporated in 1952 as Standard Vacuum Refining Company of India (StanVac) which was commissioned in 1954. In 1962 Stan Vac was named ESSO India Limited. In 1969, Lube India Ltd came into existence for manufacturing Lube Oil Base Stock (LOBS). On 15th July, 1974 the undertakings of ESSO and Lube India Ltd were nationalized and merged to form Hindustan Petroleum Corporation Limited (HPCL).

The present capacity of the Refinery is 6.500 MMTPA. The crude refining capacity utilisation of the refinery was 119.1 % in 2013-14.

HPCL-Mumbai refinery is the only refinery of HPCL to produce Lube Oil Base Stocks. The refinery also produces special products like Food Grade Hexane, Rubber Processing (RPO), Diana Processing oil etc.

4.7.10 Visakh Refinery (Andhra Pradesh)- Hindustan Petroleum Corporation Limited (HPCL)

HPCL's Visakh Refinery was commissioned in 1957 by Caltex Oil Refining (India) Ltd. The Refinery was taken over by the Government of India in 1976 and was consequently amalgamated with HPCL in 1978.

The present capacity of the Refinery is 8.300 MMTPA. The crude refining capacity utilisation of the refinery was 93.6 % in 2013-14.

HPCL-Visakh refinery first oil Refinery on the East Coast and was one of the first major industries of Visakhapatnam. With the commissioning of the Single Point Mooring (SPM) facility at Visakh in the year 2010, Very Large Crude Carriers (VLCC), which carry up to 2 million barrels of oil, can now be received at VisakhRefinery. The Indian Strategic Petroleum Reserves Ltd. (ISPRL) is coming up nearby the refinery.

BPCL Refineries

4.7.11 Mumbai Refinery (Maharashtra) – Bharat Petroleum Corporation Limited (BPCL).

The refinery in Mumbai was commissioned in January 1955 under the ownership of Burmah Shell Refineries Ltd. Following the Government acquisition of the Burmah Shell, Bharat Petroleum Corporation Ltd came into existence on 24th January 1976.

The present capacity of the Refinery is 12.000 MMTPA. The crude refining capacity utilisation of the refinery was 106.0 % in 2013-14.

BPCL-Mumbai refinery has pioneered the processing of indigenous crude oil and currently can handle processing of 72 types of crude oil. The refinery has also Lube Base Oil Unit for production of environment friendly Group II base oil.

4.7.12 Kochi Refinery (Kerala) – Bharat Petroleum Corporation Limited (BPCL)

The Kochi Refinery Ltd (KRL), a public sector undertaking was set up in pursuance of formation agreement dated 27th April, 1963 between Govt. of India, Philips Petroleum Co. of USA and Duncan Brothers of Calcutta.The refinery has been amalgamated with Bharat Petroleum Corporation Ltd in 2006.

The present capacity of the Refinery is 9.500 MMTPA. The crude refining capacity utilisation of the refinery was 107.9 % in 2013-14.

The refinery is equipped to receive crude oil in Very Large Crude Carriers (VLCC).Kochi refinery has undertaken an ambitious expansion plan to enhance refining capacity to 15.5 MMTPA and also to diversify into petrochemical manufacturing for value addition.

CPCL Refineries

4.7.13 Manali Refinery (Tamil Nadu) -Chennai Petroleum Corporation Ltd. (CPCL)

Chennai Petroleum Corporation Limited (CPCL), formerly known as Madras Refineries Limited (MRL) was formed as a joint venture in 1965 between the Government of India (GOI), AMOCO and National Iranian Oil Company (NIOC). CPCL became a subsidiary of IOCL in 2001.

The present capacity of the Refinery is 10.500 MMTPA. The crude refining capacity utilisation of the refinery was 96.1 % in 2013-14.

CPCL-Manali refinery is one of the most complex refineries in India with Fuel, Lube, Wax and Petrochemical feedstocks production facilities. The 5.8 MGD Sea Water Desalination Project to augment the water requirements of its refinery was first of its kind in the industry. Under its Renewable Energy Initiative, a Wind Energy Farm with a capacity of 17.6 MW was commissioned at Pushpathur, Tamil Nadu in 2007.

4.7.14 Cauvery Basin Refinery (Nagapattinam-Tamil Nadu) – Chennai Petroleum Corporation Limited (CPCL)

CPCL's second refinery, located at Cauvery Basin at Nagapattinamwas commissioned in 1993.

The present capacity of the Refinery is 1.000 MMTPA. The crude refining capacity utilisation of the refinery was 62.2 % in 2013-14.

CBR is a small well-head refinery processing crudes from nearby ONGC fields, Rawa crude and KG-D6 crude. An Oil Jetty was commissioned in 2003 in Nagapattinam area for handling crude and products for Cauvery Basin Refinery.

NRL Refinery

4.7.15 Numaligarh Refinery (ASSAM) - Numaligarh Refinery Limited (NRL)

Numaligarh Refinery, popularly known as " Assam Accord Refinery" was commissioned in October, 2000. Current shareholding pattern of NRL is: Bharat Petroleum Corporation Limited (61.65%), Oil India Limited (26%) and Government of Assam (12.35%).

The present capacity of the Refinery is 3.000 MMTPA. The crude refining capacity utilisation of the refinery was 88.0 % in 2013-14.

NRL is the largest refinery in the North-East equipped with modern units Hydrocraker and Delayed Coker for maximising distillate yield.

MRPL Refinery

4.7.16 Mangalore Refinery (KARNATAKA) - Mangalore Refinery and Petrochemicals Ltd. (MRPL)

Mangalore Refinery and Petrochemicals Limited (MRPL) was commissioned in March 1996. MRPL was originally set up as a Joint Venture refinery, promoted by Hindustan Petroleum Corporation Ltd. (HPCL) and the Aditya Birla Group of Companies. In March, 2003 MRPL became a subsidiary of ONGC.

The present capacity of the Refinery is 15.000 MMTPA. The crude refining capacity utilisation of the refinery was 96.8 % in 2013-14.

The Refinery has got a versatile design with high flexibility to process Crudes with 24 to 46 API gravity and has high degree of Automation. MRPL is the only Refinery in India to have 2 Hydrocrackers producing Premium Diesel (High Cetane). It is also the only Refinery in India to have 2 CCRs producing Unleaded Petrol of High Octane.

ONGC Refinery

4.7.17 Tatipaka Refinery (Andhra Pradesh) – Oil & Natural Gas Corporation Limited (ONGC)

The refinery, set up as mini refinery (Phase-I) of ONGC, was commissioned in September, 2001 at Tatipaka in East Godavari District of Andhra Pradesh.

The present capacity of the Refinery is 0.066 MMTPA. The crude refining capacity utilisation of the refinery was 98.5 % in 2013-14.

Under Phase-II, an additional refinery of same capacity of 0.066 MMTPA is under construction.

Joint Venture Refneries

4.7.18 Bina Refinery - Bharat Oman Refineries Limited (BORL) (Madhya Pradesh)

Bina refinery was set up by Bharat Oman Refineries Limited (BORL), a joint venture of Bharat Petroleum Corporation Limited (BPCL) and Oman Oil Corporation Limited (OOCL) was commissioned in May 2011.

The present capacity of the Refinery is 6.000 MMTPA. The crude refining capacity utilisation of the refinery was 90.8 % in 2013-14.

Bina refinery is the first refinery central part of India and augments the availability of petroleum products in central and northern India. Other facilities include Single Point Mooring facility (SPM), Crude Oil Storage Terminal (COT) at Vadinar in Gujarat and 935 km long cross country crude pipeline from Vadinar to Bina (VBPL).

4.7.19 Guru Gobind Singh Refinery – HPCL-Mittal Energy Limited (HMEL), Bathinda (Punjab)

Guru Gobind Singh Refinery (GGSR), owned by Hindustan Mittal Energy Limited (HMEL), a joint venture between HPCL and Mittal Energy Limited, was commissioned in April, 2012.

The present capacity of the Refinery is 9.000 MMTPA. The crude refining capacity utilisation of the refinery was 103.0 % in 2013-14.

The refinery is a testimony to a successful Public Private Partnership in the oil and gas sector. Given the strategic location of Bathinda, the refinery will serve fuel requirements of the northern States of India. HMEL has also incorporated a wholly owned subsidiary HPCL-Mittal Pipelines Limited (HMPL) to set up and operate an SPM for crude oil receipt, storage and cross country transportation of crude oil.

Private Sector Refineries

4.7.20 Reliance Industries Limited (Domestic Tariff Area)(RIL-DTA) (Private Sector), Jamnagar (Gujarat)

The refinery was commissioned in July 1999.

The present capacity of the Refinery is 33.000 MMTPA. The crude refining capacity utilisation of the refinery was 91.8 % in 2013-14.

RIL-DTA was the first private sector refinery in the country. RIL-DTA is the World's biggest grassroots Refinery having a petrochemical plant for the production Paraxylene, a polymer plant for the production of Polypropylene and a Captive Power Plant with an installed capacity of 450 MW power through Gas Turbines & Steam Turbines.

4.7.21 Reliance Industries Limited-SEZ (RIL-SEZ) (Private Sector), Jamnagar (Gujarat)

The refinery was commissioned in Dec 2008.

The present capacity of the Refinery is 27.000 MMTPA. The crude refining capacity utilisation of the refinery was 139.5 % in 2013-14.

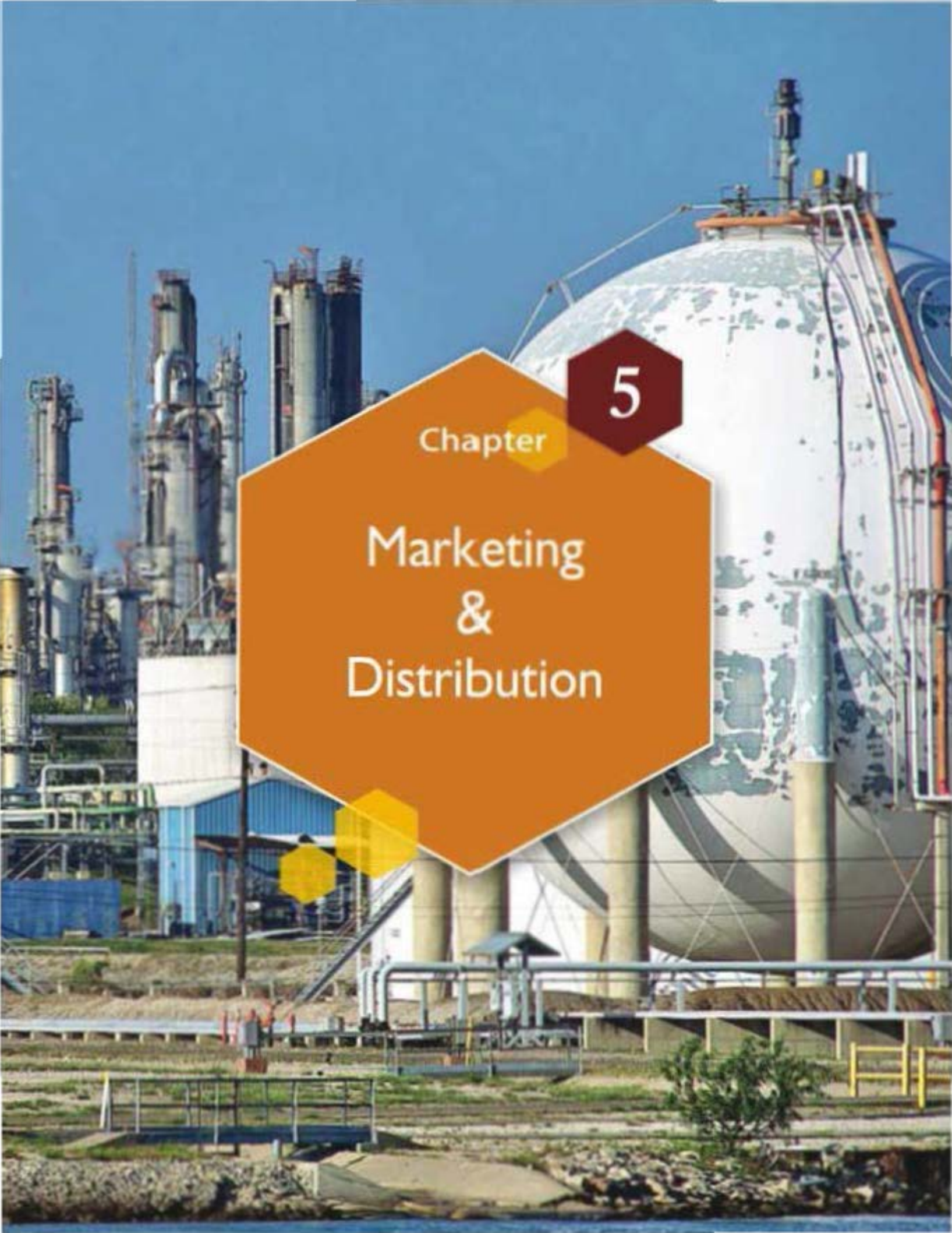
The SEZ refinery has a unique design and path breaking configuration with 'Clean Fuels' process plant. It is designed with high level of flexibility to change grades based on economy and to capture margins based on market dynamics. The new SEZ refinery is the first refinery in India to produce Euro-IV grades of gasoline and diesel.

4.7.22 Essar Oil Limited (EOL) (Private Sector), Vadinar (Gujarat)

The refinery was commissioned in November, 2006.

The present capacity of the Refinery is 20.000 MMTPA. The crude refining capacity utilisation of the refinery was 101.0 % in 2013-14.

Essar refinery is the single-location second largest refinery in the country.



Chapter 5

Marketing & Distribution

Marketing & Distribution

5.1 RETAIL MARKETING INFRASTRUCTURE

The retail marketing of petroleum products in India is done by the Public Sector Oil Marketing Companies (OMCs) i.e. Indian Oil Corporation Ltd (IOCL), Hindustan Petroleum Corporation Ltd (HPCL), Bharat Petroleum Corporation Ltd. (BPCL), Numaligarh Refinery Ltd. (NRL), Mangalore Refinery & Petrochemicals Ltd. (MRPL) and private Companies like Reliance, Essar and Shell.

There are 321 Terminal/Depots, 186 LPG Bottling Plants, 52864 Retail Outlets, 15267 LPG Distributorships, 6578 SKO/LDO Dealers in the country as on 31.12.2014. The prices of sensitive petroleum products such as SKO and Liquid Petroleum Gas (LPG) are controlled by Government. All other products are deregulated and are subject to market forces. The Ministry broadly regulates the distribution policies of the sensitive petroleum products.

5.2 STATUS OF TARGETS UNDER VISION 2015

The Vision 2015 covered all sensitive petroleum products to ensure better availability in unserved and rural areas and ensure quality products by 2015.

The vision document for 2015 for MS/HSD aimed at better facility for truckers, vehicle servicing stations along with rest areas/dhabas on National Highway (NH) at every 50 Kms., Fleet tracking service on all NH, provision of RO within 15 Kms. for all citizens, all ROs selling more than 100 KL/month to be automated by 2015 and installation of GPS on all Fuel and Kerosene tankers. For LPG the target was to raise the country's LPG population coverage from 50% to 75% by releasing 5.5 crore new LPG connections between 2009 and 2015, especially in rural areas and under-covered areas. The current coverage of LPG has increased to 67.10% from 54.6% in 2009. The target of 5.5 crore LPG connections of vision 2015 has been exceeded by releasing 6.94 core LPG connections.

5.3. DEMAND & SUPPLY OF SENSITIVE PETROLEUM PRODUCTS

5.3.1 MS/HSD/SKO

Demand of MS, HSD and SKO was fully met during 2013-14 and 2014-15 (April-November). The quantity of petrol made available during 2013-14 was 17.13 MMT. The quantity of Diesel made available during 2013-14 was 68.36 MMT. The allocation of SKO for the year 2013-14 was 9055068 KL and was fully utilized.

The actual availability of MS in the country in the

Indian Oil Retail Outlet at Tamil Nadu

current financial year 2014-15 (April-November) (Provisional) is 12.50 MMT as against the target of 16.93 MMT. The actual availability of HSD in the current financial year 2014-15 (April-November) (Provisional) is 45.76 MMT as against the target of 71.00 MMT. The allocation of SKO for the year 2014-15 is 8893818 KL which has been released over four quarters during the year.

5.3.2 LPG

The actual availability of LPG in country in financial year 2014-15 till 31.12.2014 is 13 MMT as against the RFD target of 16.6 MMT (till 31.3.2015) at an excellent level. LPG as on automotive fuel was introduced in India after the issuance of the LPG (Regulation of Use in Motor Vehicles) Order in year 2001 by Ministry of Petroleum & Natural Gas. PSU Oil Companies as well as Private players have setup Auto LPG Dispensing Stations (ALDS) in various parts of the country to dispense Auto LPG to registered vehicles with permanently fitted Auto LPG tanks and approved LPG conversion kits as notified by Ministry of Surface Transport, Govt. of India. As on 31.12.2014 total 682 Nos. of ALDS have been set up by Oil PSUs and the LPG consumed under ALDS is 119 MMT till 31.12.2014.

5.3.3. Allocation of PDS Kerosene to States/UTs

Superior Kerosene Oil (SKO) is one of the sensitive petroleum products distributed through Public Distribution System (PDS). Allocation of PDS SKO is made by the Government of India to different States/Union Territories (UTs) on a quarterly basis for distribution under Public Distribution System (PDS) for cooking and lighting only. PDS kerosene has been allocated to States/UTs based on historical allocations. Further distribution within the States/UTs through their PDS network is the responsibility of the concerned States/UTs.

For the current year 2014-15, quota of PDS Kerosene in respect of various States/UTs has been rationalized based on factors, such as LPG expansion, cap at 36 litre per capita per annum for non-LPG/PNG population, previous year quota not lifted and non-PDS usage by the States/UTs (wherever applicable). During 2014-15 total quantity of PDS-SKO allocated is 897 crore litres as compared to 908 crore litres last year.

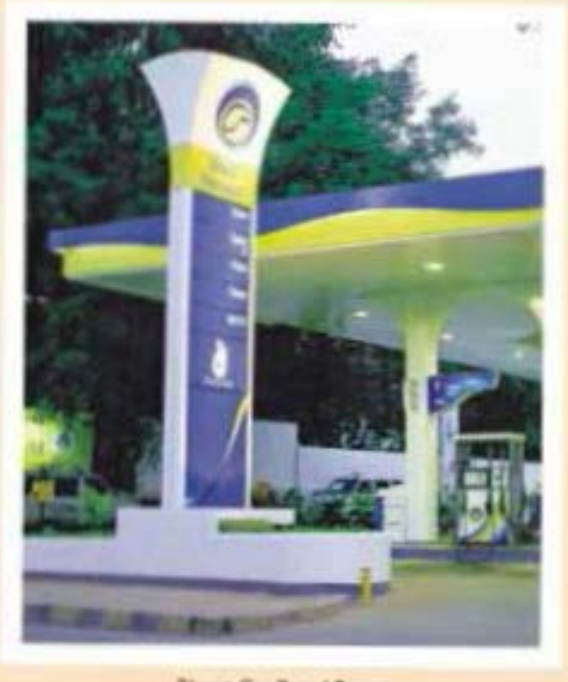
5.4 CHALLENGES IN MARKETING OF SENSITIVE FUEL PRODUCTS:

5.4.1 Adulteration of MS/HSD by PDS SKO

Several technological and regulatory measures have been taken to contain adulteration and prevent diversion.

a. **Regulatory measures:** Control Orders issued by the Government to prevent fuel adulteration, under the Essential Commodities Act 1955, empowers the State Governments to take action against those indulging in adulteration. Marketing Discipline Guidelines (MDG) have been implemented to take action against RO dealers for irregularities/ malpractices.

b. **Automation of Retail Outlets:** In order to monitor the activities at retail outlets by adopting the latest technological improvements, automation of retail outlets is being implemented. There are nearly 23,686 number of ROs selling more than 100 KL of fuel per month. In nearly 13,011 ROs automation has been completed and in 10,290 ROs, No Automation – No Operation (NANO) has been implemented as on 1st December, 2014.



Bharat Gas Petrol Pump

c. **Tamper proof locking system:** OMCs have introduced new tamper proof tank-truck locking systems to prevent en-route adulteration by transporters.

d. **Third Party Certification of Retail Outlets:** OMCs are required to obtain third party certification for all the retail outlets selling more than 100 KL per month. Number of ROs whose third party certification has been done as on 01-12-2014 is 16039.

e. **GPS tracking of Tank Trucks:** In order to prevent adulteration during transportation, OMCs have been directed to install GPS for complete monitoring of the movement of all the company owned/dealer owned/contractor owned tank trucks. Nearly 24198 tank trucks have been covered with Vehicle Management System by OMCs as on 01-12-2014 covering nearly 57% of tank trucks.

5.5 IMPROVEMENT OF DISTRIBUTION

(a) LPG

In compliance with the vision 2015 and to spread LPG distribution network in rural areas and uncovered areas, "Rajiv Gandhi Gramin LPG Vitaran Yojana" (RGGLVY) for establishing small-size LPG distribution agencies, was launched on 16th October, 2009. As on 31st December, 2014, 4058 Nos. of RGGLVs have been commissioned by OMCs. 800 Letter of Intents (LOI) have been issued by OMCs in 2014-15 as on 31st December, 2014, against the Result Framework Document (RFD) target of 1025 by 31st March, 2015.

(b) BPL Scheme under CSR fund of PSU Oil Companies.

This scheme envisaged for providing one time grant to BPL families in the rural areas for release of new LPG connections under Rajiv Gandhi Gramin LPG Vitaran Yojana (RGGLVY) is in operation in the country. As per the scheme, the security deposit for the cylinder and Pressure Regulator is paid from the fund created for the purpose by contributions from the CSR Fund of ONGC, OIL, GAIL, BPCL, HPCL and IOCL. But now the scheme has been extended through regular distributors also in addition to RGGLVY on a pilot basis upto the end of the financial year 2014-15 for all BPL families.

5.6 SUBSIDY LEAKAGE IN LPG AND SKO DISTRIBUTION

To reduce the subsidy burden in Kerosene and LPG, several initiatives have been undertaken by the Ministry including capping and de-duplication of duplicate LPG connections. These are detailed as under :

(a) Capping of subsidized LPG Cylinders

W.e.f. 14th September, 2012, number of subsidized domestic cylinders per household was restricted to 6 per annum. This cap was subsequently revised to 9 and then to 12. The aim of the capping scheme is to restrict the number of subsidized cylinders resulting in reduction in subsidy burden of Government.

(b) De-duplication of LPG connections

As per the Liquefied Petroleum Gas (Supply and Distribution) order 2000, every domestic LPG consumer (household) is entitled for one subsidized connection. However, there could be multiple connections registered with OMCs either in same name or in different name but in same address of household. The presence of multiple connections has led to leakage of subsidy. To detect such multiple connections, OMC's under the guidance of MoPNG have prescribed a Know your Customer (KYC) Process for new connections and undertaken a de-duplication exercise. This exercise is expected to result in savings of subsidy. As a result of the OMC's de-duplication exercise of the LPG consumers, around 1.00 crore connections have been blocked so far.

(c) PAHAL (DBTL Scheme)

The Government of India has launched. Direct Benefit Transfer for LPG consumer (DBTL) scheme namely, `PAHAL', in 54 districts of the country on 15th November, 2014 and in the rest of country on 1st January, 2015, covering around 15 crore LPG consumers across the country.

LPG consumers who join the PAHAL scheme, will get the LPG cylinders at market price and receive LPG subsidy (as per their entitlement) directly into their bank accounts. All domestic LPG consumers have been given two alternatives in the scheme. If LPG consumer has Aadhaar number, he/ she will have to link it to his/ her LPG consumer number and bank account. Alternatively, if he/ she does not have Aadhaar number, he/ she can link his bank account directly to his LPG consumer ID. This alternative ensures that no LPG consumer is denied subsidy for want of Aadhaar number.

All LPG consumers who have not joined the scheme, will be given a grace period of three months from the date of launch to join the scheme. During grace period such consumers will get LPG as per their entitlement at subsidized price. Additionally, a period of three months beyond grace period known as parking period is given to LPG consumers for joining the scheme. During parking period such consumers will get cylinders as per their entitlement at market price and subsidy will be kept parked with OMCs. This parked subsidy would be released as soon as consumer joins the scheme. However, if a consumer joins the scheme after parking period, the parked subsidy would lapse and consumer will get subsidy from prospective date only.

Moreover, a one-time advance of ₹ 568/- has been provided for consumer who join the said scheme. This ensures that LPG consumer do not have to spend extra amount from his pocket even for first refill after joining the scheme.This has been revised to the actual subsidy due at the time of booking w.e.f. 01.04.2015.

The PAHAL scheme aims to prevent diversion of subsidized LPG into commercial sector and thereby helps in expanding LPG coverage without increasing subsidy burden on Government and to ensure that nobody can misuse the LPG subsidy of genuine LPG consumers. This would reduce the leakage in subsidy and thus save public money. As

on 1st March, 2015, 80.6 % of the consumers (11.7 crore) had joined the scheme.

5.7 EMPOWERING LPG CONSUMERS AND IMPROVING SERVICES

Several Consumer Empowering Initiatives in LPG Marketing- Project "Lakshya" were launched with a view to improve the LPG supply chain.

- **MyLPG.in**

  It provides online data on sales and distribution of 3 million LPG cylinder to 15 Crore Consumers on a near real time basis. Various features such as LPG usage, LPG booking status, LPG refill history, request for surrender of connection, subsidy availed and transferred, rating of distributors by cylinder delivery time, rating the distributor on the five perceived parameters and Aadhaar Linking Status have been provided for use of consumers.

- **Rating of distributors based on delivery performance**

  Each distributor is now being rated from 5 stars to 1 star (***** to *) based on delivery performance.

The aim of this exercise is to measure, increase and improve the delivery performance of each distributor. Rating of distributor helps a consumer in deciding the change of distributor. It also motivates distributors to improve delivery times so as to retain consumers and acts as a monitoring mechanism for OMC sales officers to make efforts to improve the performance of low rating distributors.

- **SMS/IVRS**

  The SMS/IVR system is a customer oriented initiative, launched to facilitate a genuine customer for making a refill booking round the clock, seven days a week (24 x 7), and also circumvents the problems sometimes earlier faced by customers of finding Distriutor's telephone lines busy (especially during rush hours, with many customers trying to contact the distributor at the same time). In this system, a Consumer can book gas not only from his/her (up to) personal registered telephone/mobile numbers, but also from an un-registered telephone number. However, LPG customers, who do not have a landline/mobile number, can continue to visit the distributorship for booking their refills.

- **LPG distributor portability**

  An LPG consumer has been given the choice to switch from his old distributor to another better star rating distributor within the cluster as per his choice within or across the OMCs. The objective of introducing portability was to provide customer greater choice to select his distributor and to bring competition amongst distributors. As on 31.12.2014, total no. of requests received for portability is 7753. Out of these requests, 5357 have been closed successfully.

- **5 KG LPG COCO Scheme**

  This scheme has been launched to cater to a new category of consumers that have emerged in big cities who are mobile and do not want a permanent LPG connection but may still require LPG for their needs. Initially the scheme was launched at Company Owned Retail Outlets in Mumbai, Chennai, Kolkata and Bangalore. Government allowed the sale of 5 kg LPG cylinder with/without Domestic Pressure Regulator (DPR) through PSU Oil Marketing Companies (OMCs) retail outlets, which are accessible to all and are

open for longer hours. Subsequently sale of 5 Kg FTL cylinder has been extended to LPG distributorships points and kirana/general stores also to further convenience of the target consumers. As on 31st December, 2014, the scheme is under operation in 117 cities from 244 retail outlets, 296 distributorship points 189 Kirana stores on industry basis.

LPG sold under the scheme is called Free Trade LPG(FTL). At the time of first sale cost of equipment (DPR plus cylinder), cost of product at prevailing Non-domestic 5 kg cylinder price and administrative charges will be payable. At the time of subsequent refill, only the cost of product will be payable. Up to 31st December, 2014, OMCs have enrolled 22,681 new customers and received 30,444 enquiries.

In addition, it is the endeavour of the OMCs to market 5 kg FTL in each Metro from at least 100 points of sale (including ROs, extension counters of LPG distributors, Kirana stores, malls, corner shops etc.) of each Oil Company. The first Metro targeted for the extended network is Delhi, where 221 industry outlets/point of sales have become operative.


Chapter
6
Pricing

Pricing

Natural gas is a component in the energy basket of India which has witnessed considerable activity with the onset of liberalization in the India's Upstream Hydrocarbon Sector. It is a scarce resource in India and its pricing has always been an important issue in the country. Historically, gas markets were serviced entirely by National Oil Companies. In past, domestically produced natural gas was delivered to priority consumers at 'administered' prices, using a system of differential pricing. Subsequently, with signing of the first Production Sharing Contracts (PSC) in 1990s, the gas pricing scenario became more complex and heterogeneous in nature. The Indian gas markets are relatively small as compared to the size of the economy, but are expanding rapidly. However, the expansion has not kept pace with the demand. Domestic gas finds are inadequate to meet the increasing demand for gas. In particular, the demand from bulk consuming sectors like power and fertilizer is growing at a rapid pace. At the other end, the demand from city gas is also expected to increase rapidly in the coming years. As a result of this expansion of demand, the country is looking seriously at increasing the domestic production of gas in the country. The issues regarding policy are probably the most important: India needs a clear policy and regulatory framework in order to attract the investments needed in the energy sector, not only to sustain a high economic growth, but also to deal with poverty which leaves millions of people without access to energy.

6.1 NEW GAS PRICING GUIDELINES, 2014

There were several pricing regimes prevailing in India prior to the notification of new Domestic Natural Gas Pricing Guidelines, 2014. However, subsequent to the notification of these guidelines, the pricing of Natural Gas would be as per the provisions of these guidelines for majority of domestic gas produced in the country except for exceptions provided by these guidelines. The new Domestic Natural Gas Pricing Guidelines, 2014 is as follows:

6.1.1 "The wellhead gas price* (P), under these guidelines would be determined as per the formula given below:

$$P = \frac{V_{HH} P_{HH} + V_{AC} P_{AC} + V_{NBP} P_{NBP} + V_R P_R}{V_{HH} + V_{AC} + V_{NBP} + V_R}$$

Where

(i) V_{HH} = Total annual volume of natural gas consumed in USA & Mexico.

(ii) V_{AC} = Total annual volume of natural gas consumed in Canada.

(iii) V_{NBP} = Total annual volume of natural gas consumed in European Union (EU) and Former Soviet Union (FSU) countries, excluding Russia.

(iv) V_R = Total annual volume of natural gas consumed in Russia.

(v) P_{HH} and P_{NBP} are the annual average of daily prices at Henry Hub and National Balancing Point (NBP) respectively, less the transportation and treatment charges as given in para 2.

(vi) PAC and PR are the annual average of monthly prices at Alberta Hub and Russia (as published by Federal Tariff of the Russian Government or equivalent source) respectively, less the transportation and treatment charges as given in para 2 below.

(*Well head price refers to the price of gas receivable by the producer of gas at the contract area/lease area from the buyer of gas. In case of onland blocks, the price receivable by the contractor (producer) in the contract area will be the well head price. In case of offshore blocks, if the gas is processed and sold in the offshore contract area, the price receivable at the offshore will be the well head price. If the gas is brought to landfall point for processing and is sold at landfall point, the facilities located in the landfall point will be considered part of the contract area and the price receivable at land fall point will be the well head price).

6.1.2 The wellhead price for three different hubs and Russia would be determined by deducting US $ 0.50 per MMBTU towards transportation and treatment charges from each of the three Hub prices and Russian price.

6.1.3 The gas price, determined, under these guidelines would be applicable to all gas produced from nomination fields given to ONGC and OIL India Limited, New Exploration and Licensing Policy (NELP) blocks, such Pre-NELP blocks where the Production Sharing Contract (PSC) provides for Government approval of gas prices and Coal Bed Methane (CBM) blocks except as indicated in para 4 and 5 below.

6.1.4 The gas price, so determined under these guidelines shall not be applicable where prices have been fixed contractually for a certain period of time, till the end of such period. This gas price shall also not be applicable where the PSC concerned provides for a specific formula for natural gas price indexation/fixation and to such Pre-NELP PSCs which do not provide for Government approval of formula/basis for gas prices. Further, the pricing of

natural gas from small/isolated fields in the nomination blocks of NOCs will continue to be governed by the extant guidelines in respect of these fields issued on 8th July, 2013.

6.1.5 The matter relating to cost recovery on account of shortfall in envisaged production from D1, D3 discoveries of Block KGDWN98/3 is under arbitration. The difference between the price determined under these guidelines converted to Net Calorific Value (NCV) basis and the present price (US $ 4.2 per MMBTU) would be credited to the gas pool account maintained by GAIL and whether the amount so collected is payable or not, to the contractors of this Block, would be dependent on the outcome of the award of pending arbitration and any attendant legal proceedings.

6.1.6 The periodicity of price determination/notification shall be half yearly. The price and volume data used for calculation of price under these guidelines shall be the trailing four quarter data with one quarter lag. The first price on the basis of aforementioned formula in these guidelines would be determined on the basis of price prevailing at Henry Hub, NBP, Alberta Canada and Russia, between 1st July, 2013 and 30th June, 2014. This price would come into effect from 1st November, 2014 and would remain valid till 31st March, 2015. Thereafter, it would be revised for the period 1st April, 2015 to 30th September, 2015 on the basis of said prices prevalent between 1st January, 2014 and 31st December, 2014, i.e., with the lag of a quarter and so on. The price determined under these guidelines would be announced in advance of the half year, for which it is applicable.

6.1.7 The price determined under these guidelines would be applied prospectively with effect from 1st November, 2014.

6.1.8 Director General of Petroleum Planning and Analysis Cell (DG PPAC) under the Ministry of Petroleum & Natural Gas shall notify the periodic revision of prices under these guidelines.

6.1.9 For all discoveries after the issuance of these guidelines, in Ultra Deep Water Areas, Deep Water Areas and High Pressure High Temperature (well head shutin pressure > 690 bars, bottom hole temperature> 150 degree centigrade) areas, a premium would be given on the gas price determined as per the formula given in para 1. The premium under this para shall be determined as per prescribed procedure.

6.1.10 Price determined under these guidelines would be on GCV basis.

6.1.11 The price, determined under these guidelines would be in US $ per MMBTU.

6.1.12 In the North Eastern Region (NER), 40% subsidy would continue to be available for gas supplied by ONGC/OIL. However, as private operators are also likely to start production of gas in NER, and would be operating in the same market, this subsidy would also be available to them to incentivize exploration and production.

6.1.13 The price determined under these guidelines shall be applicable to all sectors uniformly.

The gas pricing guidelines are not applicable to the exceptions provided in para 4 of the guidelines. The pricing of gas produced from pre-NELP exploration blocks, small and medium sized discovered fields and small/ isolated blocks of National Oil Companies are as follows:

6.2 PRICING UNDER SMALL-SIZED DISCOVERED FIELDS & PRE-NELP EXPLORATORY BLOCKS

24 small-sized discovered fields and 28 pre-NELP exploratory block PSCs (of which 12 are in operation) have been signed under a Production Sharing Contract (PSC) with private E&P companies (viz. Hazira, RJ-ON-90/1 etc.). These provide for the sale of gas in the domestic market at prices obtained as per the arm's length principle, in case the gas is sold

to other than the Government nominee. There is no price formula specified under the PSCs and the price formula does not require prior approval of the Government before sale of gas by the Contractor, unlike under NELP.

6.3 PRICING OF MEDIUM SIZED DISCOVERED FIELDS

Certain blocks where discoveries were made by NOCs were auctioned to private sector E&P companies to overcome funding constraints and lack of advanced technologies under a Production Sharing Contract (PSC). Under these PSCs, viz., Panna-Mukta, Tapti (PMT) and Ravva, the entire gas produced has to be sold to the GOI nominee (viz., GAIL), as per the price formula specified in the PSC. The PSCs for Panna-Mukta & Tapti were executed on 12th December, 1994 and that of Ravva on 28th October, 1994. In case of Panna-Mukta & Tapti PSCs, the price formula for gas is linked to an internationally traded fuel oil basket, with a specified floor and ceiling price of US$ 2.11/mmbtu and US$ 3.11/mmbtu respectively. These PSCs further have a provision to revise the ceiling price after 7 years from the date of first supply, to 150% of 90% of the fuel oil basket (average of the preceding 18 months). With this revision, the revised ceiling price in case of Panna-Mukta gas is US$ 5.73 per MMBTU and in case of Tapti, it is US$ 5.57 per MMBTU. GAIL, as the Government nominee, is buying gas from the PMT JV at this rate. Out of the total allocation 17.3 mmscmd, 5 mmscmd of PMT gas has been allocated to power & fertilizer sectors, which is being supplied at the APM rate to consumers. The difference in price is recovered from the gas pool account.

