Oil and gas equipment industry in India
Oil and gas equipment industry in India
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian economic overview</td>
<td>4</td>
</tr>
<tr>
<td>Indian oil and gas industry</td>
<td>6</td>
</tr>
<tr>
<td>Thrust on increasing oil and gas activities to drive demand for equipment used in the industry</td>
<td>10</td>
</tr>
<tr>
<td>Capital goods procurement by oil and gas industry</td>
<td>12</td>
</tr>
<tr>
<td>Key oil and gas related equipment</td>
<td>14</td>
</tr>
<tr>
<td>Tax related challenges faced by the capital goods industry</td>
<td>22</td>
</tr>
<tr>
<td>Bridging the gap between domestic manufacturers and end-user demand</td>
<td>23</td>
</tr>
</tbody>
</table>
Chapter 1: Indian economic overview

Stable economic growth amid the global slowdown

Since 2003, India’s economy has grown at an average of over 6% per annum, despite countries worldwide grappling with an economic slowdown due to the global financial crisis. India’s gross domestic product (GDP) grew at an average 6.9% over FY09-13, compared to the world average of 2.9%1. Currently, India is the 10th-largest economy worldwide and the third largest by purchasing power parity (PPP)2.

Favourable demographics and recent government reforms are expected to add to the country’s growth prospects over the medium term, positioning it as the world’s fifth fastest-growing economy by 2015. These reforms include raised foreign direct investment (FDI) ceilings for the retail, airline, telecoms, and insurance and defence sectors3.

Chart 1: Real GDP growth rate (% change)

Source: World Economic Outlook database, April 2014, International Monetary Fund (IMF)
India is ranked 19th by export volume, largely due to the rising exports of merchandise goods. During FY09–14, India’s exports increased at a compound annual growth rate (CAGR) of 11% to US$312.6 billion. Of the total merchandise exports in FY14, petroleum products form a sizeable portion (20.1%).

**Fossil fuels command a significant share of India’s growing primary energy consumption**

The rapid increase in economic activity in India, together with the rising population, has resulted in greater consumption of primary energy. Currently, India is the fourth-largest energy consumer of the world. From 2009 to 2013, India’s primary energy consumption increased at a CAGR of 5.3%, while global consumption rose at a CAGR of 3%.

India’s primary energy mix is dominated by fossil fuels. Coal accounts for a 54.5% share, followed by oil and natural gas with another 29.5% and 7.8%, respectively. Hydroelectricity, renewable and nuclear energy contribute smaller portions (totalling 8.3%). The share of oil in the country’s primary energy mix is almost at par with that in the global average (32.9%). However, the share of natural gas in India is significantly lower than that in the global average (23.7%), primarily due to supply-side constraints.

**Low per capita consumption of oil and gas**

Although India is one of the world’s largest consumers of oil and gas, the country’s per capita oil and gas consumption is low as compared to that in other economies. This indicates the low availability and affordability of energy, particularly of natural gas. In 2013, India’s per capita consumption of oil and gas was 176.9 Kg of oil equivalent (kgoe), while the global average was 1,011.4 kgoe. This indicates significant growth potential in the sector, given the rising economic prosperity and rising income levels.
Chapter 2: Indian oil and gas industry: focus on boosting domestic production, developing midstream infrastructure and expanding refining capacity

Upstream: Crude oil production trails consumption

India's oil and natural gas sector predominantly relies on its national oil companies (NOCs). Oil and Natural Gas Corporation (ONGC) holds the largest share of crude oil and natural gas production. Oil India Limited (OIL), Cairn India and Reliance Industries Limited (RIL) are other major oil- and gas-producing companies in the country.

Heavy import dependence for crude oil

India’s dependence on oil imports has increased over the past few years, along with the spike in consumption. Meanwhile, domestic production remains stagnant, hampered by limited exploration and declining production from existing maturing fields. India currently imports around 76% of its oil consumption.

