OIL & GAS
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Executive summary

2 WORLD’S THIRD-LARGEST ENERGY CONSUMER

- India’s energy demand is expected to double to 1,516 Mtoe by 2035 from 753.7 Mtoe in 2017. Moreover, country’s share in global primary energy consumption is projected to increase two-folds by 2035.

3 THIRD-LARGEST CONSUMER OF OIL

- India’s consumption of petroleum products grew 4.5% to 213.69 MMT in FY20 from 213.22 MMT in FY19.
- India retained its spot as the third-largest consumer of oil in the world in 2019.

4 FOURTH-LARGEST LNG IMPORTER

- LNG import in the country accounted for about one-fourth of total gas demand, which is estimated to double over the next five years. To meet this rising demand the country plans to increase its LNG import capacity to 50 MT in the coming years.
- India increasingly relies on imported LNG. It is the fourth-largest LNG importer.
- India’s LNG import stood at 33.68 billion cubic meters (bcm) in FY20.

1 SECOND-LARGEST REFINER IN ASIA

- As of May 01, 2020, India’s oil refining capacity stood at 259.3 million metric tonnes (MMT), making it the second-largest refiner in Asia. Private companies owned about 35.19% of the total refining capacity in FY20.

Notes: MMT - Million Metric Tonnes, Mtoe - Million Tonnes of Oil Equivalent; mbpd - Million Barrels Per Day, LNG - Liquified Natural Gas
Advantage India
2 GROWING DEMAND

- India is the world’s third-largest energy consumer globally.
- Diesel demand in India is expected to double to 163 MT by 2029-30.
- Consumption of natural gas in India will increase by more than three-folds in next 10 years (until 2030).

1 SUPPORTIVE FDI GUIDELINES

- The Government has allowed 100% foreign direct investment (FDI) in upstream and private sector refining projects.
- The FDI limit for public sector refining projects has been raised to 49% without any disinvestment or dilution of domestic equity in existing PSUs.

3 RAPID EXPANSION

- The oil and gas industry is growing robustly, and players are undertaking investment to cater to the burgeoning demand.
- The industry is expected to attract US$ 25 billion investment in exploration and production by 2022. Refining capacity in the country is expected to increase to 667 MTPA by 2040.

4 POLICY SUPPORT

- Government has enacted various policies such as OALP and CBM to encourage investments.
- In September 2018, the Government approved fiscal incentives to attract investment and technology to improve recovery from oil fields, which is expected to result in hydrocarbon production worth Rs. 50 lakh crore (US$ 745.82 billion) in the next 20 years.
Market Overview And Trends
State-owned companies dominate oil and gas in India

- India remained the third-largest energy consumer in 2019.
- India’s crude oil production in FY20 stood at 32.2 MMT.
- In January 2021, the crude oil production stood at 2.5 MMT, while for FY21* it was 25.55 MMT.
- India had 4.7 thousand million barrels of proven oil reserves and produced 37.5 million tonnes in 2019.
- Oil production is expected to rise and reach 36 bcm^ by 2021.

**Notes:**
- bcm - Billion Cubic Metres, mbpd - Million Barrels Per Day, mmscmd - Million Metric Standard Cubic Metre Per Day, mmtpa -- million metric tons per annum, ^As per IEA, *from April 2020 to Jan 2021

**Source:** BP Statistical Review 2020, US Energy Information Administration, Petroleum Planning and Analysis Cell
Diesel was the most consumed oil product in India and accounted for 39% of petroleum product consumption in 2019. It is used primarily for commercial transportation and further, in the industrial and agricultural sectors.

Oil demand is expected to rise by 5.8 mbpd in 2040 from 5.27 mbpd in 2019.

Oil demand increased 3.11% to 5.27 mbpd in 2019 from 5.11 mbpd the previous year.

Rapid economic growth is leading to greater outputs, which in turn is increasing the demand of oil for production and transportation.

In FY20, crude oil imports increased to 4.54 mbpd from 4.53 mbpd in FY19.

Note: CAGR - Compound Annual Growth Rate, mbpd - Million Barrels Per Day, P - Provisional, *As per OPEC, Based on 50 MMT = 1 MBPD, *- Until November 2020
Source: Ministry of Petroleum and Natural Gas, BP Statistical Review 2020
Sector Drivers
Gas supply and demand in India

- Demand is not likely to simmer down anytime soon, given strong economic growth and rising urbanisation.
- Gas consumption is projected to reach 143.08 bcm by 2040. The Government is planning to invest US$ 2.86 billion in the upstream oil and gas production to double the natural gas production to 60 bcm and drill more than 120 exploration wells by 2022.
- India’s natural gas imports increased at a CAGR of 12% in FY16-FY20.
- LPG penetration rate of households reached ~97% in early 2020 compared with 56% in 2016.