As regards Ravva & Ravva satellite fields, under the provisions of their PSC, on expiry of five years from the date of first delivery of gas, the JV and the Government are required to enter into good-faith negotiations to determine the basis for calculation of the purchase price, taking into account all reasonably relevant factors. The present price of the Ravva field is US$ 3.5/mmbtu and that of Ravva satellite is US$ 4.3/mmbtu.

6.4 PRICING OF GAS FROM SMALL / ISOLATED FIELDS OF NATIONAL OIL COMPANIES:

The Pricing of Gas from small/isolated fields of National Oil Companies which is being supplied currently to the existing customers would be governed by the provisions of the New Gas Pricing Guidelines, 2014. The prices notified by PPAC on the basis of these guidelines would be applicable for these supplies. In case of new supplies or where the duration of existing contracts have been completed, the price would be determined by calling bids through an open competitive bidding process. The bids shall be based on the price and shall be awarded to the highest bidder. The reserve price for these bids would be equal to the price notified on the basis of New Domestic Gas Pricing Guidelines, 2014 at the time of calling of bids.

6.5 PRICING POLICY ON SENSITIVE PETROLEUM PRODUCTS

6.5.1 The pricing of petroleum products was brought under Administered Price Mechanism (APM) effective July 1975 when the pricing of petroleum products was shifted from import parity principles to cost plus principles. Under APM (1975 to 2002), various oil pool accounts were maintained with the object to i) ensure stability in selling price; ii) insulate consumers against international price fluctuations; and iii) subsidization of consumer prices of certain products like kerosene for public distribution and domestic LPG by cross subsidization from certain products like petrol, Aviation Turbine Fuel (ATF) etc. and indigenous crude oil.

6.5.2 Effective 1st April, 2002, the APM was dismantled and the Government decided to provide subsidy on sale of PDS kerosene and domestic LPG at specified flat rates under the Budget. To administer these budgetary subsidies, the Government formulated a 'PDS kerosene and domestic LPG subsidy scheme' in 2002. Under this scheme it was decided that, these subsidies will be phased out in 3-5 years.

6.5.3 The sharp rise and volatility of prices of oil and petroleum products in the International markets since 2004 became a matter of global concern. Indian basket of crude oil, which averaged about $ 23/bbl at the time of dismantling of APM in March 2002 and $36/bbl in May 2004, went up to an average of $85.09/bbl during 2010-11. The average price of Indian crude basket further increased to $ 105.52 /bbl in 2013-14. In the current financial year, the average price of Indian basket crude oil is at $95.07/bbl (up to 29th December, 2014). The trend of Indian Basket of Crude Oil during 2002-03 to 2014-15 is at Annexure-I.

6.5.4 Even though APM was dismantled effective 1st April, 2002, since 2004, the consumers of sensitive petroleum products, viz. Petrol (decontrolled w.e.f. 26th June, 2010), Diesel (decontrolled w.e.f. 19th October, 2014), PDS Kerosene and Domestic LPG are being insulated from the impact of unprecedented high international oil prices by the Public Sector Oil Marketing Companies (OMCs), namely Indian Oil Corporation Ltd. (IOCL), Hindustan Petroleum Corporation Ltd. (HPCL) and Bharat Petroleum Corporation Ltd. (BPCL). In spite of international oil prices remaining persistently high, the retail selling price of the sensitive petroleum products are kept lower than what is warranted by the international oil prices. This resulted in huge under-recoveries of OMCs with corresponding subsidization of prices for the consumers. The trend of under recovery in the two sensitive petroleum products i.e., PDS Kerosene and Subsidized Domestic LPG is given in Annexure-II.

6.5.5 The under-recoveries arising out of selling petroleum products at a price below the prevailing international prices are being shared by all the stakeholders under the Burden Sharing Mechanism in the following manner:-

(i) Government through Oil Bonds/Cash Assistance;

(ii) Public Sector Upstream Oil Companies namely Oil and Natural Gas Corporation (ONGC), Oil India Limited (OIL) and GAIL (India) Limited (GAIL) by way of price discount on Crude oil and products.

(iii) Public Sector Oil Marketing Companies by absorbing a part of the under-recovery.

6.5.6 The actual under-recovery in 2013-14 was ₹ 1,39,869 crore out of which Diesel alone accounted for ₹ 62,937 crore. The Government provided cash compensation of ₹ 70,772 crore while upstream companies (ONGC/OIL/GAIL) contributed ₹ 67,021 crore.

During the period April – December, 2014, the under recoveries of the OMCs amounted to ₹ 67,091 crore. Government provided cash compensation of ₹ 22,085 crore while upstream oil companies contributed ₹ 42,822 crore. As per the current rates, the under recovery of OMCs for the year 2014-15 is estimated to ₹ 72,415 crore (excluding subsidy under DBTL Scheme).

6.5.7 In order to reduce under-recovery of the OMCs on sale of Diesel, Government on 17th January, 2013 authorized OMCs to sell Diesel to all consumers taking bulk supplies directly from the installations of the OMCs at the non-subsidized market determined price with immediate effect. Besides, OMCs were also been authorized to increase the retail selling

price of Diesel in the range of 40 paisa to 50 paisa per litre per month (excluding VAT as applicable in different State/Union Territories) until further orders. **The Government has made the price of Diesel market determined both at Refinery Gate and Retail level for all consumers with effect from the midnight of 18–19 October, 2014.** The Government has also put a cap of 12 cylinders of Subsidized Domestic LPG for each consumers annually.

6.5.8 The product wise and total under recoveries of the OMCs from 2002-03 to 2014-15 (for the period April – December, 2014) are given below:

6.5.9 **Pricing of crude oil:** Indian Basket of Crude oil represents the average of crude oil being processed by Indian refineries in the ratio of actual processing of sweet crude and sour crude in the immediate preceding year. For sweet crude oil price, the daily Platts assessments for benchmark crude oil "Brent" is considered. For sour crude oil, the average of Platts assessment for benchmark crude oil "Dubai" and "Oman" is considered. During 2013-14, Indian refineries processed 72.04% sour crude and 27.96% sweet crude. Therefore, for 2014-15, Indian basket of crude oil represented the daily price assessment by Platts for benchmark under "Brent" (sweet crude) and average of "Dubai" and "Oman" (sour crude) in the ratio of 27.96:72.04.

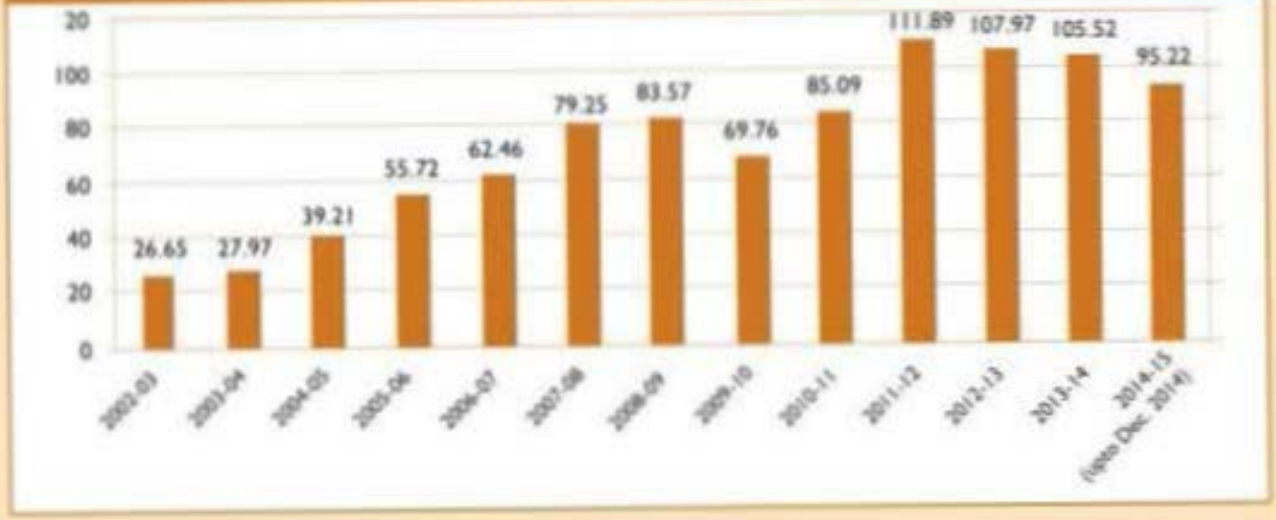
Domestic crude oil producing companies are also offered international crude oil prices benchmarked to an international crude that corresponds to their crude assay. Import of crude oil takes place at international price.

Year	Petrol*	Diesel**	PDS Kerosene	Domestic LPG	Total Under-recoveries	
			Rs. Crore		Rs. Crore	$ Billion
2002-03	-	-	2,067	3,363	5,430	1.12
2003-04	-	-	3,751	5,523	9,274	2.02
2004-05	150	2,154	9,480	8,362	20,146	4.48
2005-06	2,723	12,647	14,384	10,246	40,000	9.03
2006-07	2,027	18,776	17,883	10,701	49,387	10.90
2007-08	7,332	35,166	19,102	15,523	77,123	19.17
2008-09	5,181	52,286	28,225	17,600	103,292	22.50
2009-10	5,151	9,279	17,364	14,257	46,051	9.71
2010-11	2,227**	34,706	19,484	21,772	78,190	17.15
2011-12	0	81,192	27,352	29,997	1,38,541	28.89
2012-13	0	92,061	29,410	39,558	1,61,029	29.57
2013-14	0	62,837	30,574	46,458	1,39,869	23.12
9M, 2014-15	0	10,935	21,216	34,941	67,091	11.04
Total	**24,791**	**4,12,039**	**2,40,292**	**2,58,300**	**9,35,423**	**189.00**

* Under-recovery on Petrol is only up to 25th June, 2010. ** Under-recovery on Diesel is only up to 18th October, 2014.

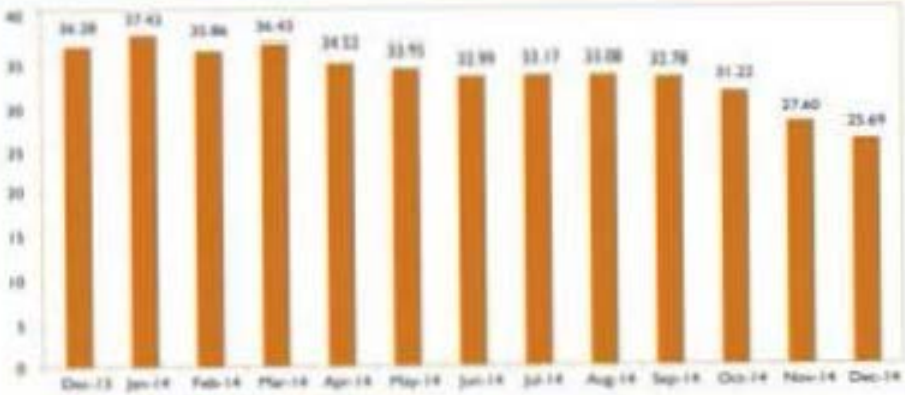
Annexure-I

Trend of Crude Oil : Indian Basket

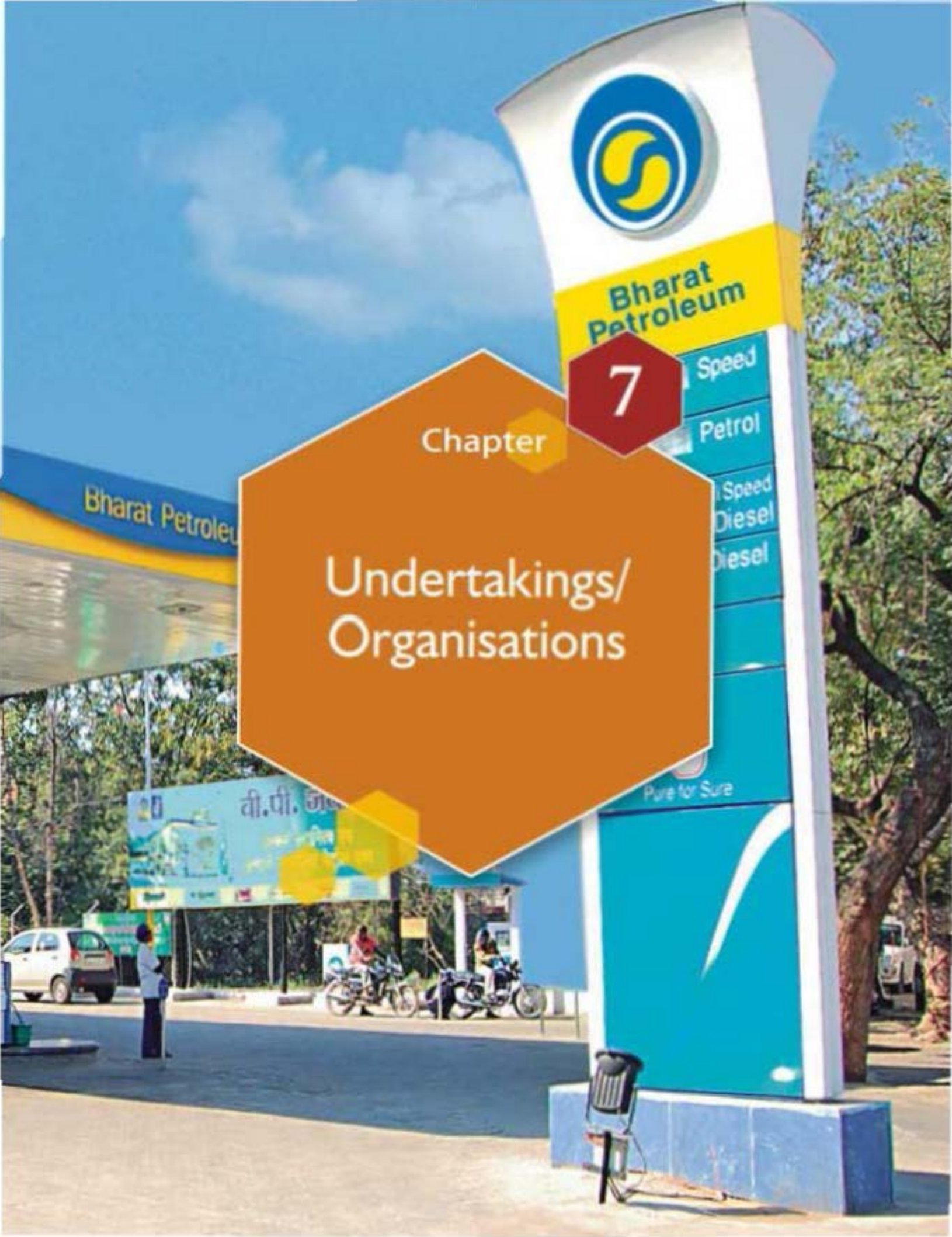


Annexure- II

Trend of Kerosene Under-recovery (Rs./Litre)



Trend of LPG Under-recovery (Rs./Cylinder)



Chapter

7

Undertakings/ Organisations

7.1 MAHARATNA CPSEs

7.1.1 GAIL (India) Limited

GAIL (India) Limited, one of the seven Maharatna Public Sector Undertakings, is India's largest company dealing with marketing and transportation of natural gas. GAIL is the youngest PSU to be accorded Maharatna status. GAIL owns and operates network of about 11,000 kms of natural gas high pressure trunk pipeline with a pan-India capacity of around 206 MMSCMD of natural gas. Average gas transmission during the previous year was 96.2 MMSCMD.

GAIL is the only company in India, which owns and operates exclusive pipelines for LPG transmission for third-party usage. It owns and operates two LPG pipeline transmission systems with a total length of 2,038 Kms. Out of this, 1,415 km of pipeline network transports LPG from western to northern parts of India (Jamnagar-Loni pipeline) and the balance 623 kms of pipeline networks transports LPG in the country's southern part (Vizag-Secunderabad pipeline). The LPG transmission system has a capacity to transport upto 3.8 MMTPA of LPG. During the previous year, LPG transmission throughput achieved was about 3.15 MMTPA.

GAIL also owns and operates a gas based integrated petrochemical plant at Pata, Uttar Pradesh with a capacity of 4,10,000 TPA of polymer. GAIL is currently doubling its capacity.

In addition to the above, GAIL has its presence in City Gas Distribution (CGD) business, Exploration and Production through equity and Joint Venture participation. Besides, GAIL has its overseas presence in five countries.

The physical and financial performance during 2014-15 (actual upto September, 2014) are as under:

Physical

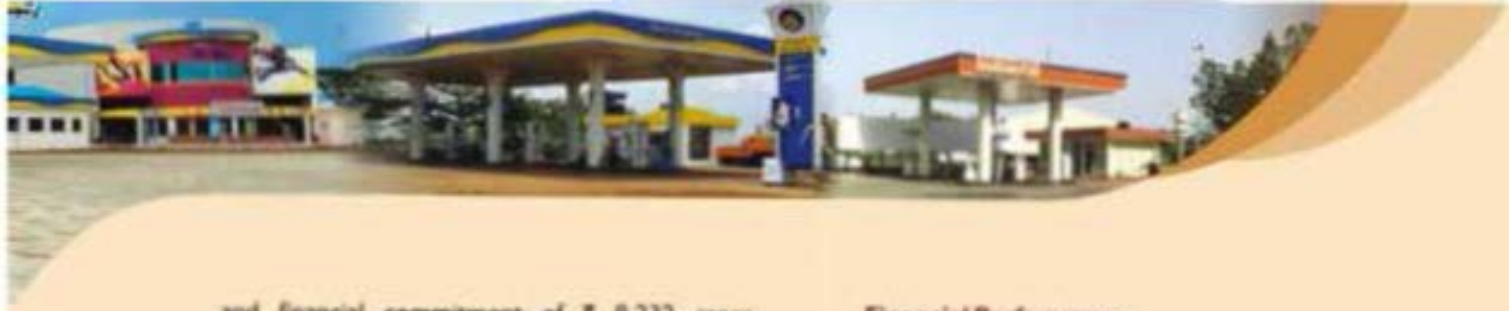
Parameters	Units	Performance in 2014-15 (upto September, 2014)	Projected performance in 2014-15 (As per RE)
Gas Transportation	MMSCMD	94	93.7
Liquid Hydrocarbon Production	TMT	648	1247
Petrochemical Production	TMT	219	450
LPG Transportation	TMT	1533	3123

Financial

Description	Units	Performance in 2014-15 (upto September, 2014)	Estimated performance in 2014-15 (As per RE)
Turnover	₹ Crore	26900	56059
Profit Before Tax	₹ Crore	2373	3817
Profit After Tax	₹ Crore	1594	2909
Gross Internal Generation (PAT + Depreciation)	₹ Crore	2395	4117

Projects

- For effective use of commissioned trunk pipelines, execution of Last Mile Consumer connectivity is being carried out. During the year, GAIL has completed 52.6 Kms of pipelines for 22 consumers to supply gas @ 0.77 mmscmd till 30th November, 2014.
- GAIL (India) Limited has been adjudged 'Company of the Year' in the Project management category for its Dabhol-Bengaluru natural gas pipeline project at the Petroleum Federation of India (Petro-Fed) Oil & Gas Industry Awards 2013
- The Petrochemical complex-II project at Vijaipur and Pata has achieved physical progress of 98.9%



and financial commitment of ₹ 8,232 crore achieved as on 30th November, 2014.

- Petrochemical plant by Brahmaputra Cracker and Polymer Limited (BCPL), a subsidiary of GAIL with 70% equity participation: The project has achieved overall physical progress of 98.7% and financial progress of 89.7% as on mid of November 2014.
- GAIL has taken 15.5% equity in OPaL which is setting up a greenfield petrochemical project at Dahej with a polymer capacity of 1.4 MMTPA.

International Cooperation and Engagements abroad

- GAIL Global (USA) LNG LLC, a wholly owned subsidiary of GAIL Global (USA) Inc, which has booked 2.3 MMTPA capacity in Dominion Cove Point LNG, LP signed a long term contract with WGL Midstream Inc, USA for supply of gas for liquefaction at this terminal.
- TAPI pipeline Company Ltd., SPV of GAIL (India) Limited, ISGS (Pakistan), AGE (Afghanistan) and Turkmengas (Turkmenistan) incorporated on 11th November, 2014. for bringing 38 MMSCMD of natural gas from Turkmenistan to India via TAPI pipeline.
- GAIL signed Memorandum of Understanding (MoU) with State Oil Company of Republic of Azerbaijan (SOCAR) to jointly pursue LNG opportunities through capacity booking, LNG procurement and promotion of LNG projects globally.
- GAIL signed Memorandum of Understanding (MoU) with Sumitomo Corporation, Japan (Sumitomo) to pursue business opportunities in petrochemicals, natural gas procurement, pipelines and LNG globally.

7.1.2 Indian Oil Corporation Ltd. (IOCL)

Indian Oil Corporation Ltd (IOCL) is India's flagship Maharatna National oil Company with business interests encompassing the entire hydrocarbon value chain to R&M, R&D, E&P, Petrochemicals and marketing of natural gas. By venturing into Renewables and Nuclear Energy, the company has grown and evolved itself from a pure petroleum refining and marketing company to a full fledged energy company.

Financial Performance

With a turnover of ₹ 4,57,553 crore for the year 2013-14 against ₹ 4,14,909 crore during 2012-13. During the year 2013-14, IOCL registered a profit (after tax) of ₹ 7,019 crore vs ₹ 5,005 crore during 2012-13. GRM stood at US$ 4.24/bbl in 2013-14 as against US$ 3.16/bbl in 2012-13.

Physical Performance

IOCL refineries marked a throughput of 53.1 MMT during 2013-14. While processing high quantity of HS and highest ever quantity of Heavy/High TAN Crudes (48.9% and 16.0% of the total crudes processed respectively), the refineries also maintained their highest-ever distillate yield of 78.1%. Support of crude oil pipelines was also in tandem as they transported 45.9 MMT of crude oil, recording capacity utilization of over 113%. Product pipelines recorded throughput of 27.2 MMT during the year. IOCL maintained its dominance in the domestic POL market during the year with sale of total domestic 71.147 MMT and total (including export) 75.53 MMT of POL products and market share of 47.1% in the industry. In the petrochemicals segment, highest-ever sales of 2,114 TMT were achieved during 2013-14. Highest ever R-LNG sales volume were also recorded during the year with a sales volume of 3.22 MMT.

Marketing & Associated infrastructure

IOCL reaches millions of people everyday through an unmatched countrywide ever expanding infrastructure network to deliver petroleum products. The network,' comprising 41,640 touch points as on 31st March, 2014, was strengthened from 39,460 touch points in the last fiscal. Largest and most extensive network of retail outlets, numbering, 23,992 (17,991 regular ROS: 5002 Kisan Seva Kendras) along with 135 Depots, 6,359 consumer pumps, 3,030 SKO/LDO dealers and 98 AFS are some of the vital components of this network, ensuring availability of product stand inventory at the doorstep of customers. The needs of domestic fuel (LPG) distributors, serving nearly 82 million customers. During the year, IOCL commissioned 1,717 ROs including, 764 KSKs. In its drive towards automation 1,700 ROs were brought under automation during, 2013-14 taking, the total to 6,077 automated ROs.

Exploration & Production

IOCL's plans of venturing into upstream segment was further strengthened with the successful acquisition of 10% stake in Pacific North West integrated LNG project in Petronas' Canadian asset. With the said

acquisition, IOCL has 3 overseas producing assets. In total, IOCL has presence in 13 domestic and 11 overseas blocks as on 31st March, 2014.

Major New Projects

Major projects commission during 2013-14 include FCCU revamp and Mathura: Butadiene Extraction Unit, Buene-1 Unit and Styrene Butadiene Rubber (SBR) Plant, all at Panipat. It is worth mentioning that SBR is a 100% import substitution product and is the Ist such plant in the country.

IOCL has a planned capex of ₹ 56,200 crore during XII plan against actual expenditure of ₹ 48,655 crore in XI plan period. Out of the planned capex of XII plan, the company has already invested ₹ 26,038 crore in the first two years of the plan, i.e. upto 31st March, 2014. Some of the major ongoing projects are listed below:

Approved projects	Approved/Anticipated cost (₹ In crore)
Paradip Refinery	34,555
DCU at Haldia	3,076
PP at Paradip	3,150
PRRPL	1,793
Debottlenecking of SMPL	1,584

Besides these major approved projects, various other projects in the field of refinery expnsation, papelines, petrochemicals, marketing etc. are under advanced stage of planning.

CSR & Contribution to Exchequer

Corporate Social responsibility (CSR) has been the cornerstone of success, right from inception of IOCL. IOCL has adopted 3 thrust areas under CSR viz. Clean Drinking Water, Health and Medical Care and Expansion of education. During 2013-14, IOCL's CSR investment was ₹ 81.91 crore.

IOCL paid ₹ 27,293 crore to central and ₹ 58,871 crore to various State exchequers in 2013-14. The total contribution of ₹ 86,164 crore, 17.9% higher as compared to that in 2012-13.

Major Awards

Major awards and accolades won by IOCL include:

- Ranked 11 in Business India's list of Super 100 Companies.
- Indian Market Capital Deal of the Year by IFR Asia.
- Gold Trophy of SCOPE Meritorious Award for Corporate Governance.
- ICSI National Award for Excellence in Corporate Governance instituted by ICSI.
- Readers Digest Trusted Brand Award 2013, for 7th Consecutive year.
- PetroFed awards in four categories.
- Scope Gold Award for Corporate Social Responsibility

7.1.3 Oil and Natural Gas Corporation Limited (ONGC)

Introduction

Oil and Natural Gas Corporation Limited (ONGC), engaged in exploration and exploitation of oil, natural gas and value added products (VAP), was incorporated on June 23, 1993 under Companies Act 1956, pursuant to Govt. of India's decision to transform the statutory Commission into a Public Limited Company, through Parliament Act for Oil and Natural Gas Commission (Transfer of Undertaking and Repeal Act, 1993). The authorized and paid up capital of ONGC as on 31st March, 2014 is ₹ 15,000 crore and ₹ 4,277.76 crore respectively; share of Government of India being 68.94%. ONGC Videsh Limited is a wholly owned subsidiary, of which the entire equity of ₹10,000 crore as on 31st March, 2014 is held by ONGC. Mangalore Refineries and Petrochemicals Ltd (MRPL) is another partially owned subsidiary where ONGC has 71.62% equity stake with management control.

Major operational Highlights for the Year 2014-15 upto December 2014:

a. Hon'ble Prime Minister Shri Narendra Modi inaugurated the ONGC Tripura Power Plant to monetize the gas assets of ONGC in the land-locked state of Tripura. The 726.6 MW gas-based power plant of ONGC Tripura Power Company is one of the biggest Clean Development Mechanism (CDM) projects of the world.

b. In Tripura Asset, a 16"x11.3 Km Line from Konaban GGS to Nimbutali was commissioned on 31st Augutst, 2014. Nimbutali junction has been commissioned on 6th September, 2014 and gas supply started to OTPC from Konaban GCS through the junction point on 8th September, 2014.

c. After commissioning of Gas Sweetening facilities for the 1st time at Offshore in May, 2014, B22/B-193 cluster production ramped up from 4,500 BOPD to 13,500 BOPD approx.

d. By putting new wells on production and re-installing Electrical Submersible Pumps (ESPs), Production from NBP field has been increased from 18,500 BOPD in March, 2014 to 23,500

Prime Minister Narendra Modi formally dedicated the Unit II of ONGC Tripura Power Company to the nation on 1st December, 2014

BOPD by end of H1 (14-15) and further to ~30,000 BOPD by end of October 2014.

e. Cluster-7 production increased from 8,000 BOPD to ~13,500 BOPD.

f. Marginal field SB-14 put on production from Apr-14 (producing ~2,000 BOPD of light oil / condensate and 0.80 MMSCMD of gas)

g. **Mumbai High North Phase III** Redevelopment Project was approved by ONGC Board on 28th June, 2014 at project cost of ₹ 5,813.25 crore. The project envisages 5 new well platforms (N19, N21, N22, N23 & N24), associated pipelines modification at 12 well platforms, drilling of 52 wells new wells and 24 side-track wells. The scheme envisages an incremental oil & gas production of 6.997MMT and 5.253 BCM by the year 2029-2030 and is scheduled for completion by May 2017.

h. **Redevelopment of the Mumbai High (South) - Phase III :** The implementation of the project at an investment of ₹ 6,069 crore will lead to an incremental gain of 7.547 million tonne (MMT) crude oil and 3.864 billion cubic meter (BCM) gas by 2030.The Project comprises of drilling 36 new Wells and 34 sidetrack Wells, and facilities. Drilling of Wells and the overall project completion is scheduled for March 2019.

i. **Daman Development Project** (C-24 Addl & B-12 fields) was approved by the ONGC Board on 28th August, 2014 with an investment of ₹ 5,219.15 crore (Phase I & II). The development plan envisages drilling of 28 wells through 7 well platforms with scheduled completion by March 2019. The project envisages peak gas & condensate production of 8.35 MMSCMD and 9,286 BCPD respectively with cumulative gas & condensate production of 27.67 BCM and 5.01 MMm3 respectively by 2035.

Policy initiatives undertaken by ONGC:

Strategic goals set for 2030; as per ONGC Perspective Plan 2030

- Sustained production growth 4-5%
- More than 130 mmtoe production in 2030 (50% international)
- 1,300 mmtoe proved reserves
- 6.5 GW alternate energy, 9MMTPA LNG
- Full downstream value capture in petrochemicals

Strategic Initiatives

- Major development projects including IOR/EOR schemes are under various stages of implementation to enhance crude oil and natural gas production.
- In order to increase the oil and gas production, ONGC has even taken up development of new marginal discoveries through innovative cluster development approach.
- A new and dedicated business unit viz. Eastern Offshore Asset has been constituted with an aim to put East Coast Discoveries on fast track development through an integrated East Coast Hub.
- With a view to explore and produce from hitherto elusive unconventional plays, ONGC has established & operationalized the following four

centers of delivery (COD).

- COD for Shale gas at Vadodara
- COD for Coal Bed Methane at New Delhi
- COD for HP-HT wells at Chennai
- COD for Basement exploration at Mumbai

- Substantive decentralization of administrative authorities together with delegation of financial authorities carried out to empower the field executives.
- Best- in-class technology inducted in core areas of E&P activities like
  1. Acquisition, Processing and Interpretation of seismic data
  2. Drilling and Production technology
  3. IT and communication

Drilling Services' initiatives:

- To strengthen our benchmarking by IDT, ONGC is in process of hiring International Consulting Agency for benchmarking studies as per international standards.
- Health Check-up and inspection of 10 drilling rigs and 10 work-over rigs with framing of discard policy under progress.
- Acquiring Drilling Software on Pan India Basis to strengthen Well Planning.
- Formulation of Quality and Cost Based Selection (QCBS) for hiring of Drilling Rigs.

Well Services' initiatives:

- **Subsea completion at shallow waters and deeper waters :**

  Application of Mudline system for shallow water well completions; Application of Vertical and horizontal tree systems for shallow water (water depth 40-100 mts) in western offshore and eastern coastal area and deep water wells in eastern offshore well completions;

  Induction of new technology for subsea completion for flow assurance, umbilical system, subsea architecture including intelligent completion in the well;

  Developing expertise in association with Subsea Domain Expert and International service providers.

- **High pressure / High temperature hydrocarbon reserve exploration and exploitation:**

  Adoption of suitable technologies for equipment & system for mitigating challenges in successful testing / completion of wells having high pressure and high temperatures in southern onland and coastal areas;

  Developing expertise in drilling and completion in association with International service providers.

- **Work over rig and Stimulation units for liquidation of wells and production enhancement:**

  Health checkup of all ONGC owned work over rigs and Stimulation Units to ensure efficiency and safety; Review of work over rig discard and replacement policy;

  Planning and acquisition of work over rigs and stimulation units as replacement as well as for capacity & capability enhancement.

- **Enhance capacity and capability to enable fracturing jobs for exploration and exploitation of hydrocarbon :**

  Increase Hydrofracturing capacity both in offshore and onshore;

  Increase stimulation bases across the on-land ONGC and number of offshore vessels for East coast and West coast separately;

  Develop in-house expertise for design, execution, analysis of stimulation jobs at par with International standards;

  R&D work to develop chemical formulations etc for field specific solutions;

  Policy & implementation of Multistage fracturing technology for thick sands mainly in southern region.

- **Shale gas exploration and exploitation:**

  Induct Shale gas fracturing technology through association with International Service providers;

  Adopt technology and develop in-house capacity and capability for future.

Technical Services' initiatives

- Equipment Management formulated standard operating practices (SOP) for various equipment used across ONGC to ensure conformance with organizational maintenance practices, improvement of safety and reliability. SOPs for Onshore Drilling rigs, Onshore Work over rigs, Onshore surface installations prepared

- Technical Services is in the process of issuing policy guidelines on the use of LED lights in ONGC. The proposal has been put up to EC for approval

Infocom initiatives

- Crisis Management Plan (CMP) for Countering Cyber Attacks and Cyber Terrorism has been prepared based on CERT-In template, validated from security expert, and is under approval of EC. CMP Incident Management team has been constituted at corporate level, which will meet weekly or in case of any requirement, to oversee resolution of incidents and discuss mitigation plans for upcoming / known threats & which are communicated by NCIIPC, CERT-in etc.
- ONGC official email, hosted within the company premises, has been extended to all users in ONGC. Uploading & downloading of attachments through all public mail is blocked.
- To improve IT security, use of unauthorised storage devices has been blocked and only unique no. storage devices are permitted in the network.

Environmental Initiatives

- Obtained EC for 373 projects till date, conducted their post project monitoring, based on six monthly EC compliances submitted to the Ministry by the asset and basin obtained compliance certificates from the regional offices of MoEF.
- MoEF through an Office Memorandum dated 2nd December, 2009 has made it mandatory requirement for any consultant to be accredited by National Accreditation Board for Education & Training (NABET) - the Quality Council of India (QCI). ONGC is the first PSU to get following two accreditations:
  a. NABET-QCI accreditation as the Consultant Organization for offshore and onshore oil and gas exploration, development & production and petroleum refining industry sectors.
  b. Provisional NABL-QCI accreditation for the Regional Lab Rajahmundry, Andhra Pradesh for Air, Water and Soil monitoring.
- Nodal and Coordinating Agency for Oil Spill with Indian Coast Guard & DG Shipping: Environment group at CHSE, Delhi acts as the nodal and coordinating agency for Oil Spill with Indian Coast Guard for National Oil Spill Disaster Contingency Plan (NOS-DCP) in East and West coast.
- Baseline Data Development of Offshore Facilities for Preparation of EIA and EC: A novel initiative is taken by IPSHEM, Goa by regular offshore monitoring for various oceanographic parameters including Oil content. The data thus produced is utilized for offshore EIA preparation and submission of six monthly compliance reports. This has reduced the time and cost of EIA preparation to a considerable amount.

Commitment to Environment and Inclusive Growth - Mangrove Plantation in Coastal Gujarat

Initiatives in Human Resource

- ONGC has always been a pioneer amongst the public sectors for the innovative initiative it undertakes for improving the effectiveness of HRM. ONGC has adopted some of the best HR practices to enhance the knowledge & skill levels of its employees and to involve, empower and improve the satisfaction level of its people for achieving Organizational Objectives.

7.2 NAVRATNA PSUs

7.2.1 Bharat Petroleum Corporation Ltd. (BPCL)

Bharat Petroleum Corporation Ltd. (BPCL) a Government of India Undertaking (Navratna), came into existence on 24th January, 1976 subsequent to the Government of India acquiring Burmah-Shell Oil Storage & Distribution Company of India and Burmah-Shell Refineries Limited.

BPCL is an integrated oil company in the downstream sector engaged in refining of crude oil and marketing of petroleum products. The Authorized Share Capital and Paid up Capital of the company as on 30th September, 2014 is ₹ 2,500 crore and ₹ 723.08 crore respectively

BPCL has Refineries at Mumbai and Kochi with a combined refining capacity of 21.5 MMTPA. The Refineries are certified for ISO 9001, ISO 14001 and OHSAS 18001, had throughput of 6.18 MMT and 5.25 MMT respectively during 2014-15 (up to September 2014).

BPCL with 12,834 employees has an all-India presence through its extensive marketing network and is the second largest oil marketing co. with Market Sales of 17.14 MMT & market share of 23.40%. Marketing Profile

BPCL has a robust distribution network comprising of 116 storage depots, 12 major installations, 23 TOPs, 50 LPG bottling plants, 36 Aviation Service Stations, 12,747 Retail Outlets, 3,655 LPG Distributorships, 2 lubricant blending plants and 1,938 KM cross-country pipeline.

Financial Performance

Financial performance (RE) of the Corporation during April - September 2014 : Gross Sales Turnover ₹1,34,466 crore and Profit After Tax (PAT) ₹1,680.46 crore.

Exploration and Production

BPRL, a 100% subsidiary company of BPCL has participating interests in 19 exploration blocks in consortium with various partners in India and abroad. BPRL has participating interest in these blocks directly or through wholly owned subsidiary companies.

Out of these 19 blocks, 8 are in India, 7 in Brazil, and 1 each in Mozambique, Indonesia, Australia and East Timor.

