

# Oil & Gas

AUGUST  
2012



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# Oil & Gas

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- ❖ Advantage India
- ❖ Market overview and trends
- ❖ Growth drivers
- ❖ Success stories: ONGC, Reliance Industries
- ❖ Opportunities
- ❖ Useful information

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## Advantage India

### Growing demand

- India is the world's fifth-largest energy consumer; oil accounts for 30 per cent of total energy consumption
- Buoyant economic growth is the main factor driving the country's energy requirements

### Skilled workforce

- About 141,929 people were employed in the petroleum industry by the end of FY11
- The University of Petroleum and Energy Studies in Dehradun, Uttarakhand, is Asia's first and only energy university

2016F

Oil demand: 4.1 mbpd; Gas demand: 91.5 bcm

## Advantage India

### Supportive FDI guidelines

- 100 per cent Foreign Direct Investment (FDI) is allowed in upstream and private sector refining projects
- The FDI limit for public sector refining projects has been raised to 49 per cent

### Policy Support

- Government has enacted various policies such as the New Exploration Licensing Policy (NELP) and Coal Bed Methane (CBM) policy to encourage investments across the industry's value chain

2010

Oil demand: 3.1 mbpd; Gas demand: 64.5 bcm

*Source:* Business Monitor International (BMI), Aranca Research  
Notes: mbpd – million barrels per day, bcm – billion cubic meters

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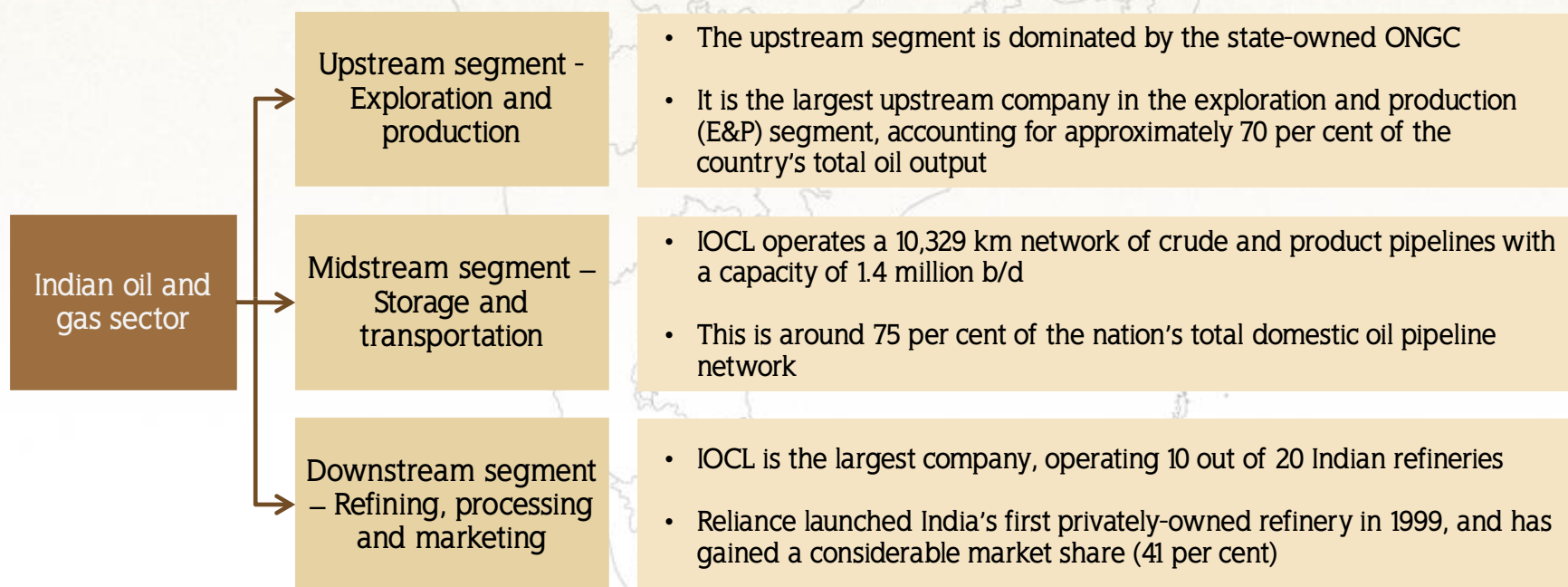
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## In India, oil and gas is dominated by state-owned entities

- India is the fifth-largest energy consumer in the world
- The country has 9.0 billion barrels of proven oil reserves with an average oil production of 0.9 mbpd (2010)
- India has 1,450 bcm of gas reserves; the country produces 52.0 bcm of gas annually (2011)

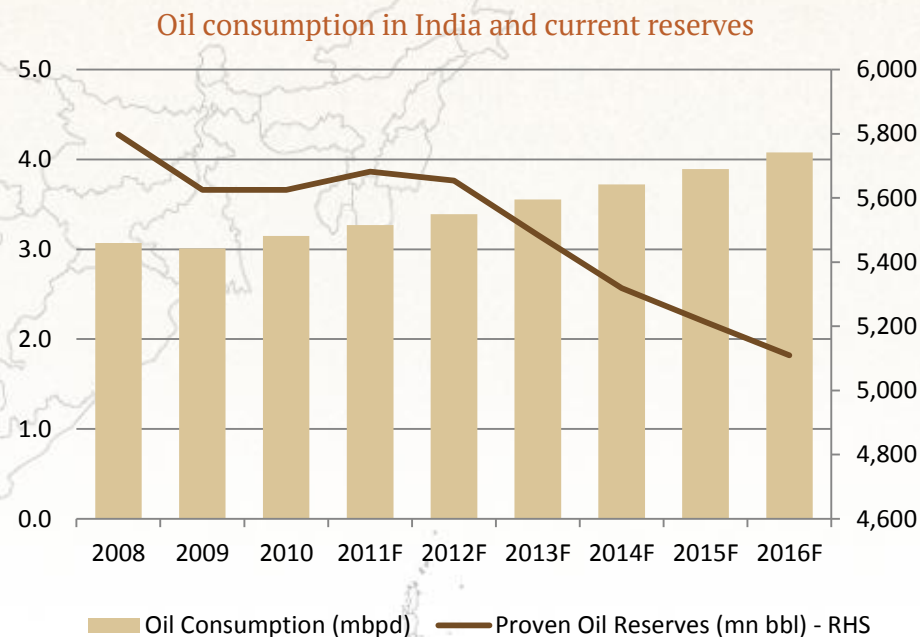


*Source:* BP Statistical Review, June 2012, BMI Forecasts, Aranca Research

Note: bcm – billion cubic meters; mbpd – million barrels per day, ONGC – Oil and Natural Gas Corporation of India, IOCL – Indian Oil Corporation Limited

## Oil supply and demand in India ... (1/2)

- Oil consumption is estimated to rise from 3.1 mbpd in 2008 to 4.1 mbpd by 2016, a CAGR of 3.6 per cent
- Owing to this strong expected growth in demand, India's dependency on oil imports is expected to increase further

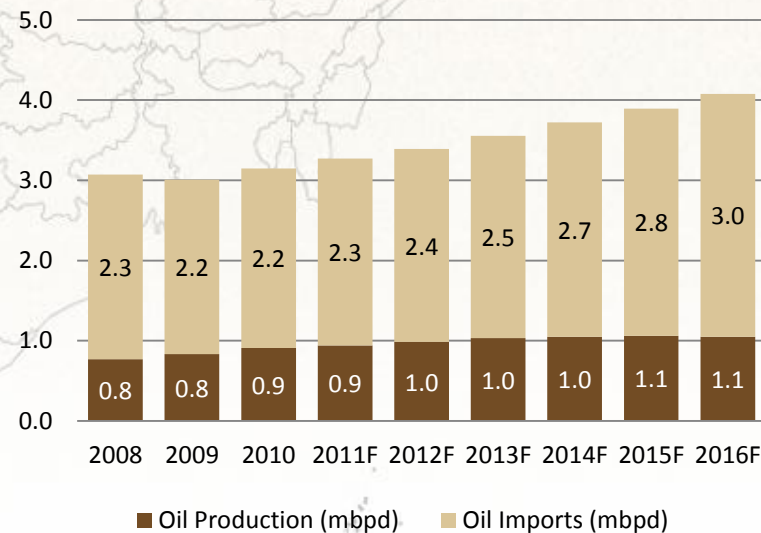


Source: BMI Forecasts - 2Q 2012, Aranca Research  
Notes: mbpd – million barrels per day, mn bbl – million barrels, CAGR – Compound Annual Growth Rate