Note: F - Forecast, bcm - Billion Cubic Metres, CAGR - Compound Annual Growth Rate, *- Until November 2020
Source: PPAC, BP Statistical Review 2020
India is one of the largest exporters of refinery products due to the presence of various refineries.

- Exports of petroleum products from India increased from 60.54 MMT in FY16 to 65.7 MMT in FY20.

- The total value of petroleum products exported from the country increased to US$ 35.8 billion in FY20 from US$ 34.89 billion in FY19.

- HSD was the major export item among petroleum products, followed by MS, ATF and Naptha.

**Note:**
- MMT - Million Metric Tonnes, P - Provisional, HSD - High speed Diesel, MS - Motor Spirit, ATF - Aviation Turbine Fuel, LPG - Liquefied Petroleum Gas, LDO - Light Diesel Oil, SKO - Superior Kerosene Oil, LOBS - Lubricating Oil Base Stocks, ^Others includes Hexane, Benzene, MTO (Mineral Turpentine Oil), Sulphur, etc.
- *- Until November 2020

**Source:** PPAC, BP Statistical Review 2020
Almost half of India’s crude oil production is from offshore fields, although this share is diminishing in the past few years as production from the large, ageing Mumbai High field has declined.

In FY20, crude oil production in India stood at 30.5 MMT.

Onshore production accounted for 50.68% of total production, while offshore contributed the remaining 49.32%.

ONGC accounted for around 61.25% of total crude oil production in India in FY20P.

Notes: MMT - Million Metric Tonne, JV - Joint Venture, P-Provisional, *- Until November 2020
Source: Ministry of Petroleum and Natural Gas
Upstream segment: crude oil and gas production... (2/2)

Note: JV - Joint Venture, *Including CBM production  ^Provisional, ^- Until November 2020
Source: Ministry of Petroleum and Natural Gas
In FY19P, 1,228,000 metres of wells were explored and developed and 545 wells were drilled in the country.

State-owned oil companies undertake most of the upstream drilling and exploration work.

The Government is planning to invest US$ 2.86 billion in the upstream oil and gas production to double the natural gas production to 60 bcm and drill more than 120 exploration wells by 2022.

Notes: P- Provisional, *OALP - Open Acreage Licensing Policy
Source: Ministry of Petroleum and Natural Gas, BMI
As of December 01, 2020, India had 10,419 kms of crude pipeline, with capacity of 147.9 mmtpa.

In terms of length, IOCL accounts for 50.88% (5,301 kms) of India’s crude pipeline network.

In terms of actual capacities, ONGC leads with 40.97%, followed by IOCL at 32.86%.

Note: km - Kilometre, mmtpa - Million Metric Tonnes Per Annum. *Others includes HMEL, BPCL and Cairn
Source: Ministry of Petroleum and Natural Gas
### Pipelines: existing pipelines in India

#### Length and capacity of products and crude oil pipeline by company (as of December 01, 2020)

<table>
<thead>
<tr>
<th></th>
<th>IOCL</th>
<th>BPCL(^{(1)})</th>
<th>HPCL(^{(2)})</th>
<th>OIL</th>
<th>ONGC</th>
<th>Cairn</th>
<th>HMEL</th>
<th>Others (GAIL and Petronet India.)</th>
<th>Total industry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length (kms)</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Pipeline</td>
<td>9,400</td>
<td>2,241</td>
<td>3,775</td>
<td>654</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2,395</td>
<td>18,465</td>
</tr>
<tr>
<td>Crude oil Pipeline</td>
<td>5,301</td>
<td>937</td>
<td>-</td>
<td>1,193</td>
<td>1,283</td>
<td>688</td>
<td>1,017</td>
<td>-</td>
<td>10,419</td>
</tr>
<tr>
<td>Total</td>
<td>14,701</td>
<td>3,178</td>
<td>3,775</td>
<td>1,847</td>
<td>1,283</td>
<td>688</td>
<td>1,017</td>
<td>2,395</td>
<td>28,884</td>
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<table>
<thead>
<tr>
<th></th>
<th>IOCL</th>
<th>BPCL(^{(1)})</th>
<th>HPCL(^{(2)})</th>
<th>OIL</th>
<th>ONGC</th>
<th>Cairn</th>
<th>HMEL</th>
<th>Others (GAIL and Petronet India.)</th>
<th>Total industry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity of Crude Oil Pipelines (mmtpa)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Pipeline</td>
<td>46</td>
<td>19.5</td>
<td>34.7</td>
<td>1.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9.4</td>
<td>111.3</td>
</tr>
<tr>
<td>Crude oil Pipeline</td>
<td>48.6</td>
<td>7.8</td>
<td>-</td>
<td>9</td>
<td>60.6</td>
<td>10.7</td>
<td>11.3</td>
<td>-</td>
<td>148</td>
</tr>
<tr>
<td>Total</td>
<td>94.6</td>
<td>27.3</td>
<td>34.7</td>
<td>10.7</td>
<td>60.6</td>
<td>10.7</td>
<td>11.3</td>
<td>9.4</td>
<td>259.3</td>
</tr>
</tbody>
</table>