The Indian blocks were acquired under various NELP bidding rounds and foreign blocks were acquired through the bidding/farm in process.

BPRL's total acreage till end November 2014 is about 25,000 sq km, of which about 22,000 sq km (approx 88%) is offshore acreage.

BPRL consortium has had a total of 19 discoveries till end November 2014 (10 in Mozambique, 5 in Brazil, 2 in India and 1 each in Indonesia and Australia).

So far BPRL has invested about ₹ 8,200 crores for its projects and has commitments in excess of USD 1.5 bn.

Major Projects

Replacement of CDU/VDU at Mumbai Refinery

The project envisages installation of new state of art integrated Crude & Vacuum Distillation unit (CDU/VDU) of capacity 6 MMTPA as a replacement of old Crude and Vacuum units to enhance safety & environment with improved mechanical integrity. The approved cost of the project is ₹ 1,419 crore and is expected to be completed by March 2015.

Integrated Refinery Expansion Project (IREP) at Kochi Refinery

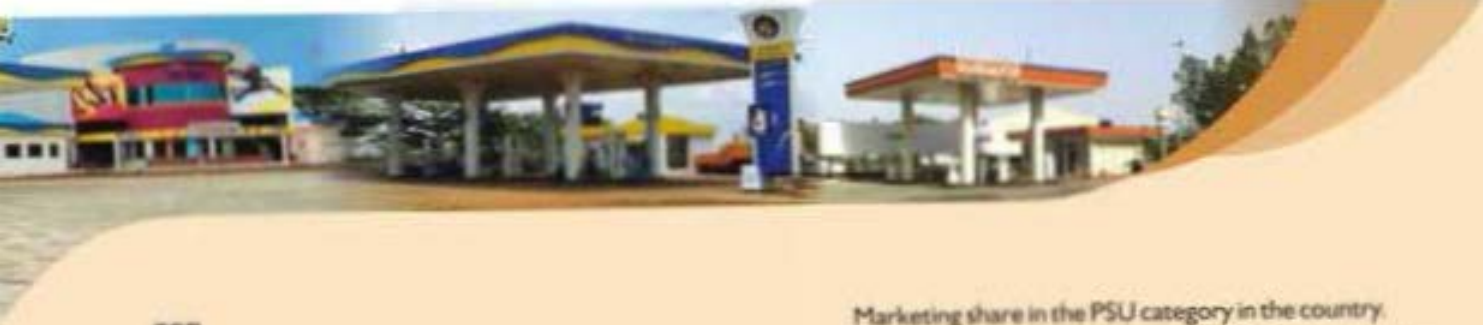
The project envisages expansion of the capacity of Kochi refinery by 6 MMTPA from the present 9.5 to 15.5 MMTPA and modernize the refinery to produce auto fuels conforming to Euro —IVN specs. The approved enhanced cost of the project is ₹ 16,504 crore and is expected to be completed by May 2016.

LPG transfer pipeline from BPCL & HPCL refineries at Mumbai to Uran

The project envisages laying of submarine pipeline of 10" diameter and 28 Km length from BPCL and HPCL Mumbai refinery to Uran LPG plant at an approved cost of ₹ 276.84 crore The Project is commissioned in October 2014.

Kota Jobner Pipeline Project

The project envisages laying of 210 Km long 14 inch dia. pipeline from Kota to Jobner at an approved cost of ₹ 276.27 crore and is expected to be completed by March 2015.



CSR

BPCL has a strong commitment towards CSR. The main thrust areas amongst others in CSR are Education, Water Conservation, skill Development, Health & Community development.

Contribution to Exchequer

BPCL's contribution to the Exchequer (RE) during April-September 2014 is ₹ 23,590 crore.

Major Accolades / Awards received:

- CMD BPCL has been recognized as the Best Performing CFO in the Oil & Gas/ Chemicals Sector, in the prestigious CFO 2013-14 awards instituted by CNBC TV18 (June 2014).
- BPCL got PetroFed Awards in two categories 'Leading Oil & Gas Corporate of the Year' and the - Oil & Gas Marketing Company of the Year' Awards, two of the topmost recognitions of the PetroFed Oil & Gas Industry Awards. Also won two Petrofed Awards (Pipeline Division and R & D Center) in the category 'Innovator of the Year' (Sept 2014).
- BPCL got World Petroleum Council's "Excellence Awards for Social Responsibility" for its flagship CSR program for Rainwater Harvesting - Project Boond in June 2014.
- BPCL got 'Star PSU of the Year' trophy in the Business Standard Awards for Corporate Excellence in 2013.
- Indian Institution of Industrial Engineering (IIIE) conferred the Performance Excellence Award 2013 on BPCL in the Platinum Category.
- Mumbai Refinery received the 'Gold Award' in the Process Sector — Mega Large Business' in the India Manufacturing Excellence Awards' (IMEA), instituted by M/s. Frost & Sullivan
- BPCL Kochi Refinery got a Rotary Binani Zinc CSR Excellence Award 2014 for the fourth consecutive year.

7.2.2 Hindustan Petroleum Corporation Limited (HPCL)

Hindustan Petroleum Corporation Limited (HPCL) is a Navaratna and a Global Fortune 500 Company, ranked at 260 with an annual Gross Sales of ₹ 2,32,188 crore during FY 2013-14 and having a strong presence in Refining & Marketing in India with about 21 % Marketing share in the PSU category in the country.

The 2013-14 performance of the Corporation has qualified for 'Excellent' rating in terms of the MOU signed with the Government of India (basis self-evaluation).

Physical Performance

As on September 2014, the total sale of products was 15.70 MMT, achieving a growth of 3.9% over historical. Pipeline throughput was 7.32 MMT and refineries processed 7.77 MMT of crude.

Financial Performance

As on September 2014, the Corporation has earned a profit of ₹ 896.25 crore as compared to (₹1,141.56 crore) of the same period in 2013-14.

Marketing and Associated Infrastructure

HPCL owns and operates Refineries at Mumbai & Visakh with a capacity of 6.5 MMTPA & 8.3 MMTPA respectively. HPCL also owns the largest Lube Refinery in the country at Mumbai for producing Lube Oil Base Stocks with a rapacity of 450 TMTPA. HPCL, in collaboration with M/s. Mittal Energy Investments Pte Ltd. Is operating a 9 MMTPA capacity Refinery at Bathinda in Punjab and also holds an equity of about 16.95% in the 15 MMTPA Mangalore Refinery and Petrochemicals Ltd (MRPL).

HPCL has the second largest share of product pipelines in India with a pipeline network of more than 2,500 kms. For transportation of petroleum products and a vast marketing network consisting 13 Zonal Offices in major cities and 100 Regional Offices facilitated by a Supply & Distribution infrastructure comprising of 35 Terminals, 68 Inland Relay Depots, 35 Aviation Service Stations, 46 LPG Bottling Plants, 7 Lube Blending Plants and 22 Exclusive Lube Depots. The customer touch points constitute of 13011 Retail Outlets, 3731 LPG Distributorships, 1638 SKO / LDO dealerships, 205 CNG Outlets, 218 Auto LPG Dispensing stations and 98 Commissioning & Forwarding Agents as of November 2014.

Exploration & Production

The details of various E&P activities undertaken by HPCL are given as below:

In order to become an integrated Hydrocarbon Company, HPCL has put specific focus on its upstream activities. The Corporation has made a strategic move by forming a wholly owned subsidiary "Prize Petroleum Company Limited (PPCL)" as its independent upstream arm. HPCL / PPCL are in the process of consolidating

their E & P activities and building internal capability by developing infrastructure and a young competent team. PPCL also enjoys the Operator status. Prize is operating 2 marginal producing fields in Cambay basin.

HPCL/PPCL are continuously pursuing various E&P opportunities in India and abroad to have a balanced portfolio of exploratory: developing and producing oil and gas assets. During the year 2014-15, Prize has acquired stake in two oil & gas blocks in Australia.

HPCL had Participating Interest in 20 exploration blocks in India in consortium with other E&P companies. Out of these, there was a discovery in one of the blocks CB¬ONN-2002/3, exploration work is in progress in 1 block and 18 blocks are in the process of relinquishment due to nil/sub commercial hydrocarbon discoveries. For Cambay block, declaration of Commerciality and Field Development Plan has been approved by MoPNG/DGH for both Miroli and Sanand Oil Pools.

In the year 2014-15, HPCL/PPCL (through its subsidiary PPIPL-Singapore) is likely to invest about ₹ 620 crore in E&P activities.

New Projects

HPCL has taken up a number of infrastructure projects for capacity expansion, viz., Mounded LPG storage and Jetty facilities at Mangalore LPG Import facility at Mangalore, New LPG Bottling Plants at Sholapur, Bhopal, Bangalore, Karimnagar and Panagarh in West Bengal. New POL Depots at Bokaro, Bihta and Kadapa and Revamping of POL Terminals at Paradeep and Budge Budge are in various stages of completion. 93 Kms Long Awa-Salawas Product PipeLine Completed and the pipeline is expected to be commissioned by Jan' 15 along with revamped Salawas terminal. The implementation of projects for laying 3 Product Pipelines i.e., (i) 442 km long Rewari-Bharatpur-Mathura-Kanpur product pipeline (ii) 164 km long Uran Chakan LPG product pipeline, and iii) 397 km long Mangalore-Hassan-Mysore-Solur LPG Pipeline are under progress.

In the Natural Gas segment, HPCL has initiated the project activities for setting up a 5 MMTPA LNG terminal at Chhara, Gujarat in a JV partnership with M/s S P Ports Pvt Ltd (a group company of M/s Shapoorji Pallonji). Further, HPCL is participating in two separate Joint Venture companies for laying building and operating three (3) natural gas pipelines.

The future plans in Refining include expansion of the existing Refineries at Mumbai to 10 MMTPA and Visakh to 15 MMTPA and setting up a new 9 MMTPA Refinery cum-Petrochemical complex at Barmer, Rajasthan as a JV with Govt. of Rajasthan.

7.2.3 Oil India Limited (OIL)

Oil India Limited (OIL), a Government of India Enterprise, 'A Navaratna Company' under the administrative set-up of Ministry of Petroleum and Natural Gas, is engaged in the business of exploration, production and transportation of crude oil, natural gas

OIL presenting final dividend cheque to Shri Dharmendra Pradhan, MoS (I/C), PNG in presence of Shri Saurabh Chandra, Secy., MoPNG

both in-country and overseas. The authorized capital of the Company is ₹ 2,000 crore and the paid up capital is ₹ 601.14 crore as on 1st April, 2014.

OIL's in-country operation spreads over various onshore ML and PEL areas in the states of Assam & Arunachal Pradesh, Mizoram, Andhra Pradesh, Pondicherry and Rajasthan. Besides, OIL is venturing into both shallow and deep water in KG basin, Cauvery and Andaman offshore either jointly or in partnership with other consortium partners.

OIL is currently holding overseas exploration blocks and PIs in other business ventures in ten countries, viz. Libya, Gabon, Nigeria, Yemen, Bangladesh, Myanmar, Venezuela, Mozambique, Russia and USA. In addition OIL also holds stake in 741 Km long pipeline construction and operation project in Sudan completed in 2005.

OIL holds 26% stake in Numaligarh Refinery Limited, 10% stake in Brahmaputra Cracker and Polymer limited, 23% stake in Duliajan – Numaligarh Pipeline Limited and 49% stake in Assam Petrochemicals Limited.

OIL owns and operates a trunk crude oil pipeline in the Northeast region of the country for transportation of crude oil produced by OIL as well as ONGC in the region to feed Numaligarh, Guwahati and Bongaigaon refineries. OIL also owns and operates a branch pipeline to feed Digboi refinery. At present, OIL is pumping imported crude to Bongaigaon refinery through its existing Barauni-Bongaigaon Trunk pipeline. OIL also produces Liquefied Petroleum Gas (LPG) in its plant at Duliajan, Assam.

The natural gas produced in Assam is sold to different customers, viz. BVFCL, APGCL, NEEPCO, IOC (AOD), APL, NRL and nearby tea gardens. The non-associated gas produced by the Company in Rajasthan is sold to Rajasthan Rajya Vidyout Utpadan Nigam Limited (RRVUNL). OIL commenced supply natural gas to M/S BCPL from September, 2014 onward for meeting their requirement of captive power generation and OIL is ready to supply the committed quantity of gas for their cracker plant likely to be commissioned in July, 2015.

Main Achievements during 2014-15 upto December 2014

- OIL has established four new hydrocarbon discoveries in upper Assam basin.
- OIL has bought a 50% stake in an oil block in Russia for USD 85 million during April 2014.

OIL receiving the SCOPE Commendation Certificate for Environment Excellence and Sustainable Development

- In order to finance the investment in Mozambique acquisition, OIL's inaugural US$ 1 billion dual-tranche unsecured bond issue in the international capital markets has been oversubscribed approximately 9.2 times.
- OIL in June 2014 has signed an agreement with Russia's Gazprom for joint pursuit of exploration opportunities across the globe.

Major Projects during 2014-15 upto December 2014

- OIL has competed 4 major projects in 2014-15. The details are as under:
- Gas Turbine Gen set of 20 MW capacity for Power Station at Duliajan (₹186.44 crore) - Completed on 31st December, 2014
- Central Gas Gathering and Offtake point-Madhuban (₹155.32 crore) - Completed on 19th December, 2014
- New SCADA Project (₹ 96.59 crore) - Completed on 29th December, 2014
- 6 Gas Pipeline for Gas supply to Gas Cracker (M/s. BCPL), Assam (₹ 70 crore) - Completed on 31st July, 2014

Policy initiative undertaken by OIL :

i. In view of the mandatory relinquishment policy of Government of India in respect of pre-NELP

nominated PELs, OIL is prioritizing activities in such areas for conversion of PELs in to Mining Leases (MLs), wherever discovery and commercial produce ability are established. Systematic implementation of recommendations of various geo-scientific consultative studies in the recent past for exploration of stratigraphic traps, re-development & revitalization of matured declining fields, intensive reservoir revitalization initiatives etc. is in progress.

ii. Effort will be enhanced to reduce the number of sick wells by bringing them back to production.

iii. OIL plans to enhance its production potential from the present level to 10 MMSCMD in the north-east mainly from non-associated gas source to meet the future requirement of natural gas, compensation for calorific value to consumers in post cracker scenario and cushion gas required for operational flexibility.

iv. OIL has been maintaining stable trend in indigenous crude oil production during the year 2014-15. The Company has initiated a number of measures in its main producing fields in Assam and Arunachal Pradesh to increase production, which are listed below:

- A number of geo-scientific studies like Integrated Basin modelling studies, Revitalization of old fields, Jorajan Re-Development, Thrust belt prospects, Stratigraphic trap prospects, Non- Associated Gas Field development, Pilot study for carrying out Seismic Reservoir characterization of Eocene Reservoirs, Post Drill Analysis of exploratory wells, Audit and certification of oil and gas reserves etc. were carried out in the recent past with the help of internationally reputed consultants and their recommendations like infill drilling, workover, enhancement in water injection are being implemented.
- Various IOR/EOR measures like enhancing water injection, MEOR technique by using micro-organisms, optimization through artificial lift methods by use of Electric Submersible Pumps (ESP), Je-pumps etc. for bringing into production shut in wells have been implemented/intensified.
- Drilling of Horizontal and J-bend wells
- Study is in progress by M/s FOROIL, France using their new proprietary technology for increasing productivity from the ageing Greater Tengakhat Field through a service contract.
- Matrix acidization in a few selected wells for smooth flow of oil/gas to well-bore.
- Procurement of 2 New generation drill rigs is in progress and expected to be commissioned by May, 2016.
- Procurement of new technology drilling tools MWD (Measurement while drilling) tools, Independent Rotary drive, Iron Roughneck, Drill pipe spinner etc and these would be in place by end 2015 or first quarter of 2016.
- Construction of Bagahjan-Duliajan Pipeline for Crude Oil (200 mm x 37 km) and Natural Gas (400 mm x 37 km) is in progress for ease transportation of crude oil gas.
- Capacity augmentation of Intermediate Tank Farm at Tengakhat is in progress to meet the requirement of additional production of crude oil.
- Construction of Oil Collecting Station at Barekuri is in progress for storing of produced crude oil from different wells in Barekuri area.

7.2.4 Engineers India Limited

Engineers India Limited (EIL) was established in 1965 with its head office in New Delhi to provide engineering and related technical services for petroleum refineries and related projects. Over the years, it has augmented its span of services and excelled in various fields to emerge as a leading Project, Design, Engineering and Turnkey (LSTK) contracting company in the fields of :

- Petroleum Refining
- Petrochemicals, Chemicals & fertilizers
- Crude, Petroleum products & Gas Pipelines
- Offshore/ Onshore Oil & Gas
- Terminals & Storage
- Sub Surface Strategic Storage
- Mining & Metallurgy
- Infrastructure

EIL in the year 2000-01, forayed into the infrastructure sector and since then has secured several noteworthy

Former President of India Dr. APJ Abdul Kalam delivered talk on leadership as part of EIL Golden Jubilee lecture series

and significant assignments related to modernization/ development of international airports, intelligent buildings and water management. In 2010-11, EIL has also taken diversification initiatives into fertilizer, nuclear and solar power and upstream E&P.

An ISO 9001 certified company, EIL has a network of regional offices in Chennai, Vadodara and Kolkata; branch office in Mumbai, overseas engineering /marketing office in Abu Dhabi, which is a hub of the company's activities in Middle East. There are Inspection/Procurement offices at various locations all over India and also in London, Milan and Shanghai with construction offices at different project sites both in India and abroad. Besides, EIL has a wholly owned subsidiary, Certification Engineers International Ltd for providing certification and inspection services. EIL has also formed two joint ventures — M/s TELL Projects Ltd with M/s Tata Projects Ltd in New Delhi and M/s Jabal EILIOT Company with M/s IOT Infrastructure & Energy Ltd and M/s Jabal Dhahran Company Ltd in Saudi Arabia.

EIL provides a comprehensive range of project related technology and engineering services spanning from project conceptualizing to project commissioning which includes revamp, capacity expansion and modernization of plants. The portfolio of 'services offered by the company includes:

PERFORMANCE HIGHLIGHTS

Business Secured 2014-15 (up to November 2014)

During the current financial year (up to November, 2014), EIL secured new business worth ₹ 1,561 crore.

Financial Performance:

The turnover and profit before tax of the company for 2014-15 was ₹ 2,000 crore and ₹ 558 crore, respectively.

Policy Initiatives Undertaken

The significant policy initiatives taken during the current financial year (upto November 2014) include the following:

MOUs signed with:

- GE Energy (USA) LLC, USA for collaboration in Petcoke Gasification
- UOP LLC,USA to expand business opportunities through integration of complimentary competencies and skills for Refinery, Petrochemical and Gas Processing industry
- Larsen & Toubro Limited to explore domestic & international oil and gas business activities particularly turnaround in refinery & petrochemical business for project execution and studies pertaining to aforementioned domains
- PT- Pertamina (Persero), Indonesia for potential

co-operation in connection with engineering services

HR Development:

Besides, the various ongoing HR interventions, policies and welfare measures, the following initiatives were pursued:

- Mentorship Development Program for new joinees under which trained mentors are allocated in ratios of 1:4 (Mentor: Mentee) was continued.
- Leadership Development program "Aarohan" carried forward to develop young leaders
- Performance Contracts based on Balance Score Card implemented
- Enhancement of IT in HR systems to provide online access to employees

Technology & Sustainable Development:

The following technology development projects were initiated during the year (up to November 2014):

i) Development of Process for Treatment of Naphtha Stream to Eliminate Mercaptan by CFC Process

ii) Regeneration of Glycol by Extractive Distillation - Eliminating need of Stripping Gases

iii) Solvent development for CO removal from sour gases

iv) Hydraulic testing of M/s KEVIN supplied PARLPAK 252m2/m3, ME250Y, ME250Y Additional and ME250Y Vantage at EIL R&D Complex

v) Development of technology for design of Higee water deaeration system in association with BPCL (R&D)

The following technology commercialization efforts were pursued:

i) Proposal to Numaligarh Refinery for Crude Distillation Unit (CDU) Preheat Train Optimization using Pinch technology was accepted and the job has been completed successfully

ii) Proposals sent and order expected for:

a) Parlpak application in quench columns and amine absorption columns of TGTU (Tail gas treatment unit) of BPCL-Mumbai Refinery.

b) Parlpak application in Scrubber column of Naphtha Deep Desulphurisation Project of IOCL-Guwahati

iii) Work order for has been received for Energy Efficiency Improvement Study (EEIS) at HPCL Visakh Refinery in association with CHT

iv) Based on Dynamic Simulation Capability Developed, a job has been secured to carry out Study for Up-gradation of Anti Surge Valve for Propane Compressor of Train 1 & 2 of ADGAS LNG plant at Das island Abudhabi. The study is under final stages of completion.

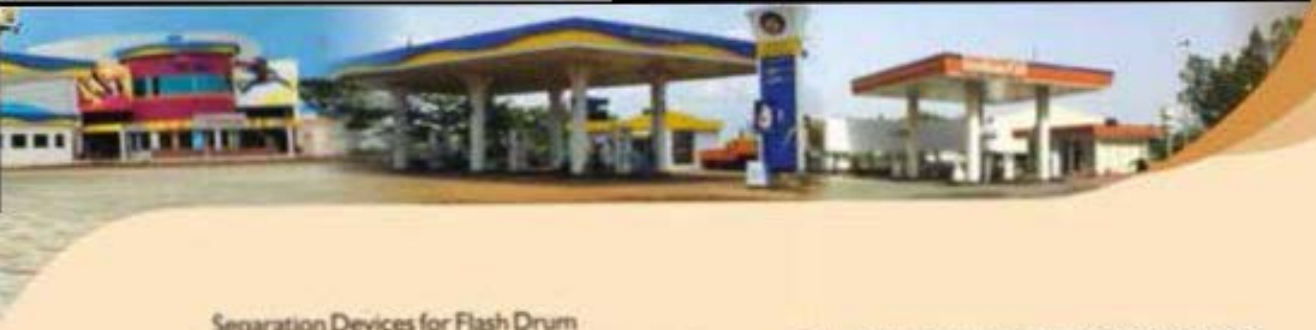
v) Proposal sent to Hindustan Copper Limited for implementation of SOR Process

vi) Co-operation Agreement with M/s Kevin Enterprises on Joint Development of High capacity trays and packings has started giving positive outcomes as order received from HPCL-VIZAG for supply of Parlpak in quench columns (3 columns) and amine absorption columns (3 columns) of TGTU(Tail gas treatment unit).

R&D activities likely to be initiated in the remaining four months of 2014-15:

i) Design Methodology for Trays with Explosion Hatches

ii) Process Design and Development of New



Separation Devices for Flash Drum

iii) Energy Efficiency Improvement Study at HPCL Visakh Refinery in association with CHT

iv) Renewal of membership of Process Science Technology Center, an industry-academia collaborative research program initiated by University of Texas, USA for year 2015-16

v) Renewal of membership of Fractionation Research Incorporated, a non-profit cooperative research organization based at Oklahoma, USA for year 2015-16

vi) Renewal of membership of Process Integration Research Consortium of University of Manchester UK for year 2015-16.

Based on innovative work done, during 2014-15 one patent has been filed entitled "High pressure fluidized bed gasifier and gasification process thereof' while two other patents filed earlier have been granted this year.

CSR Initiatives:

CSR activities are undertaken to enhance the company's overall contribution to society. In EIL, CSR is the commitment to operate in an economically, socially and environmentally responsible manner to enhance the company's overall contribution to society. EIL's CSR policy aims at creating a sustainable environment through its activities for communities and environment.

EIL's CSR activities are directed towards supplementing /supporting the ongoing and planned initiatives of the local, state or central government, with a focus on backward areas and underprivileged at various locations across the country including our project sites/offices and Delhi. The activities undertaken are in consonance and consultation with State Governments, district administration, local administration as well as Central Government Departments/Agencies, Self Help Groups, etc. so as to avoid duplication.

As per Companies Act 2013, the budgetary allocation of 2% of the average net profits made during the three immediately preceding financial years has been made in the financial year 2014-15 for CSR activities.

Various thrust areas of our CSR activities with brief detail on type of project/activities (upto November 2014) in each thrust area is elaborated below:

Education - Projects completed in this activity area were adoption of 100 Ekal vidyalayas/villages in rural/tribal areas of Dibrugarh, Assam for imparting basic informal education to children and construction/renovation of infrastructure facilities in various schools in Dibrugarh District of Assam.

7.3 MINIRATNA CATEGORY-I CPSES

7.3.1 Balmer Lawrie & Company Limited

Balmer Lawrie & Co. Limited (BL) is a multi technology, multi location Company headquartered at Kolkata with operations spread through India. The company has significant transnational business interest with a joint venture in Dubai, Indonesia and subsidiary in UK. The Company also has several joint ventures in India.

The Company's business interests span both manufacturing and services. The Company achieved a Gross Turnover of ₹ 2,842.89 crore during 2013-14 and Profit before Tax of ₹ 219.62 crore. The authorised capital, paid-up capital and reserves & surplus of the Company as on 31st March, 2014 was ₹ 60.00 crore, ₹ 28.50 crore and ₹ 791.14 crore respectively.

The major activities of the Company have been classified into Strategic Business units with fair autonomy in running of each business unit. The business units are shown as under classifying them under manufacturing and services :-

I. Manufacturing

(a) Industrial Packaging

(b) Greases & Lubes

(c) Performance Chemicals

II. Service

(a) Logistics Infrastructure

(b) Tours & Travel

(c) Logistics Services

III. Research & Development

(a) Technology Product Development, Kolkata

(b) Applications research Laboratory, Kolkata

(c) Product Development Centre, Chennai

The company also operates a wholly owned subsidiary in UK and vide joint ventures, two of which are outside the country (one in UAE and the other in Indonesia) and the rest are in India.

CSR activities undertaken by BL :-

- Education
- Health
- Drinking Water & Sanitation
- Skill Development
- Child Sustenance

- Promotion of Art & Culture
- Women Empowerment

7.3.2 Chennai Petroleum Corporation Limited

Chennai Petroleum Corporation Limited (CPCL) (formerly known as Madras Refineries Limited) was formed as a joint venture of the Government of India (GOI), Amoco India Inc., U.S.A. and National Iranian Oil Company (NIOC), Iran with the initial equity contribution in the ratio of 74:13:13. The company was incorporated on 30th December, 1965 as a Public Limited Company. Amoco Inc. disinvested its equity holding in favour of GOI in 1985. Later, Govt. of India transferred its equity share of 51.89% to Indian Oil Corporation Limited.

The Manali refinery was originally designed for processing 2.5 MMTPA (Million Metric Tonnes Per Annum) of imported Darius crude from Iran. CPCL's Manali refining capacity was increased from 2.5 MMTPA in 1969 to 10.5 MMTPA in 2011 through addition of new units and debottlenecking existing units. Secondary processing units like FCCU and OHCU were implemented to improve the total distillate yield. Facilities like DHDT, CCR and ISOM were also added to meet stringent Euro-TV quality norms for Diesel and Gasoline.

Performance

Physical Performance

CPCL processed 8066 Thousand Metric Tonnes(TMT) of crude oil during 2014-15 (upto December 2014) as against 10624 TMT in 2013-14.

Financial Performance

CPCL achieved a turnover of ₹ 53,955.6 crore during the year 2013-2014. The turnover upto December 2014 is ₹ 36,739.17 crore.

Summary of Performance

	2013-14	2014-15 (up to Dec. '14)	2014-15 (Projected)
Crude Throughput in TMT	10624	8066	10800
Total Distillate %	71.4	71.7	71.4
Turnover (₹ Cr.)	53923.7	36739.2	46591.0
Profit Before Tax (₹ Cr.)	(330.96)	(1106.96)	(1142.4)
Profit After Tax (₹ Cr.)	(303.85)	(403.56)	(440.0)

Projects

Resid up-gradation Project

To improve the distillate yield of Manali refinery, a Resid Up gradation Project is under implementation with an estimated cost of ₹ 3,110.36 Crores. This project involve: installation of Delayed Coker Unit and Revamping of existing Hydrocracker Unit along with other associated facilities. The Environment clearance for the Project was given in March 2013. The project implementation jobs are in progress and as on 30th November, 2014 physical progress of 51.1% has been achieved.

Mounded Bullet Storage

As a risk reduction measure and in order to provide intrinsically passive and safe environment, the Mounded Bullet Project is under implementation for LPG and Petrochemical feed stock storage at an estimated cost of ₹ 279 crore. As on 30th November, 2014. Physical progress of 87.7% has been achieved.

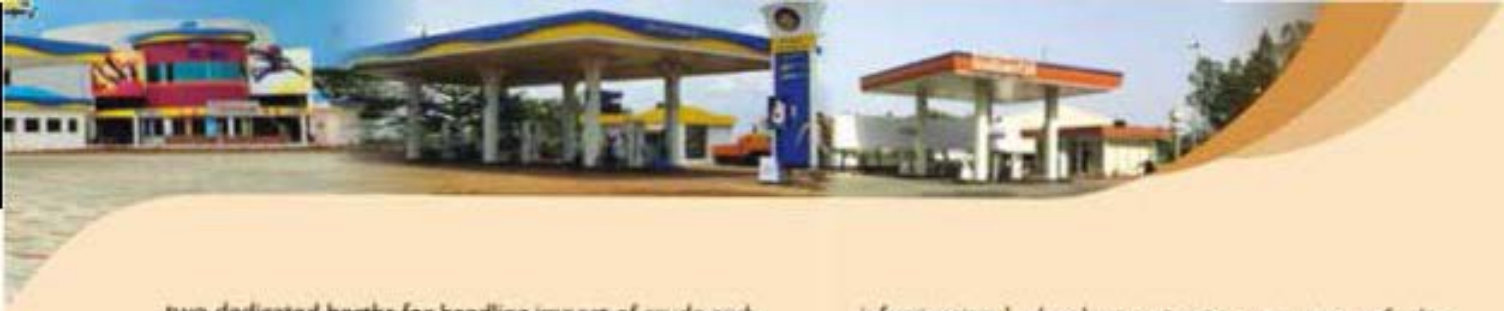
New 42" Crude Oil Pipeline

A new 42 " Crude Oil Pipeline Project, from Chennai Port to Manali Refinery, with enhanced safety features is planned to ensure reliable faster crude transfer from Port. The estimated cost of the project is ₹ 257.87 crore. The Ministry of Environment & Forests (MoEF) Government of India, accorded CRZ clearance for this Project in January 2014. However, approval from Ministry of Road Transport and Highways is awaited.

7.3.3 Mangalore Refinery & Petrochemicals Limited

Mangalore Refinery and Petrochemicals Limited (MRPL), the first ever Joint Venture Petroleum Refinery in India, was formed in 1987 by M/s Hindustan Petroleum Corporation Limited, a Navratna public sector oil company and M/s Indian Rayon & Industries Limited and its associate companies (AV Birla Group). MRPL achieved the highest ever crude processing of 14.59 MMT during the year 2013-14 against 14.41 MMT during the previous year 2012-13.

The refinery is located on the western coast of India close to the Middle East and Far East Crude and product markets. The refinery was primarily conceived to maximize middle distillates and fuel oils which were then in short supply in India. The Refinery is designed to process light to heavy and sour to sweet crude. It is connected to an all weather major Port viz New Mangalore Port. It has developed on user funded basis



two dedicated berths for handling import of crude and export of products.

MRPL has expanded the refinery name plate capacity to 15 MMTPA by adding a new crude distillation unit of 3 MMTPA capacity under the refinery expansion cum upgradation project (phase 3) at a cost of around ₹ 12,160 crore. MRPL was granted Schedule 'A' status on 4th July 2013. MRPL contribute to around 7% of India's total Refining Capacity. The refinery complex is certified with ISO-9001: 2008 & ISO-14001:2004 certifications for its Quality Management and Environment Management Systems. Further MRPL is also certified for ISO:50001 in the energy management system.

Projects:

Phase -III Refinery Upgradation and Expansion Project:

The commissioning of Secondary Process Units of Phase -III Refinery Upgradation and Expansion project is completed on 30th September, 2014.

Crude Distillation Unit (CDU), Hydrogen Generation Unit (HGU) and Diesel Hydrotreater Unit (DHTU) were commissioned during 2012-13. During the year 2013- 14, MRPL successfully commissioned Delayed Coker Unit (DCU), first train of Sulphur Recovery Unit (SRU) in April 2014, Coker Gasoil Hydro Treating Unit (CHTU) in May 2014, Second Train of SRU in July 2014 and Petrochemical Fluidized Catalytic Cracker Unit (PFCCU) in August 2014.

The total expenditure incurred by the Company on Phase —III Refinery Upgradation and Expansion project is around ₹ 12,078 crore as on 31st August, 2014.

Polypropylene Project (PP):

- The Polypropylene (PP) unit, being set up with the licensor Novelene Technology, Germany in integration with the Phase -III Project at an estimated Capex of Rs. 1,804 Crore, has achieved the overall progress of 96.6 % as on 31st August, 2014.
- Mechanical completion of Polypropylene Project (PP) was completed. The pre-commissioning activities are in progress.

MRPL's social welfare and community development initiatives focus on the key areas of education, health care and overall development of basic infrastructure in and around its operational areas. Facilitating Midday Meal to support continuing education, setting up of computer room, Anganwadi building, skill development training for youths, infrastructural development etc. are part of the Samrakshan activities.

MRPL won the Silver Trophy in the residual sector of the MSME category at the FIEO (Federation of Indian Export Organisation) Niryat Shree. MRPL has been conferred the prestigious Skoch Foundation Order-of-Merit Award for the Phase 3 Refinery Expansion and Upgradation Project has India's Best Project-2014 in the country.

7.3.4 Numaligarh Refinery Limited (NRL)

Numaligarh Refinery Limited (NRL) was incorporated on 22nd April, 1993. NRL's establishment is rooted in the "Assam Accord" signed by the Government of India on 15th August, 1985. NRL is a subsidiary of Bharat Petroleum Corporation Limited (BPCL) and operates a 3.0 MMTPA petroleum refinery at Numaligarh in Golaghat district of Assam. NRL is a Category-I Miniratna PSU. The Company's net worth as on 31st March, 2014 was ₹ 2,991 crore.

NRL's refinery has a high complexity factor owing to advanced secondary processing technologies that has enabled achievement of high distillate yield. Product slate of NRL comprises LPG, Naphtha, Motor Spirit, Aviation Turbine Fuel, High Speed Diesel, Superior Kerosene Oil, Raw/Calcined Petroleum Coke and Sulphur. Paraffin and Microcrystalline Wax are being added to the product slate after commissioning of the Wax plant.

NRL has an LPG Bottling Plant of 10 TMTPA capacity at Numaligarh besides two marketing terminals at Numaligarh and Siliguri. White Oil products, viz. MS, SKO and HSD are being transported from Numaligarh to Siliguri through the Numaligarh-Siliguri product pipeline (NSPL) of Oil India Limited.

During 2014-15, (up to Nov 2014) NRL recorded Crude throughput of 1926 MMT. Distillate yield at 90.85% and Specific Energy Consumption was recorded at 57.8 MBN.

During last three years, 2011-12 to 2013-14, NRL's expenditure against CSR activities were ₹ 5.86 crore, ₹ 5.51 crore and ₹ 5.29 crore. Budget allocation for 2014-15 is ₹ 7.62 crore against which expenditure during Apr-Nov, 2014 was ₹ 3.66 crore.

NRL is pursuing a project of expanding its refining capacity from 3.0 to 9.0 MMTPA, sourcing incremental crude oil through imports. Imported crude oil is envisaged to be transported through a new pipeline

Tank Farm area of Wax Plant, Numaligarh Refinery Limited

from an Eastern port to Numaligarh. Investment in NRL's refinery expansion project including the crude oil pipeline is estimated to be over ₹16,000 crore. Implementation of the NRL's refinery expansion project would be the single largest industrial investment in the North East region.

A MoU has been signed between NRL and M/S Chempolis, a leading Finland based biotechnology licensor on 11th September, 2014 followed by signing of a Partnership Agreement on 15th October, 2014 at Helsinki in presence of the presidents of both nations. Actions, have been initiated for carrying out detailed feasibility studies for the project. The proposed bio-refinery is expected to enable production upto 60 TMT Ethanol per annum.

NRL received the Jawaharlal Nehru Centenary Award for Energy performance for the years 2013-14 from the Centre for High Technology (CHT).

7.3.5 ONGC Videsh Limited (OVL)

Introduction

ONGC Videsh Ltd. (ONGC Videsh), a wholly owned subsidiary of Oil and Natural Gas Corporation Ltd. (ONGC) was rechristened from the erstwhile Hydrocarbons India Pvt. Ltd. which was incorporated on 5th March, 1965. The authorised and paid-up share capital of ONGC Videsh as on 30th September, 2014 stood at ₹ 10,000 crore. The primary business of the company is to prospect for oil and gas acreages abroad, which includes acquisition of oil and gas fields in foreign countries as well as exploration, production, transportation and sale of oil and gas.