Surplus refining capacity channelized to exports

India has surplus refining capacity and is a net exporter of petroleum products. Over the past few years, many companies – private and NOCs – have expanded their refining capacities, driven by the rising domestic consumption of petroleum products and incentives granted by the Government of India (GoI). Currently, the bulk of petroleum products of public sector undertaking (PSU) refineries are sold in the domestic market, while private companies mainly cater to export demand. During FY10-14, the country's refining capacity grew at a CAGR of 3.8% to 215 million metric tonnes per annum (MMTPA). The total exports of petroleum products increased from 51.2 million metric tonnes (mmt) (US$30.7 billion) in FY10 to 67.9 mmt (US$60.7 billion) in FY14. The country currently has 22 refineries, of which 17 are in the public sector, 3 in the private sector and 2 are JV refineries. NOCs account for the majority (55.8%) of the country’s refining capacity, followed by private players with a 37.2% share.

Expansion of refining capacities to remain a focus area

Refining companies are likely to continue to enhance their crude processing capacity by upgrading existing facilities and building greenfield refineries. During the Twelfth plan, new refineries are likely to be commissioned by Indian Oil Corporation Limited (Paradeep, 15 MMTPA). By the end of FY17, the country’s cumulative refining capacity is projected to increase to 310.9 MMTPA. Out of this, NOCs are likely to account for 197.9 MMTPA. Access to modern technology, and research and development initiatives may become key focus areas, given the rising global production of heavy unconventional oils, coupled with the shift of consumers towards modern fuels.

Chart 4: Current and projected refining capacity share by company

<table>
<thead>
<tr>
<th>Current capacity</th>
<th>Projected capacity (FY17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present capacity</td>
<td></td>
</tr>
<tr>
<td>PSU</td>
<td>56%</td>
</tr>
<tr>
<td>Private players</td>
<td>37%</td>
</tr>
<tr>
<td>JVs</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected capacity</td>
<td></td>
</tr>
<tr>
<td>PSU</td>
<td>58%</td>
</tr>
<tr>
<td>Private players</td>
<td>36%</td>
</tr>
<tr>
<td>JVs</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: Refining capacity, MoPNG
Augmenting the pipeline network for crude oil and petroleum products

India’s refining companies have developed a wide oil pipeline network, driven by the need to minimise transportation costs (compared to those of railways and tankers), pilferage and transit losses. India has a cumulative crude oil, liquefied petroleum gas (LPG) and petroleum product pipeline network of 23,823 km, indicating growth at a CAGR of 5% during 2009-2013. As of April 2013, petroleum products and crude oil pipelines accounted for around 37% and 25% of the total pipeline length, respectively. IOCL is the market leader in the crude and petroleum product pipeline segment, accounting for 46.5% share in total length. In terms of crude oil-carrying capacity, ONGC accounts for around 42% share, followed by IOCL with 29%. There are 31 petroleum product pipelines, accounting for 83.5% share of total length and 95% of capacity. The remaining network comprises four LPG pipelines, covering 2,316 km with 4.73 MMTPA capacity.

Significant gas deficit — supply trails demand

The country’s natural gas market is characterised by a supply deficit, primarily due to low domestic production and inadequate transmission and distribution infrastructure. On the other hand, demand for natural gas in India has increased significantly, primarily from the power and fertilizers sectors. It cumulatively accounted for more than 62% of gas consumption in FY13. Demand is also driven by the growing use of natural gas in the city gas distribution (CGD) sector and industrial sectors, such as refining and petrochemicals. Rising concerns on carbon emission have added to demand for natural gas. However, this demand is price sensitive, making for a volatile period, as the industry is awaiting the Government’s decision on revised pricing for domestic natural gas supplies.

![Chart 5: Rising natural gas deficit](source: PPAC, MoPNG)
Midstream: Developing infrastructure to meet rising demand

Rise in LNG import capacity, focus on securing LNG supplies

India's dependence on liquefied natural gas (LNG) is increasing, given the country’s limited domestic production to meet the rising demand. LNG imports have increased from 8.9 MMTPA in FY10 to 10.8 MMTPA in FY14, at a CAGR of 5%. Currently, LNG import accounts for 28.3% of the total gas supply.

The country's LNG re-gasification capacity is expected to increase from 18.6 MMTPA (excluding that in Kochi, which was commissioned in August 2013) in FY14 to around 53 MMTPA in FY17 on the back of the greenfield LNG terminals proposed by private and public sector companies along the eastern and western coast of India.