## Oil supply and demand in India ... (2/2)

- In 2011, imports accounted for approximately 71 per cent of the country's total oil demand
- Backed by new oil fields, domestic oil output is anticipated to grow to 1.1 mbpd by 2016

Imports and domestic oil production in India

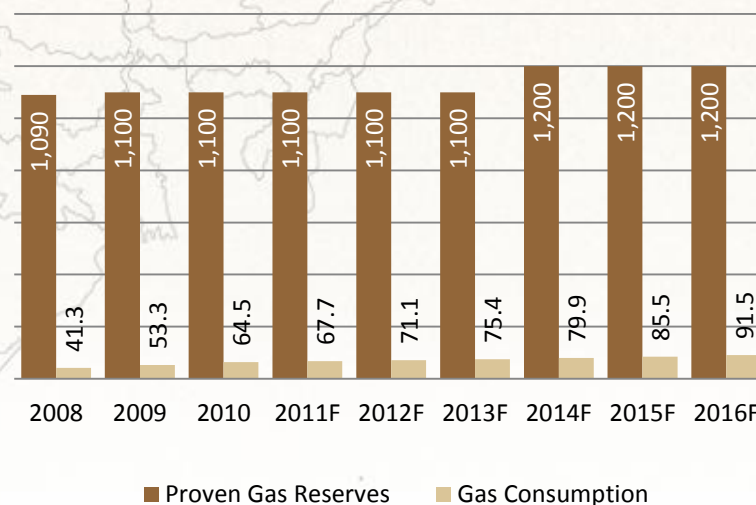


Source: BMI Forecasts - 2Q 2012, Aranca Research  
Notes: mbpd – million barrels per day

## Gas supply and demand in India ... (1/2)

- With India developing gas-fired power stations, consumption is up more than 160 per cent since 1995
- Demand is not likely to simmer down any time soon given strong economic growth and rising urbanisation; during 2009-16, gas demand is likely to witness a CAGR of 8 per cent

Proven reserves and total gas consumption in the country (bcm)



Source: BMI Forecasts - 2Q 2012, Aranca Research

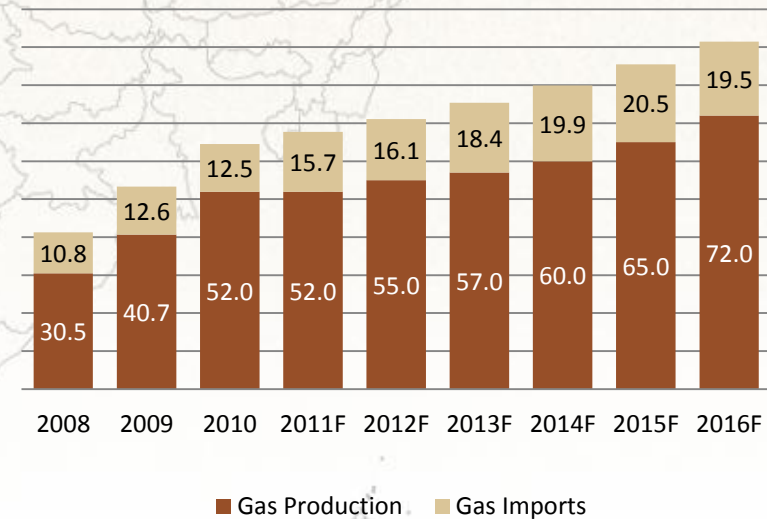
Notes: BMI – Business Monitor International  
bcm – billion cubic meters,  
CAGR – Compound Annual Growth Rate



## Gas supply and demand in India ... (2/2)

- Domestic production accounts for more than three quarters of total gas consumption in the country
- Imports make up the rest; in 2011 the share of imports was approximately 23 per cent

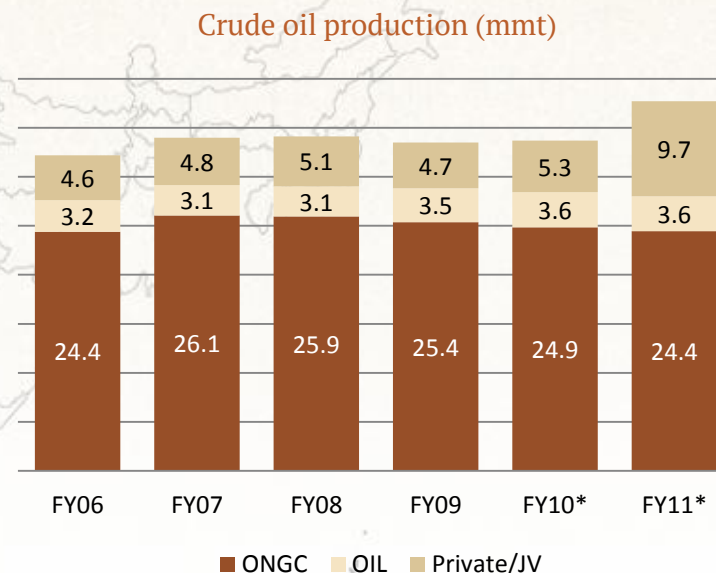
Domestic gas production and imports (bcm)



Source: BMI Forecasts - 2Q 2012, Aranca Research  
Note: bcm – billion cubic meters

## Upstream segment: Crude oil and gas production ... (1/2)

- Total crude production stood at 37.7 mmt during FY11
- ONGC accounted for 65 per cent of the total crude oil production in the country



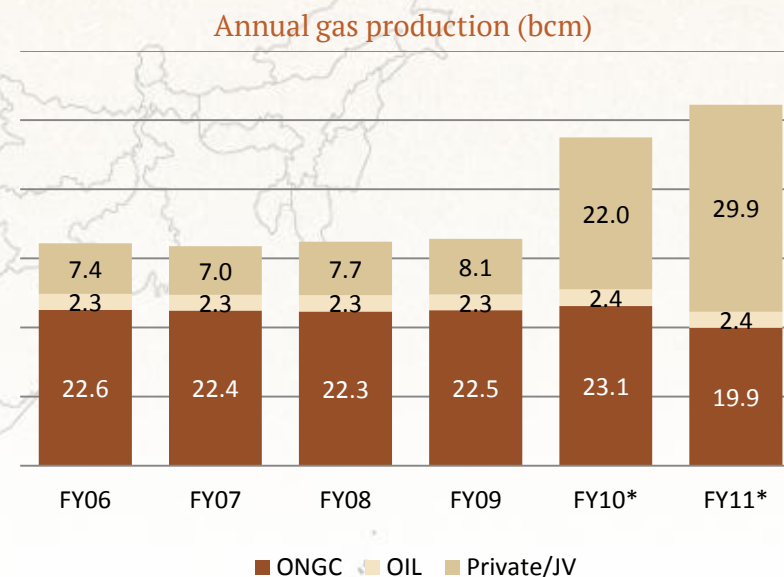
Source: Company reports, www.petroleum.nic.in, Aranca Research

Note: mmt – million metric tonne

\* – Provisional, JV – Joint Venture

## Upstream segment: Crude oil and gas production ... (2/2)

- Total gas production was 52.2 bcm during FY11
- The contribution from Private/JV has drastically increased in the last couple of years post development of the Reliance - Krishna Godavari (KG) basin