- Government of India is planning to invest Rs. 70,000 crore (US$ 9.97 billion) to expand the gas pipeline network across the country.

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**Note:** kms - Kilometres, mmtpa - Million Metric Tonnes Per Annum, \(^{(1)}\)Includes Petronet Cochin-Coimbatore-Karur Product pipeline, \(^{(2)}\)Includes Petronet Mangalore-Hassan-Bangalore Product Pipeline

**Source:** Ministry of Petroleum and Natural Gas
With 9,400 kms of refined products pipeline in India, the Indian Oil Corporation (IOC) leads the segment with 50.91% of the total product pipeline network as of December 01, 2020.

Top three companies IOCL, HPCL and BPCL contribute more than 80% of the total length of product pipeline network in the country.

As of June 30, 2020, Gas Authority of India Ltd. (GAIL) had the largest share (69.19% or 11,774 km) of the country’s natural gas pipeline network (17,016 kms).

In November 2020, oil regulator Petroleum and Natural Gas Regulatory Board (PNGRB) simplified the country's gas pipeline tariff structure to make fuel more affordable for distant users and attract investment for building gas infrastructure.

Note: km - Kilometre, mmtpa - Million Metric Tonnes Per Annum, LPG - Liquefied Petroleum Gas, IOC - Indian Oil Corporation, HPCL - Hindustan Petroleum Corporation Ltd, BPCL - Bharat Petroleum Corporation Ltd, OIL - Oil India Limited, (1) Others include GAIL and Petronet India

Source: Ministry of Petroleum and Natural Gas
India has 23 refineries - 18 are in the public sector, two in the joint sector and three in the private sector.

India’s state refineries have upgraded their facilities to comply with a new government requirement to produce oil products with the equivalent of Euro VI emission standards.

Crude oil throughput of public sector refineries increased at a CAGR of 3.30%, from 108.03 MMT in FY07 to 164.80 MMT in FY20. At the same time, crude oil throughput of private sector refineries recorded a CAGR of 7.87%, from 33.43 MMT to 89.50 MMT.

The share of private sector refineries throughput in the total crude throughput grew from 29.99% in FY07 to 35.19% in FY20.

Note: MMT - Million Metric Tonne, Public Sector includes IOCL, BPCL, HPCL, CPCL and ONGC, Private sector includes RIL and NEL, *Provisional
Source: Ministry of Petroleum and Natural Gas
In FY20, the sector’s total installed provisional refinery capacity was 249.9 MMT. IOC emerged as the largest domestic refiner with a capacity of 69.7 MMT.

Top three companies, IOC, RIL and BPCL, contribute almost 70% of India's total refining capacity.

**Shares in India's total refining capacity (as of December 01, 2020)**

- IOC: 27.89%
- RIL: 6.04%
- BPCL: 8.00%
- HPCL: 15.33%
- NEL: 10.84%
- ONGC: 27.29%
- CPCL: 4.60%

**Total installed refinery capacity (MMT)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Public sector</th>
<th>Private sector (incl JV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY11</td>
<td>116.89</td>
<td>76.50</td>
</tr>
<tr>
<td>FY12</td>
<td>120.07</td>
<td>93.00</td>
</tr>
<tr>
<td>FY13</td>
<td>120.07</td>
<td>95.00</td>
</tr>
<tr>
<td>FY14</td>
<td>120.07</td>
<td>95.00</td>
</tr>
<tr>
<td>FY15</td>
<td>120.07</td>
<td>95.00</td>
</tr>
<tr>
<td>FY16</td>
<td>135.07</td>
<td>95.00</td>
</tr>
<tr>
<td>FY17</td>
<td>139.00</td>
<td>95.00</td>
</tr>
<tr>
<td>FY18</td>
<td>142.10</td>
<td>105.50</td>
</tr>
<tr>
<td>FY19</td>
<td>142.07</td>
<td>110.00</td>
</tr>
<tr>
<td>FY20</td>
<td>164.80</td>
<td>89.50</td>
</tr>
<tr>
<td>FY21*</td>
<td>161.67</td>
<td>88.20</td>
</tr>
</tbody>
</table>