Blocks acquired during the year 2014-15

- **Myanmar Onshore Blocks**

  ONGC Videsh has been awarded two onshore blocks namely B2 (Zebyutaung-Nandaw) and EP-3 (Thegon-Shwegu) in the Myanmar Onshore Bidding Round, 2013. This was announced by the Ministry of Energy, republic of the Union of Myanmar. Block B-2, having an area of 16995 sq. kms. is located in Northern Myanmar, bordering state of Manipur in India and Block EP-3 having an area of 1650 sq. kms. is located in Central Myanmar. The PSC for the Blocks were signed on 08th August, 2014

- **New Zealand Offshore Blocks Bidding Round-2014**

  ONGC Videsh has won an Exploration Block-14TAR-R1 (Petroleum Exploration Permit 57090) with an area of 2120.761 sq.km in New Zealand in the Bidding Round Block Offer, 2014 by the Government of New Zealand. ONGC Videshhad submitted bid for one exploration block located in

the Taranaki offshore basin in October, 2014. The license was awarded on 09th December, 2014 for a term of 12 years commencing from 1st April 2015.

ONGC Videsh presently has participation in 36 E&P projects in 17 countries namely Azerbaijan (2 projects), Vietnam (2 projects), Russia (2 projects), Sudan (2 projects) and South Sudan (2 projects), Iran (1 project), Iraq (1 project), Libya (1 project), Myanmar (4 projects), Syria (2 projects), Bangladesh (2 projects), Brazil (2 projects), Mozambique (1 projects), Colombia (8 projects), Venezuela (2 projects), Kazakhstan (1 project) and New Zealand (1 project) and is actively seeking more opportunities across the world. Details of participating interest in respect of ONGC Videsh projects are placed at Annexure-A. Out of 36 projects, ONGC Videsh is Operator in 15 projects and Joint Operator in 7 projects.

Currently, ONGC Videsh has oil and gas production from 13 projects in 10 countries, namely, Russia (Sakhalin-1 and Imperial Energy), Syria (Al-Furat Petroleum Co.), Vietnam (Block 06.1), Colombia (MECL), Sudan (Greater Nile Petroleum Operating Company), South Sudan (Greater Pioneer Operating Company and Sudd Petroleum Operating Company), Venezuela (San Cristobal), Brazil (BC-10), Azerbaijan (ACG) and Myanmar (Block A-1 & A3). Presently there is no production from AFPC, Syria project which is under force Majeure since December, 2011 after EU imposed sanctions on Syria. There are 4 projects where hydrocarbons have been discovered and are at various stages of development. Out of these 4 projects, first oil production from Carabobo1, Venezuela, through early accelerated production system started in December, 2012 and 17 projects are under various stages of exploration. ONGC Videsh also has stake in 2 pipeline projects (1 each in Sudan & Azerbaijan).

Blocks relinquished during the year

As of 30th November, 2014, no block has been relinquished by ONGC Videsh during FY 2014-15.

Special Achievements during the year:

(a) Physical

ONGC Videsh started production of oil and gas with a meagre production of 0.253 MMTOE in FY'03 and during the year 2013-14, ONGC Videsh achieved a production level of (O+OEG) 8.357 MMTOE. The production for the period April to November, 2014 along with production for RE 2014-15 & Actual 2013-14 is given below:

Particulars	Unit	RE 2014-15	April to November, 2014 (Provisional)	2013-14 Actual
Crude Oil*	MMT	5.362	3.653	5.486
Gas	BCM	3.110	2.096	2.871
Total Oil + Gas (MMTOE)	MMTOE	8.472	5.749	8.357

* Including Condensate

As on 1st April 2014, the remaining 1P and 2P reserves are 207.133 MMTOE (Oil 112.185 MMT, Gas 94.948 BCM) and 600.691 MMTOE (Oil 261.400 MMT, Gas 339.291 BCM) respectively in 11 countries.

(b) Financial

The consolidated total revenue of ONGC Videsh increased by 23.27% from ₹ 18,029 crore for the year 2012-13 to ₹ 22,224 crore for the year 2013-14 mainly due to higher production. The consolidated net profit after tax was up by 13.1% from ₹3,929 crore for the year 2012-13 to ₹ 4,445 crore for the year 2013-14. Net worth increased from ₹ 29,167 crore as on 31st March, 2013 to ₹ 41,549 crore as on 31st March, 2014, inter alia due to increase in equity share capital from ₹ 5,000 crore to ₹ 10,000 crore, additions to Foreign Currency Translation Reserve and addition of profits for the year. The consolidated gross revenue of ONGC Videsh for the half year ended 30th September, 2014 was ₹ 11,667 crore as compared to gross revenue of ₹10,232 crore for the half year ended 30th September, 2013, showing an increase of 14.03%, mainly due to increased production. The consolidated group profit after tax of ONGC Videsh for the half year ended 30th September, 2014 was ₹ 2,068 crore as compared to consolidated group profit after tax of ₹1,886 crore for the half year ended 30th September, 2013, showing an increase of 9.70%.

The revenue & profit after tax for the period April to September, 2014, RE 2014-15 & Actual 2013-14 is given below:

Particulars	Unit	RE 2014-15	April to September, 2014	2013-14 Actual
Total Revenue	₹ Crore	22,044	11,667	22,224
Group Profit After Tax		3,402	2,068	4,445

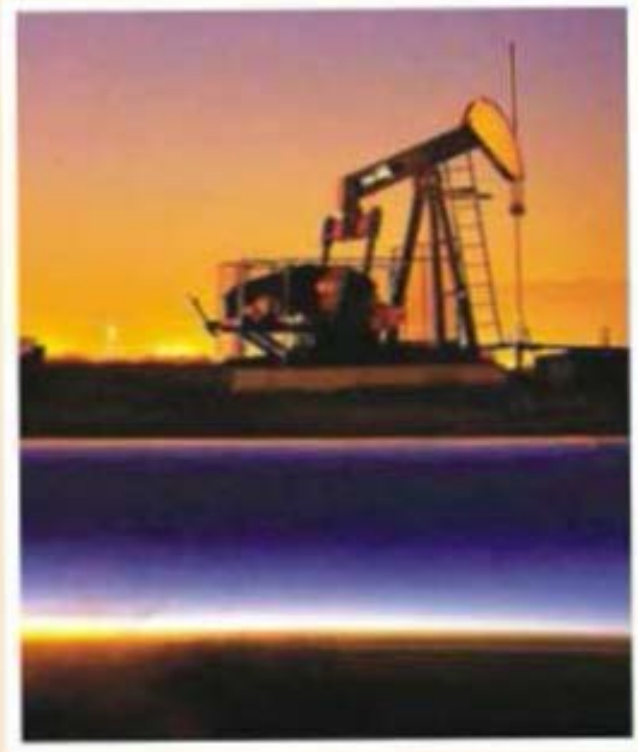
Investments made during the year:

The actual plan expenditure for from April to November, 2014 (provisional), RE 2014-15 & Actual 2013-14 is given as under:

Particulars	Unit	RE 2014-15	April to September, 2014	2013-14 Actual
Total Plan Expenditure	₹ Crore	10,147	5,126	35,357

During the year 2013-14, the actual plan expenditure was ₹ 35,357 crore as against ₹ 36,117 crore kept in Revised Estimates (RE), showing 98% utilisation.

ONGC Videsh has invested a total amount of ₹ 1,13,356 crore upto 31st March, 2014 since inception. During the period from April to November, 2014, ONGC Videsh has invested a total amount of ₹ 5,126 crore (Provisional) and RE 2014-15 plan outlay is estimated at ₹ 10,147 crore.



Import/Export of POL & Natural Gas:

ONGC Videsh does not import/export POL & Natural Gas.

Agreements/MoU signed during the year:

- **MoU with ONGC**

  ONGC Videsh entered into a performance related MoU with ONGC for the year 2014-15, duly authenticated by MoP&NG and DPE incorporating the suggestions/ changes of the MoU Task Force. The MoU was executed on 25th March, 2014 and was submitted to DPE and MoP&NG on 28th March, 2014.

  Crude Oil (including condensate) production targets for MoU 2014-15 are 5.100 MMT under Excellent category (excluding 0.200 MMT from South Sudan) & 4.989 MMT under Very Good category (excluding 0.195 MMT from South Sudan). Natural Gas production targets are 2.768 BCM under excellent category and 2.630 BCM under Very Good category

- **Heads of Agreement (HOA) with PVEP, Vietnam**

  ONGC Videsh Limited has signed a Heads of Agreement (HOA) with PVEP for mutual cooperation for exploration in Blocks 102/10 & 106/10 of PVEP and Block 128 of ONGC Videsh in offshore Vietnam, subject to due diligence and negotiations on terms of participation. The HOA was signed by Mr. Narendra K. Verma, Managing Director on behalf of ONGC Videsh and Dr. Do Van Khanh, President & CEO on behalf of PVEP.

  The HOA were exchanged in the gracious presence of visiting Prime Minister of Vietnam H.E. Mr. Nguyen Tan Dung and Hon'ble Prime Minister of India, Shri Narendra Modi at Hyderabad House, New Delhi on 28th October, 2014.

- **Letter of Intent (LOI) with PetroVietnam**

  ONGC Videsh Limited (ONGC Videsh) and PetroVietnam, the major oil producing state owned company of Vietnam have signed a Letter of Intent (LOI) on 15th September, 2014 to participate in the exploration of oil & gas in the offshore Vietnam, during the state visit of Hon'ble President of India to Vietnam.

Signing of MoU for Co-operation in the field of Oil & Gas between India and Mozambique

The Letter of Intent (LOI) was signed by Mr. Narendra K. Verma, MD & CEO on behalf of ONGC Videsh and Dr Do Van Hau, President & CEO on behalf of PetroVietnam in the gracious presence of Hon'ble President of India, Mr. Pranab Mukherjee, President of Vietnam H.E. Truong Tan Sang and Mr. Dharmendra Pradhan, Hon'ble Minister of State (Independent Charge), Petroleum & Natural Gas, Govt. of India.

The LOI provides for expansion of exploration activities by ONGC Videsh in Vietnam by considering participation in 2-3 additional blocks subject to technical and commercial viability and requisite approvals. In turn, PetroVietnam may consider participation in some of the exploration blocks of ONGC Videsh on mutually agreeable terms subject to due-diligence.

- **Memorandum of Understanding (MoU) with YPF S.A**

ONGC Videsh Limited (ONGC Videsh) and YPF S.A., the major oil producing company of Argentina have entered into a Memorandum of Understanding (MOU) on 1st September, 2014 to cooperate in the hydrocarbon sector.Under the MOU, the two companies will analyse the opportunities for cooperation in upstream sector in Argentina, India and third countries. The MOU also envisages collaboration in the areas of research & development and human resources.

- **Memorandum of Understanding (MoU) between ONGC Videsh and Turkish Petroleum Corporation**

ONGC Videsh Limited (ONGC Videsh) entered into a Memorandum of Understanding (MOU) with Turkish Petroleum Corporation (TPAO) on the sidelines of World Petroleum Congress (WPC) 2014 at Moscow. The MOU was signed by Mr. SP Garg, Managing Director, ONGC Videsh and Mr. Besim Sisman, President and CEO of TPAO on 18th June, 2014 in the presence of Asc. Prof. H. Murat Mercan, Deputy Minister, Ministry of Energy and Natural Resources, Republic of Turkey.

The MOU paves the way for joint cooperation between two National Oil Companies in the hydrocarbon sector. The MOU envisages two companies working together for E&P activities in Turkey, joint participation in bidding for opportunities including exploration bid rounds in third countries and pursuit of hydrocarbon area related research and development activities.

- **Memorandum of Understanding (MoU) between ONGC Videsh and Rosneft**

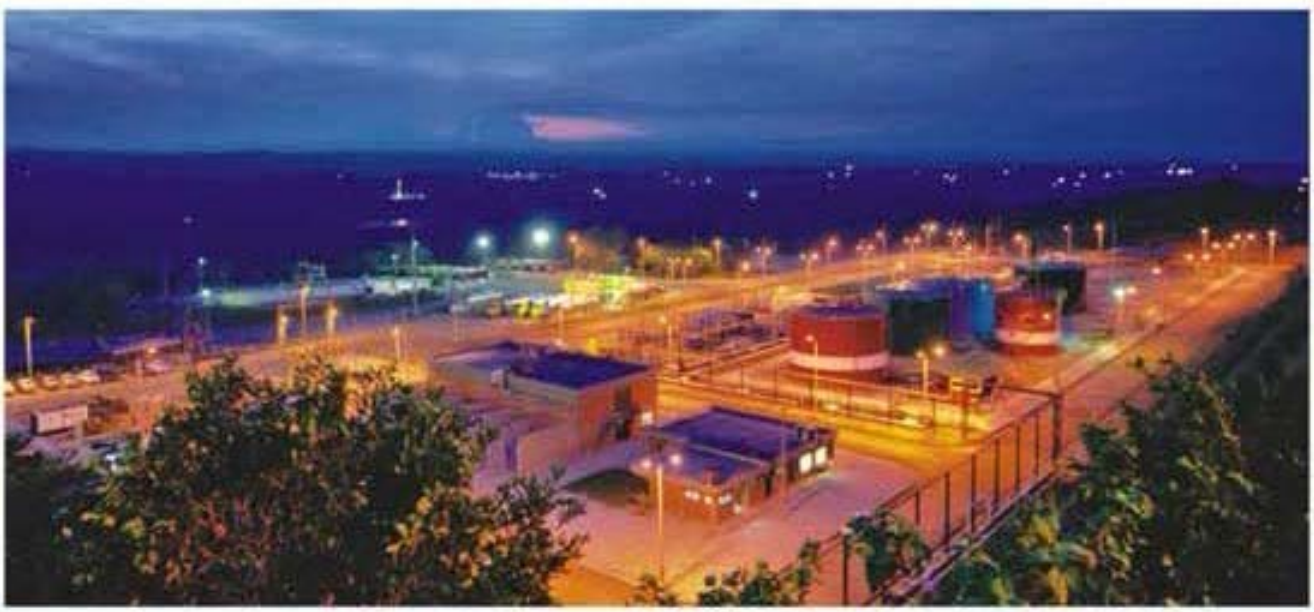
  Igor Sechin, President and Chairman of the Management Board, Rosneft and Dinesh Kumar Sarraf, Chairman of the Board of Directors, ONGC Videsh Ltd and Chairman & Managing Director, ONGC signed a Memorandum of Understanding at the St. Petersburg International Economic Forum, in the presence of Mr. Vladimir Putin, President of the Russian Federation. The Memorandum paves the way for the companies' cooperation in subsurface surveys, exploration and appraisal activities and hydrocarbons production in Russia's offshore Arctic.The parties will jointly consider forming a consortium led by Rosneft and involving other partners

- **Memorandum of Understanding (MoU) between ONGC Videsh and Mubadla Petroleum, UAE**

  ONGC Videsh Limited (ONGC Videsh) has entered into a Memorandum of Understanding (MOU) with Mubadla Petroleum on 29th September, 2014 for collaboration in upstream oil & gas exploration, development and production projects and Liquefied Natural Gas (LNG) opportunities in a manner that shall be mutually beneficial to the parties. The MOU was signed by Dr. Anil Bhandari, Director (Exploration), on behalf of ONGC Videsh and Mr. Musabbeh Al Kaabi, Chief Growth Officer, on behalf of Mubadla Petroleum, UAE

- **Memorandum of Understanding and Cooperation with Pemex-Exploracion Y Produccion (PEP), Mexico**

  ONGC Videsh Limited (ONGC Videsh) and Pemex-Exploracion Y Produccion (PEP), the upstream subsidiary of Pemex, the National Oil Company of Mexico, have entered into a 'Memorandum of Understanding and Cooperation' (MOU) on 25th September 2014 to cooperate in the hydrocarbon sector in Mexico. The MOU was signed by Dr. Anil Bhandari, Director (Exploration), on behalf of ONGC Videsh and Mr. Gustavo Hernandez Garcia, Director General, on behalf of Pemex –Exploracion Y Produccion at Cancun, Mexico on the side-lines of World National Oil Companies Congress-Americas being held in Cancun. The MOU was signed in presence of Mr. Emilio Lozoya, the Chief Executive Officer of Pemex.Under the MOU, the two companies plan to discuss future cooperation and collaboration in the upstream sector in Mexico. The MOU also envisages cooperation in the fields of technology, human resources, research & development.:



7.4 OTHER CPSEs

7.4.1 Biecco Lawrie Limited

Biecco Lawrie Limited (BLL), under the administrative control of the Ministry of Petroleum & Natural Gas (MoP&NG), was established in 1919 and became a Government Company in 1972. This is a medium sized Engineering Unit with diversified activities having two factories located at Kolkata. As on 31st March, 2014, the Company had an authorized share Capital of ₹ 75 crore, while the issued, subscribed and paid-up Capital was ₹ 74.76 crore. The president of India and the Oil Industry Development Board (OIDB) holds 32.23% and 67.33% respectively, of the Equity Share Capital.

During the financial year 2013-14 total Sales and other income was ₹ 3,961.78 lakhs which was marginally lower than the figure of ₹ 4,707.73 lakhs pertaining to 2012-13. The Net Loss during 2013-14 was to the tune of ₹ 1,438.81 lakhs. The Deferred Tax for the year 2013-14 is ₹ 11.06.

The major operations of the Company are as under :-

(i) Switchgear & Spare Parts
(ii) Electrical Repairs
(iii) Projects
(iv) Lube Oil Blending & Filling

7.4.2 Balmer Lawrie Investments Limited

Government of India, in view of its planned deregulation of oil and globalization of the economy, decided to disinvest 33.58%, of its total equity holding of 59.58%, in IBP Company Limited (IBP) to a strategic partner with management control. Consequently, the shareholding of IBP, in its erstwhile subsidiary Balmer Lawrie & Company Limited (BL), was de-merged in favour of Balmer Lawrie Investments Limited (BLIL), which was incorporated on 20th September 2001 under the Companies Act, 1956. The President of India holds 59.67%, of its total paid up equity capital. BLIL is under the administrative control of Ministry of Petroleum & Natural Gas having its Registered office at Kolkata.

BLIL is a non-banking financial Company as defined under section 45-I(f) of the Reserve Bank of India Act, 1934. BLIL does not carry on any business except to hold 1,00,64,700, equity shares of ₹ 10/- each of BL.

Joint Ventures/Subsidiaries:

(a) Joint Venture Companies - BLIL does not have any joint venture with any corporate entity.

(b) Subsidiary Companies-

BLIL has at present two subsidiary companies, namely:

(i) Balmer Lawrie & Co. Ltd. (as per Section 4(1)(b)(ii) of the Companies Act, 1956 [which is referred to herein as 'BL']; and
(ii) Balmer Lawrie (UK) Ltd. (as per Section 4(1)(c) of the Companies Act, 1956).

An MoU was signed between CGDA and Balmer Lawrie for implementation of Air Travel Module in Defence Travel System

7.5 OTHER ORGANISATIONS

7.5.1 Oil Industry Development Board (OIDB)

Objectives and Functions of the Board

The Oil Industry Development Board was established on 13th January, 1975 under the Oil Industry (Development) Act, 1974 to provide financial and other assistance for development of Oil Industry. The functions of the Board, as defined in Section 6 of the Act, involve rendering financial assistance including loans and grants to the promotion of all such activities as are, in its opinion, conducive to the development of the Oil Industry.

Organisational Setup

During 2014-15, the Board under the Chairmanship of Secretary, MOP&NG consisted of Secretary, Deptt of Chemical and Petrochemical, Special Secretary and Financial Adviser, MOPNG, Special Secretary, Deptt of Expenditure, Joint Secretary (Exploration), MOPNG, Chairman IOCL, ONGC, GAIL, BPCL and HPCL, Director General of Hydrocarbons, Director (R&D) IOCL and Secretary, OIDB as Member Secretary.

Resources of the Board

The funds required for various activities as envisaged under the Act are made available by the Central Government after due appropriation by Parliament from the proceeds of cess levied and collected on indigenous crude oil. So far OIDB has received an amount of ₹ 902.40 crore from the Central Govt. This amount together with internal receipts generated as interest income on loans given to various oil sector companies and short term investment of surplus funds has accumulated to ₹ 11,312 crore (provisional) as on 15th January, 2015.

Deployment of Funds

During 2014-15 (upto 15th January 2015), OIDB has extended loans to IOC, GAIL Gas, BPCL and HPCL, amounting to ₹ 1,428 crore and Grants to institutions viz. DGH, PCRA, CHT, OISD, PPAC and Rajiv Gandhi Institute of Petroleum Technology (RGIPT) (for R&D activities) amounting to ₹ 203.05 crore. Indian Strategic Petroleum Reserves Ltd. (ISRPL), a wholly owned subsidiary of OIDB has been entrusted with the construction of Strategic Storage for crude oil at three locations. During 2014-15 (upto 15th January 2015), an amount of ₹ 204 crore was released to ISPRL as advance against equity.

Setting up of Hydrocarbon Sector Skill Council for Oil & Gas Sector

OIDB has been entrusted with the nodal responsibility of forming a Hydrocarbon Sector Skill Council, (HSSC). A joint application was filed with National Skill Development Council by OIDB during the year. The industry group has already identified 134 trades covering entire hydrocarbon sector and construction in services specific to hydrocarbon sector. NSDA/NSQC has approved the proposal of setting up of HSSC. NSDC has also conveyed its approval for grant of ₹ 5 crore to HSSC.

7.5.2 Oil Industry Safety Directorate (OISD)

Oil Industry Safety Directorate (OISD) is a technical directorate under the Ministry of Petroleum and Natural Gas and has been entrusted with the responsibility of formulating standards, overseeing its implementation through safety audits in petroleum industry to enhance safety levels and reduce risk inherent with this industry. OISD standards cover the entire activities pertaining to hydrocarbon sector i.e. exploration & production, refining, gas processing, storage, distribution, environment etc. which are implemented on self-regulatory basis by public sector oil companies.

Our goal is to achieve Nil accident in Oil & Gas Installations in co-ordination with industry members both public and private sector.

Safety Audits by OISD (ESA/SSA)

OISD carries out periodic safety audits of all types of Oil & Gas installations to monitor their compliance with the OISD standards. OISD Safety Audit Performance for the year 2014-15 is as indicated below:

Actions	Unit	Plan	Actual (Dec'14)
Core Audits			
Refineries & Gas Processing plants	Nos	20	06
Mktg. Installations	Nos	60	39
E&P Onshore	Nos	60	51
E&P Offshore	Nos	10	09
Cross Country Pipelines	Kms	5000	4940
Additional audits Pipelines Installations			
Jetty Pipelines for Hydrocarbon Transportation	Nos	03	01
Pipelines Crude Tank farms	Nos	03	02

Hon'ble Prime Minister of India along with Hon'ble MoS (I/C) PNG dedicated a petroleum installation to the country apropos pre-commissioning safety audit by OISD in July, 2014

Pre-Commissioning Safety Audits (PCSA)

To ensure safe & productive capitalization thereby enabling uninterrupted distribution of petroleum products for the public at large, OISD carries out pre-commissioning safety audits of Greenfield projects across the Oil & Gas Industry. These audits are conducted where green-field developments and also major additional facilities at existing locations are being done, to ensure ab initio compliance of these facilities to the OISD standards at the construction stage itself.

During 2014-15, 38 nos. of such audits had been conducted on the request of the user Industry members. 270 Km of Pipeline covering eight pipelines installations were also audited in this context.

'Consent to Operate' for Offshore Installations

OISD, as the competent authority to oversee implementation of the Petroleum & Natural Gas (Safety in Offshore Operations) Rules, 2008 accords 'consent to operate' to offshore installations including Drilling Rigs. 07 drilling platforms and 04 drilling rigs have been accorded 'consent to operate' during 2014-15.

प्रधान मंत्री

Prime Minister

MESSAGE

I am happy to know that the Oil industry Safety Directorate is organizing a convention on the "Future of Oil and Gas in India's Energy Security". I am also happy to note that a special session on safety has been included in the convention.

Energy security is indeed a vital element of India's march to progress and prosperity. And the quest for energy security shall remain elusive, unless personnel employed in the oil and gas sector can be assured of the highest standards of safety.

My best wishes to the organizers and participants of the convention. I hope the deliberations shall be fruitful and productive.

New Delhi
19 August, 2014

(Narendra Modi)

Technical Seminar / Conference / Workshops

Technical Seminars / Conferences / Workshops for the Oil industry are conducted by OISD to discuss the latest technological developments, sharing of incident experiences etc.

During the year 2014-15 OISD has organized the following two seminars/workshops:

(i) One day Workshop on "Safety & Integrity of Cross Country Oil & Gas Pipelines" was organized on 25th August, 2014.

(ii) Joint Seminar with API on the theme 'Enhancing Process Safety Implementation in Oil & Gas Industry' was held during 17th-18th November, 2014.

Dissemination of Safety Knowledge through National Conventions/Seminars

Through endeavors of OISD, a special session on Safety was included in a National Convention on the subject 'Future of Oil & Gas in India's Energy Security' held in Mumbai during August, 2014. The effort was appreciated by the Hon'ble Prime Minister of India.

Encouragement of Safety Performance across the Industry through 'Oil Industry Safety Awards'

Annual evaluation of Safety Performance of the Industry Members is done by a specially developed methodology, which takes cognizance of hazards associated, incident recorded during the year and safety management system of the installation. Organizations, achieving 'exceptional safety performance' during the year, are awarded with the Oil Industry safety Awards. In addition, individuals making exceptional contributions towards the cause of safety in their respective installations are also encouraged and presented with such awards.

Oil Industry Safety Awards for the year 2012-13, had been handed over to the recipients by Hon'ble Minister of State (Independent Charge) for Petroleum & Natural Gas in a glittering function at Delhi on 3rd December, 2014.

SOP on integrity assessment of ageing cross-country pipelines

For Inspection of Pipelines, with a focus on particularly the health assessment of ageing assets, OISD has developed a comprehensive document. The document was released by Hon'ble Minister of State (Independent Charge) for Petroleum & Natural Gas, during the recently concluded Safety Awards ceremony. The guidelines would enable operators to take timely decision on repair/replacement of the pipelines based on direct assessment of the health of the pipelines.

Hon'ble MoS(I/C) PNG, Secy. PNG & Joint Secy.(Refinery) releasing the document during Oil Industry Safety Awards Ceremony at New Delhi.

The Safety Council

To ensure proper implementation of the various aspects of safety in the Oil & gas Industry in India, Government of India had set up a Safety Council at the apex under the administrative control of Ministry of Petroleum & Natural Gas. The Oil Industry Safety Directorate (OISD) assists the Safety Council, which is headed by Secretary, P&NG as Chairman and members represent the entire spectrum of stakeholders — PSU, Pvt. Sector & JVs — as well as relevant expert bodies. To review the safety performance, the Safety Council meets once a year and 31st meeting of the Council was held on 9th December 2014.

Development of Safety Standards

OISD develops Standards / Guidelines / Recommended Practices for the oil and gas sector through a participative process involving all the stakeholders (including the public at large), drawing inputs from international standards and adapting them to Indian conditions by leveraging the experience of the constituents. These standards cover inbuilt design safety, asset integrity and best operating practices in the field of production, processing, storage and transport of petroleum. OISD standards are reviewed periodically to ascertain needs of developing new standards, updating / amending existing standards to incorporate the latest technological developments as well as current experiences on the ground. As on date, OISD has developed 118 technical safety standards for the oil industry. 11 of these standards had also been included in statutory provisions of Petroleum Rules and Gas Cylinder Rules.

During the year 2014-15, OISD has formulated five numbers of New Standards and revised/amended six numbers of the existing standards. The list of new standards formulated by OISD during 2014-15 includes a comprehensive standard OISD STD 244 on "Storage and Handling of Petroleum Products at Depots and Terminals Including Standalone Crude Oil Storage Facilities". The formulation of such comprehensive standard shall further enhance the safety level in these installations.

Currently, three numbers of New Standards are under formulation and another nine numbers of existing OISD Standards have been taken up for revision / amendments.

Incident Investigation & Analysis

OISD investigates as well as participates in investigation of major incidents (depending upon the severity/ damage) to analyze root cause of the incident. A data bank of incidents of the oil industry is maintained and analyzed to assess trends, areas of concern and required corrective action. These are then disseminated to the industry through safety alerts, advisory notes, workshops, training programs, website links etc. During 2014-15, 11 numbers of major incidents were investigated by OISD.

Knowledge sharing collaborations

In addition to the existing MOUs with Bureau of Safety and Environmental Enforcement (BSEE) of the Department of the Interior, Govt. of USA and with Centre for Chemical Process Safety (CCPS) under the aegis of AIChE, USA, OISD has taken further strides in this area in the year 2014-15.

Industry leaders engaged in animated discussion during the panel discussions at API and OISD Joint Seminar

As a significant initiative in this context; with an objective to further enhance Process Safety in the entire Oil & Gas Industry in India on May 15, 2014, OISD has signed a Memorandum of Understanding with the "American Petroleum Institute (API)" — world leader in Standards Formulation in the Petroleum Industry.

The signing of this historical and landmark MoU would not only be beneficial to both the organizations i.e. OISD and API, but it would go a long way in enhancing the safety of the entire Oil & Gas Industry as a whole.

Both the partners have followed up the MoU by organizing a Joint Seminar on the theme Enhancing Implementation of Process safety at Oil & Gas Installations.

Assessing 'Equivalent' Rim Seal Fire Protection System (RSFPS) for Class 'A' External Floating Roof Petroleum Storage tanks.

Upon sustained efforts of OISD in association with the Industry, provision of Aluminum Geodesic Dome Roof over the existing External Floating Roof Tanks of small diameter (< 5000 Kl) has been established as an alternate technology to the Rim Seal Fire protection System. With such dome roof installed, these tanks then may be considered as Internal Floating Roof Tanks (IFRTs); thus obviating the need for RSFPS thereon.

Further in this context, Bench Scale trials of another potential 'Equivalent' System the 'Two Wire Based Detection System with Automatic Foam Suppression' were successful and the system has now graduated to another level which is field trials on existing Petroleum Tank.

Monitoring of MB Lal Committee Recommendations

OISD & MoP&NG continues to vigorously follow up with the entire Oil & Gas Industry to regularly monitor the pace of Implementation of M B Lal Committee recommendations. 94% of the recommendations have already been complied with by the Industry and the rest are under advanced stage(s) of implementation.

Safety Regulator for Petroleum & Natural Gas industry

In line with the recommendations of the various expert committees in this context, OISD has developed the draft Petroleum & Natural Gas Safety Board Bill. The bill had been duly processed for consideration at the Committee of Secretaries (CoS). At present the Bill under consideration at the CoS.

7.5.3 Directorate General of Hydrocarbons (DGH)

In view of the need to establish an agency that could effectively supervise the activities of all E&P companies from the private & joint sectors in the national interest, Directorate General of Hydrocarbons was set up on 8th of April, 1993.

The objective of DGH is to promote sound management of the Indian Petroleum and Natural Gas resources having a balanced regard for the environment, technological and economic aspects of the petroleum activity.

Role and Functions

- To review the exploration programmes of companies operating under Petroleum Exploratiion Licences granted under the Oilfields (Regulation and Development) Act, 1948 and the Petroleum and Natural Gas Rules, 1959 with a view to advising Government on the adequacy of these programmes.
- To evaluate the hydrocarbon reserves discovered and estimated by the operating companies.
- To advise the Government on the offering of acreages for exploration to companies as well as matters relating to relinquishment of acreage by companies.
- To review the development plans for commercial discoveries of hydrocarbon reserves proposed by the operating companies and advise Government on the adequacy of such plans and the exploitation rates proposed and matters relating thereto.
- To review and audit concurrently the management of petroleum reservoirs by operating companies and advise on any mid course correction required to ensure sound reservoir management practices in line with the optimal exploitation of reserves and the conservation of petroleum resources.
- To regulate the preservation, upkeep and storage of data and samples pertaining to petroleum exploration, drilling, production of reservoirs etc. and to cause the preparation of data packages for acreage on offer to companies.
- All other matters incidental thereto and such other functions as may be assigned by Government from time to time.
- Assist Govt. in Contract management functions.
- Exploration & Development of unconventional hydrocarbon resources like Gas Hydrate, Shale gas/oil and oil shale.

DGH Achievements for the year 2014-15 (April-December, 2014)

1. **Offer of New Exploration Areas**

   The Ministry of Petroleum & Natural Gas is planning to offer exploration area under uniform licensing policy. Comprehensive data has been gathered and so far, a total of 54 blocks have been carved out for offer under next bidding round.

2. **MIS (Management Information System)**

   DGH has embarked on a project of implementing Integrated Management Information System (MIS) to facilitate better information management across its departments and operators and all other stakeholders. Implementation is in progress.

3. **Setting up of NDR (National Data Repository)**

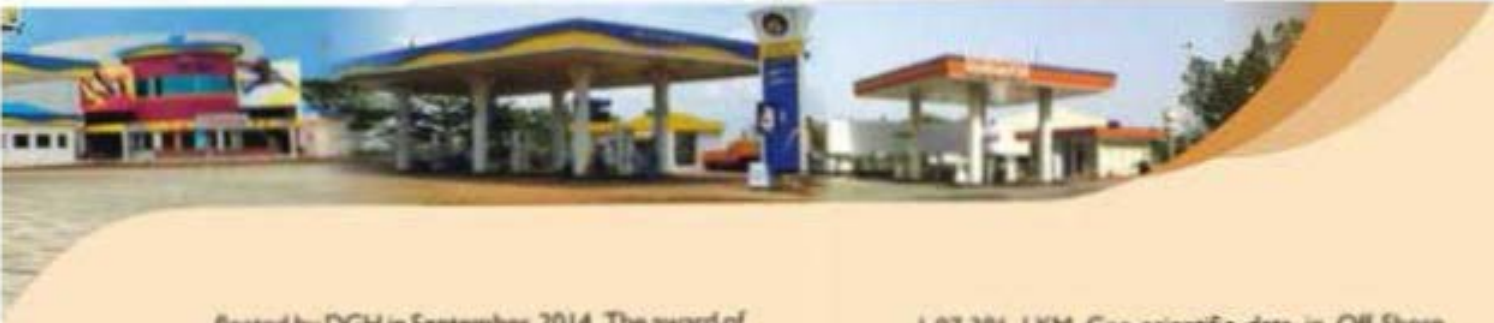
   - Contract for establishment and operationalization of NDR has been awarded to M/s Halliburton Offshore Services Inc. on 28.02.2014.
   - M/s Halliburton Offshore Services has commenced work on setting up of NDR on 03.03.2014.
   - Site preparation work for NDR project at 5th and 6th floor of DGH office at OIDB Bhawan, Sector-73, Noida and Commissioning of Hardware and integration of Software at the site has been completed.

4. **Identification of issues/concerns in operation of existing PSCs**

   Various Issues and concerns regarding PSCs were identified and addressed at DGH. MoP& NG vide letter dated 10.11.2014 has notified the Policy Framework for Relaxation, Extensions and Clarifications at the development and Production Stage under the PSC Regime for Early Monetization of Hydrocarbon Discoveries

5. **Committee on Site Restoration Guidelines on petroleum operations:**

   Government of India has constituted a committee for formulation of Site Restoration guidelines for petroleum operations to establish the transparent policies and procedure for abandonment and decommissioning of petroleum operational activities in India towards end of field life. Three meetings of the Committee were held on 12.02.2014, 21.04.2014 and 15.05.2014 respectively. As per the decision of the Committee, an international open tender has been



floated by DGH in September, 2014. The award of the contract is under finalization.

6. Standing Committee on GIPIP (Good International Petroleum Industry Practices)

Government of India has constituted a Standing committee to identify the areas requiring codification of "Good International Petroleum Industry Practices (GIPIP)" and to prepare national codes for petroleum operations. An international open tender has been floated by DGH in September, 2014 and GIPIP work has been awarded to M/s PetrTel, USA. First report is expected by mid 2015.

7. Shale Oil and Gas Policy for NOCs

Shale Gas and Shale Oil Policy has been announced by the Government of India in October, 2013 for National Oil Companies (NOCs) to explore and exploit shale oil and gas resources in nomination regime acreages. As per policy guidelines, ONGC and OIL have to carry out shale gas and oil exploration in 50 and 05 blocks respectively for assessment under Phase-I of 3 years. ONGC has proposed to carry out shale gas and oil exploration activities in Cambay, Cauvery, Krishna-Godavari and Assam and Arakan Basins and OIL has proposed to carry out shale gas and oil exploration activities in Assam and Rajasthan basins. Till now ONGC has drilled one pilot well and collected core samples for laboratory studies.

8. Re-assessment of Hydrocarbon Resources of India

A Multi Organisation Team (MOT) has been constituted to carry out re-assessment of hydrocarbon Resources of India in all its 26 sedimentary basins. The Exercise will cover all the 26 sedimentary basins of India. Resource assessment is scheduled to be completed within 30 months. An international open tender for awarding the study has been floated by ONGC in the month of December, 2014.