Source: Company reports, www.petroleum.nic.in, Aranca Research

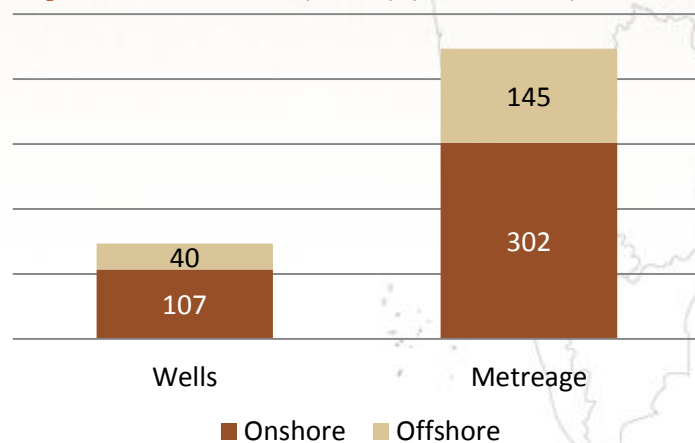
Note: bcm – billion cubic meters

\* – Provisional, JV – Joint Venture

## Upstream segment: Exploration and development activities

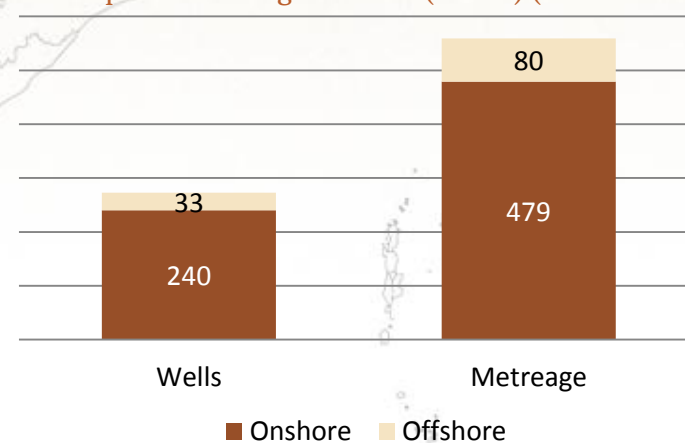
- During FY11, 1,005,000 meters of wells were being explored and developed in India
- The total number of wells drilled in the country during the same period was 420
- Most upstream drilling and exploration work is undertaken by state-owned oil companies
- The leader in the upstream segment is ONGC, which accounts for 70 per cent of the total crude oil output in India

Exploration activities (FY11\*) ('000 meters)



Source: www.petroleum.nic.in, Aranca Research  
Note: \* – Provisional

Development drilling activities (FY11\*) ('000 meters)

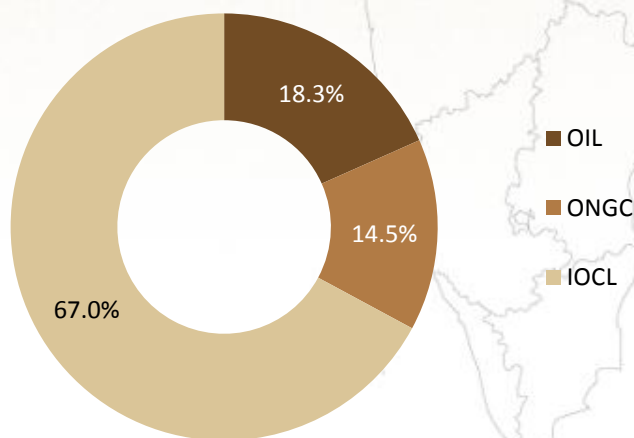


Source: www.petroleum.nic.in, Aranca Research  
Note: \* – Provisional

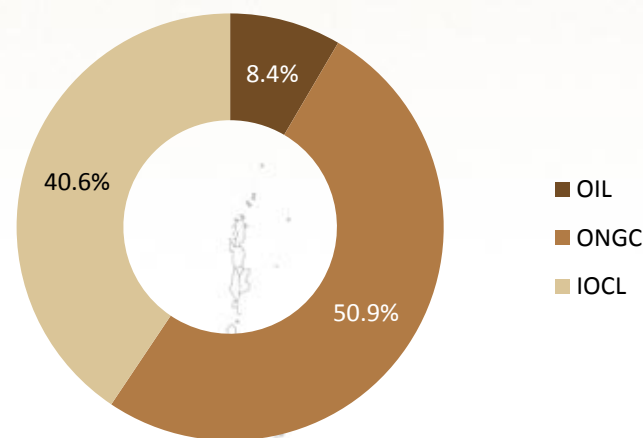
## Pipelines: Shares in India's crude pipeline network

- The total crude pipeline network in India measures 6,518 km with a capacity of 99.6 mmtpa
- At 4,366 km, IOCL accounts for the major share (67 per cent) of the country's crude pipeline network by length; IOCL also has to its name the longest pipelines in the country – the Salaya-Mathura-Panipat Pipeline (1870 km), and the Haldia-Barauni/Paradip-Barauni Pipeline (1302 km)
- However, in terms of capacity, ONGC leads the pack with a share of 51 per cent (50.7 mmtpa) followed by IOCL at 40.6 per cent (40.4 mmtpa)

Shares\* in crude pipeline network by length (out of 6,518 km )



Shares in crude pipeline network by capacity (out of 99.6 mmtpa)



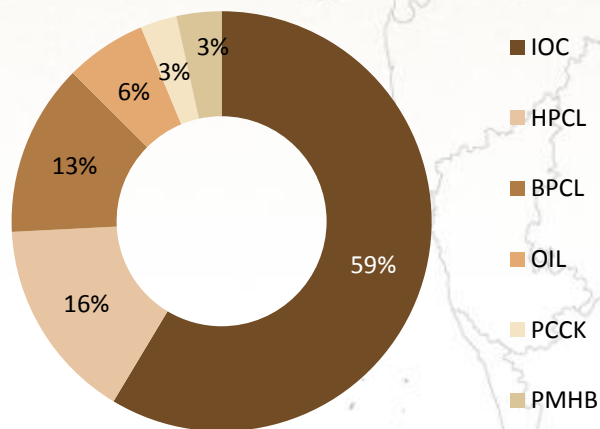
Source: Basic Statistics Report, Indian Petroleum & Natural Gas – www.petroleum.nic.in, Aranca Research;

Note: km – kilometer; mmtpa – million metric tonnes per annum; \*refer to the glossary on slides 40, 41 for expansion of the acronyms (of companies)

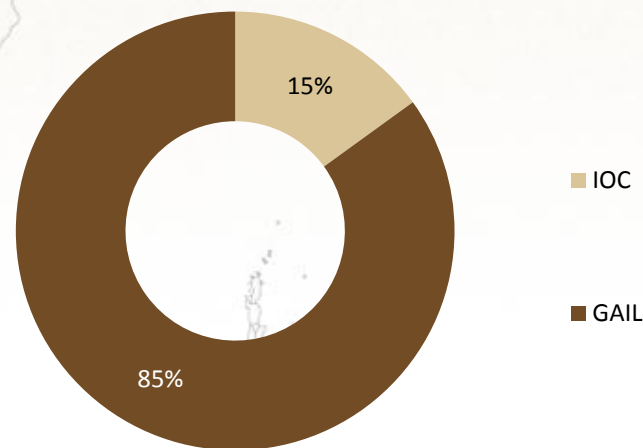
## Pipelines: Shares in India's pipeline network for refined products and LPG

- The total pipeline network for refined products in India measures 10,959 km with a capacity of 71.5 mmtpa; IOC accounts for 59 per cent of the total network by length (6,127 km)
- In the LPG pipeline network, GAIL has the largest share at 85 per cent (1,550 km out of a total 1,824 km)

Shares\* in product pipeline network by length (out of 10,959 km)



Shares in LPG pipeline network by length (out of 1,824 km)