**Note:** MMT - Million Metric Tonne; HPCL - Hindustan Petroleum Corporation Ltd, BPCL - Bharat Petroleum Corporation Ltd, OIL - Oil India Limited, ONGC - Oil and Natural Gas Corporation, IOCL - Indian Oil Corporation Ltd, CPCL - Chennai Petroleum Corporation Limited, FY 21* - December 01, 2020

**Source:** Ministry of Petroleum and Natural Gas, PPAC
Downstream segment: petroleum products

- Consumption of petroleum products in India increased to 213.7 MMT in FY20 from 194.60 MMT in FY17.
- Petroleum products derived from crude oil include light distillates such as LPG, naphtha; middle distillates such as kerosene; and heavy ends such as furnace, lube oils, bitumen, petroleum coke and paraffin wax.
- Production of petroleum products by fractionators reached almost 4,760 tmt in FY20.

![Consumption of Petroleum Products (MMT)](chart1)

![Production of Petroleum Products by Fractionators (TMT)](chart2)

**Note:** MMT - Million Metric Tonne, TMT - ThousandMetric Tonne, P - Provisional

**Source:** Ministry of Petroleum and Natural Gas
The total number of OMC retail outlets increased to 73,333 in December 2020 (P) from 59,595 in FY17.

IOCL, as of December 01, 2020 (P), owned the maximum number of retail outlets in the country (30,623), followed by HPCL (17,607) and BPCL (17,559).

As of December 01, 2020 (P), there were 24,872 LPG distributors (under PSUs) in India.

<table>
<thead>
<tr>
<th>Pipeline</th>
<th>Capacity (mmtpa) as on December 01, 2020</th>
<th>Length (kms) as on December 01, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Pipeline</td>
<td>147.9</td>
<td>10,419</td>
</tr>
<tr>
<td>Product Pipeline</td>
<td>111.3</td>
<td>18,465</td>
</tr>
<tr>
<td>Natural Gas Pipeline*</td>
<td>337.3</td>
<td>17,016</td>
</tr>
</tbody>
</table>

Note: MMT - Million Metric Tonne, mmtpa - Million Metric Tonnes Per Annum, OMC - Oil Marketing Companies, (P) - Provisional, PSU - Public Sector Unit, *- as on 1st December 2020 for product pipeline and on 30th June 2020 for natural gas pipeline

Source: Ministry of Petroleum and Natural Gas
State-wise crude reserve, capacity and throughput

<table>
<thead>
<tr>
<th>State</th>
<th>Balance recoverable reserves of crude oil, 2019 (MMT)</th>
<th>State</th>
<th>Installed capacity, as of April 2019 (mt)</th>
<th>Crude throughput for FY19 (MMT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assam</td>
<td>160.34</td>
<td>Gujarat</td>
<td>101.9</td>
<td>104.97</td>
</tr>
<tr>
<td>Gujarat</td>
<td>118.20</td>
<td>Maharashtra</td>
<td>19.5</td>
<td>22.70</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>17.99</td>
<td>Haryana</td>
<td>15.0</td>
<td>15.65</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>9.16</td>
<td>Karnataka</td>
<td>15.0</td>
<td>16.13</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>7.94</td>
<td>Tamil Nadu</td>
<td>11.5</td>
<td>10.79</td>
</tr>
<tr>
<td>Nagaland</td>
<td>2.38</td>
<td>Kerala</td>
<td>15.5</td>
<td>14.10</td>
</tr>
<tr>
<td>Arunachal Pradesh</td>
<td>1.74</td>
<td>Andhra Pradesh</td>
<td>8.36</td>
<td>9.64</td>
</tr>
<tr>
<td>Tripura</td>
<td>0.07</td>
<td>Uttar Pradesh</td>
<td>8.0</td>
<td>9.24</td>
</tr>
<tr>
<td><strong>Total Onshore</strong></td>
<td><strong>317.82</strong></td>
<td>West Bengal</td>
<td>7.5</td>
<td>7.66</td>
</tr>
<tr>
<td>Western Offshore</td>
<td>236.25</td>
<td>Assam</td>
<td>7.0</td>
<td>6.90</td>
</tr>
<tr>
<td>Eastern Offshore</td>
<td>40.42</td>
<td>Bihar</td>
<td>6.0</td>
<td>5.82</td>
</tr>
<tr>
<td><strong>Total Offshore</strong></td>
<td><strong>276.67</strong></td>
<td>Punjab</td>
<td>11.3</td>
<td>8.83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Madhya Pradesh</td>
<td>6.0</td>
<td>6.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Odisha</td>
<td>15.0</td>
<td>12.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>247.56</strong></td>
<td><strong>251.94</strong></td>
</tr>
</tbody>
</table>