Growing natural gas transmission network

Despite accounting for around 38% of the total pipeline network, India's gas transportation infrastructure has historically remained inadequate due to the limited availability of gas in the country and the regional concentration of gas-producing fields and LNG import facilities (mostly in western India). As of March 2014, India had a natural gas transmission network of 15,340 km, with an aggregate transmission capacity of 390 million standard cubic metres per day (mmscmd). GAIL accounts for 70.7% of the total pipeline network in India by length. PNGRB had also authorised GSPL and Andhra Pradesh Gas Distribution Corporation Limited to expand Mallavaram-Bhopal-Bhilwara-Vijaipur and build Kakinada-Srikakulam gas pipeline.

Table 1: Current and projected R-LNG capacity (in MMTPA)

<table>
<thead>
<tr>
<th>LNG terminal</th>
<th>Company name</th>
<th>Current</th>
<th>Projected (FY17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dahej</td>
<td>Petronet LNG Limited</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Hazira</td>
<td>Shell Hazira</td>
<td>3.6</td>
<td>5</td>
</tr>
<tr>
<td>Dabhol</td>
<td>GAIL India</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Kochi</td>
<td>Petronet LNG</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Mundra</td>
<td>Gujarat State Petroleum Company</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Ennore</td>
<td>Petronet LNG Limited</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Kakinada</td>
<td>Andhra LNG Private Limited</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Kakinada FSRU</td>
<td>AP Gas Distribution Corporation and GAIL</td>
<td>-</td>
<td>3.5</td>
</tr>
<tr>
<td>Pipavav</td>
<td>Swan Energy</td>
<td>-</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Source: Indian Infrastructure, Volume 16, July 2014
Penetration of pipelines to increase

The GoI and other stakeholders are encouraging investments to strengthen the midstream segment and address the significant unmet demand for gas. During the Twelfth plan, companies are likely to invest INR841.8 billion for expanding their gas pipeline network (including the CGD network). Around 90% of this proposed investment will be used to expand the gas transmission and distribution network\(^7\). Furthermore, the GoI has announced plans to build additional 15,000 km of gas pipelines to complete the construction of the gas grid via the Public Private Partnership (PPP) route\(^8\).

Expanding CGD network

The use of natural gas in the residential, industrial and commercial sectors is rising on the back of favourable regulatory policies and cost benefits. The existing CGD network extends to 90 cities and covers 47 geographical areas (GAs). The network of distribution pipelines spans nearly 40,535 km. The total number of compressed natural gas (CNG) stations in the country has increased to 966 in FY14 from 617 in FY11, at a CAGR of 11.9%\(^9\).

The Petroleum and Natural gas Regulatory Board (PNGRB) plans to expand the CGD network through competitive bidding in more than 300 GAs in a phased manner, depending on the availability of natural gas. To expand the CGD network and boost competition, PNGRB has introduced amendments to existing bidding parameters in 2013 and 2014. It has also authorised three GAs — Bhavnagar, Jamnagar and Jalandhar — to go ahead with the third CGD round. In addition, it has invited bids for developing CGD networks in 14 cities under the fourth bidding round. Recently, the PNGRB has extended the bidding deadline to September 2014 for the districts of Khammam, Nalgonda and Rangareddy & Medak in Telangana; Shahjahanpur in Uttar Pradesh; and Guna in Madhya Pradesh\(^20\).

The Indian Government has raised the share of allocated domestic gas to 100% of the requirement for CNG (transport) and PNG (domestic), up from the previous 80% mentioned in the Gas Utilization Policy. With this, it plans to reduce the dependence of CGD players on costlier RLNG, as well as provide cheaper fuel to end consumers. Favourable policy is likely to encourage investment in the CGD sector. This, in turn, is expected to generate more opportunities for equipment companies\(^21\).
Chapter 3: Thrust on increasing oil and gas activities to drive demand for equipment used in the industry

Ageing infrastructure, a favourable regulatory framework and de-control of petroleum products price to drive investments; rising business opportunities for oil and gas equipment manufacturers

The GoI has taken many initiatives for attracting investment to boost domestic output and strengthen the relative infrastructure. These efforts are likely to create several opportunities for oilfield services, EPC companies and capital goods companies.