9. Policy for Geo-scientific data generation for hydrocarbons in Indian sedimentary Basins

In order to acquire geophysical data in poorly explored and unexplored areas, the Government has formulated a new policy for Geo-scientific data generation for hydrocarbons in Indian sedimentary Basins and Agreement to carry out Non-exclusive Multi-Client Geo-scientific surveys/ Activities. Under the above policy, Seven proposals has been received for generation of 1,07,386 LKM Geo-scientific data in Off-Shore Basins of India.

10. Exploration activities in the Mining Lease (ML) areas

Policies allowing the Contractors to carry out exploration activities in the Mining Lease (ML) areas after the expiry of exploration period and submission of Integrated Development Plans for a cluster of discoveries etc. have been introduced in 2013 to facilitate early monetisation of discoveries and exploring additional hydrocarbon potential in the ML areas. Till December, 2014, 12 hydrocarbon discoveries (11 Oil & 1 Gas) have been notified in the Mining Lease (ML) areas after announcement of above policy

11. Gas Hydrate

The NGHP (National Gas Hydrate Program) carried out Expedition-01 in the year 2006. The NGHP Expedition-01 established presence of gas hydrate in KG, Mahanadi and Andaman deep waters in numerous complex geologic settings. The NGHP Expedtion-02, which aims at identifying gas hydrates associated with sands, is currently at a very advanced stage of planning. 20 locations have been approved for probing during the NGHP Expedition-02 for identifying sand depositional systems within Krishna-Godavari & Mahanadi offshore deep water basins of India. Expenditure of NGHP Expedition-02 will be shared by 50% funds from OIDB, 20% from ONGC and 10% each from OIL, GAIL and IOCL. ONGC will be executing the NGHP Expedition-02.

12. Exploration Performance under PSC Regime

As a result of exploration the awarded blocks, following benefits have been realized in terms of oil discoveries and accretion of oil reserves:

- A total of 212 discoveries (106 oil and 106 gas) have been made so far under PSC Regime.
- As on 01.04.2014, In-Place Hydrocarbon volume accretion of 2290.183 Million Metric Tonnes (MMT) of oil and oil equivalent of gas (O + OEG) has been realized with estimated ultimate recovery of 930.144 MMT of O + OEG.
- 15 Discoveries have been notified
- DGH received 6 new proposals of Field Development Plans
- Proposals of Declarations of Commerciality (DOC) for 18 discoveries have been examined.

7.5.4 Centre for High Technology (CHT)

Centre for High Technology (CHT) was established by Ministry of Petroleum & Natural Gas (MoP&NG) in 1987 as a specialised agency of the oil industry to assess futuristic technology requirements for acquisition, development and adoption in the field of refinery processes, petroleum products, additives, storage and handling of crude oil, products and gas.

CHT acts as the Technical Wing of MoP&NG for implementation of scientific and technological programmes of Govt. of India. Major functions of CHT include assessment of technology requirement as also operational performance evaluation and improvement of the refineries. CHT acts as a focal point of oil industry for centralised technical assistance, knowledge dissemination, performance data base, exchange of information and experience. CHT also coordinates funding of research work in refining and marketing areas and pursue the programmes of "Scientific Advisory Committee on Hydrocarbons" of MoP&NG

Following are the major activities carried out by CHT during 2014-15:

1. **Auto Fuel Vision and Policy 2025**

   Government of India had constituted an Expert Committee in December, 2012 under the Chairmanship of Shri Saumitra Chaudhuri, Member Planning Commission to draft Auto Fuel Vision and Policy 2025. The Committee submitted its report in May 2014. Follow-up action is underway for introduction of upgraded quality of Auto Fuel in the country in a phased manner as per Roadmap suggested by the Expert Committee. CHT provided extensive technical and secretarial support to the Expert Committee in the preparation, finalisation and publication of the Report.

2. **Indigenous Technology Development**

   CHT co-ordinated the activities of Scientific Advisory Committee (SAC) on Hydrocarbons of MoP&NG in identifying and funding of research projects for hydrocarbon sector. CHT also coordinated various activities connected with approval and funding of projects under the Hydrogen Corpus Fund.

   SAC approved 4 new path-breaking projects concerning refining operations, viz., (i) Desalter Design, (ii) Hydroprocessing of Residues (iii) Improved Reactor Design for Hydroprocessing Applications and (iv) Production of Special Value Products at Digboi Refinery. Two hydrogen related projects on bi-hydrogen production through fermentative process and Hybrid-sorption enhanced steam reforming for hydrogen production from Natural Gas were also successfully completed with the funding under the Hydrogen Corpus Fund of MoP&NG. The Committee was reconstituted in October, 2014 with revised mandate under the Chairmanship of Dr Anil Kakodkar, an eminent Scientist and DAE Chair Professor, BARC.

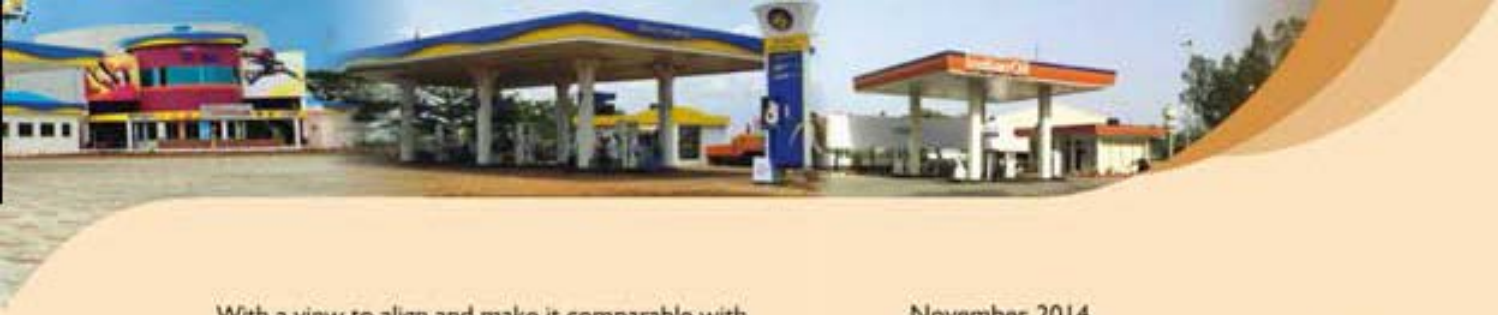
3. **19th Refinery Technology Meet (RTM)**

   19th Annual Refinery Technology Meet (RTM), the Annual International Refining Conference and Exhibition, was successfully organised by Centre for High Technology (CHT) under MoP&NG from 12th to 14th November, 2014 at Chennai. The RTM with ,the theme "Emerging Refining and Energy Landscape", showcased the technological advancements, latest developments made by the Indian refining sector and provided a platform for sharing, interacting and exchange of technical ideas among refinery operators, leading technology providers, researchers, etc. 11 PSU companies and 46 JV/Private/ Foreign companies with 635 delegates participated in the Meet. 163 technical papers were presented. A dedicated Q&A Session on Refinery Operations was also organised. 12 leading companies had put up Exhibition Stalls.

   Shri Saurabh Chandra, IAS, Secretary, MoP&NG inaugurated the Meet and also gave away the Energy Performance Awards for 2013-14 to the winning refineries. Shri Sandeep Poundrik, IAS, Joint Secretary (Refinery), MoP&NG made a presentation on "Refining Overview" and Shri Saumitra Chaudhuri, ex-Member, Planning Commission, Govt. of India delivered the Theme Address.

4. **Modification of Methodology and Energy factors for Evaluation of Specific Energy Consumption**

   CHT has been carrying out Energy Performance Evaluation of refineries based on Specific Energy Consumption considering the Energy Factors developed by CHT/EIL. The Specific Energy Consumption is in terms of MBTU/barrel/NRGF called MBN.



With a view to align and make it comparable with internationally accepted practices, the methodology for Energy Performance Evaluation and Comparison was modified with the assistance and services of M/s Shell GSI available under the on-going Technical Services Agreement. The modified methodology will be implemented in the next phase for refinery performance evaluation of specific energy consumption.

5. **Finalisation of Methodology for GHG (CO_2 equivalent) Inventory Performance of Refineries**

For Greenhouse Gas (GHG) inventory benchmarking of refineries, CHT in consultation with all the refineries finalized the methodology for comparing the performance w.r.t. GHG emissions and decided to use Carbon Weightage Tonnage (CWT) method for evaluation. Based on the information submitted by the refineries, CHT evaluated the GHG performance of refineries for 2013-14.

6. **Jawaharlal Nehru Centenary Awards for energy performance of Refineries for 2013-14**

CHT compiled and evaluated the energy performance of PSU refineries, including Private refineries, viz., Essar and Reliance, in terms of specific energy consumption (MBTU / BBL / NRGF) for distribution of 'Jawaharlal Nehru Centenary' Awards for 2013-14, instituted by MoP&NG. The awards were finalised by the Award Selection Committee constituted by

MoP&NG and were presented to the winning refineries by Secretary, MoP&NG during the Inaugural Session of the 19th RTM on 12th November, 2014.

7. **Oil & Gas Conservation Awards for 2014**

As a part of this programme, Centre for High Technology organized survey in the area of "Furnace/Boiler Insulation effectiveness and Furnace/Boiler efficiency" in January 2014. The survey was conducted simultaneously at all Refineries including Jamnagar Refinery of Reliance Industries Limited and Vadinar Refinery of Essar Oil Ltd.

The awards were finalised by the Award Selection Committee constituted by MoP&NG and were presented to the winning refineries by Secretary, MoP&NG during the Inaugural Session of the 19th RTM on 12th November, 2014.

8. **Activity Committee Meetings**

CHT organised Activity Committee Meetings on major areas of refinery operations & pipelines with the aim of sharing of best operational practices & improvements and dissemination of information on latest developments.

9. **Other Activities**

- CHT reviewed and examined applications for issuance of essentiality certificates for import of various project items and submitted its analysis/recommendations to MoP&NG.
- CHT prepared the consolidated report on the analysis of refineries' performance and submitted to MoP&NG for QPR meetings
- CHT reviewed and examined technical proposals/queries related to Standard Input Output Norms forwarded by MoP&NG and submitted its analysis and recommendations

7.5.5 Rajiv Gandhi Institute of Petroleum Technology

1. Introduction:

Rajiv Gandhi Institute of Petroleum Technology (RGIPT) has been set up by Government of India, as an institute of national importance under an Act of Parliament. The objective of the institute is to offer technical and managerial educational programmes in the domain of petroleum sector with a vision to create aspirations in the youth of the country towards the petroleum sector and to serve as the fountainhead for the nurturing world class human capital capable of being the future leaders of technology and innovations in the entire hydrocarbon value chain with a view to serve both domestic and global needs in the sector. The institute is co-promoted by six oil PSUs and the Oil India Development Board (OIDB) under the patronage of Ministry of Petroleum. As provided in the RGIPT Act, the Central Government has framed the First Statute of RGIPT which has been notified in Official Gazette in October 2009.

While RGIPT has taken up the construction of its own campus, on the academic front the Institute has commenced its academic operations from temporary campus at Rae Bareli from 2008-09 onwards and has introduced the following educational programmes:

1. B. Tech. in Petroleum Engineering
2. B. Tech. in Chemical Engineering
3. MBA in Petroleum & Energy Management
4. M. Tech in Petroleum Engineering
5. M. Tech in Chemical Engineering
6. Phd - Doctoral programs

2. Performance;

Academic Activities:

In 2014-15 RGIPT has successfully entered 7th year of academic activities. The performance highlights are as follows:

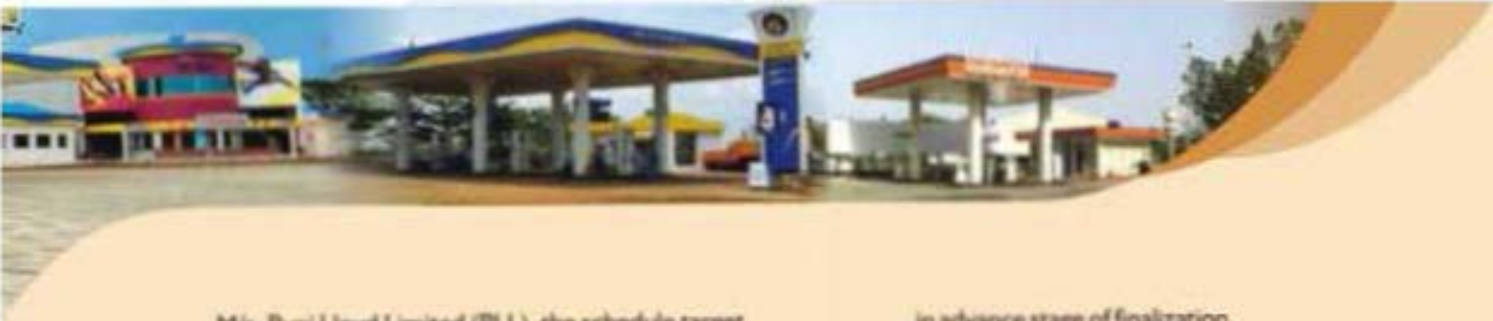
- The third batch of B. Tech degree students of Chemical Engineering and Petroleum Engineering passed out this year.
- The fifth batch of M. Techs in Petroleum Engineering and MBA in Petroleum and Energy Management also graduated.
- With moderate campus placement, the industry, both public and private, has recruited the RGIPT students.
- Registration of new batches of B.Tech, M.Tech and MBA-2014-16 was completed successfully in June/July 2014. Total 70 students in B. Tech. Chemical Engineering and Petroleum Engineering, 6 students in M. Tech and 17 students in MBA were given admission.
- RGIPT participated in the biennial international exhibition cum conference 'Petrotech-2014' in Greater NOIDA. Also, 17 students from B. Tech. and MBA programmes participated in the conference and presented a paper. RGIPT students also participated in 'ReYuvaNation' that was organized on the eve of Petrotech-2014 and won prizes in 'Speech, Energy Quiz, Photography and Short movie making competitions.
- Prominent visitors to RGIPT as Guest Lecturer during the year included: Dr. Henery Biwole Pascal from University of Nice Sophia Antipolis, France; Prof. Nitesh P. Balsara, Distinguished Professor of Chemical and Biomolecular Engineering, University of California; Prof. Manindra Agrawal, Padam Shri Awardee, Dean of Faculty Affairs and Professor Department of Computer Science and Engineering, IIT Kanpur, Mr. S. Varadarajan – C&MD, BPCL, Mr. S.K. Sharma – Senior President – Oil, Glencore India Pvt. Ltd; Mr. Bipin V. Vora – Consultant & Advisor to UOP R&D and Marketing Managements, USA.
- MoU for academic collaboration has been signed between RGIPT and College of Engineering, Chonnam National University, South Korea.

3. Campus Project status:

Currently two campus development projects are in progress as follows:-

Jais (District – Amethi, UP)

Background: RGIPT had purchased 47 acres of land from Indian Oil Tanking Limited in the year 2008 at Jais, Dist. Amethi for setting up of RGIPT Campus. The first phase of work was launched with award of Civil, Structural and Water proofing works in June 2010. However, due to the extremely poor performance of the contractor,



M/s. Punj Lloyd Limited (PLL), the schedule target of completion of civil & structural work was extended till 31st March 2013. However, the contractor resorted to litigation invoking arbitration process claiming extra compensation. In view of unjustified demand of the Contractor and based on the recommendation of the Project Management Consultant, Engineers India Limited (EIL), the contract with M/s. PLL was terminated in May 2013.

Progress in 2014-15: After termination of the contract with M/s. Punj Lloyd Limited in May 2013, a new Composite work contract was awarded by RGIPT on 2nd September 2013 to M/s. NCC Limited with the overall completion schedule by 31.12.2015.

The work has since been progressing as per the schedule. As on December 2014, the progress of work achieved is 80% with nil backlog. It is expected that the work will be completed in December 2015 as per the schedule drawn with the contractor.

Sivasagar (Assam)

Background: Hon'ble Prime Minister laid the foundation stone in February 2011 for setting up Assam centre of RGIPT at Sivasagar. This centre was to cater requirement of blue collared technicians for upstream area to meet the current gap in skill set and to meet the anticipated demand in view of Govt.'s ambitious exploration plan.

Govt. of Assam has allotted 100 acres of land at Sivasagar. The allotted land was in very low lying and required considerable earth filling and piling before commencement of construction activities. In the year 2012 and 2013, due to incessant rain the progress of earth filling was affected badly and no significant progress could be achieved. Due to extremely poor performance of site development at Sivasagar, the Project Management Consultant, M/s EIL's contract was terminated in September 2013.

Progress in 2014-15: Site Grading and Piling work has since been completed in April, 2014. RGIPT Board recommended the award of job of construction activities at Sivasagar to CPWD on deposit work basis in October 2013. CPWD has since initiated the process of tendering for civil structural work. The tenders for construction are in advance stage of finalization.

Other Developments during 2014-15

Establishment of Centre in South India (Bangalore)

A detailed feasibility study on the advice of MoP&NG was carried out through PwC for setting up a centre for Fire Engineering and Process Safety Research in South India. Hon'ble Minister, P&NG in a meeting with Hon'ble Chief Minister, Karnataka in October, 2013 has proposed to consider allotment of suitable land for setting up a centre of RGIPT. Accordingly, approx. 150 acres of land was identified and allotted in Kambalipura Industrial Area, Hoskote Taluka, in Bangalore Rural District. The Foundation Stone of Bangalore Centre was laid by the then Hon'ble Minister of Petroleum & Natural Gas on 5th March 2014. However, the terms of allotment of land are under discussion with Govt. of Karnataka.

Establishment of Andhra Petroleum University

Under the Schedule 13 of the Andhra Pradesh Reorganization Act 2014 (Education), MoPNG has advised RGIPT to explore the possibility of setting up of a Petroleum University in Andhra Pradesh. The DPR detailing the entire conceptual blueprint, the financial outlay and the implementation plan for setting up the Petroleum University has been submitted to MoPNG in September 2014. The land offered by the Govt. of Andhra Pradesh for setting up of the Andhra Petroleum University was not found to be suitable by the Committee who visit the sites at Rajahmundry in September 2014. Govt. of Andhra is in process of offering an alternate site.

4. **Policy Initiatives:**

A Strategic Workshop on Future Directions of RGIPT was conducted with KPMG as knowledge partner. Its deliberations will help chart the future course of action.

5. **Welfare of SC/ST/OBC/PH- Recruitment backlog of SC/ST/OBC/PH as on 14.01.2015**

Rajiv Gandhi Institute of Petroleum Technology (both Rae Bareli and NOIDA campus combined) is currently having total 28 nos. of administrative staffs and out of that 8 positions have been filled up with the candidates of SC and OBC categories candidates. Category wise break-up is as follows:

Total No. of Administrative Staff	General	SC	OBC
28*	18	4	6

** Including NOIDA campus, excludes teaching staff

Currently, there is no backlog in these categories.

6. The number of women employees' vis-à-vis the total number of employees in each grade

Item	Group-A	Group-B (Non-Gazetted)	Group-C	Total No.
Women employess **	2	2	2	6

** Including NOIDA campus, excludes teaching staff

7. Implementation of Official Language Policy of the Government

Complying the Official Language Policy of the Government of India, Rajiv Gandhi Institute of Petroleum Technology (RGIPT), Rae Bareli has made available its website in Hindi along with English. Also, letters and queries received in Hindi are being answered in Hindi.

7.5.6 Petroleum Planning & Analysis Cell (PPAC)

1. Introduction

The Petroleum Planning & Analysis Cell (PPAC) was created as an attached office of MoP&NG w.e.f. 1st April, 2002 after dismantling of the Administered Pricing Mechanism (APM) in the petroleum sector and abolition of the erstwhile Oil Coordination Committee (OCC). Its purpose is to assist the Government, inter alia, in the discharge of the following functions:

1. Administration of subsidy on PDS Kerosene and domestic LPG and freight subsidy for far-flung areas;

2. Maintenance of an information data bank and communication system to deal with emergencies and unforeseen situations;

3. Analyzing the trends in the international oil market and domestic prices;

4. Forecasting and evaluation of petroleum import and export trends;

5. Operationalizing the sector specific surcharge schemes, if any.

2. Important Database

PPAC maintains data related to production, consumption, import and export of crude and petroleum products

Production of Petroleum Products: Production of petroleum products from Indian refineries including fractionators has gone up from 122.7 Million Metric Tonnes (MMT) in 2004-05 to 220.2 MMT (Provisional) in 2013-14 which shows growth of around 79.5% during the last decade. Production growth of 1.1 % was noted in 2013-14 as compared to 217.8 MMT in 2012-13. Production of petroleum products during April-November 2014 was 145.6 MMT (provisional) registering a decline of 0.3 % compared to the corresponding period in 2013-14.

Consumption of Petroleum Products: Consumption of petroleum products in India has grown by 0.9% during 2013-14. From a level of 157.06 MMT during 2012-13, consumption rose to 158.41 MMT during 2013-14.

Consumption of petroleum products in India has grown by 3.6% during April-November 2014 compared to the corresponding period in 2013-14. From a level of 104.2 MMT during April-November 2013, consumption rose to 106.0 MMT (provisional) during April-November 2014.

Imports and Exports of Crude Oil and Petroleum Products

- **Crude oil:** During 2013-14, India imported 189.24 MMT (Provisional) of crude oil valued at ₹ 8,64,875 crore which is an increase of 2.4% in quantity and 10.2% in value terms over the preceding year 2012-13. During April to November 2014 of the current year, crude oil imports were 125.70 MMT (provisional) valued at ₹ 5,40,263 crore. On domestic consumption basis, India imported 77.6% of its crude oil requirement during 2013-14. The crude oil import dependency for domestic consumption during April to November 2014 was 78.1%. The country is, however, a net exporter of petroleum products.
- **Petroleum Products:** During 2013-14, India imported 16.72 MMT (Provisional) of petroleum products valued at ₹ 74,605 crore which is an increase of 6.0 % in quantity and 9.1% in value terms, as compared to the previous year. During April to November 2014

of the current year, petroleum products imports were 13.37 MMT valued at ₹ 53,871 crore.

- During 2013-14, India exported a total of 67.86 MMT (Provisional) of petroleum products, valued at ₹ 3,68,279 crore which is higher by 7.0% in quantity and 15.1% in value over the previous year. During April to November 2014 of the current year, petroleum products exports were 43.14 MMT (Provisional) valued at ₹ 2,25,568 crore.

Production of Indigenous Natural Gas and Import of LNG in India

- Gross Production of Indigenous Natural Gas declined by 12.9% to reach 35.39 BCM in 2013-14 as compared to 2012-13. The main reason of decline was lower production in KG-D6 Block of RIL.
- Gross Production of Indigenous Natural Gas during April-November 2014 was 22.44 BCM registering a decline of 5.2 % compared to the corresponding period in 2013-14. The fire in natural gas pipeline in Rajamundry (Andhra Pradesh) section also contributed to lower indigenous production.
- LNG imports decreased marginally by 0.9 % with import of 13.02 MMT during 2013-14 as compared to 2012-13.

LNG imports during April - November, 2014 were 9.65 MMT (provisional) registering an increase of 7.6 % compared to the corresponding period in 2013-14.

3. **Price Trends of Petroleum products and impact on under-recoveries**

(i) About 3/4th of domestic requirement for petroleum products in the country is met through import of crude oil. Therefore, the prices of crude oil and petroleum products in the international oil markets have a decisive influence on the domestic prices of petroleum products. Crude prices have been steadily increasing since December, 2008 and the average price of Indian basket of crude oil during 2013-14 was $105.52 per barrel and is marginally lower at $95.01 per barrel during 2014-15 (up to 29.12.2014). However, the crude oil prices have declined sharply after July 2014 and the average price of Indian basket crude oil has been at $ 61.21 per barrel during December 2014.

(ii) Post de-control of the price of petrol effective 26th June 2010, the OMCs are free to fix the retail selling price of petrol. During 2013-14, the retail selling prices of 3 products i.e. Diesel (retail sales), PDS Kerosene and Subsidized

Domestic LPG were regulated by the Government. The capping on subsidized domestic LPG, which was initially fixed at 6 cylinders per annum in September 2012, was progressively increased to 12 cylinders per annum in January 2014.

(iii) Effective 19th October 2014, the Government has made the price of Diesel market determined, both at refinery gate and retail level for all consumers.

(iv) The OMCs incurred under-recoveries of ₹ 1,39,869 crore in 2013-14 as against ₹ 1,61,029 crore during 2012-13. The OMCs have incurred under-recoveries of ₹ 67,091 crore during April-December 2014

(v) The OMCs had reported combined profit of ₹ 12,814 crores during 2013-14 which is only 1.3% of their turnover. During April-December 2014, the OMCs have reported combined profit of ₹ 1,790 crore which is only 0.26% of the turnover during that period. The OMCs' rising under-recoveries coupled with delay in timely compensation of the under-recoveries have worsened the cash flows of the OMCs compelling them to borrow heavily. The combined borrowing of the PSU OMCs is ₹ 94,485 crore as on 31st December, 2014.

4. Important Activities

The following important activities were undertaken by PPAC besides the routine work:

(a) Gas Pricing determination and issuance under the provisions of the New Domestic Natural Gas Pricing Guidelines, 2014

Gas Price determination and issuance / notification of prices effective from November, 2014 has been carried out in line with New Domestic Natural Gas Pricing Guidelines, 2014.

(b) LPG & Bitumen outlook for next 5 to 10 years

This study was instituted to assess the impact of "Bottom Residue up-gradations" being undertaken by refineries in the country. This was required by MoP&NG to evaluate and formulate policy with regard to import of these petroleum products for meeting domestic demand with a five year short term vision and a ten year perspective plan.

7.5.7 Petroleum Conservation Research Association (PCRA)

PCRA is a registered society working under the aegis of the Ministry of Petroleum and Natural Gas, Government of India with its vision, mission and objectives as under:

VISION: To become a Center of Excellence for Conservation of Hydro-carbons and Environment Protection for sustainable development on our inherent strength.

MISSION: Efficient energy utilization and environment protection leading to improvement in quality of life.

OBJECTIVES:

- To formulate strategies and promote measures for accelerating conservation of petroleum products leading to environment protection, energy security and sustainable development.
- To create awareness among masses about the importance, benefits and methods of conserving petroleum products and clean environment by enhancing information and capacity building.
- To promote research, development and deployment efforts aimed at petroleum conservation and environment protection, support and facilitate efforts for adoption and dissemination of fuel efficient technologies and substitution of petroleum products with alternate and renewable fuels.
- To establish synergistic institutional linkages at the national and international levels in the areas of petroleum conservation and environment protection.
- To provide training and technical advisory services, designed to achieve economy and efficiency in use of petroleum products for cleaner environment.
- To function as a 'Think Tank' to the Government of India for proposing policies and strategies on petroleum conservation and environment protection aimed at reducing excessive dependence on oil.

ACTIVITIES: MoP&NG has formulated a strategy for conservation of petroleum fuels in close coordination with PCRA in the country during 2014-15. The strategies include technical and field level interventions that can help in increasing the efficiency in usage of petroleum products.

Field Activities are one of the core areas of PCRA

operations. Through sectorial field activities, PCRA engineers and its external experts are able to reach the target groups with innovative energy conservation programmes. These activities are designed to cover a large spectrum of socio-economic profile of our country in different sectors viz., Industry, Transport, Domestic, and Agriculture.

During 2014-15 (April – January), a total of 6508 field activities were carried out in various sectors. In addition, PCRA has also taken up following major initiatives:

- **Energy Efficiency Opportunities under PAT:** PAT (Perform, Achieve & Trade) is a National Mission on Enhanced Energy Efficiency, which intends to enhance energy efficiency in large energy intensive industries in India. Under the PAT scheme 478 industrial units have been notified by Govt. to reduce their specific energy consumption and PCRA is assisting many industries under PAT scheme.
- **ISO 50001- Energy Management System:** Industry unit benefit immensely from popular ISO 50001- Energy management tool by curtailing inefficient energy utilization. PCRA has completed ISO 50001 works at Bharat Oman Refinery Limited, Bina (Madhya Pradesh) and have been providing consultancy works in other sectors as well.
- **Standards and Labeling Programme for Appliances Consuming Petroleum Products:** PCRA, in association with BEE (Bureau of Energy Efficiency), has undertaken the initiative leading to development of Standards & Labeling Programme for appliances consuming petroleum products viz. Domestic LPG Stoves, Diesel Generator sets and Diesel Engine Driven Monoset Pumps for Agricultural Purposes. The objective of this programme is to achieve fuel savings at consumer end by using fuel efficient appliances having Star Ratings ranging from 1-Star to 5-Star.

  The schemes are operational and vendor registration is underway.
- **Fuel Economy Norms for Heavy Duty Vehicles (Trucks and Buses):** PCRA and BEE are jointly working to formulate a time bound action plan to develop fuel economy norms for Heavy Duty Vehicles under the guidance of Ministry.
- **Research & Development:** During the year 2014-15 (April – January), PCRA's energy conservation efforts were enhanced by development of processes and technologies through R&D. During this period, 5 (five) projects were completed, 7 (seven) are ongoing and 4 (four) new R&D projects were approved by the Screening Committee of R&D.
- **Mass Awareness Campaigns for Conservation of Petroleum Products:** During the year 2014-15 (April-January), PCRA undertook various people connect activities to reach out to the target groups. Major activities undertaken in this regards are-
  - **Creation of Social Media Networking:** PCRA accounts have been created on Twitter and Facebook. A successful contest was organized on Facebook and Twitter on "Save Fuel, Save Earth". Approximately 750 entries received, with attractive prizes given to the winners.
  - **Participation in major exhibitions:** PCRA participated in IITF 2014 in New Delhi and Vibrant Gujarat in Ahmedabad, show casing the various conservation activities of PCRA.

Launching of Standards and Labeling Programme for Diesel Generator Sets upto 19 KW capacity by Shri Dharmendra Pradhan, Hon'ble Minister of State (IC), Petroleum & Natural Gas, Govt. of India on 22.09.14

  - **Participation in Raahgiri:** PCRA participated in Raahgiri to disseminate the message of Conservation to the people through Nukkad Nataks and engagement of public in activities like slow cycling, tug-of-war, photobooth, quiz etc

[Shri Dharmendra Pradhan, Hon'ble Minister of State (IC), Petroleum & Natural Gas, Govt. of India with award winners during inauguration function of OGCF 2015 on 14.01.15]

- Oil and Gas Conservation Fortnight-2015: It is a nationwide programme being celebrated during 16th – 31st January every year to sensitize the people about the conservation and efficient use of petroleum products.

  OGCF 2015 was inaugurated in the National Capital by the Hon'ble MoS (IC), P&NG and attended by Govt. officials / Oil industry officials / School children/General Public & Media. Awards were given for exemplary work on conservation activities during the function. Over 23000 children from 45 cities across the country participated in the Painting and Essay (13 languages) competitions and the National Winners received awards during OGCF inaugural function.

  OGCF 2015 also commenced simultaneously at the State Capitals, where functions were presided over by Governors / Ministers and other dignitaries of State Govts. During the fortnight, PCRA and Oil Industry undertook various mass awareness activities to spread the message of Oil & Gas conservation and to educate the masses on the methods to achieve it.

  There was special focus on the following areas:

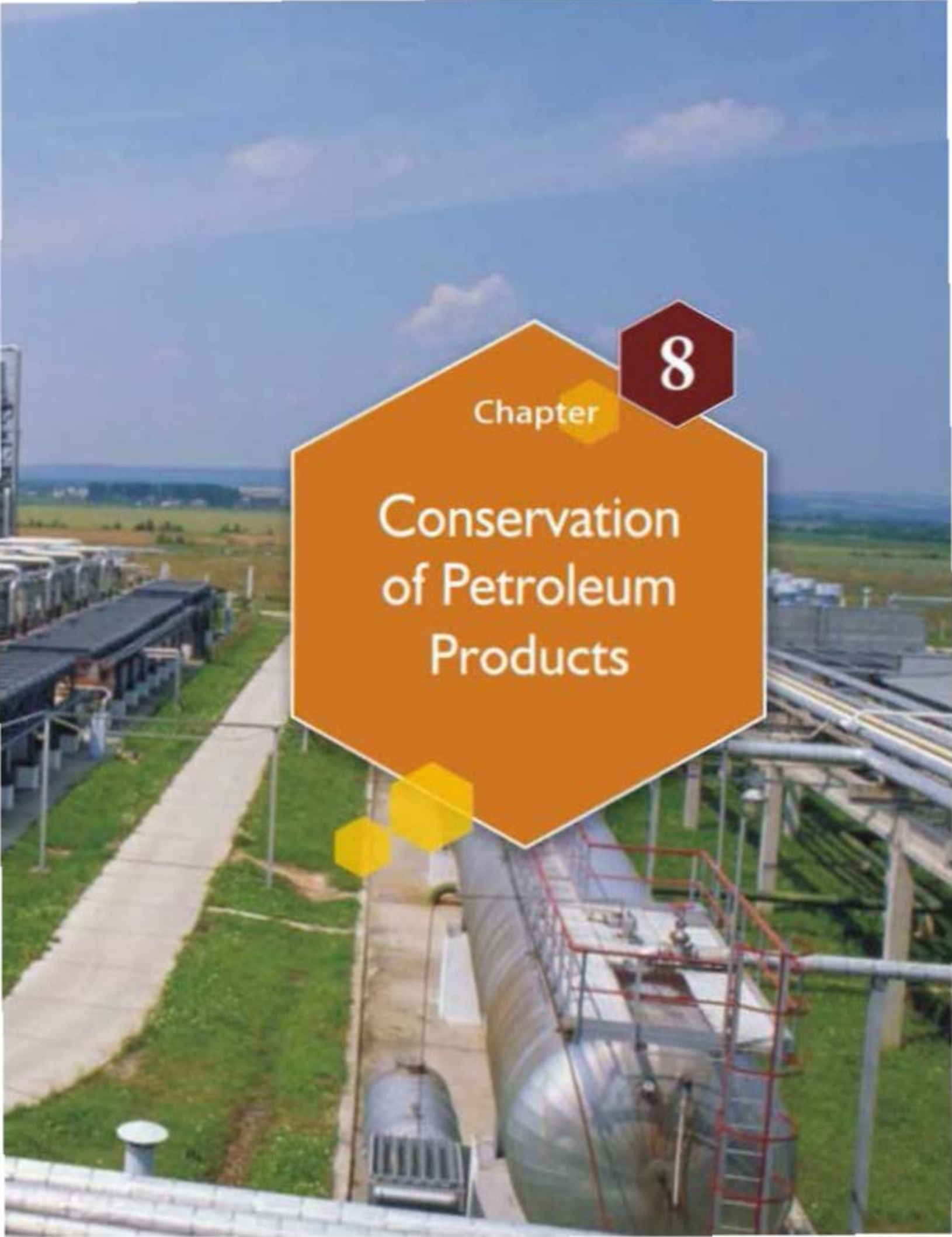
- Conservation activities for drivers / mechanics / helpers of commercial vehicles: This activity was carried out at approximately 45200 Retail Outlets of OMCs (IOCL/BPCL/HPCL) in all States and Union Territories with active involvement of officers from Oil Companies, PCRA, Dealers, NGOs, RTOs and others. Under this activity emphasis was laid on better driving habits as well as proper vehicular maintenance, fuel conservation tips, etc. Approximately 47.74 lac persons were counseled under this activity.
- Activity for domestic sector involving housewives / cooks: LPG Clinics were held in housing colonies, societies, community centers, RWAs, schools, etc. in different States and Union Territories. Conservation tips & practical demonstrations on fuel saving, cooking and safe operation of LPG / PNG were given to housewives, cooks along with free distribution of Brochures/leaflets (in Regional languages). Approximately 77.79 lac participants were covered under this activity.
- Motivation to students for promoting Oil & Gas Conservation: A national event in the form of Quiz was held for the students in 35 cities covering 586 schools. Around 5 Lac students participated in the quiz. Grand Finale of the Quiz was held at Delhi on 29.01.15. It was telecast on DD National on 1.2.15

7.5.8 Petroleum and Natural Gas Regulatory Board (PNGRB)

The Petroleum and Natural Gas Regulatory Board (PNGRB) was constituted under the Petroleum and Natural Gas Regulatory Board Act, 2006 notified in the Gazette dated 31st March, 2006. The Board was constituted on 1st October, 2007. The Board consists of Chairperson, one Member (Legal) and three other Members, appointed by the Central Government. Presently, the Board is functioning with full strength.

The Board regulates the refining, processing, storage, transportation, distribution, marketing and sale of petroleum, petroleum products and natural gas excluding production of crude oil and natural gas to ensure uninterrupted and adequate supply of petroleum, petroleum products and natural gas in all parts of the country and to promote competitive markets for matters connected therewith or incidental thereto.

GAIL's Swachh Bharat Abhiyan conducted in Bhubaneswar on 2nd October, 2014



Chapter 8

Conservation of Petroleum Products

Conservation of Petroleum Products

8.1 PREAMBLE

Impressive growth rate in Indian Economy has resulted in higher demand for various forms of energy including energy obtained from the petroleum products. The growing energy demand, coupled with substantial increase in import of crude oil to meet a large percentage of the energy needs, puts pressure on economy due to high crude oil prices in the international market. With the projected increase in the demand of petroleum products of approximately 5% per annum, conservation of petroleum products assumes special significance.