*Note: MMT - Million Metric Tonne, MT - Million Tonne
Source: Ministry of Petroleum and Natural Gas*
### Key domestic oil and gas companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Ownership (% as of FY20)</th>
<th>Total Income from Operations in FY20 (US$ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian Oil Corporation Limited</td>
<td>56.98% state-owned</td>
<td>79.97</td>
</tr>
<tr>
<td>Reliance Industries</td>
<td>Public Listed</td>
<td>87.1</td>
</tr>
<tr>
<td>Bharat Petroleum Corporation Limited</td>
<td>54.31% state-owned</td>
<td>46.78</td>
</tr>
<tr>
<td>Hindustan Petroleum Corporation Limited</td>
<td>51.11% state-owned (through ONGC)</td>
<td>37.83</td>
</tr>
<tr>
<td>ONGC</td>
<td>68.07% state-owned</td>
<td>13.57</td>
</tr>
<tr>
<td>GAIL India Limited</td>
<td>53.59% state-owned</td>
<td>9.43</td>
</tr>
<tr>
<td>Oil India Limited</td>
<td>66.13% state-owned</td>
<td>1.93</td>
</tr>
</tbody>
</table>

**Note**: FY - Indian Financial Year from April-March  
**Source**: Company’s Annual Report 2019-20
Recent Trends and Strategies
Notable trends in the oil and gas sector

1 Coal Bed Methane (CBM)
- CBM policy was designed to be liberal and investor-friendly. The 1st commercial production of CBM was initiated in July 2007 at about 72,000 cubic metres per day.
- Production in 2019-20 stood at 655.44 million cubic metres.

2 Underground Coal Gasification (UCG)
- The technology was first widely used in the US in 1800s and in India (Kolkata and Mumbai) in early 1900s.
- UCG is currently the only feasible technology available to harness energy from deep unmineable coal seams economically and in an eco-friendly manner. It reduces capital outlay, operating costs and output gas expenses by 25-50% vis-a-vis surface gasification.

3 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.

4 Oil Pricing
- Organisation of the Petroleum Exporting Countries (OPEC) meets 78% of India’s crude oil demand, 59% LPG needs and ~38% LNG consumption as of 2020.
- In November 2020, the Indian government urged OPEC to remove pricing anomalies for different regions with a view to help the Corona-battered global oil industry get back to normalcy.

5 Open Acreage Licensing Policy
- Open Acreage Licensing Policy (OALP), which allows an explorer to study the data available and bid for blocks of his choice, has been initiated to increase foreign participation by global E & P companies like Shell, BP, Conoco Phillips etc.
- In January 2020, Open Acreage Licensing Programme Bid Round-V offered 8 sedimentary basins and 11 blocks with a total area of 19,789.04 sq.km.
Expansion

- H-Energy is planning to invest Rs. 3,500 crore (US$ 540.62 million) to build Liquified Natural Gas (LNG) terminals and lay down a 60 km pipeline.
- In February 2019, Atlantic Gulf and Pacific started construction of its first LNG terminal in India, which is being built on a 12-hectare site, with an initial capacity of 1 million tons per annum. The terminal is expected to be operational by the fourth quarter of 2021.
- As per the Union Budget 2019-20, under scheme ‘Kayakave Kailasa’, the Ministry of Petroleum & Natural Gas enabled SC/ST entrepreneurs in providing bulk LPG Transportation. State run energy firms Bharat Petroleum, Hindustan Petroleum and Indian Oil Corp have plans to spend US$ 20 billion on refinery expansions to add units by 2022.
- Indian Oil Corp plans to make an investment of US$ 22.91 billion, including US$ 7.64 billion for expanding its existing brownfield refineries, in the next 5 to 7 years. Moreover, the company plans to lay the nation's longest LPG pipeline of 1987 kms from Gujarat's coast to Gorakhpur in Uttar Pradesh to cater to growing demand for cooking gas in the country.
- India targets US$100 billion worth investment in gas infrastructure by 2022 and to add another 228 cities to the gas distribution (CGD) network. This would include setting up RLNG terminals, pipeline projects, completion of the gas grid and setting up of CGD network in more cities.
- Reliance Industries Ltd. is planning to expand its Jamnagar oil refining capacity by about 50% from current 35.2 million tonne per annum (MTPA) to 41 MTPA.
- On July 10, 2020, Reliance Industries and BP India formed a new Indian fuels and mobility joint venture, Reliance BP Mobility Limited (RBML), to provide consumers with advanced fuels with lower emissions, electric vehicle charging and other low carbon solutions over time.
- On July 02, 2020, Haldia Petrochemicals Ltd (HPL), the flagship company of the Chatterjee Group (TCG), and Rhone Capital, a global private equity firm, jointly acquired US-based Lummus Technology from McDermott International for an enterprise value of US$ 2.725 billion.
- On September 15, 2020, the Prime Minister, Mr. Narendra Modi inaugurated the three petroleum sector projects in Bihar which cost more than Rs. 900 crores (US$ 122 million)
- In October 2020, Torrent Gas Ltd. announced plan to spend Rs. 8,000 crore (US$ 1.1 billion) over the next five years to expand its urban gas operations with the aim of setting up 500 CNG dispensing pumps by March 2023.