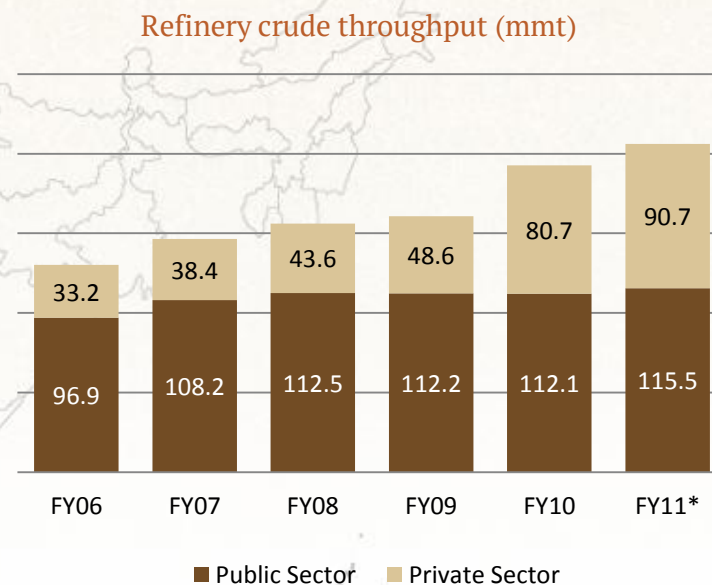


Source: Basic Statistics Report, Indian Petroleum & Natural Gas – www.petroleum.nic.in, Aranca Research;

Note: km – kilometer; mmtpa – million metric tonnes per annum; \*refer to the glossary on slide 40, 41 for expansion of the acronyms (of companies)

## Downstream segment: Refinery crude throughput ... (1/2)

- State-controlled entities dominate the downstream segment as well
- India has 21 refineries, 18 in the public sector and 3 in the private sector
- In FY11, public sector refineries accounted for 56 per cent of the total refinery crude throughput



Source: www.petroleum.nic.in, Aranca Research

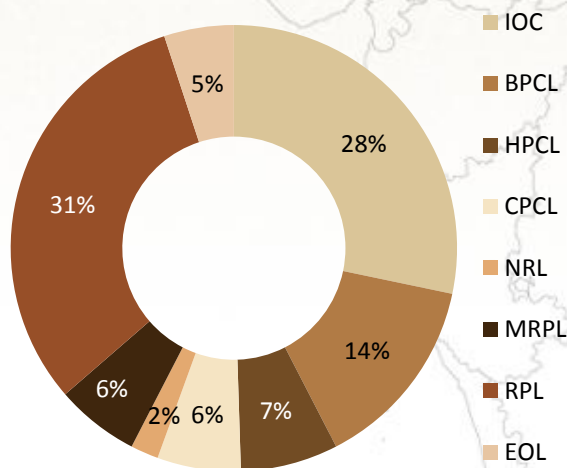
Note: mmt – million metric tonne

\* – Provisional

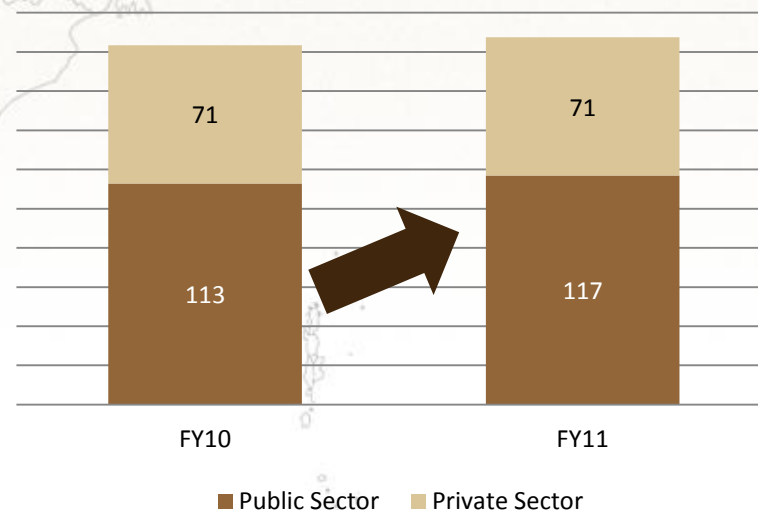
## Downstream segment: Refinery crude throughput ... (2/2)

- Total crude throughput rose from 130.1 mmt during FY06 to 206.2 mmt by FY11
- In FY11, the sector's total installed capacity stood at 187.4 mmt, up 2.2 per cent from the previous fiscal year
- In FY11, Reliance emerged as the largest domestic refiner with a capacity of 60 mmt (Jamnagar Refinery)

Shares\* in India's total refining capacity (Apr 2011)



Total installed capacity (mmt)



Source: www.petroroleum.nic.in, Aranca Research;

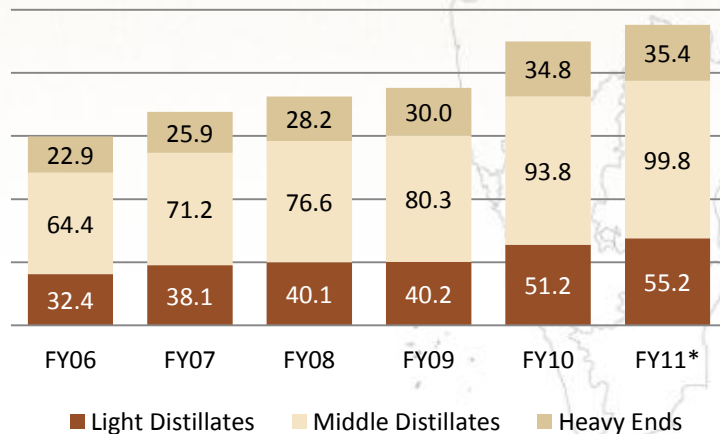
Note: mmt – million metric tonnes; \*refer to the glossary on slides 40, 41 for expansion of the acronyms (of companies) mentioned



## Downstream segment: Petroleum products

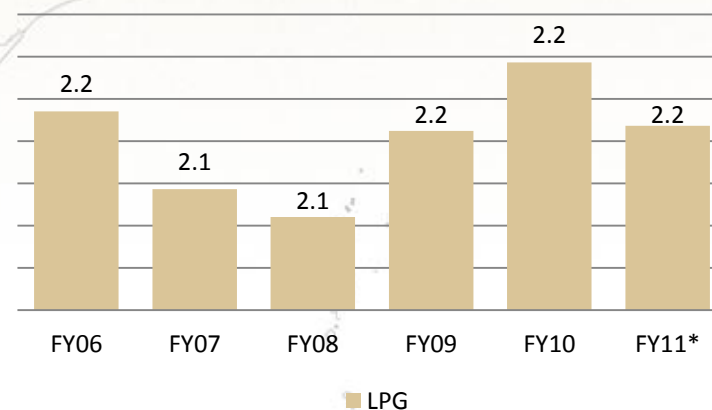
- Petroleum products produced during FY11 amounted to 192.5 mmt (including 2.2 mmt of LPG from natural gas)
- Petroleum products derived from crude oil include light distillates such as LPG, naphtha, natural gas liquids (NGL); middle distillates such as kerosene; and heavy ends such as furnace and lube oils, bitumen, petroleum coke, paraffin wax
- Production of petroleum products is expected to reach 904.8 mmt by the end of the Eleventh Plan Period

Petroleum products from crude oil (mmt)



Source: www.petroleum.nic.in, Aranca Research  
Note: mmt – million metric tonne  
\* – Provisional

Petroleum products from natural gas (mmt)



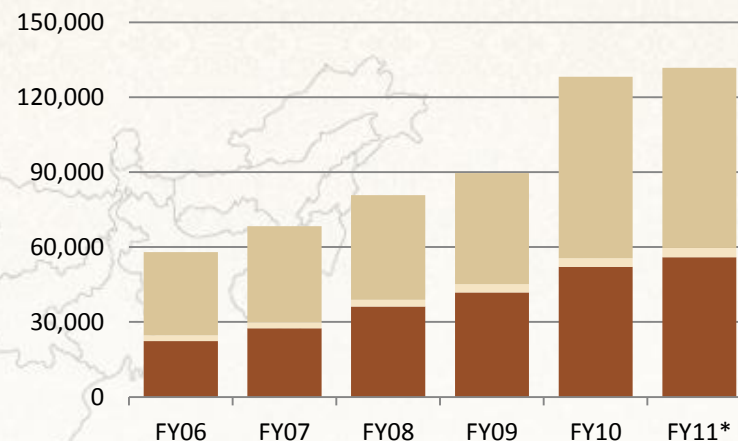
Source: www.petroleum.nic.in, Aranca Research  
Note: mmt – million metric tonne  
\* – Provisional