- **Favourable regulatory framework**: The Government has allowed 100% FDI in upstream and private sector refining projects. In addition, FDI limit for public sector refining projects has been raised to 49%. Additionally, the Indian Government has enacted various policies such as New Exploration Licensing Policy (NELP), coal bed methane (CBM), shale gas and Petroleum, Chemicals and Petrochemical Investment Regions (PCPIR) policy to encourage investments across the industry’s value chain.

- **Ageing infrastructure**: Several assets in the oil and gas segment are over 30 years old. Hence, oil companies are undertaking large projects for the redevelopment and revamp of these assets.

- **De-controlling of product prices**: The GoI has taken various measures to increase the investment attractiveness of the oil and gas sector; these include:

  - The complete deregulation of petrol prices: It has also allowed an INR 0.5/liter monthly price hike for diesel (expected to be deregulated in the next few months) and has capped the number of subsidized domestic cylinders to 12 per household per year. These decisions are expected to reduce subsidies on petroleum products and, in turn, help oil companies (HPCL, BPCL, and IOCL) reduce their losses and free up capital for investments and expansions.

**Capital outlays in the Twelfth Five-Year Plan**

During the Eleventh Plan period (2007-2012), domestic players exceeded the planned capital expenditure outlay. They invested INR 2,751.6 billion, 120% of the planned target of INR 2,289.9 billion. The upstream sector, which had the highest share in the planned capital expenditure, recorded approximately 129% of the planned target. This resulted in more than anticipated oil and gas reserves accretion. The downstream sector achieved around 104% of its planned outlay target, primarily due to large investments made by IOCL, accounting for 51% of the total expenditure.

During the Twelfth Plan period (2012-17), an outlay of INR 3.4 trillion has been envisaged by Indian NOCs for the upstream and downstream sectors. The upstream sector is expected to account for more than INR 1.8 trillion of this. The majority of the amount will be spent on conducting drilling and developing exploration and production wells. PSUs are expected to spend approximately INR 1.5 trillion on capacity augmentations in the refining and marketing space. Private players such as RIL and Essar Oil are also spending significant capital on their capacity additions.

**Table 2: Planned capex for the eleventh plan period (INR billion)**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Upstream</th>
<th>Downstream</th>
<th>Petrochemicals</th>
<th>Engineering</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target</td>
<td>1,509.3</td>
<td>631.0</td>
<td>147.3</td>
<td>1.5</td>
<td>2,289.9</td>
</tr>
<tr>
<td>Expenditure</td>
<td>1,938.7</td>
<td>653.5</td>
<td>157.5</td>
<td>1.8</td>
<td>2,751.6</td>
</tr>
</tbody>
</table>

Source: MoPNG via working group report on petroleum and natural gas for the twelfth plan, November 2011

---

Capital spending of INR1.2 trillion is projected across the natural gas value chain during the Twelfth Plan period. Investments worth INR439 billion are projected for capacity augmentation in gas transmission pipelines. The balance is projected for new capacity additions in LNG terminals (INR313 billion) and the expansion of the CGD network (INR403 billion)²⁵.

Table 3: Planned capital outlay in natural gas value chain during twelfth plan period (INR billion)

<table>
<thead>
<tr>
<th>LNG terminals</th>
<th>Gas transmission pipelines</th>
<th>City gas distribution infrastructure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>313</td>
<td>439</td>
<td>403</td>
<td>1,154</td>
</tr>
</tbody>
</table>

Source: MoPNG via working group report on petroleum and natural gas for the twelfth plan, November 2011

Planned capital investment by major Indian oil and gas companies

Given the rise in demand for oil and gas, the gap between their demand and supply from indigenous sources is likely to widen over years. Nevertheless, Indian oil and gas companies have been investing across the value chain to bridge the rising gap. During FY15–17, oil and gas companies (including NOCs and private companies) plan to invest around INR2.8 trillion across the value chain. Out of this, ONGC accounts for 34.2% of the total investment, followed by RIL with 28.4%. On a segment level, upstream accounts for 56.8% share, followed by downstream with 42.6%.
Chapter 4: Capital goods procurement by the oil and gas industry

Overview of the oil and gas equipment industry, by value chain

Oil and gas equipment players manufacture and sell equipment used across the oil and gas value chain in exploration, production and distribution. The industry consists of large, mid-size and small companies offering services such as construction and engineering, as well as manufacturing equipment.