Source: Bloomberg reports, News Articles
Strategies adopted… (2/4)

2

**Diversification**
- Oil companies are focusing on vertical integration for next stage of growth. For instance, oil producer Oil India Ltd. is planning to build and operate refineries, while Indian Oil is planning to enter oil and gas exploration.

3

**Investments to enhance production**
- The Indian oil and natural gas sector is likely to witness an investment of US$ 206 billion in the next eight to ten years.
- Indian Oil Company (IOC) is planning to invest Rs. 1.43 lakh crore (US$ 22.19 billion) to double its oil refining capacity to 150 million tonnes by 2030.
- ONGC plans to invest more than US$ 500 million in Mumbai High.
- In February 2020, Indian Oil Corporation (IOC) announced plans to invest Rs. 500 crore (US$ 71.54 million) at Chitradurga in Karnataka.
- In December 2020, the Indian Oil Corporation (IOCL) announced plans to invest Rs. 1,689 crore (US$ 228.81 million) in new projects in Andhra Pradesh. This includes Rs. 1,522 crore (US$ 206.19 million) on petro products infrastructure and Rs.167 crore (US$ 22.62 million) on LPG storage facilities.

4

**Commercial use of oil**
- In October 2020, the Cabinet Committee on Economic Affairs (CCEA) allowed Abu Dhabi National Oil Co. (ADNOC) to commercially use 50% of the oil it had stored in Indian underground strategic reserves.
- This flexibility will encourage the company to store more oil in the three strategic petroleum reserves built at Visakhapatnam, Mangalore, and Padur and will act as an insurance against supply and price disruptions.

*Notes: ISEER - Indian Seasonal Energy Efficiency Ratio
Source: News Articles, techARC*
5. **Pilot project Initiated for Shale Gas Production in India**
   - Oil and Natural Gas Corp (ONGC) has started Shale Gas exploration by spudding the first Shale Gas well RNSG-1 in Burdwan district of West Bengal.
   - In 2018, Great Eastern Energy Corp (GEECL) announced to invest US$ 2 billion over the next ten years in West Bengal to explore shale gas reserves.
   - As of March 2017, 22 assessment wells (5 exclusive shale gas in Cambay basin and 17 dual objective wells) in 19 Petroleum Mining Lease (PML) blocks have been drilled and required data are being generated/evaluated for shale gas/oil assessment.

6. **Move to non-conventional energy resources**
   - The Government is planning to set up around 5,000 compressed biogas (CBG) plants by 2023.
   - JBM signed an MoU with the Ministry of Petroleum and Natural Gas (MoPNG), Govt. of India, for the development of Compressed Biogas (CBG) Projects.
   - In December 2020, the Minister for Petroleum & Natural Gas and Steel Mr. Dharmendra Pradhan laid the foundation stone for the Leafiniti Bioenergy’s CBG plant in the Bagalkot district of Karnataka. This plant will utilise 200 TPD (tonnes per day) of press mud and will be commissioned at an estimated cost of Rs. 42 crore (US$ 5.6 million).

7. **More focus upon small companies**
   - Private sector units like Adani, Sun Petrochemicals and few new entrants have bagged 1/3rd of small oil and gas fields.

*Source: CEAMA, India Retail Report, Business Line, IMAP India, News Sources*
8

Innovate for India

- In December 2020, the Minister for Petroleum & Natural Gas and Steel Mr. Dharmendra Pradhan has appealed to the scientific community to Innovate for India (I4I) and create competitive advantages to make India ‘Aatmanirbhar’

9

High Octane Petrol

- In December 2020, Indian Oil launched a world-class premium grade Petrol (Octane 100) in India. Branded as XP100, the premium-grade petrol was launched in 10 cities.