## Downstream segment: Distribution and marketing

- Total sales of petroleum products by companies was 141.8 mmt in FY11, which was 2.6 per cent higher than the previous fiscal year
- Total number of retail outlets of public sector oil marketing companies (OMCs) increased to 38,964 in April 2011 from 36,462 in April 2010
- IOC owns the maximum number of retail outlets in the country (47.1 per cent of total), followed by BPCL (20.1 per cent) and HPCL (18.0 per cent); remaining outlets are owned by private firms
- The number of LPG distributors in India were 10,541 as on April 1 2011

Note: mmt – million metric tonne,  
mmtpa - million metric tonnes per annum

Downstream distribution statistics ('000 tonnes)



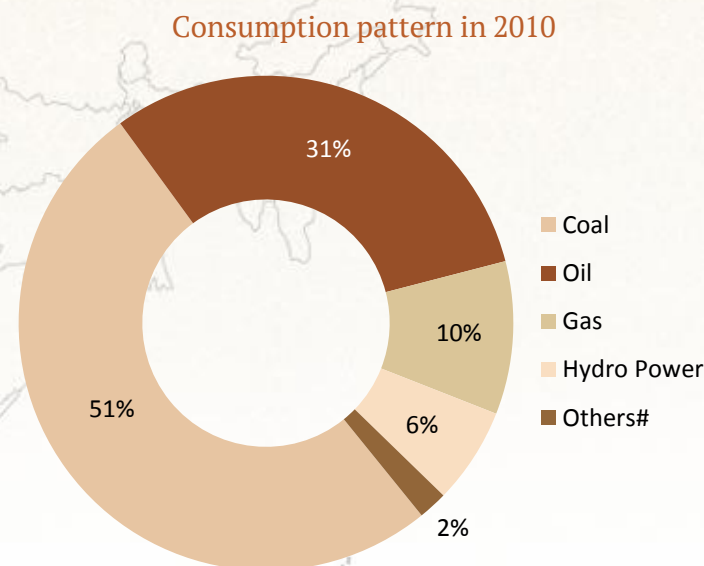
Pipeline	Capacity (mmtpa) As of April 1 2011	Length (km) As of April 1 2011
Product Pipeline	71.5	10,959
LPG Pipeline	3.9	1,824
Crude Pipeline	99.6	6,518
<b>Total</b>	<b>175.0</b>	<b>19,300</b>

Source: Basic Statistics Report, Indian Petroleum & Natural Gas –  
www.petroleum.nic.in, Aranca Research

## India's energy consumption mix ... (1/2)

- In 2010, coal accounted for more than 50 per cent of total primary energy demand
- Energy demand in the Asia Pacific region is expected to reach 5,496 million TOE over the next five years (20.6 per cent growth compared to 2010)
- India's share is forecasted to increase from 11.3 per cent to 11.8 per cent during the same period

Note: TOE – tonne of oil equivalent  
Note: # Other sources includes nuclear power as well

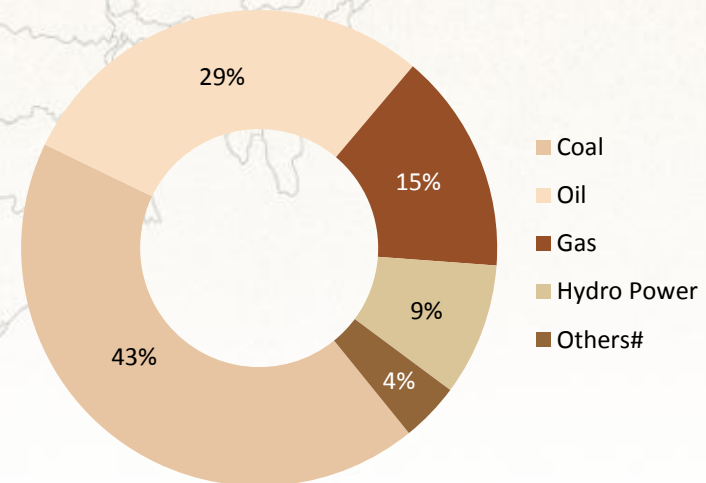


Source: BMI Report, June 2011, Aranca Research

## India's energy consumption mix ... (2/2)

- Over the next few years, the dependence on gas, hydro power and nuclear power is expected to increase relative to oil and coal
- Nuclear power is expected to contribute approximately 2 per cent to total energy consumption by 2014

Consumption pattern expected in 2014



Source: BMI Report, June 2011, Aranca Research  
Note: # - Other sources includes nuclear power as well

## Key domestic oil and gas companies



Company	Ownership (%)	Turnover (USD billion)
Indian Oil Corporation Limited	89% state-owned	62.3 (FY11)
Reliance Industries	Public Listed	75.1 (FY12)
Bharat Petroleum Corporation Limited	66% state-owned	33.7 (FY11)
Hindustan Petroleum Corporation Limited	51% state-owned	28.3 (FY11)
ONGC	69.1% state-owned	25.8 (FY11)
GAIL India Limited	57% state-owned	7.3 (FY11)
Oil India Limited	98.1% state-owned	1.8 (FY11)

Source: Bloomberg, Aranca Research  
Note: FY – Indian financial year (April – March)

## Key international oil and gas companies operating in India



Company	Ownership (%)	Global Turnover (USD billion)
Cairn Energy India Pty Ltd	Private Sector	2.5 (FY12)
Shell	Private Sector	484.5 (2011)
BG Group	Private Sector	21.1 (2011)
BP	Private Sector	384.3 (FY12)

*Source:* Company Reports, Bloomberg, Aranca Research

Note: Note: FY – Indian financial year (April – March); it is also the same for British financial year

## Notable trends in the oil and gas sector

### Coal bed methane (CBM)

- Government approved the CBM policy in 1997 to boost the development of clean and renewable energy resources
- CBM is an eco-friendly natural gas (methane), which is absorbed in coal and lignite seams
- CBM policy was designed to be liberal and investor friendly; the first commercial production of CBM was initiated in July 2007 at about 72,000 cubic metres per day

### Underground coal gasification (UCG)

- The technology was first widely used in the US in the 1800s, and in India (Kolkata and Mumbai) in the early 1900s
- UCG is currently the only feasible technology available to harness energy from deep unmineable coal seams economically in an eco-friendly manner
- Reduces capital outlay, operating costs and output gas expenses by 25–50 per cent, vis-à-vis surface gasification

### Gas hydrates and bio-fuels

- The government initiated the National Gas Hydrate Programme (NGHP), a consortium of national E&P companies and research institutions, to map gas hydrates for use as an alternate source of energy
- Bio-fuels (bio-ethanol and bio-diesel) are alternate sources of energy from domestic renewable resources; these have lower emissions compared to petroleum or diesel