The need of the hour is to create an environment where conservation methods / techniques / energy efficient equipments are adopted in the various sectors. Effective energy conservation measures can go a long way to serve the dual purpose of energy conservation and environmental protection.

In our country, an identified scope of reducing energy consumption by 20% to 25% exists in all major sectors through conservation measures. As there are millions of consumers in the country, any savings achieved by individual consumers will cumulatively amount to large quantities and obviate the need to produce or import equivalent amount of new energy on a recurring basis.

8.2 ETHANOL AND BIO-DIESEL

The Transport Sector has become a major consumer of petroleum products, which has put a heavy pressure on the quality of environment. Deteriorating ambient air quality in the urban areas due to emissions from transport vehicles has been a matter of great concern in recent years. Apart from better quality of existing petroleum fuels, the use of less polluting fuels like Hydrogen and blending of Bio-diesel and Ethanol are some of the steps which have the potential to control the impact on the environment and reduce the dependence on the fossil fuels.

8.2.1 Ethanol Blended Petrol Programme

8.2.1.1 The Government had started the Ethanol Blended Petrol (EBP) Programme in 2003. In 2006 the same was extended to the entire country, except the North-Eastern States, Jammu & Kashmir, Andaman & Nicobar Islands and Lakshadweep. In the series of the steps to give boost to EBP Programme, the Government decided on 22.11.2012 that 5% mandatory ethanol blending with Petrol should be implemented across the country. The 5% mandatory blending is to be reckoned for the country as a whole and was to be achieved by 30.06.2013. Procurement price of ethanol was to be decided between Oil Marketing Companies (OMCs) and suppliers of ethanol and in case of any shortfall in domestic supply, the OMCs and Chemical companies would be free to import ethanol. Accordingly, a Gazette Notification was issued by MoPNG on 02.01.2013 directing OMCs to sell ethanol blended Petrol with percentage of ethanol upto 10% as per BIS specification to achieve 5% ethanol blending across the country as a whole.

8.2.1.2 However, the Government decided on 03.07.2013 that sugarcane or sugarcane juice may not be used for production of ethanol and it be produced only from molasses and that OMCs will procure ethanol only from domestic sources to achieve the mandatory requirement of 5% ethanol blending with Petrol by October 2013 in areas/parts of the country where sufficient quantity of ethanol is available. In other parts of the country, blending of ethanol may be increased progressively depending upon the availability of ethanol to reach the 5% mandatory level. OMCs and Sugar Industry Associations may interact with each other on a regular basis to achieve the target.

8.2.1.3 Now in order to give fillip to the EBP Programme, the Government has decided, inter-alia, on 10.12.2014 to fix the delivered price of ethanol in the range of Rs.48.50 per litre to 49.50 per litre, depending upon the distance of distillery from the depot/installation of the OMCs, inclusive of all central and statutory levies, transportation cost etc, which would be borne by the Ethanol suppliers. OMCs have been directed to sign MoU with the State Governments for a comprehensive system for un-interrupted inter-depot transfer of Ethanol within and outside the State. This may include annual excise permits to OMCs for movement of ethanol and other relevant and necessary measures.

8.2.1.4 Further, in order to broad-base the scope of availability of ethanol, the Government has also decided on 10.12.2014 to allow procurement of ethanol produced from other non-food feedstocks (besides molasses), like cellulosic and ligno cellulosic materials including petrochemical route, subject to meeting the relevant BIS Standards.

8.2.1.5 Accordingly, OMCs have been directed to implement the EBP Programme as per the aforesaid directions of the Government.

8.2.2 BIO-DIESEL

8.2.2.1 Bio-diesel is a fatty acid having properties similar to diesel derived from crude oil by distillation process which can be a substitute of High Speed Diesel (HSD). The properties of bio-diesel are such that it can be mixed with any diesel fuel.

8.2.2.2 Bio-diesel Purchase Policy

To encourage production of bio-diesel in the country, the Ministry of Petroleum and Natural Gas announced a Bio-diesel Purchase Policy, in October, 2005, which became effective from 1.1.2006. Under this scheme Oil Marketing Companies (OMCs) are to purchase Bio-diesel (B100), meeting the fuel quality standard prescribed by BIS for blending with High Speed Diesel (HSD) to the extent of 5% at identified purchase centres across the country. The Policy has identified 20 purchase Centres of the public sector OMCs all over the country. The OMCs would purchase bio-diesel from those bio-diesel manufacturers who register with them after satisfying the technical specifications, at a specified delivered price.

8.2.2.3 Latest Status

OMCs have reviewed the procurement price of bio-diesel at the various purchase centres accordingly and presently the declared price of Bio-diesel is Rs.41.00 per litre w.e.f. 07.11.2014. However, the Bio-diesel manufacturers have not come forward to sell their Bio-diesel produce to OMCs at this declared price.

Further, the Cabinet, in its meeting held on 16.01.2015, has allowed the direct sale of bio-diesel to all consumers.

8.3 KEY INITIATIVES LAUNCHED BY PETROLEUM CONSERVATION RESEARCH ASSOCIATION (PCRA) FOR FUEL CONSERVATION

8.3.1 Implementation of Standards & Labeling Programme

Standards & Labeling program is an initiative undertaken by PCRA by which energy efficient equipments meeting energy efficiency standards are awarded Star Rating (1 to 5) by Bureau of Energy Efficiency (BEE), Ministry of Power. Star Rated products consume less petroleum fuel than conventional ones resulting in substantial saving of precious petroleum products. PCRA has initially chosen 3 equipments namely, Domestic LPG Stoves, Diesel Engine Driven Monoset Pumps & Diesel Generators (upto 19 KW).

A. Domestic LPG Stoves

LPG in India is majorly marketed by Public Sector Oil companies and there are more than 16 crore customers enrolled as LPG consumers. In recent years, approx. 100 lakhs LPG stoves per year have been sold in the market.

PCRA identified this as one of the potential areas, wherein conservation of LPG could be achieved through use of energy efficient LPG Stoves in order to reduce the import bill and the subsidy amount. As a result of labeling programme, the thermal efficiency of LPG stove is pegged at minimum 68%. This benchmarking initiative aims at raising the efficiency of new LPG stoves being manufactured at 68% and above.

Star Rating Programme for Domestic LPG Stove:

Star Rating	Thermal Efficiency (As per IS 4246 latest)
1 Star	If Thermal efficiency ≥ 68% & < 72%
2 Star	If Thermal efficiency ≥ 72% & < 75%
3 Star	If Thermal efficiency ≥ 75% & < 78%
4 Star	If Thermal efficiency ≥ 78% & < 81%
5 Star	If Thermal efficiency ≥ 81%

Current Status:

• Ministry of Power accorded approval to PCRA's above benchmarking proposal under Energy Conservation Act 2001, including mention of "In Association with PCRA" on all labels to be put up on

Star rated products. BEE has released the schedule on their portal for registration of domestic LPG gas stove manufacturers/ traders on voluntary basis

• Scheme is operational and some of the manufacturers have already enrolled in to the scheme.

B. Diesel Engine Driven Monoset for Agricultural purposes (2-10 HP)

According to Market Survey carried out by PCRA, India produces 1.5 million pumps per year with an expected annual growth of 7%. The existing population of diesel driven pump sets in country is about 14.42 millions. According to study, nearly 8.55% (5.9 MMT) of country's total diesel consumption (69.1 MMT in 2012-13) is being used for irrigation purposes. The survey also reveals that about 90% of pumps used in farms are of 21 % efficiency only.

PCRA identified this equipment with substantial potential for conservation of Diesel through use of fuel efficient Agricultural pump sets.

The following Star labeling programme has been proposed.

Star Rating Programme for Domestic LPG Stove:

Star Rating	Specific Fuel Consumption (SFC) in g/h/m/l/s of pump at duty point w.r.t. SFCmax** (given in IS 11501:latest)
1 Star	> 0.90 SFCmax & ≤ 1.00 SFCmax
2 Star	> 0.80 SFCmax & ≤ 0.90 SFCmax
3 Star	> 0.70 SFCmax & ≤ 0.80 SFCmax
4 Star	> 0.60 SFCmax & ≤ 0.70 SFCmax
5 Star	≤ 0.60 SFCmax

** SFC max (Maximum Specific Fuel Consumption) of Diesel Engine Driven Monoset Pump at duty point

Current Status:

- Ministry of Power had approved the energy efficiency standards jointly developed by PCRA and BEE for Diesel Engine Driven Monoset Pumps for agricultural purposes (2 to 10 HP). Scheme has been launched in June 2014.
- BEE has released the schedule on their portal for registration of Diesel Engine Driven Monoset pump manufacturers / traders on voluntary basis.
- The advertisement targeting the manufacturers of Diesel Engine Driven Monoset Pumps, to enroll themselves for the scheme has been released in the newspapers. Scheme is now operational and enrolments have since started.

C. Diesel Generator Sets (Up to 19 KW)

DG set market has witnessed steady growth in the last decade to meet the standby power requirement. As per market survey report, existing number of Diesel Engine Driven Generator sets in country is about 20 Lacs units.

Nearly 12% (8.20 MMT) of the total diesel consumption (68.4 MMT in 2013-14) has been used for captive power generation. PCRA identified Diesel Engine Driven Generator Set as a product having substantial potential for conservation of Diesel through Standard & Labeling Program. The S&L Programme of Diesel engine Driven Generator Set will provide informed choices to the consumer to procure fuel efficient equipment for their usage. The Star Rated product shall conform to IS 10000, IS 10001, IS 13364 & IS 4889 (all part with all amendments, wherever applicable). Current scheme includes DG sets having diesel engine capacity upto 19 KW.

Decrease in specific fuel consumption through S&L Star Rating programme would contribute towards diesel saving for the customer as well as the nation. Approved Star Rating plan is as under:

Star Rating	Specific Fuel Consumption (SFC) in g/kWh
1 Star	> 302 & ≤ 336
2 Star	> 272 & ≤ 302
3 Star	> 245 & ≤ 272
4 Star	> 220 & ≤ 245
5 Star	≤ 220

8.3.2 Fuel Economy Norms for Heavy Duty Vehicles (Trucks and Buses)

MoP&NG has decided that PCRA and BEE will jointly formulate a time bound action plan to develop fuel economy norms for Heavy Duty Vehicles. In this regard, an Inter-Ministerial Steering Committee was set up on 1.07.2014 under the Chairmanship of Additional Secretary, MoP&NG.

8.4 FIELD ACTIVITIES

During 2014-15 (April- January), a total of 6508 field activities were carried out in Transport, Industry, Agricultural and Domestic sectors as below:

S. N.	Sector	Activity	Ach. 2014-15 (April- Jan.)
1	Industrial	Energy Audits	215
2		Fuel Oil Diagnostic Study	110
3		Service to Small Scale Industry	121
4		Follow Ups	136
5		Institutional Training Programme	361
6		Workshop- Industrial	296
7		Seminar / Technical Meet	108
8	Transport	Driver Training Programme	700 (Drivers trained = 20042 nos.)
9		Model Depot Project	34
10		Training for DTI	19
11		Workshop- Transport	647
12	Domestic	Youth Programme	1714
13		Workshop- Domestic	949
14	Agriculture	Kisan Mela	47
15		Agricultural Workshop	568
16	Misc.	Exhibition	65
17		Van Publicity Cycle	32
		TOTAL	6508

8.5 ENERGY EFFICIENCY OPPORTUNITIES UNDER PAT

PAT (Perform, Achieve & Trade) is part of the BEE initiated National Mission on Enhanced Energy Efficiency, which intends to enhance energy efficiency in large energy intensive industries in India. Under the PAT scheme 478 industrial units have been notified by GOI to reduce their specific energy consumption. While there is an incentive for exceeding the targets by way of earning and trading the E-certs, under achiever will have to pay a penalty. PCRA has embarked upon a plan to cater to this vast available opportunity (6.686 mmtoe approx.) by carrying out energy efficiency studies and provide solutions.

8.6 IMPLEMENTATION OF ISO 50001 (ENERGY MANAGEMENT SYSTEM)

Industries benefit immensely from popular ISO 50001-energy management tool by curtailing inefficient energy utilization. Increasing industrial competition and ever increasing costs of available forms of energy, especially fossil fuels have focused attention on the need to cut down on wasteful energy consumption and to enhance and sustained industrial profits.

PCRA has equipped itself with 14 lead auditors for ISO 50001, who have provided the consultancy work of implementation of ISO 50001 to various installations such as BPCL Mumbai Refinery, Uran LPG plant, CIPLA, IOCL installations, etc.

During Apr-Nov'14, PCRA has completed ISO 50001 works at Bharat Oman Refinery Limited, Bina, Madhya Pradesh and works are going on in 16 other locations (Pharmaceutical sector - 4 nos./ Refinery – 1 nos. / Lube blending plants - 2 nos. / LPG Plants - 7 nos. / Gas Processing - 1 no. and Foundry - 1 no.).

8.7 EMPANELMENT OF ENERGY AUDITORS

Over the years, PCRA has been playing an important role of developing quality energy auditors whose

services become available to industries and commercial establishments in the country. The empanelment committee comprises members from BEE, NPC, TERI and PCRA. Today a strong force of more than 80 PCRA empanelled energy audit firms are providing service to the Indian industry.

8.8 MASS AWARENESS CAMPAIGN FOR CONSERVATION OF PETROLEUM PRODUCTS

(a) Social Media Networking: PCRA is utilizing the social media network to reach out to the internet savvy generation. To build up and sustain interest, PCRA is updating the platforms on a daily basis, with tips, advertisements, contest etc. PCRA is present on Facebook, Twitter, Google plus and Youtube. Public has evinced keen interest in participating recently held contests on Facebook & Twitter, results of which are under compilation.

(b) **Mygov.in :** PCRA started an Open Forum inviting suggestions for new activities under forthcoming Oil & Gas Conservation Fortnight (OGCF) – 2015. The Forum has seen active participation of the public, and the suggestions received are being reviewed.

PCRA has started a contest on mygov.in inviting taglines on CONSERVATION OF PETROLEUM PRODUCTS – A NATIONAL MOVEMENT. The contest was open up to 19 December 2014.

Chapter 9

International Co-operation and Engagement Abroad

International Co-operation

9.1 To strengthen the country's energy security, the Government is encouraging oil companies to aggressively pursue equity oil and gas opportunities overseas. India is actively engaged in bilateral and multi lateral cooperation with foreign counties. To strengthen the country's energy security, the Ministry of Petroleum & Natural Gas is engaged in oil diplomacy. India's oil PSUs in particular are being encouraged to adopt a global vision in their pursuit of raw materials and raw material-producing assets abroad, and to vigorously pursue acquisition of oil and gas assets overseas. In this mission, the International Cooperation (IC) Division provides a comprehensive international template / framework along with diplomatic support to the oil companies.

9.2 THE MAJOR COMPONENTS OF MOP&NG'S OIL DIPLOMACY ARE:

(i) Engaging with Governments of hydrocarbon-rich countries for seeking exploration & production blocks on nomination basis or Government-to-Government basis;

(ii) Participating in the Global Energy Dialogue through multilateral fora, such as the International Energy Forum and the International Energy Agency;

(iii) Leveraging India's pre-eminent position in the International Energy Forum to effectively ventilate issues of direct concern to India, such as transparency in oil markets and pricing issues;

(iv) Entering into collaborative arrangements with international organizations in the energy sector, such as the International Energy Agency through Memoranda of Understanding, Agreements /Declarations for cooperation in the areas of specific relevance to an emerging economy like India;

(v) Pursuing the acquisition of oil & gas assets abroad, with the objective of increasing the oil & oil equivalent gas available for the country.

(vi) Entering into collaborative arrangements with international organization, to facilitate technical assistance in R&D, data sharing, statistical model building and analytical tools for energy sector forecasts, etc.

9.3 THE MECHANISMS FOR ACHIEVING OIL DIPLOMACY OBJECTIVES ARE:

(i) Meetings at the level of Heads of State /Government/Oil Minister of hydrocarbon-rich countries;

(ii) Inter-Governmental Agreements with oil and gas-rich countries;

(iii) The instrumentality of Joint Working Groups with oil & gas-rich countries;

(iv) Through Memoranda of Understanding /Declarations of Cooperation with the Governments of oil-rich countries and the relevant international organizations;

(v) Bilateral meetings at the level of the Minister and Secretary;

(vi) Attending important Ministerial meetings of international organizations, such as the International Energy Forum, etc.;

(vii) Utilizing the services of Indian High Commissions /Embassies abroad for issues relating to the country's energy security;

IndianOil won the 'Global Human Resources Development Awards 2014' in the category 'Improved Quality of Working Life' instituted by International Federation of Training & Development Organisation (IFTDO)

(viii) Holding high-level conferences, such as the India-Africa Hydrocarbons Conference, Petrotech, etc., to seek engagement with oil & gas producing countries /international oil companies

9.4 In order to explore new avenues and fortify existing bilateral cooperation in the hydrocarbon sector, the Minister/Minister of State led a number of delegations on visits abroad and also received foreign delegations in India. List of important visits by Minister/Minister of State and foreign delegations to India are shown below:

(i) 11th Meeting of India- Kazakhstan Inter Governmental Commission (IGC)

11th Meeting of India- Kazakhstan Inter Governmental Commission (IGC) on Trade, Economic, Scientific, Technological , Industrial and Culture Cooperation was held on 24-25 April, 2014 in Asthana, Kazakhstan. Indian delegation was led by the Secretary (PNG). In the Hydrocarbon sector, the Kazakhstan side offered the ABAI oil and gas block in Caspian Sea for joint development with OVL.

(ii) 14th Ministerial meeting of the International Energy Forum

14th Ministerial meeting of the International Energy Forum was held on 15-16 May, 2014 in Moscow. Indian delegation was led by the Secretary (P&NG). During the Opening Plenary Session Ministers, Heads of International Organizations, International executives and thought-leaders discussed the challenges and opportunities related to the shifts in the new geography of energy, with a focus on the expected paths for oil and gas supply and demand, and how decision-makers might best draft policy to enhance energy security. The Forum also focused on issues relating to unconventional oil and gas transition to lower CO2 emitting economy, ways to leverage IEF's platform, etc.

(iii) 3rd India-Kuwait Joint Working Group (JWG) Meeting on Hydrocarbons.

Areas of cooperation between India and Kuwait were discussed in the JWG meeting held at Kuwait on 24-25 June, 2014. The main areas identified for action were

(i) Investment by Kuwait in OPAL and OMPL Petrochemical projects.

(ii) Request of Kuwait to have a long-term contract, for supply of crude oil to the public sector refineries.

(iii) Investment by Kuwait in the Paradip refinery cum petrochemical project of IOCL and the Kochi refinery cum petrochemical project of BPCL.

(iv) Storage of Kuwait's crude oil in ISPRL's Visakhapatnam cavern subject of finalization of an appropriate business model by the Indian side.

(v) Possibilities of collaboration in the area of training and R&D.

(vi) Engagement of retired as well as serving employees from the public sector oil companies for working in the upcoming projects in the hydrocarbon sector in Kuwait. Recently a database of 5400 retired employees had been compiled under the banner of PETROTECH and shared with the Kuwait side.

(iv) Turkmenistan, Afghanistan, Pakistan and India (TAPI) Pipeline Project

The 18th 19th and 20th Steering Committee Meetings of the TAPI Pipeline Project were held on 8th July, 2014, at Ashgabat; 20th November, 2014, at Ashgabat; and 11th February, 2015 at Islamabad. The Indian Delegation to the 19th and 20th Steering Committee Meeting was led by Minister of State (Independent Charge). While the delegation to the 18th SCM was led by Secretary, Petroleum & Natural Gas. The Steering Committee is in the process of finalizing a consortium leader to construct and maintain the pipeline and finalize the Joint action plan.

(v) India-Russia JWG

The 19th India-Russia Working Group on Energy and Energy Efficiency under the India Russia Inter-Governmental Commission on Trade, Economic, Scientific and Technological and Cultural Cooperation was held in New Delhi on 30th and 31st October, 2014. Both sides reviewed the current status of India-Russia cooperation in the energy sector, discussed prospects for further deepening the collaboration between the two countries and reaffirmed the importance of bilateral partnership in the energy sector for the development of India –Russia relations as a whole. A protocol was signed between India and Russia on Energy and Energy Efficiency, subsequently a program of cooperation in the oil and Gas sector has been signed at the Ministerial level on 11th December, 2014

(vi) 2nd Saudi Arabia–India Energy Consultations

Minister of State (Independent Charge) led a delegation to participate in the 2nd Sauid Arabia-India Energy Consultations on 28-29th October, 2014 to Riyadh, Saudi Arabia. The visit highligheted India's positions as a main buyer of Saudi crude, issues of increasing the credit limit for crude importers of India and inviting Saudi Investment in the oil and gas and petrochemical sector in India.

(vii) The 19th Steering Committee

Meeting of TAPI was held on 20th November, 2014to discuss the TAPI project with other partner countries viz. Turkmenistan, Afghanistan, Pakistan for further taking up the project.

(viii) The 20th Steering Committee

Meeting was held in Islamabad on 18th February, 2015. A delegation led by Shri Dharmendra Pradhan, Minister of State (i/c) PNG visited Islamabad to participate in the 20th SCM.

9.5 MEMORANDUM OF UNDERSTANDING (MoU)

i) A Memorandum of Understanding was signed on 28.11.2014 between India and Mozambique for Cooperation in the field of Oil and Gas Sector.

(ii) A protocol on cooperation in Energy and Efficiency as signed by both the side. Subsequently a Programme of Cooperation in the oil and Gas sector has been signed at the Ministerial level on 11th December, 2014

9.6 AN OVERVIEW OF INTERNATIONAL OPERATIONS OF OIL PSUs

MoP&NG is encouraging the domestic oil and gas companies to emerge as global energy players, to pursue interests in hydrocarbons wherever they exist, to acquire equity in raw material-producing assets, with an overarching objective of enhancing the country's energy security.

Our oil companies are present in 24 countries namely, Australia, Azerbaijan, Bangladesh, Brazil, Canada, Colombia, East Timor, Gabon, Indonesia, Iran, Iraq, Kazakhstan, Libya, Mozambique, Myanmar, New Zealand, Nigeria, Russia, South Sudan, Sudan, Syria, USA, Venezuela, Vietnam.

The total investment by oil PSUs (OVL, GAIL, IOC, OIL, BPCL& HPCL) from April – November, 2014 is more than Rs. 8372.27 Crore. ONGC Videsh presently has participation in 36 E&P projects in 17 countries namely Azerbaijan (2 projects), Vietnam (2 projects), Russia (2 projects), Sudan (2 projects) and South Sudan (2 projects), Iran (1 project), Iraq (1 project), Libya (1

Sri S.K. Srivastava, CMD, OIL at the MOU signing between OIL and Ms. Zarubezhneft, Russia during the India-Russia Annual Summit on December 11, 2014 at New Delhi

project), Myanmar (4 projects), Syria (2 projects), Bangladesh (2 projects), Brazil (2 projects), Mozambique (1projects), Colombia (8 projects), Venezuela (2 projects), Kazakhstan (1 project) and New Zealand (1 project) and is actively seeking more opportunities across the world.ONGC Videsh has oil and gas production from 13 projects in 10 countries, namely, Russia (Sakhalin-1 and Imperial Energy), Syria (Al-Furat Petroleum Co.), Vietnam (Block 06.1), Colombia (MECL), Sudan (Greater Nile Petroleum Operating Company), South Sudan (Greater Pioneer Operating Company and Sudd Petroleum Operating Company), Venezuela (San Cristobal), Brazil (BC-10), Azerbaijan (ACG) and Myanmar (Block A-1 &A3). Presently there is no production from AFPC, Syria project which is under force Majeure since December, 2011 after EU imposed sanctions on Syria. There are 4 projects where hydrocarbons have been discovered and are at various stages of development. Out of these 4 projects, first oil production from Carabobo1, Venezuela, through early accelerated production system started in December; 2012 and 17 projects are under various stages of exploration. ONGC Videsh also has stake in 2 pipeline projects (1 each in Sudan&Azerbaijan).

Swachh Bharat Abhiyan

9.7 The International Cooperation Division provides support in many of the initiatives of PSUs to acquire overseas assets through diplomatic support. PSUs overseas oil & gas and pipeline assets are listed below:

Overseas Projects/assests

S.No.	Country	Name of the Block	Participating Interest with details of other partners
1.	Vietnam	Block 06.1, Offshore	ONGC Videsh-45% TNK-35% (Operator) Petrovietnam-20%
		Block 128, Offshore	ONGC Videsh- 100%
2.	Russia	Sakhalin-1, Offshore	ONGC Videsh – 20% Exxon Mobil –30% (Operator) Sodeco – 30% SMNG – 11.5% RN Astra – 8.5%
	OIL	Imperial Energy, Russia	ONGC Videsh-100%
		License 61	OIL-50 Petroneft-50% (Joint Operator)
3.	Sudan	GNPOC, Block 1, 2 & 4, Sudan	ONGC Videsh – 25% CNPC – 40% Petronas – 30% Sudapet – 5% (Jointly Operated)
		Khartoum-Port Sudan Pipeline (741 Km), Sudan	ONGC Videsh-90% (Operator) OIL-10%

S.No.	Country	Name of the Block	Participating Interest with details of other partners
4.	South Sudan	GPOC, Block 1, 2 & 4, South Sudan	ONGC Videsh – 25% CNPC – 40% Petronas – 30% Nilepet – 5% (Jointly Operated)
		SPOC (Block 5A) onland	ONGC Videsh– 24.125% Petronas–67.875% Nilepet – 8% (Jointly Operated)
5.	Myanmar	Block A-1, offshore	ONGC Videsh – 17% Daewoo–51% (Operator) KOGAS – 8.5% GAIL – 8.5% MOGE – 15%
		Block A-3, offshore	ONGC Videsh – 17% Daewoo–51% (Operator) KOGAS – 8.5% GAIL – 8.5% MOGE – 15%
		Shwe Offshore Mid-Stream Project, Myanmar	ONGC Videsh – 17% Daewoo–51% (Operator) KOGAS – 8.5% GAIL – 8.5% MOGE – 15%
		Onshore Gas Transportation Pipeline, Myanmar	ONGC Videsh – 8.347% CNPC-SEAP – 50.9% (Operator) Daewoo - 25.041% GAIL - 4.1735% KOGAS - 4.1735% MOGE - 7.365%
		Block B-2,	ONGC Videsh - 97% (Operator) M&S - 3%
		Block EP-3, Myanmar	ONGC Videsh - 97% (Operator) M&S - 3%
		Block M-4	OIL-60% Oilmax-10%
		Block YEB	Mercator-25% Oil Star-5%
6.	Mozambique	Rovuma Area-1(offshore)	ONGC Videsh - 16% Anadarko - 26.5% (Operator) OIL - 4% ENH - 15% Mitsui - 20% BPRL - 10% PTTEP - 8.5%
7	Iraq	Block 8, Iraq (onshore)	ONGC Videsh - 100%

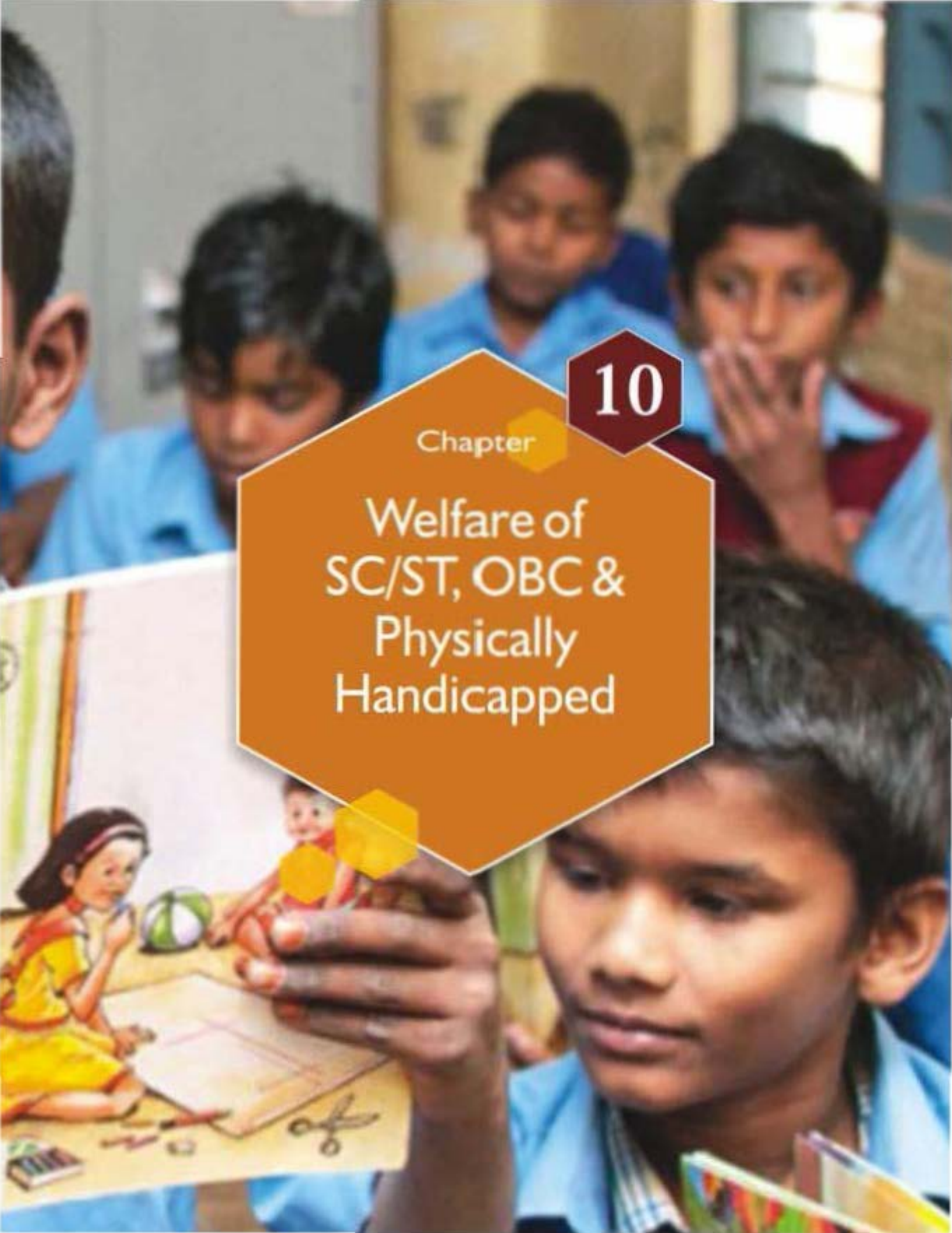
S.No.	Country	Name of the Block	Participating Interest with details of other partners
8.	Iran	Farsi Offshore Block, Iran	ONGC Videsh – 40% (Operator) IOC – 40% OIL – 20%
9.	Libya	Block 43, Libya Area 95-96	ONGC Videsh- 100% Sonatrach – 50% Indian Oil – 25% OIL – 25%
10.	Syria	Block 24, onland	ONGC Videsh – 60% IPR International – 25% (Operator) TriOceanMediterranean – 15%
		Al Furat Petroleum Co., Syria	Himalaya Energy (Syria) B.V. – 33.33% to 37.5% Shell – 62.51% to 66.67% (Operator –Al Furat Petroleum Company)
11.	Brazil	Block BM-SEAL-4, Brazil	ONGC Videsh-25% Petrobras -75% (Operator)
		BC-10, Brazil, (offshore)	ONGC Videsh - 27% Shell - 50% (Operator) Qatar Petroleum International - 23%
		BM-SEAL-11 (4 blocks) Sergipe Basin	Petrobros-60 IBV-40
		BM-C-30 Campos Basin	Anadarko-30 BP-25 Maersk-20 IBV-25
		BM-POT-16 (2 Blocks) Portiguar Basin	Petrobras-60 Petrogel-20 IBV-20
12.	Colombia	Mansarovar Energy Colombia Limited (MECL), Colombia	ONGC Videsh–25-50%, Sinopec-25-50% Ecopetrol-50% (Jointly Operated)
		Block RC-8, Colombia (offshore)	ONGC Videsh – 40% (Operator) Ecopetrol - 40% Petrobras – 20%
		Block RC-9, Colombia (offshore)	ONGC Videsh – 50% Ecopetrol - 50% (Operator)
		Block RC-10, Colombia (offshore)	ONGC Videsh – 50% (Operator) Ecopetrol - 50%
		Block LLA-69, Colombia (onshore)	ONGC Videsh - 50% SIPC - 50% (Jointly Operated)
		Block GUA OFF 2, Colombia (offshore) CPO-5 (onland)	ONGC Videsh - 100% OVL-70% (Operator) Petrodorado-30%
		SSJN (onland)	PSE 50% Operator OVL-50%

S.No.	Country	Name of the Block	Participating Interest with details of other partners
13	Venezuela	San Cristobal Project,	ONGC Videsh-40% PDVSA-60% (Jointly Operated)
		Carabobo-1 Project, Venezuela	ONGC Videsh – 11% IOC – 3.5 OIL – 3.5% Repsol – 11% PDVSA – 71% (Jointly Operated)
14	Kazakhstan	Satpayev Project, Kazakhstan	ONGC Videsh – 25% KMG – 75% (Operator
15.	Azerbaijan	ACG, Azerbaijan	ONGC Videsh-2.7213% BP-36% (Operator) SOCAR-12% Chevron-11% INPEX-11% Exxon-8% StatOil-8% TPAO-7% ITOCHU-4%
		BTC Pipeline (1760 Km), Azerbaijan	ONGC Videsh-2.36% BP-30.1% (Operator) SOCAR-25% StatOil-8.71% TPAO-6.53% ITOCHU-3.4% Chevron-8.9% INPEX-2.5% ENI-5% TOTAL-5% Conoco Philips-2.5%
16.	Bangladesh	Block SS4, Bangladesh	ONGC Videsh - 45% (Operator), OIL - 45% BAPEX - 10%
		Block SS9, Bangladesh	ONGC Videsh - 45% (Operator), OIL - 45% BAPEX - 10%
17.	New Zealand	Block- 14TAR-R1,	ONGC Videsh - 100%
18.	Indonesia	Nunukan Block	BPRL- 12.5% PT Pertamina Hulu Energy -35% (operator) PT Medico – 40% Videocon Indonesia -12.5%
19.	Australia	Block EP – 413 (onland) ARC Energy-44.252	BPRL- 27.803% Norwest Energy 27.945

S.No.	Country	Name of the Block	Participating Interest with details of other partners
20.	East Timor	Block JPDA 06-103	BPRL- 20% OILEX-10 Videocon-20% Japan Enegry -15% GSPC-20% Pan Pacific Petroleum-15%
21.	USA	Niobrara Shale Oil/Condensate JV asset	Carrizo (Niobrara) LLC – 60% OIL - 20% Indian Oil – 10% Haimo Oil & Gas -10%
22.	Canada	Pacific Northwest LNG Project	Progress Energy Canada Ltd. – 62% Sinopec – 15% Indian Oil – 10% Japex – 10% Petroleum Brunei – 3%
23.	Nigeria	OPL- 205 OML – 142	Summit Oil 30% SunteraNigeria 205 Ltd – 70%*
24.	Gabon	Shakthi	Old PSC : OIL – 45% Indian Oil – 45% MarvisPte Ltd - % New PSC: OIL – 50% Indian Oil – 50%
25.	Yemen	Block 82	MEDCO-38-25 (OP) Kuwait Energy-21.25 OIL-12.75 IOC-12.75 YGCO-15%

Unconventional Energy Resources:

Shale Gas and Oil exploration and exploitation: In order to facilitate shale gas and oil exploration and exploitation by National Oil Companies (NOCs) under Nomination regime, the Government has approved the policy guidelines on 14th October, 2013. NOCs shall apply for grant of Shale Gas and Oil rights and will be required to undertake a mandatory Minimum Work Program (MWP) in a fixed timeframe for Shale Gas & Oil exploration and exploitation, so that there is optimum accretion and development of Shale Gas & Oil resources from the area already granted to them.



Chapter 10

Welfare of SC/ST, OBC & Physically Handicapped

Welfare of Scheduled Cates/scheduled Tribes, Other Backward classes and Physically Handicapped

10.1 PREAMBLE

The guidelines in respect of the Reservation for the Scheduled Castes/Scheduled Tribes, Other Backward Classes and Physically Handicapped persons issued from time to time by the Department of Personnel & Training, the Department of Public Enterprises, the Ministry of Social Justice and Empowerment and Ministry of Tribal Affairs are being implemented in the Ministry of Petroleum & Natural Gas and the Public Sector Undertakings under its administrative control. The SCT Cell of this Ministry monitors the implementation of reservation policies in PSUs as well as in the Ministry. The PSUs have also constituted Implementation Cells under the supervision of their Liaison Officers to safeguard the interests of SCs/STs, OBCs and Persons with the Disability (PWD) employees and to redress their grievances. The Liaison Officers of the PSUs are responsible for ensuring implementation of the Presidential Directives as well as the various orders of the Government on the subject. Remedial action on the grievances of the SCs/STs, OBCs and PWD employees of PSUs received through Members of Parliament, National Commission for SC and ST, National Commission for Backward Classes are taken, wherever necessary. The status of appointment of SCs/STs/OBCs/PWD persons is monitored by the Ministry through half yearly report furnished by PSUs separately.