Oil and gas equipment can be primarily divided into three segments, namely, upstream, midstream and downstream, based on their presence and use across the value chain. The scope of the upstream segment generally ends at the last choke valve of the Christmas tree arrangement on a wellhead, including in processes such as exploration, drilling and well completion. The midstream segment comprises activities such as wellhead processing and the transportation of oil. The downstream segment is conventionally considered to consist of oil refining, gas processing, distribution and marketing. For the purpose of this report, we have clubbed midstream and downstream equipment.

Global oilfield and gas services and equipment industry break-up

Globally, equipment manufacturing for the upstream segment accounts for ~18% of oilfield services and equipment spend. Within equipment spend, oil country tubular goods (OCTG) and rig equipment account for ~63% share by value.

Chart 7: Global oilfield services and equipment spending split (2011)

- Equipment Manufacturing: 18%
- Drilling Related Services: 3%
- Logistics: 4%
- Seismic: 21%
- Infrastructure: 5%
- Completion & Stimulation: 12%
- Contract Drilling: 8%
- Production and maintenance: 11%
- Formation Evaluation: 33%

Source: Morgan Stanley OFS Teach-in Report 2012

Chart 8: Global oilfield equipment spending split (2011)

- Oil country tubular goods: 33%
- Service company equipment: 20%
- Rig equipment: 9%
- Subsea production equipment: 8%
- Surface production equipment: 30%

Source: Morgan Stanley OFS Teach-in Report 2012
Increasing presence of global players in India

Increasing interest of global players: With FDI of up to 100% permitted via the automatic route (through RBI), foreign companies are looking to invest in the market by setting up manufacturing bases or by forming alliances with Indian players. Further demand aggregation and the increased adoption of policies promoting local manufacturing have attracted many global players such as Alstom, Alfa Lava, GE, Honeywell and Emerson to set up base in India. As a result, the country has seen strong FDI equity inflow in the capital goods industry.

Table 4: Key equipment manufacturers by segment in India

<table>
<thead>
<tr>
<th>Sector</th>
<th>Key equipment</th>
<th>Key manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td>OCTG, rig equipment, drill bits, centrifugal pumps, gas lift equipment, downhole tools, swivel joints, valves, flanges, X-mas tree, etc.</td>
<td>BHEL, Larsen &amp; Toubro, Thermax, Jindal Pipe, United Drilling, Deep Industries, Sara Sae, Interdrill, BOTIL, Parveen Industries, Akers Solutions, Emerson, Weir</td>
</tr>
<tr>
<td>Downstream*</td>
<td>Separators, pressure vessels, boilers, storage vessels, columns, heat exchangers, air coolers, storage tanks and separator internals</td>
<td>BHEL, Larsen &amp; Toubro, Godrej and Boyce, Alfa Laval, Thermax, Vijay Tank and Vessel, ISGEC Heavy Engineering, Kevin Enterprises, Chemtrols, Alstom India, Doosan</td>
</tr>
</tbody>
</table>

*includes midstream equipment

Table 5: Key deals in the Oil and gas related equipment sector in the last five years

5.1 Investments by strategic players

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Acquirer</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/09/2013</td>
<td>Virgo Valves &amp; Controls</td>
<td>Emerson</td>
</tr>
<tr>
<td>31/01/2013</td>
<td>LNV Technology</td>
<td>Huaxin (Hong Kong) Intl.</td>
</tr>
<tr>
<td>03/03/2012</td>
<td>Alfa Laval (India)</td>
<td>Alfa Laval AB</td>
</tr>
<tr>
<td>29/02/2012</td>
<td>Spetech Plant Equipments</td>
<td>Bilfinger SE</td>
</tr>
<tr>
<td>11/01/2012</td>
<td>ISGEC Heavy Engineering (Facilities)</td>
<td>Hitachi Zosen Corporation</td>
</tr>
<tr>
<td>20/09/2011</td>
<td>Hightemp Furnaces</td>
<td>Dowa Holdings Co</td>
</tr>
<tr>
<td>09/07/2011</td>
<td>Nile Limited (Pressure Vessel Division)</td>
<td>De Dietrich Process Systems</td>
</tr>
<tr>
<td>31/03/2011</td>
<td>Fisher Sanmar</td>
<td>Emerson</td>
</tr>
<tr>
<td>30/01/2011</td>
<td>A&amp;E Chennai Works</td>
<td>Doosan Heavy Industries</td>
</tr>
<tr>
<td>02/09/2010</td>
<td>BDK Engineering Industries</td>
<td>The Weir Group Plc</td>
</tr>
</tbody>
</table>