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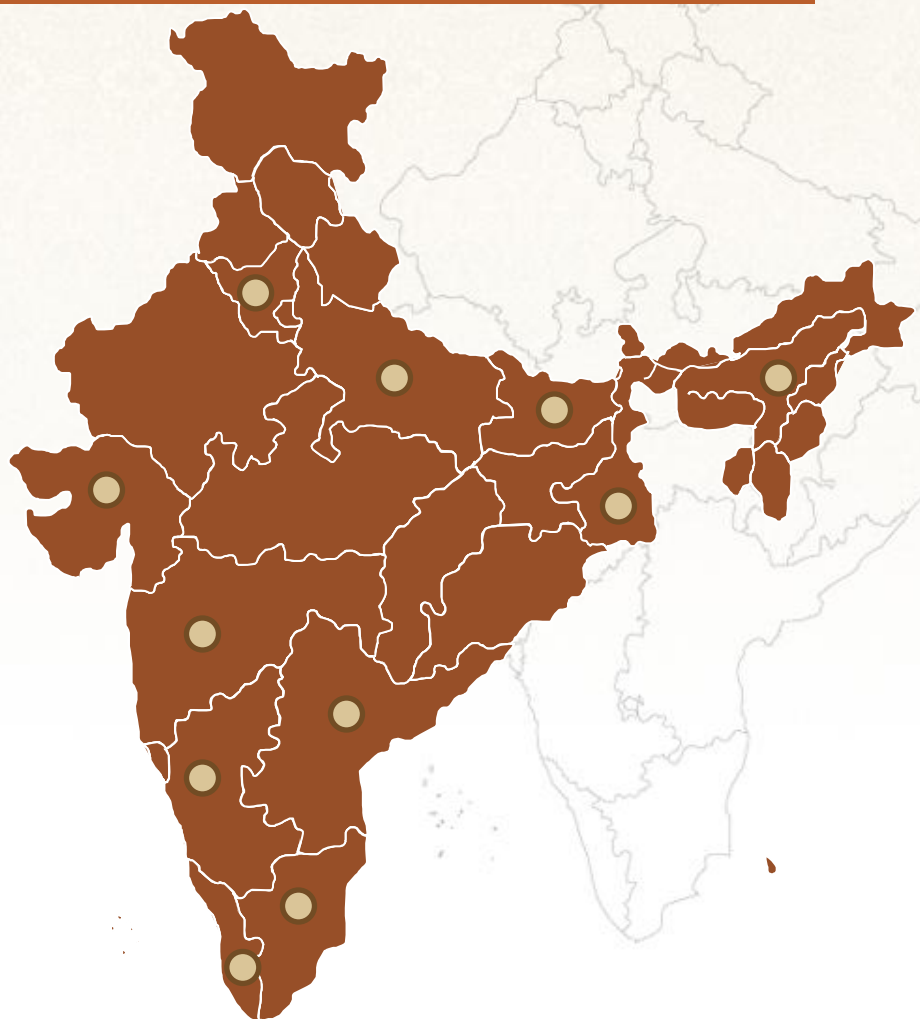
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## Geographical distribution of oil refineries

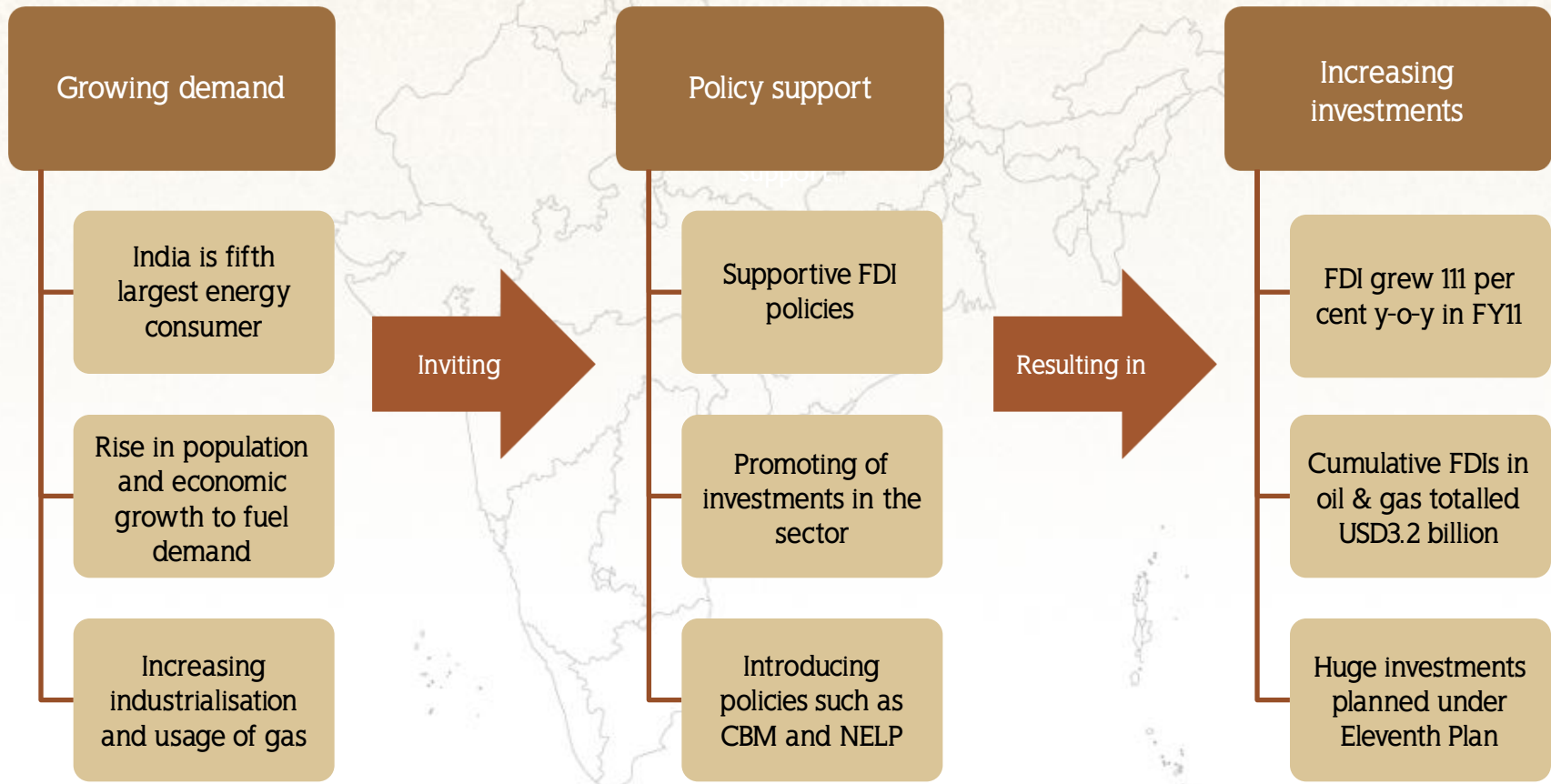


State	Installed capacity as of Apr 2011 (mt)	Crude throughput for 2010-11 in mt
Gujarat	84.2	104.3
Maharashtra	18.5	19.8
Haryana	15.0	13.7
Karnataka	11.8	12.7
Tamil Nadu	11.5	10.8
Kerala	9.5	8.7
Andhra Pradesh	8.4	8.3
Uttar Pradesh	8.0	8.9
West Bengal	7.5	6.9
Assam	7.0	6.0
Bihar	6.0	6.2
<b>Total</b>	<b>187.4</b>	<b>206.2</b>

Source: Ministry of Petroleum & Natural Gas, Aranca Research

Note: mt – million tonne

## Persistent domestic demand to drive the market



## Growth drivers ... (1/2)

Robust domestic market; expected to expand

- India is the fifth-largest energy consumer in the world
- Oil consumption is expected to rise 42.5 per cent during 2010–20
- The country's gas demand is approximately 11.2 per cent of the total Asia Pacific regional demand

Increasing demand for natural gas

- Several industries are increasing the usage of natural gas in operations; this has boosted natural gas demand in India
- Some of the main industries that use natural gas - pulp and paper, metals, chemicals, glass, plastic and food processing

Abundant raw material

- The nation has large coal, crude oil and natural gas reserves
- Crude oil reserves rose from 775 mmt in 2009 to 1,201 mmt in 2010
- Natural gas reserves increased from 1,074 bcm in 2009 to 1,437 bcm in 2010

Favourable policies

- 100 per cent FDI allowed in E&P projects/companies; 49 per cent allowed in refining
- Policies to promote investments in the industry such as NELP and CBM

*Source:* BMI, www.petroleum.nic.in, Aranca Research

## Growth drivers ... (2/2)

### Huge investments

- Investments worth USD563 billion is expected across the oil and gas value chain under the Eleventh Plan (2007–12)
- Since 2005, FDI worth USD2.2 billion was invested in the petroleum and natural gas sectors in India

### Skilled labour

- The nation offers abundant skilled labour at much competitive wages compared to other countries
- The University of Petroleum and Energy Studies in Dehradun, Uttarakhand, is Asia's first and only energy university

### Natural gas discoveries

- Several domestic companies (such as ONGC, Reliance and Gujarat State Petroleum) have reportedly found natural gas in deep waters
- This offers significant expansion opportunity for the next decade