In pursuance of the observations of Parliamentary Committee on the Welfare of SCs/STs/PWD persons and the Presidential Directives on Reservations for SCs/STs in service, a team lead by the Liaison Officer of this Ministry inspects the Reservation Rosters maintained by the Units of PSUs, annually. In 2014 the team has inspected rosters randomly many units of PSUs where Rosters are maintained.

10.2 SPECIAL COMPONENT PLAN FOR SC/ST/PH FOR 2014-15

Under this plan, most of the PSUs of this Ministry are undertaking the following developmental activities for the Welfare of SC/ST population during 2014-15

- Scholarship/Financial Assistance for purchase of books/uniforms etc to SC/ST students in neighboring schools
- Every year Rs. 2.00 crore has been allocated to various work centers of ONGC and SCP/STP towards Welfare and upliftment of SC/ST communities
- Education for Primary level Schools, hiring of teacher, provision of Uniform, note books, stationary etc. to school going children

- During the financial year 2014-15 the PSUs of this Ministry have made provision in the plan outlet for award of scholarship to SC/ST students
- A Special drive relating to SC/ST/OBC/PH welfare activities has been launched during the period 2014-15 i.e. recruitment, minimizing the shortfall etc.
- Most of the PSUs of this Ministry are implementing the provisions under Disability Act, 1995 in respect to identification of course, implementing various provision of 3% reservation of course in Orthopadedicllly Handicapped (OH), Visually Handicapped (VH) and Hearing Handicapped (HH) category.
- Special Recruitment Drive (SRD) for filling the Backlog Reserved Vacancies for SC/ST/OBC/PH categories was launched and almost 60% of these vacancies were filled. Remaining vacancies will be filled in the year 2015-16 so that this backlog is completely eliminated.

10.3 BACKLOG OF SC/ST/OBC/PH IN OIL COMPANIES UNDER THE ADMINISTRATIVE CONTROL OF THE MINISTRY AS ON 31.12.2014

	Number of backlog Reserved Vacancies remaining (Direct Recruitment)							
PSU	Group A		Group B		Group C		Group D	
	SC/ ST	OBC/ PH	SC/ ST	OBC/ PH	SC/ ST	OBC/ PH	SC/ ST	OBC/ PH
Balmer Lawrie	9/5	18/1	6/4	6/0	3/0	0/3	0/2	0/5
OIL	nil	nil	nil	nil	4/7	0/10	nil/1	nil/6
EIL	5/3	1/14	nil	nil/1	nil	0/2	nil	nil
BPCL	nil	0/38	0/1	247/0	nil	145/6	nil	242/0
NRL	3/nil	Nil/2	Nil	Nil	Nil	Nil/6	nil	nil
IOC	23/19	38/1	nil	nil	0/6	13/43	1/0	1/25
GAIL	9/5	13/4	2/5	14/2	12/4	6/1	Nil/6	nil
HPCL	nil	0/3	nil	nil	nil	7/13	nil	52/5
ONGC	4/2	4/0	nil	nil	2/4	11/95	1/16*	24*/0
ONGC Videsh	nil	nil	nil	nil	nil	nil	nil	nil
CPCL	nil	nil	nil	nil	nil	nil	nil	nil
BIECCO LAWRIE	Nil/1	5/nil	Nil/2	7/nil	1/nil	nil	Nil/9	nil/8
MRPL	1/0	0/7	nil	nil	10/6	0/17	nil	0/1
OIDB	nil	nil	nil	nil	nil	nil	nil	nil
RGIPT	nil	nil	nil	nil	nil	nil	nil	nil

*Recruitment on Court Orders/directions leads to shortfall which is being taken note of in subsequent recruitment exercise.

Chapter 11

Development of North-Eastern Region

Development of North-Eastern Region

11.1 PREAMBLE

1. The history of oil and gas exploration in India dates back to the 19th century in the state of Assam located in the extreme North-Eastern corner of India. The first well that struck oil was in Makum area near Margherita during 1867 drilled by McKillop, Stewart & Co., barely nine years after Drake's well in 1859 in Titusville, Pennsylvania. Subsequently, a number of wells were drilled in Makum and Namdang areas of Margherita and produced crude oil in minor quantities for more than two decades. The Assam Railway & Trading Co. Ltd, which was involved in the business of timber, coal, tea & construction of railway lines, drilled the first commercial well Digboi-1 (September 1889 -November 1890, total depth of 662ft) with an initial production of 200 gallons per day, opened up a new chapter in exploration and production of oil in this part of the world and the oil industry of India was officially born. During the subsequent years before independence of India, Digboi oil field was extensively developed and searched for new oil fields continued.
2. Other significant milestones in oil and gas exploration in North East took place mainly during post independence. These include the discoveries of the Nahorkatiya and Moran fields by Assam Oil Company (AOC) and Rudrasagar oil fields by ONGC in 1953, 1956 and 1960 respectively. Subsequently, more than 100 oil and gas fields, that include fields such as Jorajan, Kumchai, Hapajan, Shalmari, Dikom, Kathaloni, Tengakhat, Bhogpara, Chabua, Baghjan, Barekuri, Mechaki, Lakwa, Lakhmani, Geleki, Amguri, Kharsang, Charali, Borhollа-Champang, Khoraghat, Baramura, Tichna, Gojalia, Rokhia, Khobal, Hortoki have been discovered by Oil India Limited (OIL) and Oil & Natural Gas Corporation Limited (ONGC) in the North Eastern states of Assam, Arunachal Pradesh, Nagaland, Tripura and Mizoram.
3. Since then, both the National Oil Companies viz., OIL and ONGC have proven substantial amount of producible hydrocarbons and have technical know-how of producing and managing complex reservoirs and contributing to about 8 MMT per annum of oil plus oil equivalent of gas (O+OEG) from their producing assets in North-East.
4. The total prognosticated hydrocarbon resources (O+OEG) of Upper Assam Shelf basin are estimated to be of the order of 3180 MMT and for Assam-Arakan Fold Belt basin, the total prognosticated hydrocarbon resources is of the order of 1860 MMT. Thus, there is a total of 5040 MMT of prognosticated hydrocarbon resources in the North- East. About 2224 MMT of in-place hydrocarbon reserves have been established so far by E&P companies, which means about 56% of hydrocarbon resources are under "yet to find" category.
5. The two National Oil Companies (NOCs), namely, ONGC and OIL have been engaged in the North East Region for exploration and exploitation of oil and gas for more than 55 years and generated a vast geo-scientific database and geological understanding of the basin.
6. With the advent of New Exploration Licensing Policy (NELP) by the Government in 1999, the E & P activities were further intensified by award of new acreages to various national and international E & P Companies on the basis of open bidding system. This has helped in inducting new technology in drilling and production of hydrocarbon as well as enhancing geo-scientific knowledge and overall understanding of Assam-Arakan Basin.

11.2 EXPLORATION ACTIVITIES IN NORTH-EAST UNDER THE NOMINATION REGIME:

1. Oil India Limited since its inception in February 1959 has been actively pursuing exploration & development activities in the state of Assam. During 1962-65, various new technologies were adopted such as deviation drilling, dual completion, pressure maintenance etc. In 1968, exploration programme in Kharsang, Arunachal Pradesh began and in Kusijan areas, west of Digboi hydrocarbon was discovered.
2. During 1969-79, extensive geophysical survey and development effort in Assam and Arunachal Pradesh was carried out which led to the discovery of the Jorajan field in 1972 and establishment of gas resources in Eocene of Tengakhat (west of Naharkatiya) in 1973.
3. OIL started its seismic survey campaign in the year 1976-77 and till date have acquired more than 25,000 GLKM of 2D seismic data and nearly 8500 Sq. Km of 3D seismic data in Upper Assam Basin.
4. During nineties, intensive exploration/exploratory well drilling & development activities resulted in

discovery of fields such as Bogapani, Kumchai, Hapjan, Shalmari and Rajgarh. Deeper Exploration: After discovery of hydrocarbon in the deeper Eocene-Paleocene horizons, more thrust was given to explore into these horizons in different fields of Upper Assam. As a result, production from deeper reservoirs during late 1990s surpassed the production from shallower reservoirs (Barail and Tipam). This led to significant discoveries involving deeper prospects subsequently with depths ranging between 3550-3800 m in the central basement high areas of Dikom-Kathaloni-Chabua-Matimekhana to more than 5500 m in Mechaki areas towards the eastern flank of Upper Assam Basin.

5. In 1993-94, OIL made efforts to explore North bank of river Brahmaputra. Extensive 2D seismic data acquisition was done and a number of drillable prospects identified. Since then, a total of eight wells have been drilled in the North Bank. However, there is no commercial success as yet.
6. Currently, OIL holds two exploration blocks in the state of Assam and three blocks in Arunachal Pradesh under nomination regime. From 2000 onwards, OIL is aggressively participating in NELP exploration blocks apart from nomination blocks and holds eight exploration blocks under NELP regime.
7. ONGC started its exploration work in Assam in 1956. Seismic surveys and geological mapping of the outcrop areas were initiated while gravity-magnetic surveys began in 1961. The analysis of seismic data along with the outcrop mapping data generated by ONGC and earlier workers helped refining the basin architecture and its evolution.
8. The first wild cat well of ONGC was drilled on Disangmukh structure in 1960, however, the first commercial oil discovery was on Rudrasagar structure in the same year. As a result of initial successes encountered in pursuing structural prospects the focus remained on identification of such prospects through seismic data. Since then ONGC has drilled more than 700 exploratory wells in the state of Assam
9. The reservoirs of Barail Group belonging to Upper Eocene to Lower Oligocene age and those of Tipam Group of Upper Miocene age proved to be most prolific and drew significant attention of explorationists. A significant number of oil and gas fields, including Panidihing, Disangmukh, Lakwa, Lakhmani, Sonari, Geleki, Demulgaon, Amguri and Charali, were discovered with this exploration philosophy.
10. During the past nearly five decades, it has been ONGC's endeavour to prove the extension of the established hydrocarbon bearing areas of Sivasagar and Dhansiri Valley of North Assam Shelf and at the same time step out and explore new areas. In the process it has established hydrocarbon fields in the logistically difficult areas of Cachar and neighbouring states of Tripura and Nagaland.
11. Currently ONGC holds three exploration blocks each in the states of Assam and Nagaland under nomination regime. In addition, ONGC holds seven exploration blocks under NELP regime in North East.
12. Hon'ble Prime Minister Shri Narendra Modi inaugurated the ONGC Tripura Power Plant to monetize the gas assets of ONGC in the land-locked state of Tripura. The 726.6 MW gas-based power plant of ONGC Tripura Power Company is one of the biggest Clean Development Mechanism (CDM) projects of the world.

18.3 EXPLORATION ACTIVITIES IN NORTH-EAST UNDER THE PSC REGIME

1. Under the PSC regime, exploration blocks were first awarded in the States of Assam in the year 1998 under Pre-NELP rounds of bidding. Subsequently, blocks were awarded under various rounds of NELP. The 31 awarded blocks (Assam-21, Manipur- 2, Mizoram- 3, Nagaland-2 and Tripura-3) cover an area of 43,722 Sq. km. Out of these, 18 blocks are operational and 11 blocks have been relinquished (Assam – 9, Tripura – 1 and Mizoram-1). PEL is awaited for one block and two blocks have been proposed for relinquishment by operators. In addition, there are two discovered fields that are in operation under PSC regime, namely, Kharsang in Arunachal Pradesh and Amguri in Assam.

2. The following exploration activities have been carried out as on 31st December, 2014 under the PSC regime in the awarded blocks.
   - Acquisition of 5246 Line Kilometer (LKM) of 2D seismic data & 2,004 Sq. Km of 3D seismic data completed.
   - Drilling of 58 wells including 26 exploratory wells have been carried out
   - A total of seven hydrocarbon discoveries (gas) have been made (one in Assam, one in Mizoram and five in Tripura)
   - Expenditure to the tune of US$ 535 Million has been incurred under PSC for exploration, development and production activities.

3 The status of discoveries made under the PSC regime is as under:

Block Name	Operator	State	Gas Discovery	Month of Discovery	Current status
AAP-ON-94/1	Hindustan Oil Exploration Company Ltd.	Assam	1	January, 2008	FDP under examination at DGH
AA-ONN-2001/1	ONGC	Tripura	2	a. February,2009 b. December, 2013	a. DOC is to be submitted by operator b. Appraisal program is to be submitted by operator
AA-ONN-2002/1	Jubilant Oil & Gas Pvt. Ltd.	Tripura	3	a.November, 2009 b. December, 2009 c. May, 2013	(a) Discoveries not pursued by Operator. (b) FDP yet to be by operator (c) PCI Submitted, Appraisal Plan not yet submitted
AA-ONN-2001/2	ONGC	Mizoram	1	December, 2011	Appraisal program is to be submitted by operator

(DoC: Declaration of Commerciality, FDP: Field Development Plan, PCI: Potential Commercial Interest)

4. The following exploration activities by OIL and ONGC have been carried out so far under the PSC regime in the awarded blocks:
5. OIL has been awarded eight exploration blocks in the North Eastern part of India out of which seven blocks are in the State of Assam and part of Upper Assam Basin and one block is in the state of Mizoram which constitutes part of Assam-Arakan Basin.

The Minister of State (Independent Charge) for Development of North Eastern Region (DoNER), Minister of State

6 **The present status of NELP blocks in North-Eastern region awarded to OIL is as under :**

Status of OIL's NELP Operated blocks in NE India

Sl.No.	Basin	Blocks	Area	Phase of	Exploration Activity
1	UPPER ASSAM BASIN	AA-ONN-2002/3 (Karbi Anglong, NELP-IV)	1095	In Phase- II extended to 1st July, 2014	Pre-drilling activities In progress
2		AA-ONN-2004/1 (Amguri NELP-VI)	144/0	Relinquished	The block relinquished on 27th December, 2011.
3		AA-ONN-2004/2 (Dibrugarh NELP-VI)	218	In phase-II, expiry on 27th June,2014	Loc-DRB falls in forest, forest clearance awaited
4		AA-ONN-2009/4 (Teok NELP-VIII)	84	Initial exploration period, expiry on 8th December,15	Acquisition of 2D/3D Seismic data in process.
5		AA-ONN-2010/2 (Karbi Anglong NELP-IX)	396	Initial exploration period	PSC signed. PEL awaited from Govt of Assam.
6		AA-ONN-2010/3 (Sadiya, NELP-IX)	171	Initial exploration period	PSC signed. Acquisition of 3D seismic data under process.
7.		AA-ONN-2003/3	275	Relinquished	
8	ASSAM ARAKAN BASIN	MZ-ONN-2004/1 (Mizoram, NELP-VI)	3213	In Phase-II, expiry on 21st May,2015.	Drilling activities in process.

7. ONGC has been awarded eight blocks (One Pre-NELP Exploration Block & seven NELP Exploration Block) in north east. Out of these two blocks are in Nagaland, one each in state of Tripura & Mizoram and the remaining four are in state of Assam. The present status of NELP blocks in North-Eastern region awarded to ONGC is as under.

Block	NELP	Work Carried out			Discovery	Remarks
		2D(GLK)	3D(SKM)	Wells		
AA-ONN-2001/1	III	70		3	Khubal-4 Khubal-7	a. DOC is to be submitted by operator b. Appraisal program is to be submitted by operator
AA-ONN-2001/2	III	174	0	1	Hortoki	Exploration in progress
AA-ONN-2001/3	III	-	130	-	-	Disputed Area Belt issues
AA-ONN-2001/4	III	-	-	-	-	Nagaland acreages.
AA-ONN-2002/4	IV	-	-	-	-	
AA-ONN-2005/1	VII	-	-	-	-	Disputed Area Belt issues
AA-ONN-2009/3	VIII	146	84	-	-	

11.4 CRUDE OIL & NATURAL GAS PRODUCTION IN NORTH-EAST

1. As far as commercial production of oil and gas is concerned in the North East, ONGC and OIL produced about 3.567 Million Metric Tonnes (MMT) of oil and 3.048 Billion Cubic Meters (BCM) of gas in the North East in the year 2014-15 upto December 2014. The oil and gas production under the PSC regime in North East was about 0.055 MMT and 0.016 BCM respectively during the year 2014-15 upto December 2014.
2. Under the PSC (JV) regime, two discovered fields were awarded under Medium and Small Sized Discovered Fields rounds of bidding. The Medium Sized field Kharsang in Arunachal Pradesh, covering an area of 11 Sq. Km was awarded in 1995 and the Small Sized field Amguri in Assam, covering an area of about 52.57 Sq. Km was awarded in 2001.

3. So far till 31st December, 2014, Kharsang field has cumulatively produced about 7.991 Million Barrel of crude oil and 236 MMSCM of natural gas. The current oil and gas production rate is about 1,228 barrels per day of oil and 66,784 cubic meter of gas per day respectively. Amguri field has cumulatively produced about 0.496 Million Barrel of crude oil plus condensate and 203 MMSCM of associated and non-associated natural gas. There is currently no oil/gas production from the field as the gas producing well ceased to flow since November, 2011 due to sanding in wellbore. The gas production was about 45,000 cubic meters per day before the well ceased. Further, the contract of one of the Joint Venture partners viz. Canoro Resources Ltd in Amguri was terminated on 29th August, 2010 due to contractual issues. Efforts are being made to re-start the field operations.

11.5 ALTERNATE HYDROCARBON SOURCES IN NORTH EAST

1. Oil Shale : DGH has completed a project in Assam-Arakan Basin in association with BRGM, France and Mineral Exploration Corporation Limited (MECL), India, to identify and estimate resources in respect of oil shale deposits and syncrude potential in NE part of India covering an area of about 250 Km2, spanning three blocks in Assam and Arunachal Pradesh. An estimate of syncrude resources has been made by BRGM in the three blocks at 400 MMT (approx) of oil up to a depth of 500m. Further, DGH has entered into a MoU with IOC for extraction technology.
2. Coal Bed Methane (CBM) : In order to harness the CBM potential in the North-East, one CBM block, namely, AS-CBM-2008/IV has been awarded in the state of Assam, covering an area of about 113 Sq. Km. The block was awarded under CBM IV round of bidding to the Consortium of M/s Dart Energy and OIL . The estimated CBM resource in this block is about 60.3 BCM. The PEL has been granted by the State Government for this block in April, 2012. The block is currently under exploration Phase-I.
3. Shale Gas: Based on the data available from conventional oil/gas exploration in the country for the last so many years, it appears that few sedimentary basins, including Assam Arakan Basin may be prospective from Shale gas point of view. Resource estimation for Shale Oil/Gas has been taken up for various Indian basins, including Assam Arakan. In October 2013, MOP&NG has issued guidelines for exploration and exploitation of Shale Oil & Gas by NOCs in the nomination acreages under which ONGC and OIL have identified fifty blocks and five blocks respectively. Out of fifty five blocks, three blocks operated by ONGC and four blocks operated by OIL are in the state of Assam.

11.6 ISSUES AND CONCERNS IN NORTH EAST

1 Currently, exploration activities have been affected for various reasons in the following nine blocks awarded under NELP in different States of North East

S. No.	Location	Blocks	Issues/Problem
1	Assam	AA-ONN-2001/3	Work held up due to border dispute with Nagaland. Block located in Disputed Area
2		AA-ONN-2003/1	Environmental Clearance/ Forest Clearance not granted by MoEF/Govt. of Assam
3		AA-ONN-2004/3	Environmental Clearance/Forest Clearance not granted by MoEF/Govt. of Assam
4		AA-ONN-2002/3	Road construction to reach location/site awaited
5		AA-ONN-2005/1	Work held up due to border dispute with Nagaland. Block located in Disputed Area
6	Manipur	AA-ONN-2009/1	Bridge construction to reach location/sit in the blocks awaited
7		AA-ONN-2009/2	
8	Nagaland	AA-ONN-2001/4	Nagaland Govt. has either stopped or not allowed to commence exploration activities
9		AA-ONN-2002/4	

11.7 NORTH EAST INVESTMENT OPPORTUNITIES

1. National oil Companies ONGC & OIL, have a long history of E & P activities in this region. Subsequently, the area was opened for exploration to the Private/JV & Foreign Companies through Pre-NELP and NELP rounds of biddings. There was a good response from private sectors. Currently, five PSUs, six Private and two Foreign companies are engaged in E & P activities in North-East under the PSC regime.
2. There is an urgent need to explore the hitherto unexplored area and exploit the untapped hydrocarbon resources. Further, the region has potential for exploration & exploitation of several unconventional resources such as Oil Shale, Shale Gas, Basin Centered Gas Accumulation (BCGA) and CBM. Tight gas/oil reservoirs and high pour point oil in North East are other areas which might open up new opportunities for future exploration/exploitation.
3. For incentivizing exploration and production in North East region, 40% subsidy on gas operations has been extended to the private companies operating in the region as well. This provision of level playing field is expected to boost exploration activities by private operators in the region, increase gas production and enhance the level of economic activities in the region.
4. Policy interventions to encourage E&P activities and to address various bottlenecks to such activities in the North-East are being explored.

Chapter 12

Welfare, Development & Empowerment of Women

Welfare Development and Empowerment of Women

The Ministry of Petroleum & Nature Gas and Public Sector Undertakings/Organisations under its administrative control have been taking numerous initiatives towards welfare and development as also to empower the women employees. With a view to deal with gender sensitization and to promote the cause of women empowerment, special programmes are organized focusing on their professional development and welfare activities. These include external and in-house training, programmes on women health, sponsoring them to attend the National Meet of the Forum of Women in Public Sector, etc.

Women Forum have been formed in the PSUs to look after the interest of the women employees. List of Do's and Don'ts prepared by the National Commission for Women has been circulated for attention of all employees. Committees have been set up to attend to redressal of complaints on 'Sexual harassment at work place.'

The number of women employees vis-a-vis total number of employees as on 31st December, 2014 in the oil PSUs is tabulated as

Sl. No.	Name of PSU	Total No. of Employees	Total No. of Women Employees
1.	ONGC	33157	2174
2.	ONGC Videsh Ltd.	311	25
3.	IOCL	33880	2593
4.	HPCL	10799	889
5.	BPCL	12834	1164
6.	GAIL	4207	254
7.	EIL	3136	390
8.	OIL	6115	202
9.	CPCL	1644	88
10.	NRL	881	44
11.	MRPL	1715	125
12.	BIECCO LAWRIE	289	03
13.	BALMER LAWRIE	1371	97
14.	OIDB	22	04
15.	RGIPT	28	06

Chapter 13

General

13.1 PROGRESSIVE USE OF HINDI IN OFFICIAL WORK

The Ministry of Petroleum and Natural Gas continued its efforts for the promotion of official language in official work. Section 3(3) of Official Language Act, 1963 was fully complied with. All letters received in Hindi were invariably replied to in Hindi. Similarly, correspondence with the offices located in Region A and B was done in Hindi to the extent possible.

There is a Hindi Advisory Committee functioning in the Ministry under the Chairmanship of Hon'ble Minister of Petroleum and Natural Gas. The Committee consists of six Members of Parliament, nine non-official members, besides senior officers of the Ministry and PSUs of the Ministry as its official members. The function of the committee is to render advice to the Ministry for promotion of official language in official work. Re-constitution of this Committee is under process.

An Official Language Implementation Committee is also functioning in the Ministry under the Chairmanship of Sr. Economic Advisor. The function of this committee is to review the progress of official language in the Ministry and its undertakings and give suggestions for the promotion of the same. Regular meetings of the committee were organized during the year under review and follow up action was taken on the suggestions of the committee.

Similarly, Official Language Implementation Committees are also functioning in all our PSUs. Officers from the Ministry attended the meetings of such Committees which are located in Delhi. Officers of the Ministry also participated in various Hindi events organized by our PSUs from time to time.

The Committee of Parliament on Official Language visited 18 offices of our PSUs and reviewed the progress of official language in these offices. Follow up action was taken on the assurances given to the Committee by these offices. Senior officers of the Ministry also attended these inspection meetings of the Parliamentary Committee.

The Ministry is already notified under Rule 10(4) of Official Language Rules, 1976. During the year under review, the Ministry notified 42 offices of our PSUs under the said Rule. Under the said rule, such Central Govt. offices are notified where 80% or more staff has acquired the working knowledge of Hindi. Similarly, the Ministry specified nine of its Sections to do their entire work in Hindi.

With a view to assessing the progress of official language in our PSUs and in pursuance of the targets fixed in the Annual Programme 2014-15 issued by the Department of Official Language, senior officers of the Ministry visited more than 73 offices of our PSUs and reviewed the progress of Hindi in these offices. On the spot suggestions were given to the officers concerned for removing the deficiencies.

With a view to assist the officials to do their maximum work in Hindi and to remove their hesitation to do the same, regular Hindi workshops were conducted in the Ministry. Large number of officials attended these workshops and benefitted from the suggestions given in these workshops. As a result of this, percentage of Hindi correspondence in the Ministry increased considerably.

In pursuance of the directions of the Department of Official Language, Hindi Fortnight was organized in the Ministry from 1st September, 2014 to 14th September, 2014. During this occasion, a Message from the Hon'ble Minister of Petroleum and Natural Gas was issued to all our officers as well as to all the PSUs. Various activities including different Hindi Competitions were conducted during this fortnight. Large number of officials of the Ministry participated in these competitions and successful candidates were given cash awards.

In line with the directions of Department of Official Language, the Ministry purchased Hindi Books, Technical Glossaries, etc. were distributed to the sections of the Ministry, with a view to promote Hindi in official work, an All India Petroleum Rajbhasha Sammelan was organized in Kochi on 14th and 15th February, 2014. All Officers connected with Official Language and their senior officers participated in the said conference.

One of the important tasks assigned to the Hindi Division of the Ministry is of translation of various documents of the Ministry. The Hindi Division successfully carried out these responsibilities. The translation of various documents including the Parliament Questions, Cabinet Notes, Parliamentary Standing Committee material was done well in time.

13.2 RTI

Right to Information (RTI) Act-2005 has been implemented in the Ministry of Petroleum & Natural Gas as per Gazette Notification of Government of India dated 15th June,2005. RTI Act is inter-alia designed to promote transparency and accountability in the functioning of public authorities.

As per provision of Section 5 and 19 of the Right to Information Act-2005 and in suppression of all the earlier orders issued, with effect from 16th May, 2007, all the Under Secretaries (or Section Officers in the Sections where there is no Under Secretary) in the Ministry of Petroleum & Natural Gas have been designated as Public Information Officers (PIOs) in respect of Sections allocated to them. Accordingly, all the Directors/Deputy Secretary/Joint Adviser in the Ministry of Petroleum & Natural Gas have been designated as Appellate Authorities in respect of their concerned Under Secretary/Section Officers (PIOs). All the PSUs under the administrative control of the Ministry of Petroleum & Natural Gas have also implemented RTI Act-2005 and PIOs/APIOs and Appellate Authorities has been designated by them. Basic information in respect of the Ministry of Petroleum & Natural Gas and all its PSUs along with details of Appellate Authorities, PIOs & APIOs have been hosted on the websites of the Ministry and all Oil PSUs.

During April to December 2014, 2843 applications /receipts including 26 appeals have been received under RTI Act, 2005 in the Ministry. In so far as RTI & PG Section is concerned, out of these applications/receipts and appeal, 2843 applications /receipts and 26 appeals have been forwarded to the respective Divisions of the Ministry for disposal under the provisions of the Act.

13.3 PUBLIC GRIEVANCES

In accordance with the guidelines of the Cabinet Secretariat, Government of India, the Public Grievance Cell has been functioning in the Ministry of Petroleum & Natural Gas. The Cell has been attending to the grievances of members of the public against the Public Sector Oil Companies and other organizations under the administrative control of this Ministry. All possible efforts are being taken to ensure the regular monitoring of the public grievances received through Department of Public Grievances(DPG), Department of Administrative Reforms and Public Grievances (DARPG) and other Departments of the Government as well as the members of the public. A systematic mechanism has been evolved so as to ensure speedy and expeditious redressal of the public grievances. The Public Grievance Cell is functioning under the charge of Joint Secretary(RTI & PG) who is also the nodal officer for Public Grievances, Ministry of Petroleum & Natural Gas. In addition, a new online system called " Centralized Public Grievance Redress and Monitoring System" (CPGRAMS) has been introduced in the month of June, 2008. With the aid of this online system, public grievances from the public and others are received speedily and is convenient for the common man.

During the year 2014-15(from 1st April, 2014 to 31st December, 2014), the Public Grievance Cell of this Ministry received a total of 8590 grievances and the pendency of the grievances as on 31st March, 2014, was 446 grievances only. Thus, during the aforesaid period a total numbers of 7663 grievances have been redressed.

As for grievances received through CPGRAMS, it is mentioned that around 90% of such grievances stand disposed as on 31st December, 2014. However, the grievances keep pouring in constantly through CPGRAMS in the Ministry either from citizens directly or are posted/transferred by Government agencies like DARPG, DPG, President Secretariat, PMO which are dealt/processed by referring the same either to subordinate/attached organizations/Oil Public Sector Undertakings under the Administrative control of the Ministry or to different sections/desks/divisions of the Ministry internally, as the case may be. However, it should be borne in mind that ideally speaking, the Government's emphasis is to make such endeavours that the public grievances should not arise ab initio.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Chapter 14

Appendices

Appendices

APPENDIX - I

Work allocated to Ministry of Petroleum and Natural Gas

1. Exploration for and exploitation of petroleum resources, including Natural Gas and Coal Bed Methane.
2. Production, supply, distribution, marketing and pricing of petroleum, including Natural Gas, Coal Bed Methane and petroleum products.
3. Oil refineries including Lube Plants.
4. Additives for petroleum and petroleum products.
5. Lube blending and greases.
6. Planning, development, control and assistance to all industries dealt with by the Ministry.
7. All attached or subordinate offices or other organizations concerned with any of the subjects specified in the list.
8. Planning, development and regulation of oilfield services.
9. Public sector projects falling under the subjects included in this list. Engineers India Limited and IBP Company, together with its subsidiaries, except such projects as are specifically allotted to any other Ministry / Department.
10. The Oil Fields (Regulations and Development) Act, 1948 (53 of 1948).
11. The Oil and Natural Gas Commission Act, 1959 (43 of 1959).
12. The Petroleum & Minerals Pipelines (Acquisition of Right of User Inland) Act, 1962).
13. The Esso (Acquisition of Undertakings in India) Act, 1974 (4 of 1974).
14. The Oil Industry (Development) Act, 1974 (47 of 1974).
15. The Burmah-Shell (Acquisition of Undertakings in India) Act, 1976 (2 of 1976).
16. The Caltex [Acquisition of Shares of Caltex Oil Refining (India) Limited and of the Undertakings in India of Caltex (India) Limited] Act, 1977.
17. Administration of the Petroleum Act, 1934 (30 of 1934) and the rules made thereunder.
18. Administration of Balmer Lawrie Investments Limited and Balmer Lawrie and Company Limited.
19. Petroleum & Natural Gas Regulatory Board Act, 2006.
20 To promote long term engagement of India Oil Companies in the hydrocarbon sector abroad.
21. Strengthening energy security by acquiring oil and gas equity abroad and participation in transnational oil and gas pipeline projects.
22. Creation and administration of strategic petroleum reserve through Indian Strategic Petroleum Reserves Limited (ISPRL).

APPENDIX - II

List of Public Sector Undertakings and other organisations under the administrative control of the Ministry of Petroleum & Natural Gas

I. Oil Companies in which Government of India has a shareholding as on 31.03.2014

1.	Oil & Natural Gas Corporation Limited	68.94%
2.	Indian Oil Corporation Limited	68.57%
3.	Hindustan Petroleum Corporation Limited	51.11%
4.	Bharat Petroleum Corporation Limited	54.93%
5.	GAIL (India) Limited	56.11%
6.	Engineers India Limited	69.37%
7.	Oil India Limited	67.64%
8.	Biecco Lawrie & Co. Ltd.	32.23%
9.	Balmer Lawrie Investment Ltd.	59.57%

II. Subsidiaries and Other Companies

1.	ONGC Videsh Limited	- wholly owned by ONGC
2.	Mangalore Refinery & Petrochemicals Limited	- subsidiary of ONGC
3.	Bharat Petro Resources Limited	- subsidiary of BPCL
4.	Chennai Petroleum Corporation Limited	- subsidiary of IOC
5.	Numaligarh Refineries Limited	- subsidiary of BPCL
6.	Certification Engineers International Ltd.	- wholly owned by EIL
7.	EIL Asia Pacific Sdn BHD	- wholly owned by EIL
8.	GAIL Gas Limited	- wholly owned by GAIL

III. Other Organisations

1. Oil Industry Development Board
2. Petroleum Conservation Research Association
3. Oil Industry Safety Directorate
4. Centre for High Technology
5. Petroleum Planning & Analysis Cell
6. Directorate General of Hydrocarbons
7. Rajiv Gandhi Institute of Petroleum & Technology
8. Petroleum and Natural Gas Regulatory Board

APPENDIX - III

Production of Crude Oil and Natural Gas

Item	2009-10	2011-11	2011-12	2012-13	2013-14	2014-15 (Apr,14-Dec,14)	2014-15**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I. Crude Oil Production ('000' Tonnes)							
(a) Onshore:							
Gujarat	5960	5905	5780	5331	5061	3534	4978
Assam/Nagaland/Tripura	4740	4721	5025	4863	4710	3402	4858
Arunachal Pradesh	131	116	118	121	111	61	93
Tamil Nadu	239	233	247	238	226	176	240
Andhra Pradesh	304	305	305	295	297	184	250
Rajasthan	447	5149	6553	8593	9180	6679	8707
Total (a)	**11821**	**16429**	**18027**	**19441**	**19585**	**14036**	**19126**
of which							
OIL	3572	2582	3847	3661	3466	2582	3600
ONGC	7515	7447	7386	6944	6705	4614	6595
JVC/Private	734	5400	6794	8836	9414	6839	8932
(b) offshore :							
ONGC	17340	16973	16330	15617	15541	12109	16915
JVC/Private	4529	4282	3733	2804	2663	2027	2722
Total (b)	**21869**	**21255**	**20063**	**18421**	**18203**	**14136**	**19637**
Grand Total (a+b)	**33690**	**37684**	**38090**	**37862**	**37788**	**28172**	**38763**
2 Natural Gas Production (MMSCM)							
(a) Onshore :							
Gujarat	2444	2262	2173	2032	1657	1156	1423
Assam/Nagaland	2703	2680	2905	2910	2868	2255	3045
Arunachal Pradesh	40	44	40	41	41	25	32
Tripura	564	610	644	647	822	830	1339
Tamil Nadu	1178	1119	1285	1206	1304	920	1369
Andhra Pradesh	1479	1384	1364	1249	1171	392	1029
ajasthan	239	432	590	685	982	854	1240
West Bengal (CBM) $	38	41	84	107	166	162	573
Total (a)	**8685**	**8574**	**9084**	**8877**	**9012**	**6594**	**10050**
OIL	2416	2350	2633	2639	2626	2060	2838
ONGC	5634	5504	5751	5447	5316	3571	5547
JVC/Private	635	720	699	791	1069	963	1665
(b) Offshore :							
ONGC (Mimbai High)	17462	17591	17565	18102	17968	13027	18453
JVC/Private	21350	26054	20910	13700	8428	5699	8117
Total (b)	38811	43645	38475	31802	26395	18726	26570
Grand Total (a+b)	**47496**	**52219**	**47559**	**40679**	**35407**	**25332**	**36620**

* : Provisional ** Target fixed for the year $: Coal Bed Methane Production (includes production from Jharkhand and M.P)

APPENDIX - IV

Installed Capacity And Refinery Crude Throughput

(Figures in TMT)

Refinery / Location	Installed Capacity	Refinery Crude Throughput						
	1.4.2014	2009-10	2010-11	2011-12	2012-13*	2013-14*	2014-15* (Apr,14 -Dec,14)	2014-15
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(a) PUBLIC SECTOR	**120066**	**112117**	**115311**	**120895**	**120303**	**119547**	**89797**	**121446**
IOC, Guwahati, Assam	1000	1078	1118	1058	956	1019	759	1000
IOC, Barauni, Bihar	6000	6184	6207	5730	6344	6478	4405	6200
IOC, Koyali, Gujarat	13700	13206	13561	14253	12155	12960	10085	13000
IOC, Haldia, West Bengal	7500	5686	6878	8072	7490	7952	5791	7700
IOC, Mathura, Uttar Pradesh	8000	8107	8880	8202	8561	6641	6343	8300
IOC, Digboi, Assam	650	600	651	622	660	651	466	650
IOC, Panipat, Haryana	15000	13615	13660	15496	15126	15095	10473	15100
IOC, Bongaigaon, Assam	2350	2220	2008	2188	2356	2328	1757	2350
Total IOC	**54200**	**50696**	**52964**	**55621**	**54649**	**53126**	**40080**	**54300**
BPCL, Mumbai, Maharashtra	12000	12516	13020	13355	13077	12684	9452	12631
BPCL, Kochi, Kerala	9500	7875	8699	9472	10105	10285	7684	9870
Total BPCL	**21500**	**20391**	**21719**	**22828**	**23183**	**22969**	**17136**	**22501**
HPCL, Mumbai Maharashtra	6500	6965	6638	7506	7748	7785	5374	7000
HPCL, Visakh, andhra Pradesh	8300	8796	8200	8682	8029	7776	6352	9000
Total HPCL	**14800**	**15761**	**14838**	**16189**	**15777**	**15561**	**11726**	**16001**
CPCL, Manali, Tamil Nadu	10500	9580	10104	9953	9105	10065	7657	10350
CPCL, Narimanam, Tamil Nadu	1000	517	703	611	640	559	409	750
Total CPCL	**11500**	**10097**	**10807**	**10565**	**9745**	**10624**	**8066**	**11100**
NRL, Numaligarh, Assam	3000	2619	2252	2825	2478	2613	2153	2600
ONGG, Tatpaka, Andhra Pradesh	66	55	69	69	57	65	39	45
MRPL, mangalore, Karnataka	15000	12498	12662	12798	14415	14589	10598	14900
(b) PRIVATE SECTOR	**80000**	**80651**	**81678**	**81179**	**88273**	**88229**	**67103**	**87762**
RPL, Jamnagar, Gujarat	33000	34415	31198	32497	32613	30307	23582	30305
RRL (SEZ), Jamnagar, Gujarat	27000	32735	35607	35186	35892	37720	28151	37661
ESSAR Oil Ltd. Vadinar	20000	13501	14873	13496	19769	20202	15371	19796
(c) JOINT VENTURE	**15000**	**-**	**-**	**2048**	**10636**	**14721**	**9786**	**14500**
BORL, Bina, M.P.	6000	-	-	2048	5732	5450	4644	5500
HMEL, GGS, Bathinda, Punjab	9000	-	-	-	4904	9271	5142	9000
Total (a+b+c)	**215066**	**192768**	**196989**	**204121**	**219212**	**222497**	**166687**	**223707**

Note : Crude throughput in terms of Crude oil processed
Source : Public Sector Undertakings/ Private Company.