Source: CEAMA, India Retail Report, Business Line, IMAP India, News Sources
Growth Drivers
Growth drivers

Growing demand

- Robust growth in domestic market
- Increasing demand for natural gas

Favourable business condition

- Abundant raw material
- Skilled labour

Government support

- 100% FDI investment allowed
- Favourable policies

Notes: TCM - Trillion Cubic Metres, EandP - Exploration and Production
Rising demand

- Energy demand of India is anticipated to grow faster than energy demand of all major economies on the back of robust economic growth. Consequently, India’s energy demand as a percentage of global energy demand is expected to rise to 11% in 2040 from ~6% in 2017.

- Crude oil consumption is expected to grow at a CAGR of 3.60% to 500 million tonnes by 2040 from 221.56 million tonnes in 2017.

- Natural Gas consumption is forecast to increase at a CAGR of 4.18% to 143.08 million tonnes by 2040 from 58.10 million tonnes in 2018.

- Diesel demand in India is expected to double to 163 million tonnes (MT) by 2029-30.

- As of May 20, 2020, Oil Marketing Companies (OMCs) delivered 6.8 crore LPG cylinders to Pradhan Mantri Garib Kalyan Package (PMGKP) beneficiaries.

- India’s oil demand is projected to rise at the fastest pace in the world to reach 10 million barrels per day by 2030, from 5.05 million barrel per day in 2020.

Notes: F-Forecast, MT - Million Tonnes, BCM - Billion Cubic Metres
Regulatory overview of the industry

1. National Policy on Biofuels, 2018
   - Proposed an indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel by 2030.
   - Promoted advanced biofuels through a viability gap funding scheme of Rs. 5,000 crore (US$ 745.82 million) in six years for 2G ethanol Bio refineries along with additional tax incentives.

2. Pricing of CNG and PNG by CGD Entities (2014)
   - In 2014, the pricing for CNG (transport) and PNG (domestic) were examined by the Ministry of Petroleum and Natural Gas while the disclosure of prices of the CNG and PNG commodities were made compulsory.

3. Domestic Natural Gas Pricing Formula, 2014
   - New domestic natural gas pricing formula was formed and was to be revised on an half yearly basis.

4. Open Acreage Licensing
   - Launched in June 2017, it allowed companies to carve out area for petroleum exploration and production. The policy, launched under Hydrocarbon Exploration and Licensing Policy (HELP), replaced New Exploration and Licensing Policy under which bidders did not have the freedom of carving out areas for E&P.

Source: CEAMA, India Retail Report, Business Line, IMAP India, News Sources
FDI investments in petroleum and gas in India

- FDI inflow in India’s petroleum and natural gas sector stood at US$ 7.86 billion between April 2000 and September 2020.
- India has invited global firms to invest in its strategic petroleum reserves (SPRs) owing to the country’s rising energy consumption. India’s share in global energy consumption is set to rise from 7% to 12% in 2050.

Source: Department Of Promotion Of Industry And Internal Trade
### M&A activities in the Indian oil and gas sector

<table>
<thead>
<tr>
<th>Date announced</th>
<th>Acquirer name</th>
<th>Target name</th>
<th>Value of deal (US$ million)</th>
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<tbody>
<tr>
<td>Dec 2020</td>
<td>Bharat Petroleum Corporation</td>
<td>Bharat Oman Refineries (BORL) (36.62% stake)</td>
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<td>Mar 2019</td>
<td>Brookfield</td>
<td>East West Pipeline (EWPL) (Previously known as Reliance Gas Transportation Infrastructure)</td>
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<td>Apr 2018</td>
<td>Indian Oil Corporation Ltd (IOCL)</td>
<td>Shell Exploration &amp; Production, Oman</td>
<td>329</td>
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<td>Feb 2018</td>
<td>ONGC</td>
<td>HPCL (51.11% stake)</td>
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<td>Feb 2018</td>
<td>ONGC Videsh</td>
<td>Abu Dhabi National Oil Co (10% stake in offshore oilfield)</td>
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<td>Aug 2017</td>
<td>Rosneft</td>
<td>Essar Oil (49% stake)</td>
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<td>Oil and Natural Gas Corp's</td>
<td>Gujarat State Petroleum Co's</td>
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<td>Dec 2015</td>
<td>ONGC Videsh Ltd. (OVL)</td>
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<td>Jan 2015</td>
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<td>Jun 2014</td>
<td>Gulf Petrochem Ltd.</td>
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<td>Mar 2014</td>
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<td>Progress Energy Canada Ltd.</td>
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*Source: Thomson Banker, News Articles*
Opportunities
1 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.