Source: Merger Market

5.2 Generating interest from private equity players

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Investor</th>
</tr>
</thead>
<tbody>
<tr>
<td>29/10/2012</td>
<td>M.E Energy</td>
<td>Helix Investments</td>
</tr>
<tr>
<td>22/08/2012</td>
<td>INOX India Ltd.</td>
<td>Standard Chartered PE</td>
</tr>
<tr>
<td>25/08/2011</td>
<td>Sara SAE Pvt. Ltd.</td>
<td>Multiples Private Equity</td>
</tr>
</tbody>
</table>

Source: Merger Market

In the next section, we have elaborated on key oil and gas related equipment segments such as process plant equipment, boilers, valves and pipes and their respective market positioning in India.

The oil and gas industry is the largest end-user market for the process plant equipment industry. Process plant equipment finds wide application in refineries and gas processing plants in critical processes such as phase separation, oil processing and storage, gas processing, and oil and gas metering and transport.

On the other hand, pumps, valves and steel pipes form an integral part of both upstream and downstream equipment. These are used extensively for transporting crude oil from oilfields to refineries, as well as in marketing and distribution.

Key process plant equipment used in the oil and gas industry:

- Pressure vessel
- Cryogenic storage tank
- Columns
- Boilers
Chapter 5: Key oil and gas related equipment

Process plant equipment overview

- Major process plant equipment include pressure vessels, storage tanks, columns, towers, crystallizer, heat exchangers, evaporators and furnace. These find application across a wide spectrum, including oil and gas, refinery, chemical, petrochemical, energy, fertilizer, paper and pulp, sugar, cement and dairy.

- The process plant equipment market in India was valued at INR163,450 million in 2011. Production amounted to INR198,610 million in 2012. It is expected to touch INR350,000 million by 2017, growing at a CAGR of ~12%.

- The market is fragmented, with more than 200 companies manufacturing process plant equipment across India. Close to 65% of these are small and mid-size enterprises.

- This sector employs 128,000 persons directly and 240,000 persons indirectly.

Exports and imports (process plant equipment)

Exports: The process plant equipment market in India was valued at INR31,940 million in 2011, by exports. It is expected to be worth INR87,500 million by 2017, growing at a CAGR of 18.3% during this period beginning in 2012. In recent years, India has enjoyed large demand for process plant equipment from foreign developing countries as a result of the increasing capabilities of domestic manufacturers. As far as domestic consumption is concerned, the process plant equipment industry is one of the most self-reliant sub-sectors within the capital goods sector, with domestic procurement accounting for ~91% of the demand. However, in terms of their share in exports at the global level, Indian manufacturers are yet to catch up with their peers from developed countries. Indian players account for a meagre 0.5% of total global exports.

Imports: The process plant equipment market in India was valued at INR18,040 million in 2012, by imports. It is expected to be worth INR38,680 million by 2017, growing at a CAGR of ~16.5% during this period. Imports are gaining market share over domestic manufacturers, which is evident from the fact that the 6-year CAGR of imports during 2005-2011 at 17% outgrew the domestic average of 12%. Import content is approximately 10% of standard machinery and 25%-30% of hi-tech equipment for process plant machinery.