APPENDIX - V

Production of Petroleum Products

(Figures in TMT)

Products	2009-10	2010-11	2011-12	2012-13	201314	2014-15* (Apr.14- Dec.14)	2014-15**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LPG	10334	9708	9547	9825	10030	7157	10013
Mogas	22537	26138	27186	30118	30275	24280	30572
Naphtha	18788	19196	18825	19018	18505	13144	17696
Kerosene	8703	7809	7861	7971	7418	5745	7073
ATF/RTF/Jet A-1	9304	9589	10065	10088	11220	8180	11943
HSD	73298	78057	82880	91103	93759	70826	93017
LDO	472	590	502	400	423	250	350
Furnace Oil	15828	18659	16732	13690	12920	8524	12795
LSHS/HHS/RFO	2518	1860	1701	1364	485	466	627
Fuel Oil	18346	20519	18433	15054	13405	8991	13422
Lube Oils	950	884	1028	896	941	627	1059
Bitumen	4889	4478	4610	4670	4785	3323	4724
Petroleum Coke	3709	2711	7837	10943	12068	9185	10335
Others	13279	15142	14429	17650	17927	13684	19149
Total Production	**184610**	**194821**	**203202**	**217736**	**220756**	**165392**	**219353**
of which :							
Refineries	**179768**	**190316**	**198561**	**213219**	**216456**	**162321**	**215155**
Fractionators	**4842**	**4504**	**4640**	**4518**	**4330**	**3071**	**4198**

*: Provisional **Target fixed for the year

Source: Public Sector Undertakings/ Private Company.

APPENDIX - VI

Product-Wise Consumption Of Petroleum Products

(Figures in '000' Tones)

Products	2009-10	2010-11	2011-12	2012-13	201314	2014-15* (Apr,14- Dec,14)	2014-15**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LPG	13135	14331	15350	15601	16336	13286	17715
Motor Spirit	12818	14194	14992	15744	17128	14133	18844
Naphtha	10134	10676	11222	12289	11454	8045	10727
SKO	9304	8928	8229	7502	7165	5340	7120
ATF	4627	5078	5536	5271	5505	4164	5552
HSDO	56242	60071	64750	69080	68369	51916	69221
LDO	457	455	415	399	386	255	340
Fuel Oil	11629	10789	9307	7656	6193	4463	5951
Lubes/Greases	2539	2429	2633	3196	2891	2191	2921
Bitumen	4934	4536	4638	4676	4938	3420	4560
Petroleum Coke	6586	4982	6138	10135	11651	10367	13823
Others	5400	4569	4924	5509	6182	4798	6397
Total	**137808**	**141040**	**148132**	**157057**	**158197**	**122378**	**163171**

Notes : consumption includes sales by oil companies, own consumptions & direct private imports.
*: Provisional **: Estimated

APPENDIX - VII

Improts/Exports of Crude Oil and Petroleum products

(Figures of Qty in TMT & Value in Rs. Crore)

ITEM	2009-10		2010-10		2011-12		2012-13		2013-14		2014-15 (Apr-Dec.)*		2014-15**	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Imports														
Crude Oil	**159,259**	**375,277**	**163,595**	**455,276**	**171,729**	**672,220**	**184,795**	**784,652**	**189,238**	**864,875**	**142236**	**581,751**	**189,648**	**775,668**
Product														
LPG	2,718	8,329	4,484	15,888	5,790	27,019	6,293	31,696	6,607	37,425	6,143	29,766	8,191	39,688
Petrol	385	1,264	1,702	6,427	654	3,311	147	891	235	1,481	346	2,220	461	2,960
Naphtha	1,734	4,942	2,063	6,853	2,091	9,827	1,735	9,791	1,026	6,067	491	2,987	655	3,983
Kerosene	985	2,909	1,381	4,939	564	2,710	0	0	0	0	30	172	40	229
Diesel	2,531	6,390	1,996	6,969	1,059	5,039	626	3,219	84	503	92	543	123	724
Lubes	1,419	3,515	1,291	4,093	1,434	8,314	1,468	9,259	1,674	10,664	1,444	9,239	1,925	12,319
Fuel Oil	896	1,935	1,013	2,455	1,203	4,392	1,068	4,546	1,283	5,537	779	3,325	1,039	4,433
Bitumen	69	138	98	210	78	197	85	235	237	773	271	886	361	1,181
Others $	3,928	4,262	3,352	8,164	2,977	7,282	4,352	8,727	5,571	12,156	5,383	10,059	7,178	13,412
Total Product import	**14,665**	**33,687**	**17,379**	**55,998**	**15,849**	**68,091**	**15,774**	**68,363**	**16,718**	**74,605**	**14,979**	**59,197**	**19,972**	**78,929**
Total import	**173,924**	**401,964**	**180,974**	**511,275**	**187,578**	**740,311**	**200,569**	**853,015**	**205,956**	**939,480**	**157,215**	**640,948**	**209,620**	**854,597**
Exports														
LPG	131	491	154	693	174	947	200	1,294	227	1,589	174	1,098	232	1,464
Petrol	9,771	31,203	13,578	49,480	14,524	73,982	16,657	95,346	15,247	92,977	12,383	68,881	16,511	91,841
Naphtha	10,043	30,318	10,655	37,138	10,139	45,620	8,647	43,533	8,322	46,059	5,297	26,482	7,063	35,309
Aviation Turbine Fuel	4,588	13,331	4,478	16,140	4,561	21,857	4,664	25,223	5,745	33,246	3,964	20,188	5,285	26,917
Kerosene	46	154	33	141	34	191	23	140	15	98	9	57	12	76
Diesel	18,451	50,930	20,335	69,300	20,407	104,572	22,464	115,554	26,469	148,138	19,639	96119	26,185	128,159
LDO	41	87	98	260	84	331	9	42	30	135	6	28	8	37
Lubes	28	121	29	154	27	181	59	381	20	138	5	57	7	76
Fuer Oil	5,186	10,545	6,734	15,098	7,895	25,576	5,922	20,415	6,159	22,407	3,885	12,607	5,180	16,809
Bitumen	31	67	56	124	5	27	87	281	95	321	65	190	87	235
Others	2,839	7,441)	2,927	8,332	2,988	11,360	4,675	17,810	5,535	23,169	3,494	15,096	4,659	20,128
Total Export	**51,155**	**144,687**	**59,077**	**196,861**	**60,837**	**284,643**	**63,408**	**320,090**	**67,864**	**368,279**	**48,921**	**240,803**	**65,228**	**321,071**
Net Import	**122,769**	**264,277**	**121,897**	**314,414**	**126,741**	**455,668**	**137,161**	**532,926**	**138,092**	**571,201**	**1,08,294**	**400,145**	**144,392**	**533,527**
Net Product Export	**36,490**	**111,000**	**41,698**	**140,862**	**44,988**	**216,552**	**47,634**	**251,727**	**51,146**	**293,674**	**33,942**	**181,606**	**45256**	**242,141**

*Provisional **Estimated

APPENDIX - VIII

Plan Outlay & Actual Expenditure for P&NG Sector

Companies	Actual 2012-13	Actual 2013-14	2014-15	
			Budget Estimate 2014-15	Actual Apr-Dec'14"
Internal & Extra Budgetary Resoures				
OVL	10891.41	35357.00	14792.00	5665.79
ONGC	29507.91	32469.54	36059.07	20768.69
OIL	2890.03	9350.97	3632.00	2444.74
GAIL	5962.00	4069.78	3104.62	1275.04
IOCL	9378.11	16660.61	11375.00	7045.71
HPCL	2883.65	2641.87	3773.33	1229.76
BPCL	3829.59	4373.58	5250.00	4556.75
MRPL	2111.55	1448.74	1300.15	1031.00
CPCL	260.56	228.60	1102.00	280.46
NRL	160.60	372.14	177.65	80.47
BALMER LAWRIE	67.28	119.55	62.00	65.58
BIECCO LAWRIE	0.00	0.00	7.00	0.00
Total (I&EBR)	**67942.69**	**107092.38**	**80634.82**	**44443.99**
Gross Budgetary Support Schemes (GBS)				
1. RGIPT	19.43	16.55	42.00	54.00
2. Strategic Storage Programme for Storage of Crude Oil by ISPRL	0.00	0.00	1.00	0.00
Total (GBS)	**19.43**	**16.55**	**43.00**	**54.00**
Total (GBS-I&EBR)	**67962.12**	**107108.93**	**80677.82**	**44497.99**

APPENDIX - IX

Earning of Oil PSUs

The Profit Before Tax (PBT) and the Profit After Tax (PAT) earned by Public Sector Undertakings in the Oil Sector during 2013-14 were Rs. 70227.12 Crore and Rs. Rs. 48001.25 crore respectively. Similarly, the PBT and PAT for 2014-15 are expected to be about Rs. 53230.57 crore and rs. 35501.85 crore respectively. Oil PSU-wise details are as under :

(Rs. in Crore)

Sl. No.	Name of PSUs	Profit Before Tax (PBT)		Profit After Tax (PAT)		% of GoI holdings as on 31.03.2014
		2013-14 (Actual)	2014-15 (Expected)	2013-14 (Actual)	2014-15 (Expected)	
1	ONGC	32432.00	33530.00	22095.00	22133.00	68.94
2.	OVL	6947.00	5946.00	4445.00	3402.00	-
3.	IOCL	9925.51	2000.00	7019.09	1320.00	68.57
4.	GAIL	6402.32	3817.41	4375.27	2909.20	56.11
5.	HPCL	2616.00	941.00	1734.00	621.00	51.11
6.	OIL	4410.44	350.61	2981.30	2217.22	67.64
7.	BPCL	5948.97	4688.14	4060.88	3275.82	54.93
8.	MRPL **	410.05	1816.87	601.18	1346.60	-
9.	CPCL ***	-330.96	-456.00	-303.85	248.00	-
10.	NRL	562.65	473.70	371.09	322.63	-
11.	EIL	698.00	426.00	480.00	284.00	69.37
12.	Balmer Lawrie *****	219.62	170.00	156.67	112.00	-
13.	Biecco Lawrie ******	-14.49	3.58	-14.38	3.58	32.23
14	TOTAL	70227.12	53230.57	48001.25	35501.85	

* OVL is 100% subsidiary of ONGC. ** No Government of India share holding. 71.63% shares hold by ONGC and 16.96% by HPCL.

*** 51.89% Share hold by IOCL **** 61.65% share hold by BPCL 26% hold by OIL na 12.35% hold by Government of Assam

***** There is no direct holding by Government of India in Balmer Lawrie & co. Limited. Blamer Lawrie Investments Limited, a Government copany holds 61.8% of shares in Balmer lawrie. Central Government holds 59.57% in Balmer Lawrie Investments Limited.

****** 67.33% share of Biecco Lawrie is in Oil Industry development Board.

APPENDIX - X

(I) **Paras contained in Inspection Reports :** A total of 58 Inspection Reports/Paras were outstanding against this Ministry as on 30.9.2014. Efforts are being made to settle such outstanding paras by taking up the matter with Audit.

Status of IR Paras for 2014-15 : As per letter of audit dated 20.10.2014, this Ministry has a total of 58 IR Paras pending. It is seen from the list forwarded by Audit that one para pertaining to period 2002-03 which was already settled by Audit figures in the list. Besides, a number of IR paras (06 in number) in respect of which replies were sent requesting for settlement have not been settled by Audit. There are being taken up separately with the Audit. However, given the fact that one para already stood settled, the figure in respect of 48 paras pertaining to Ministry should be 47 and consequently, the total pendency including figures of PAO comes to 57.

(ii) **Important Audit Observations of Audit Report No. 14 of 2014 on Pricing Mechanism of Major Petroleum Products in Central Public Sector Oil Marketing Companies**

Audit conducted a Performance Audit on the 'Pricing Mechanism of major petroleum products' for the period 2007-12. The petroleum products covered in the audit are petrol (MS) till June 2010, diesel (HSD) till January 2013 for bulk consumers, PDS (Kerosene) and Domestic LPG, the price of which is regulated by the Government. Audit analyzed the extent to which the cost of operations in Oil Marketing Companies (OMCs) matches with the stipulated norms considered for price fixation and the effectiveness of the loss sharing mechanism set up by GOI. Audit also analyzed the impact of such regulation on OMCs, consumers, Government and upstream companies.

Significant audit findings are summarized below:

- As per the pricing mechanism, Refinery Gate Price (RGP) is arrived at by adding various cost elements associated with import of products to their FOB (Free on board) price. However, OMC refineries process the products rather than import them and hence do not incur such import relaied expenses. The quantum of such cost elements recovered through RGP, though not actually incurred was worked out as ₹ 50.513 crore for the period 2007-12. The OMCs, however, import crude and hence incur expenses related to import of crude. Allowing for such import related expenses on import of crude oil estimated at Rs.23.887 crore, the OMCs ought to have benefitted by around Rs.26.600 crore through the pricing of products at the refinery gate.

(Para 3.1 .i)

- Rangarajan Committee (2006), while recommending continuance of such protection in pricing had pointed out that these could be utilized to generate a better margin for investment in technology up-gradation of the refineries. Audit selected six OMC refineries and noticed that considerable scope of improvement still exists in three, namely Haldia refinery of IOCL and Mumbai refineries of BPCL and HPCL.

(Para 3.1.2)

- OMCs also uplift petroleum products from standalone/private refineries in order to fill the gap between production and domestic requirement. OMCs pay these refineries import linked prices (RGP) for such products. Private refineries, however, export their balance products at prices comparable to Export Parity Price (EPP)/FOB, which are lower than RGP. This affords an undue benefit to private refiners (Reliance Industries Limited and Essar Oil Limited), which was estimated at Rs.667 crore on HSD alone in one year (2011-12).

(Para 3.1.4)

- While reviewing expenses related to marketing of products, Audit noticed that the compensation received by OMCs on freight was higher than cost (₹ 3.868 crore for three years period 2008-11). OMCs incurred higher marketing cost than the compensation fixed through the pricing mechanism (₹ 6.578 crore during 2007-12). It was also noticed that the marketing margin achieved by IOCL and BPCL was higher than the 18.09 % stipulated in the pricing mechanism while HPCL could not generate the desired return. The margin on retail investment was lower than the desired level of 18.09 % in BPCL and HPCL on account of higher investment in expanding their retail network.

(Para 3.1.6 & 3.1.7)

- The regulated pricing mechanism resulted in under-

recoveries to the OMCs which were reimbursed subsequently. Settlement of under-recovery claims of the OMCs has been consistently delayed (upto 310 days) and over the period 2005-09, have been compensated through issue of oil bonds instead of cash settlement. OMCs borrowed working capital and suffered an interest loss of ₹ 5,180 crore during 2007-08 to 2011-12 on account of delay in compensation. OMCs also sold oil bonds at a discount suffering a loss of ₹ 3,994 crore. Delay in declaration of cash compensation also led to avoidable payment of interest of ₹ 381 crore on short payment of advance income tax by the OMCs.

(Para 3.1.10)

- The under-recoveries were to be borne by OMCs, upstream companies and the Government. In the absence of an explicit and consistent policy, the share of under-recovery to be borne by each stakeholder remained uncertain. The major share of under-recovery was borne by the Government and the upstream companies. The uncertainty adversely affected both upstream companies and OMCs.

(Para 3.3.1 & 3.3.2)

- Government implemented dual pricing policy on diesel in January 2013 with the bulk consumers paying non-subsidized market determined price. Subsequent to this change, there has been a rise in the retail sales of diesel. The share of bulk sales in total diesel sales declined to around 10 per cent in August 2013 as against annual average of 18 per cent during 2011-12. Appropriate checks are needed to prevent likely diversion of cheaper subsidized fuel which would dilute the positive impact of market pricing for bulk customers on under-recoveries.

(Para 3.3.3)

SUMMARY OF IMPORTANT AUDIT OBSERVATIONS PRINTED IN THE REPORT OF THE C&AG OF INDIA UNION GOVERNMENT (CIVIL)-NO.24 OF 2014-AUDIT ON HYDRO-CARBON PRODUCTION SHARING CONTRACTS'

1. INTRODUCTION

In 1991, the Government of India (GoI) decided to invite foreign and domestic private sector Companies to participate in the development of discovered oil and gas fields, and in some cases, fields partially developed by the National Oil Companies (NOCs) -Oil and Natural Gas Corporation Limited (ONGC) and Oil India Limited (OIL). The GoI announced (1997) the New Exploration Licensing Policy (NELP), under which NOCs compete with Private Sector Companies for obtaining Exploration & Production licenses through a bidding process, instead of getting them on nomination basis.

The Ministry of Petroleum and Natural Gas (MoPNG), the Directorate General of Hydrocarbons (DGH) and the Contractor /Operator of the blocks are the main stakeholders in the PSC. The MoPNG is, inter alia, responsible for the exploration and production of petroleum and natural gas, including the administration of the Oilfields (Regulation and Development) Act, 1948. MoPNG is assisted by the DGH, which was established in April 1993 with the objective of promoting sound management of Indian petroleum and natural gas resources having a balanced regard for the environment, safety, technological and economic aspects of petroleum activities. The Contractor is required to carry out petroleum operations and has the right to recover cost and expenses in case of a successful commercial discovery leading to production, as per terms of the PSC.

The PSCs between the GoI and the Contractor(s) for specific fields / blocks provide the contractual basis for petroleum operations, cost recovery, profit sharing and other aspects.

The content ofthese PSCs varies substantially among those for discovered fields, pre-NELP exploratory blocks and NELP blocks, and even within different NELP rounds (with Model PSCs being drawn up for each NELP round).

2. MAIN AUDIT FINDINGS

2.1 KG-DWN-98/3 (Operator: RIL)

The KG-DWN-98/3 (also referred to as KG-D6) block, with a contract area of 7645 square km (sq. km.), is an offshore block in the KG basin. The Block is classified as a "deepwater block", with water depth ranging from 400 metres (m) in the north-west to 2700 m in the south-east. The total expenditure incurred in the block till March 2013 was US$ 10,441.98 million out of which US $ 9,293.22 million had been cost recovered by the Contractor. Out of the Profit Petroleum (PP) of US$ 1032.58 million till March 2013, the Contractor has got US$929.32 million and the GoI has got US $ 103.26 million.

Regulatory and control issues

- In none of the four years' audit period was the annual Work Programme and Budget (WP&B) approved before start of the Financial year. The WP&B is one of the most important tools available with the MC to exercise monitoring and control over the operations of the block. Since MC did not effectively utilize this tool, there was inadequate budgetary/financial control over operational activities leaving the expenditure open-ended.
- Expenditure amounting to US$ 160.81 million incurred on account of three appraisal wells was not eligible for cost recovery and had been disallowed by MoPNG. However, even after the MoPNG communicated its decision, the Operator continued to claim the cost recovery, as seen in the final accounts for the year ended 2013. As of June 2014, the MoPNG had been unable to enforce its decision.

Approvals for petroleum operations

- MoPNG did not review determination of the entire contract area as 'discovery area' strictly in terms of Articles 4.1 and 4.2 at the end of the 1st and 2nd exploration phases before issuing relinquishment order under Article 3.11 in October 2013.
- MoPNG / DGH did not insist that the Contractor carry out only appraisal activities in the 'discovery area' till July 2009. Audit is of the opinion that further exploration activities in the 'discovery area'.(which included drilling of eight exploration wells and six appraisal wells of discoveries resulting from these exploration wells at an expenditure of US$427.03 million) was improperly carried out at the risk of revenue of the commercial discoveries made in the block.
- As per PSC provisions, the review of DOC in respect of three discoveries, viz. D 29, D 30 and D 31, was to he completed by MC by August 2010. However, due to lack of adequate production testing data, DGH re.jected the DOC proposal. Nonetheless, despite technical advice of the DGH to the contrary, the issue has been reopened after almost three years from the date when it was rejected by DGH and has not been finalised as yet.
- The degree of uncertainty and substantial changes in the recoverable gas reserves estimates raises questions on the process of examination, consideration and acceptance of gas estimates by the DGH.
- The Operator was required to drill, connect and put on stream 22 wells under Phase I of approved AIDP. However, the Operator drilled, completed and connected only 18 wells. Gas production started declining in August 2010. While production level achieved in 2010-11 was 90 per cent of approved production profile, this figure decreased to 57 per cent in 2011-12 and 26 per cent in 2012-13. The Operator failed to adhere to the approved AIDP in terms of numbers of producer wells to be drilled and connected.
- The Operator created facilities to handle gas production of 80 mmscmd. as of March 2012, the Operator had incurred expenditure of US$ 5.76. billion on the development of DI -D3 gas fields as against the MC approved cost of US$ 5.20 billion. The facilities created by the Operator remained underutilized. Unutilized due to declining trend in gas production and non-drilling of wells as per the approved AIDP.
- DGH approved Optimized Field Development Plan (OFDP) for four satellite discoveries. Initially, the OFDP was not techno-economically viable; however, it was made marginally viable by devising different scenario and changing assumptions, e.g. exclusion of royalty as expenditure, variation in capex etc. Expenditure related issues • Engineering, Procurement, Installation and Construction (EPIC) contract of offshore facilities was awarded to M/s Allseas Marine Contractors (AMC) at a lump sum and provisional price of Euro 699.09 million and Euro 64.99 million respectively. Due to various factors attributable to Operator, AMC and its sub-contractors, AMC could not achieve the milestones. Concessions of Euro 200 million approximately given to AMC by the Operator in order to expedite completion of the works were not allowable for cost

recovery as the concessions were not in line with EPIC contract including provisions relating to 'change in contract price'; and were in violation of Section 3.2 (ix) of Appendix C to the Accounting Procedure to PSC which states that, "amounts paid with respect to non fulfilment of contractual obligations are not recoverable and not allowable"..

- Within four months from the date of signing the agreement, the Operator requested the FPSO vendor to extend the dry docking life of the FPSO from ten to fifteen years for a one-time compensation of US$ 17.36 million. Since the FPSO was chartered for 10 years only, extension of dry docking to fifteen years is not justified and the cost recovery of US$ 17.36 million may be disallowed.
- Despite the FPSO vendor being unable to meet its contractual obligations, the Operator re-scheduled the date of first production of oil (DFPO), without imposing any penalty. In addition, though there was no provision in the agreement which entitled the vendor to any compensation or incentive for expediting deliveries, the Operator paid compensation of US$ 45 million to the vendor for early mobilization of the vendor's commissioning team and expediting deliveries of top side modules etc., which may be disallowed.
- The FPSO has been leased for ten years. However, the Operator refurbished the existing living quarters and fabricated and installed additional living quarters, at a cost of US$ 15 million with the intention to purchase the (FPSO) at a later date. Audit recommends that the cost recovery of US$ 15 million may be disallowed.
- As per the Onshore Terminal (OT) construction contract, no compensation was payable to the vendor on account of Plant and Equipment (P&E) provided by RIL in case the vendor was unable to mobilize the P&E However, an amount of INR 22.7 million was paid to the vendor as compensation charges for Cranes which were hired by RIL by amending, the contract to exclude these cranes.
- In four cost-plus contracts relating to construction of OT awarded by RIL, in general, payment of compensation was to be made to the vendors only on the 'cost' incurred by them. However, these contracts also provided for payment of mark-up to the vendor as a percentage of the value of free- issue material of some categories supplied by RIL such as cement, steel. etc. RIL incurred an expenditure of ₹1110.90 million on payment of such compensation.
- Start-up and Production bonuses of US$12.48 million were paid to employees from the revenue earned from the Block. Since the Start-Up and Production Bonus are one-time and of an ad hoc nature, in Audit opinion, these bonuses should not be paid from the revenue earned from the sale of gas.
- Despite having adequate drilling, prospects and keeping in view the poor response received from the vendors for provisioning of the rigs indicative of the scarcity of deep-water drilling rigs, the Operator did not consider it prudent to consider the option of long-term hiring of the drilling rigs and availing, the firm rate advantage of such long-term hiring. This resulted in additional expenditure of approximately US$ 88.77 million in piece-meal hiring of deepwater drill ship "Deepwater Frontier" from M/s Transocean Offshore International Ventures Limited.
- Operator paid bonus for time saved during the rig movement between wells with hanging Blow Out Preventor (BOP). As per the contract clause, any bonus payment was to take into account the sum total of time saved for all the operational activities for completion of a well rather than a single activity. Therefore, payment of bonus for rig movement with hanging BOP was not justified and resulted in additional expenditure of US$ 2.83 million.
- The Operator paid uptime bonus of US$ 13..37 million to M/s. Aker Contracting FP AS, Norway (ACFP), which resulted in additional benefit to the vendor, as normally bonus payments are extra payments given as a reward or incentive for earlier completion of work or increase in production level, not for performing, their contractual obligations. In this case, ACFP was contractually bound to make available FPSO during the charter period.

Revenue issues

- The pricing mechanism for Crude from MA oilfield has not been finalized and approved by MoPNG. The sales (under COSA) are being. treated as provisional by the MoPNG. However, the Operator is treating the sales as firm and final. Marker has not been fixed so far leaving scope for ambiguity in pricing.
- The pricing and sale of Condensate has not yet been approved by the Government. It is being sold at a discount;value below Dated Brent. The difference between the sale value of Dated Brent and KG-DWN-98/3 Condensate amounted to US$ 33.93 million during the period July 2010 to March 2012.
- Operator is charging the gas price at the rate of US$ 4.340 mmbtu which includes 0.135 US$/mmbtu towards marketing margin from its consumers.

Marketing margin is not being considered as revenue for the purpose of Cost Petroleum, Profit Petroleum and Royalty while Contractor has collected an amount of US$ 261.33 million on this account for the period 2009-10 to 2012-13.

Accounting issues

- Parent Company Overhead (PCO) charged by the Operator for cost recovery up to the financial year 2007-08 under Section 2.6.2 of Accounting Procedure of PSC was disallowed by MC while adopting the Accounts for the year 2008-09. on the ground that Operator (RIL) has no parent company. However, Contractor has reclassified and claimed these expenditures amounting to US$ 101.41 million (upto 2011-12) under Corporate Office Support (COS). Such expenditure cannot be vouched by Audit in the absence of documentary evidence and by placing reliance only on the basis of a certificate of a Company Auditor appointed by RIL or a certificate given by the JV Auditor appointed by MC who in turn had relied upon the certificate given by the Company Auditor.
- Closing stock of crude and condensate had not been accounted for in the books of the JV. Consequently, cost recovery of US$ 12.80 million towards the value of closing stock had not been adjusted for the years 2008-09 to 2012-13 and there was a short remittance of US$ 0.14 million of Profit Petroleum of closing stock for the years 2008-09 to2012-13.

2.2 Panna-mukta And Mid & South Tapti Fields (joint Operators: Bgepil, Ril And Ongc)

The Panna-Mukta and Mid & South Tapti Fields are offshore shallow water fields in the offshore Bombay Basin, which were initially discovered and operated by ONGC. Subsequently, these were awarded (1994) to a consortium of private parties under a JV arrangement with ONGC.

Issues relating to Arbitration

The partners RIL and BGEPIL served arbitration notice (December 2010) under PSC to GOI. The claims raised by RIL and BGEPIL pertain to

i) Cost Recovery provisions under Panna-Mukta and Tapti PSC,
ii) Calculation of IM,
iii) Amount of royalty payable under PMT PSC.
iv) Amount of cess payable by Contractor to GOI,
v) Amount of service tax payable under PSC, and
vi) Meaning and effect of Accounting and Audit provisions.

GoI also raised counter claim towards depressing expenditure allowance available under Section 42 of Income Tax Act, accounting of inflated sales, accounting of Development Cost in excess of cost recovery limit(CRL), short accounting of sales, sales revenue, marketing margin, income tax rate, non-completion of committed work programme as per Appendix-G, excess cost recovery over CRL.

The awards given by the Tribunal have been contested either by GOI or by the PMT JV partners (BGEPIL and RIL). All the afore-mentioned issues are sub-judice as on July 2014.

Recoverable costs and cost recovery

- PMTJV charged production inventory to petroleum operations at the time of purchase instead of actual consumption as mandated by the PSC provision. As on 31 March 2012, PMTJV held production inventory worth US$ 26.15 million, which had been charged to cost recovery though not consumed. The cost recovery of production inventory without its actual usage for petroleum operations had adversely impacted GoI share of PP.
- The JV has been booking rig mobilization charges to the cost of the first well and demobilization charges to the cost of last well irrespective of the number of wells drilled in the two fields. As the GOI Profit Petroleum of the two fields are at different slabs, the improper allocation of rig mob/demob charges may impact the Government take. Major E&P operators in India, i.e. ONGC and RIL (K.G-DWN-98/3 Block), allocate rig mobilization and demobilization charges based on the actual number of days utilized in wells and number of wells drilled respectively. As different operators follow different methodologies, MoPNG/DGH ought to address the issue to decide a common acceptable method which would protect the interest of the Government.
- PMTJV allocated the common personnel expenditure on 50:50 basis though these expenditures were identifiable for Panna-Mukta and Tapti contract area separately. As the profit petroleum percentage was different for these two contracts, such equal allocation impacted the GOI profit petroleum.
- As per the PSC, accumulation of surplus stocks should be avoided to the extent possible. Material and equipment held in inventory should only be charged to the accounts when such material is

removed from inventory and used in Petroleum Operations. PMTJV recovered inventory carrying cost of US$ 549843 on the sparable drilling, inventory till February 2009 impacting the GOI PP of US$ 90178.

- The helideck and truss, cost of which was recovered, was not used by the PMTJV for almost seven years from the date of its removal from the deck and is yet to be disposed of. The total storage cost incurred for the hel ideck, and truss was US$ 0.814 million (February 2009 to January 2014).

Deficiencies in Contracting procedures and execution of Contracts

- The PMTJV hired a rig from its JV partner (M./s Reliance Industries Limited) on assignment basis at higher rates resulting in an extra expenditure of US$ 6.49 million which impacted GOI-PP by US$1.00 million (approx.).
- PMTJV in two instances awarded contracts on nomination basis without adhering to the contracting procedure stipulated in the Joint Operating, Agreement at a higher rate compared to the estimated cost. As there was no price discovery, the reasonableness of the contract value could not be ascertained in Audit.

Petroleum saved and sold

- ONGC sold its share of gas to a private party (M/s Torrent Power Limited) at a price lower than the price prescribed in the PSC in contravention to MOPNG directives that led to loss of revenue. ONGC also did not reduce the sale or gas proportionate to the decline in production which also led to loss of revenue. The total revenue loss to ONGC was US$ 19.62 million and loss to GoI take was US$ 9.92 million.
- PMTJV did not consider all the facilities used for petroleum operations (pre wellhead and post well head activities) for computing the well head value thereby impacting the royalty payable to the GOI by US$ 0.47 million. Upgraded reserves (1997 to August 2007) were not considered for amortization of CAPEX and remitting additional royalty payable to GOI.

Petroleum Operations

- PMTJV had commenced South West Panna Project without waiting, for new seismic data leading to subsequent abandonment of the project which entailed infructuous expenditure of US$ 35.76 million.
- Delay in implementing water injection in Panna field resulted in decline in production. The value of decline in oil production during 2008-12 was to the extent of US$ 661.86 million.

Compliance and Control Issues

- COSA had not been formalized by PMTJV with IOCL since 1994 due to non resolution of disputes on delivery point, storage charges, dead freight, voyage costs/losses etc. valuing Rs.724.18 crore (storage expenses) and Rs.63.56 crore (voyage expenses). MOPNG could not ensure signing, of COSA between IOCL and PMTJV by expeditiously resolving the contentious issues.

2.3 RJ-ON-90/1 Block (operator: Cairn Energy) this On-land Block in Rajasthan was awarded in 1995 under Pre-NELP round and is now operated by Cairn Energy. The block has twenty five discoveries (Oil: 22 and Gas:3) out of which five Oil discoveries were on production as on March 2012.

Compliance Issues

- Though the PSC stipulated that transportation cost beyond delivery point would be borne by the buyers, yet the Operator incurred US$ 8.87 million towards shipping of crude to MRPL and RIL beyond designated delivery point (Kandla) and adjusted it from the revenues. This adjustment resulted in short payment of Profit Petroleum to GoI by US$ 1.77 million.

Revenue Issues

- The Government had designated (September 2005) MRPL as its nominee for the RJ crude. However, after a period of about eighteen months. MRPL expressed its inability to take RJ crude citing the characteristics of RJ crude (highly viscous with high pour point and residue) and its refining capacity. This adversely affected production and evacuation of crude from RJ block.
- Inability of MRPL to lift RJ crude necessitated laying of pipeline from Barmer to Salaya which was completed in-May 2010 against the scheduled completion by June 2009 after delay of about 10 months. The pipeline had to be extended from Salaya to Bhogat which though scheduled for completion by Q2 of 2010 was mechanically completed only in June 2014, nearly four years behind schedule. The Operator attributed the delay in completion to delays in securing Right of Uses (RoUs), in Rajasthan and Gujarat, unionization of farmers, local political agitations etc. Meanwhile, the pipeline cost rose to US$ 1108 million (March 2013) against the approved cost of US$ 941 million.

- The Government refineries (IOCL, MRPL, HPCL and BPCL) having expressed (July 2005 and October 2008) their willingness and ability to take and process the RJ crude, failed to uplift their allocated share of RJ crude which led to controlled/moderated production of crude from the block during 2009-10 and granting marketing freedom (October 2009) to the Operator to sell the unallocated portion of the crude produced from the block to domestic private refineries, which took 51.11 to 87.57 per cent of the total production from the block from 2009-10 to 2011-12.
- Two spur lines (on the Barmer to Salaya pipeline) at Radhanpur and Viramgam (additional delivery points) to facilitate delivery of RJ crude to IOCL's Panipat and Koyali refinery respectively (Cost: US$ 58.84 million) remained largely underutilized due to failure of IOCL to uplift allocated quantity of RJ crude.

APPENDIX -XI

Position of ATNs in respect of Audit Observations included in the Annual Report as well as those included in earlier Annual Reports

Sl. No.	Year	No. of Paras/PA reports on which ATNs have been submitted to PAC/COPU after vetting by Audit	Details of the Paras/PA reports on which ATNs are pending		
			No. of ATNs not sent by the Ministry even for the first time	No of ATNs sent but returned with observations and Audit is awaiting their re-submission by the Ministry	No. of ATNs which have been finally vetted by Audit but have not been submitted by the Ministry to PAC/COPU
1.	2003	03	-	-	-
2.	2004	21	-	-	-
3.	2005	49	-	2	-
4.	2006	31	-	-	-
5.	2007	27	-	1	-
6.	2008	23	-	2	-
7.	2009-10	15	-	3	-
8.	**2010-11**	**05**	**-**	**-**	**-**
9.	**2011-12**	**07**	**-**	**03**	**-**
10.	**2012-13**	**06**	**01**	**-**	**-**
11.	**2013**	**-**	**02**	**01**	**-**
12.	**2014**	**-**	**02**		

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