2 Downstream segment

- India is already a refining hub with 21 refineries, and expansion is planned for tapping foreign investment in export-oriented infrastructure, including product pipelines and export terminals.
- Development of City Gas Distribution (CGD) networks similar to Delhi and Mumbai’s CGDs.
- India is set to expand India’s natural gas grid to 34,500 kms by adding another 17,000 km gas pipeline. The regasification capacity of the existing 42 MMT per annum will be expanded to 61 MMT per year by the year 2022.
- Indian companies are expected to spend Rs.100 billion (US$ 1.35 billion) over three years on 1,000 liquefied natural gas (LNG) stations along main roads and industrial corridors and in mining areas to cut diesel consumption.

3 Upstream segment

- Locating new fields for exploration: 78% of the country’s sedimentary area is yet to be explored.
- Increasing the share of natural gas: The government is working towards increasing the share of gas from 6.2% (currently) to 15% of the energy mix by 2030.
- Development of unconventional resources: CBM fields in deep sea.
- Opportunities for secondary/tertiary oil producing techniques.
- Higher demand for skilled labour and oilfield services and equipment.
Key Industry Contacts
## Contact Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Contact Person</th>
<th>Telephone</th>
<th>E-mail</th>
</tr>
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<tbody>
<tr>
<td>Oil Industry Development Board (OIDB)</td>
<td>3rd Floor, Tower C, Plot No. 2, Sector - 73, Noida, Uttar Pradesh - 201301</td>
<td>Mr. Ajay Srivastava, Financial Adviser and Chief Accounts Officer</td>
<td>0120-2594630 0120-2594603</td>
<td><a href="mailto:facao.oidb@nic.in">facao.oidb@nic.in</a></td>
</tr>
<tr>
<td>Petroleum Conservation Research Association (PCRA)</td>
<td>Sanrakshan Bhavan, 10 Bhikaji Cama Place, New Delhi - 110066</td>
<td>Mr. Alok Tripathi, ED</td>
<td>91-11-26198799 Ext.301</td>
<td><a href="mailto:pcra@pcra.org">pcra@pcra.org</a></td>
</tr>
<tr>
<td>Bureau of Energy Efficiency (BEE)</td>
<td>Ministry of Power, 4th floor, SEWA Bhawan, RK Puram, New Delhi - 110066</td>
<td>Mr. Abhay Bakre, Director General</td>
<td>91-11-26178316, 91-11-26179699</td>
<td><a href="mailto:dg-bee@nic.in">dg-bee@nic.in</a></td>
</tr>
<tr>
<td>Oil Industry Safety Directorate</td>
<td>Ministry of Petroleum &amp; Natural Gas, 8th Floor, OIDB Bhawan, Plot No. 2, Sector-73, Noida, Uttar Pradesh-201301</td>
<td>Mr. Varanasi Janardhana Rao, ED</td>
<td>0120-2593800</td>
<td><a href="mailto:rao.vj@gov.in">rao.vj@gov.in</a></td>
</tr>
<tr>
<td>Petroleum Planning and Analysis Cell (PPAC)</td>
<td>Ministry of Petroleum and Natural Gas, 2nd floor, Core-8, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi - 110003</td>
<td>Mr. Vinod Kumar, Deputy Director - Information Technology</td>
<td>011-24306153</td>
<td><a href="mailto:webadm@ppac.gov.in">webadm@ppac.gov.in</a></td>
</tr>
<tr>
<td>Directorate General of Hydrocarbons</td>
<td>Ministry of Petroleum and Natural Gas, OIDB Bhawan, Plot No 2, Sector 73, Noida</td>
<td>Mr. Atanu Chakraborty, Director General</td>
<td>0120 - 2472001</td>
<td><a href="mailto:dg@dghindia.org">dg@dghindia.org</a></td>
</tr>
</tbody>
</table>
Glossary

- 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
- EandP: Exploration and Production
- FDI: Foreign Direct Investment
- FY: Indian Financial Year (April to March)
- FY20 implies April 2019 to March 2020
- GoI: Government of India
- Rs.: Indian Rupee
- PM: Prime Minister
- 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
Glossary

- 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
- OALP: Open Acreage Licensing Policy
- TOE (or toe): Tonnes of Oil Equivalent
- US$ : 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

Wherever applicable, numbers have been rounded off to the nearest whole number
### Exchange Rates (Fiscal Year)

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<td>2005-06</td>
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### Exchange Rates (Calendar Year)

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<tr>
<td>2021*</td>
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**Note:** As of January 2021  
**Source:** Reserve Bank of India, Average for the year
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