*Source: BMI, [www.petroleum.nic.in](http://www.petroleum.nic.in), Aranca Research*

## Regulatory overview of the industry ... (1/2)

- **FDI Policies** - The E&P segment's FDI limit is 100 per cent, and the refining segment's limit is 49 per cent
- **Oil Field (Regulation and Development) Act, 1948** – An act to regulate oilfields and develop mineral oil resources
- **Petroleum and Natural Gas Rule, 1959** – Regulates the grant of petroleum and natural gas exploration licenses and mining leases, which belong to the government
- **Petroleum and Minerals Pipelines Act, 1962** — Acquisition of user's rights by the government of India on land demarcated for laying pipelines to transport petroleum and other minerals from one area to another
- **Oil Industry (Development) Act, 1974** – An act establishing a board to develop the oil industry and levy excise duty on crude and natural gas
- **CBM Policy, 1997** — To encourage exploration and production of CBM gas as a new eco-friendly source of energy
- **NELP, 1999** — To provide a contract framework for E&P of hydrocarbons; licenses for exploration are awarded through a competitive bidding system; nine rounds of bidding completed till 2011

*Source:* [www.petroleum.nic.in](http://www.petroleum.nic.in), Aranca Research

## Regulatory overview of the industry ... (2/2)

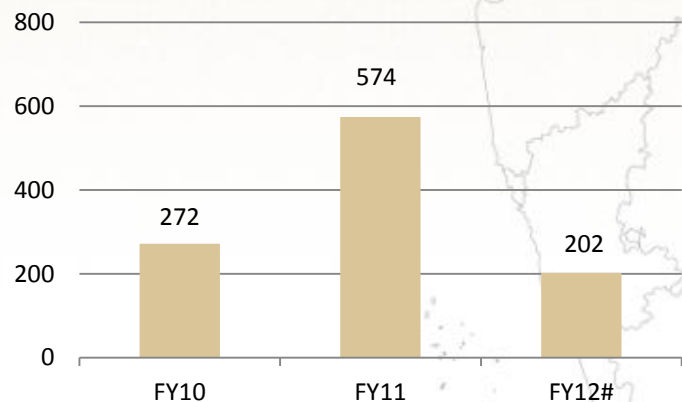
- **Freight Subsidy (for far-flung areas) Scheme, 2002** — To compensate public sector OMCs on the freight incurred to distribute subsidised products in far-flung areas
- **National Biofuel Policy, 2002** — To promote bio-fuel usage, the GoI has provided a 16 per cent concession on the excise duty on bio-ethanol and exempted bio-diesel from excise duty
- **Auto Fuel Policy, 2003** — To provide a roadmap to comply with various vehicular emission norms and corresponding fuel quality upgrading requirements over a period of time
- **Petroleum and Natural Gas Regulatory Board (PNGRB) Act, 2006** — To regulate refining, processing, storage, transportation, distribution, marketing and sale of petroleum, petroleum products and natural gas

*Source:* [www.petroleum.nic.in](http://www.petroleum.nic.in), Aranca Research

## FDI investments in petroleum and gas in India

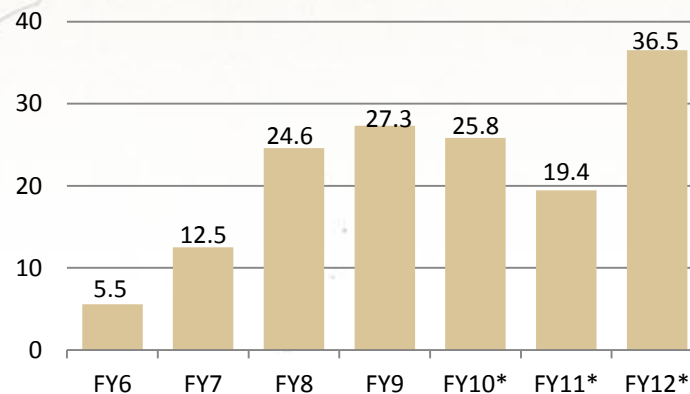
- Cumulative FDI inflows over Apr 2000 – Apr 2011 in India's petroleum and natural gas sector stood at a little less than USD3.2 billion (2 per cent of total FDI); during the first eleven months of FY12 a further USD202 million has flowed in
- Across all sectors, cumulative FDI inflows over Apr 2000 – Feb 2012 was USD162.3 billion with the services sector accounting for the largest share (20 per cent) followed by telecommunication (8 per cent) and computer software & hardware, real estate, construction (7 per cent each)

FDI inflows into petroleum and natural gas (USD million)



Source: www.dipp.nic.in, Aranca Research  
Note: #- April- February

FDI inflows into India (USD billion)



Source: www.dipp.nic.in, Aranca Research  
Note: \* – Provisional

## M&A activities in the Indian oil and gas sector

Date Announced	Acquirer Name	Target Name	Value of Deal (USD million)
Apr 2012	Trafigura Pte Ltd	Nagarjuna Oil Co Ltd	130.0
Feb 2011	BP PLC	Reliance Industries Ltd	9,000.0
Aug 2010	BPRL	EP413	13.4
Aug 2010	Sesa Goa Ltd	Cairn India Ltd	1,180.8
Aug 2010	Vedanta Resources PLC	Cairn India Ltd	6,568.5
Aug 2010	Reliance Industries Ltd	Marcellus Shale Natural Gas	391.6
Jun 2010	Reliance Industries Ltd	Infotel Broadband Svcs Ltd	1,026.7
Apr 2010	Sim Siang Choon Hardware	Interlink Petroleum Ltd	17.8
Apr 2010	Reliance Industries Ltd	Atlas Energy Inc-Marcellus	339.0
Mar 2010	Investor Group	Gulfsands Petroleum PLC	573.3
Mar 2010	Natural Power Venture Pvt Ltd	Great Offshore Ltd	11.8
Feb 2010	Investor Group	Republic of Venezuela-Carabobo	4,848.0
Jan 2010	Avantha Power & Infrastructure	Malanpur Captive Power Pvt Ltd	11.1

Source: Thomson Banker, Aranca Research



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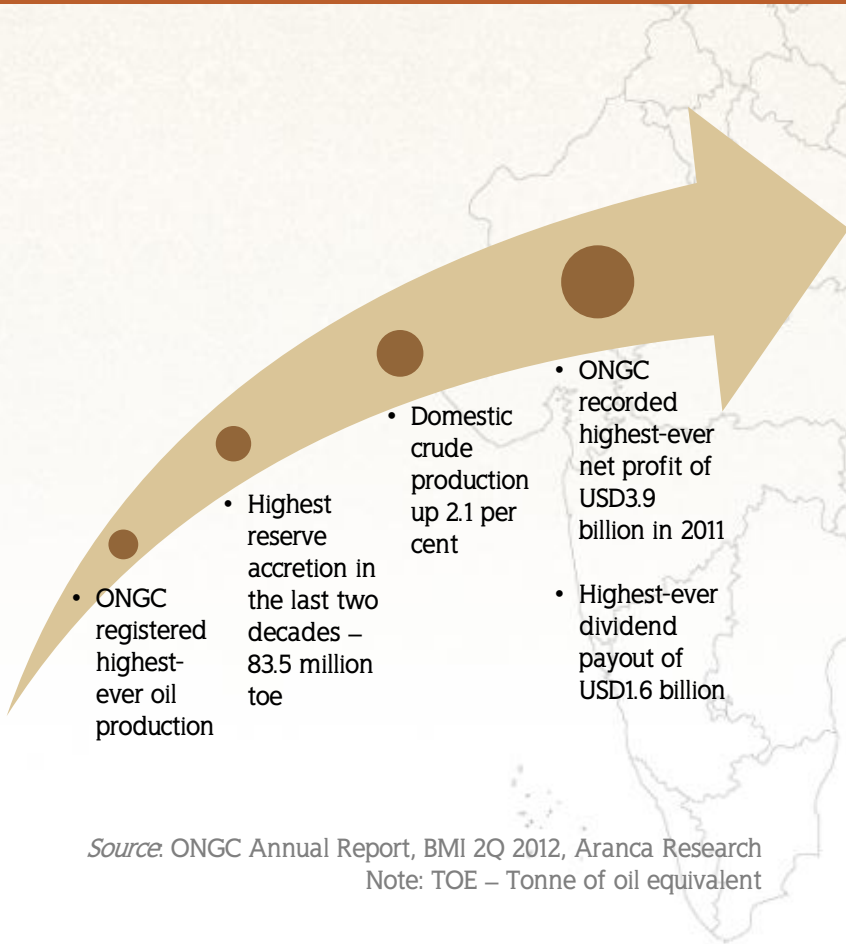
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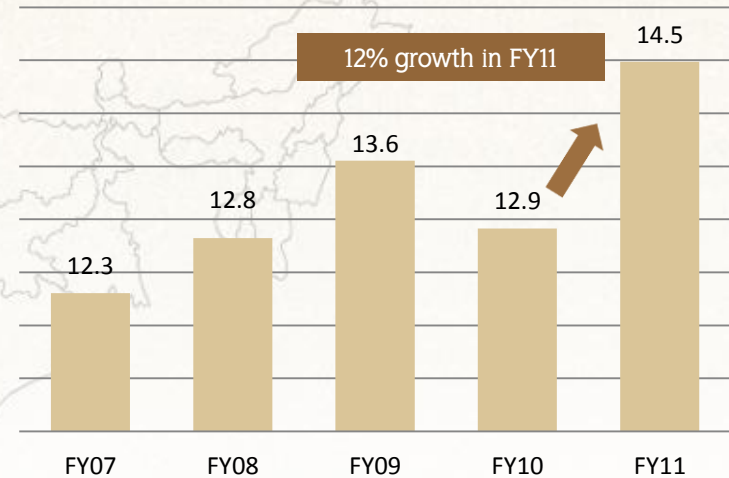
For updated information, please visit [www.ibef.org](http://www.ibef.org)

## ONGC: Continuing on its strong growth path



Source: ONGC Annual Report, BMI 2Q 2012, Aranca Research  
Note: TOE – Tonne of oil equivalent

ONGC revenue growth (USD billion)



### ONGC's position in the Indian market

- ONGC is the largest upstream oil company
- ONGC accounts for 70 per cent of total crude oil output in India and 74 per cent of total gas production

## Reliance Industries: Well positioned for growth

- Reliance Industries is a leading company in the petrochemical, refining and oil & gas industry
- The company was ranked 134th by net revenues and 119th by net profit in the Fortune Global 500 list 2011
- It contributes 14 per cent to India's exports (Mar 2011) and 4.6 per cent of total market capitalisation in the country

	FY11	FY12
<ul style="list-style-type: none"> <li>• Volume growth in the refining, and oil and gas businesses</li> <li>• Turnover increased by 35.9 per cent in FY12</li> <li>• Significant improvement in net profit due to improved refining and petrochemical margins</li> </ul>	<b>Turnover</b> USD48.5 billion	<b>Turnover</b> USD65.9 billion
	<b>EBITDA</b> USD7.3 billion	<b>EBITDA</b> USD7.3 billion
	<b>Net Profit</b> USD4.2 billion	<b>Net Profit</b> USD4.1 billion

Reliance Industries has entered into JVs with various companies across segments to align growth opportunities; it signed JVs with Atlas, Pioneer, Carrizo SIBUR, and D.E. Shaw as well as entered into a strategic alliance with BP recently

# Oil & Gas

AUGUST  
2012

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- ❖ Market overview and trends
- ❖ Growth drivers
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- ❖ Opportunities
- ❖ Useful information

For updated information, please visit [www.ibef.org](http://www.ibef.org)

## Opportunities

### Upstream segment

- Locating new fields for exploration: 78 per cent of the country's sedimentary area is yet to be explored
- Development of unconventional resources: CBM fields in the deep sea
- Opportunities for secondary/tertiary oil producing techniques
- Increased demand for skilled labour and oilfield services and equipment

### Midstream segment

- Expansion in the transmission network of gas pipelines
- LNG imports have increased significantly; this provides an opportunity to boost production capacity
- In light of mounting LNG production, huge opportunity lies for LNG terminal operation, engineering, procurement and construction services

### Downstream segment

- Development in city gas distribution (CGD) networks, which are similar to Delhi and Mumbai's CGDs
- To construct new refineries considering advantages such as low operation costs, lesser freight charges and favourable policies
- Expansion of the country's petroleum product distribution network

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## Industry Associations

Name	Address	Contact person	Telephone	E-mail
Oil Industry Development Board (OIDB)	301, World Trade Centre, Babar Road, New Delhi – 110001	Mr T S Balasubramanian, Financial Adviser and Chief Accounts Officer	91-11- 23413298 91-11- 23414692	oidb@hotmail.com
Petroleum Conservation Research Association (PCRA)	Sanrakshan Bhavan, 10 Bhikaji Cama Place, New Delhi – 110066	Mr Arun Kumar, ED	91-11- 26198799 Ext.301	pcra@pcra.org
Bureau of Energy Efficiency (BEE)	Ministry of Power, 4th floor, SEWA Bhawan, RK Puram, New Delhi – 110066	Dr Ajay Mathur, Director General	91-11- 26178316, 91-11- 26179699	dg-bee@nic.in, amathur@beenet.in
Oil Industry Safety Directorate	Ministry of Petroleum & Natural Gas, 7 <sup>th</sup> floor, “New Delhi House”, 27 Barakhamba Road, New Delhi – 110001	Mr J B Verma, ED	91-11- 23316798	verma.jb@gov.in
Petroleum Planning and Analysis Cell (PPAC)	Ministry of Petroleum & Natural Gas, 2 <sup>nd</sup> floor, Core-8, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi – 110003	Dr Basudev Mohanty, Director	91-11- 24362501, 91-11- 24361380	-
Directorate General of Hydrocarbons	Ministry of Petroleum & Natural Gas, C-139, Sector 63, Noida – 201301	Mr S K Srivastava, Director General	0120 - 4029401	dg@dghindia.org

## Glossary ... (1/2)

- **B/D (or bpd):** Barrels Per Day
- **MBPD (or mbpd):** Million Barrels Per Day
- **BCM (or bcm):** Billion Cubic Metres
- **CBM:** Coal Bed Methane
- **CGD:** City Gas Distribution
- **E&P:** Exploration and Production
- **FDI:** Foreign Direct Investment
- **FY:** Indian financial year (April to March)
  - So FY12 implies April 2011 to March 2012
- **GoI:** Government of India
- **INR:** Indian Rupee
- **LNG:** Liquefied Natural Gas
- **MMT (or mmt):** Million Metric Tonne
- **MMTPA (or mmtpa) :** Million Metric Tonnes Per Annum
- **EBITDA:** Earning Before Interest Taxes Depreciation Amortisation
- **NRL:** Numaligarh Refinery Limited
- **CPCL:** Chennai Petroleum Corporation Limited
- **HPCL:** Hindustan Petroleum Corporation Limited
- **BPCL:** Bharat Petroleum Corporation Limited
- **IOC:** Indian Oil Corporation Ltd
- **EOL:** Essar Oil Ltd
- **RPL:** Reliance Petroleum Limited
- **MRPL:** Mangalore Refinery and Petrochemicals Limited
- **PCCK:** Petronet Cochin-Coimbatore-Karur
- **PMHB:** Petronet Mangalore-Hassan-Bangalore



## Glossary ... (2/2)

- **NELP:** New Exploration Licensing Policy
- **TOE (or toe):** Tonnes of Oil Equivalent
- **USD:** US Dollar
- **ONGC:** Oil and Natural Gas Corporation of India
- **IOCL:** Indian Oil Corporation Limited
- **mn bbl :** Million Barrels
- **CAGR:** Compound Annual Growth Rate
- **JV:** Joint Venture
- **UCG:** Underground Coal Gasification
- **NGL:** Natural Gas Liquids
- **OMCs:** Oil Marketing Companies
- **NHGP:** National Gas Hydrate Programme
- Conversion rate used: USD1= INR48
- Wherever applicable, numbers have been rounded off to the nearest whole number

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