Chart 9: Process plant equipment market in India 2005-2017

Source: Report of the Working Group on Capital Goods & Engineering Sector for the 12th Five Year Plan
Chart 10: Process plant equipment market in India – imports and exports 2005–2017

Source: Report of the Working Group on Capital Goods & Engineering Sector for the 12th Five Year Plan

Chart 11: Share of Indian manufacturers in global exports within Process Plant Equipment (2010)

Source: “Capital Goods in India Call for action,” Confederation of Indian Industry, http://cii.in/PublicationDetail

Market growth drivers:

- Increasing growth in the end-user segment (especially oil and gas)
  - Growth in process plant equipment is highly correlated with that in the oil and gas sector, since it is a major consumer of process plant equipment. With growing demand for petroleum products, oil and gas players are expected to further add refining capacity. This would drive demand for process plant equipment.

- Investments in the Indian upstream and downstream segments are on the rise
  - During FY15-17, oil and gas companies (including NOCs and private companies) plan to invest around INR2.8 trillion across the value chain. Out of this, ONGC accounts for 34.2% share, followed by RIL with 28.4%.

- Strong manufacturing capability leading to higher export potential
  - Domestic manufacturers have gained the requisite capability to execute end-to-end large projects. They are now equipped to provide equipment of the highest quality and in compliance with global standards, thus leading to huge export potential.
Indian manufacturers present across the value chain

- The process equipment industry has evolved considerably over the last few years. Indian players are now able to cater to the varied needs of customers, ranging from design and engineering at the back-end to erection and commissioning at the front end, while competing with global majors for engineering, procurement and commissioning contracts.

Favourable policies and strong investment pipeline by PSU

- Increased initiatives by the GoI, such as to permitting 100% FDI in the capital goods and engineering sectors and strong investment plans by PSUs to add refining capacity, would drive demand for Oil and gas equipment. By the end of FY17, the country’s cumulative refining capacity is projected to increase to 310.9 MMTPA. Out of this, NOCs are likely to account for 197.9 MMTPA36.

Key challenges

- Limited R&D in developing new and critical process equipment
  - There is a technological gap between domestic and foreign manufacturers. This is leading to an increase in imports, as demand from end-user segments for next-generation products has considerably evolved over time.

- High dependence on imports of old process plant equipment
  - Companies are increasingly using refurbished imported process plant equipment, primarily because it is cost effective compared to procuring new equipment. Old machinery can be imported without minimal restriction on age and quality benchmarks, resulting in losses for domestic manufacturers.

- Shortage of capital and high interest rate differential
  - Being a capital-intensive industry, players are unable to source financing to execute large-size projects, primarily due to high interest rates. Also, the high interest rate differential is leading to higher financial costs, thus increasing delivery cycle time for equipment. This is detrimental for the industry.

- High dependence on overseas process licensors
  - In the absence of a systematic technology transfer policy and limited proprietary know-how on process technology, domestic manufacturers are dependent on global players to manufacture next-generation products.

Logistics and infrastructure to support the industry

- Another major problem is weak support infrastructure, which leads to severe transportation issues, such as high risk in transporting large equipment. This leads to further increase in costs.

Boiler industry overview

- The boiler market (includes boiler used in electrical and other industries) in India was valued at INR195,000 million in 2012. It is expected to grow at a CAGR of 9.3% and 15.1% to be worth INR290,000 million and INR585,000 million by 2017 and 2022, respectively37.

- Based on investment estimates and capacity addition targets, domestic demand for Boiler, Turbine & Generator (BTG) is anticipated between INR1,250,000 million and INR1,500,000 million by 202238.

- The boiler export and import market was valued at INR11,209 million and INR16,000 million as of 2012, after having grown at a CAGR of ~15% and 4%, respectively during 2008-201239.

Chart 12: Boiler market in India (2011-2022)

Source: Indian Electrical Equipment Industry Mission Plan 2012-2022, CEA, EY Analysis
**Chart 13: Boiler market in India — export and import (2008–2012)**

Source: IEEMA - Indian Electrical Equipment Industry Under-Utilisation of Capacity; Reasons and Remedy Thereof

**Key players**

- The boiler industry is fragmented by the number of manufacturers. About 675 manufacturers make BTG sets, with over 90% of them being SMEs.
- BHEL is the Indian market leader in boiler manufacturing, with over 60% share and an installed base of 120,000 MW.
- Other players include L&T, Thermax, Gammon, BGR and Alstom.
- Amid a favourable demand outlook, various domestic OEMs have collaborated with global players to acquire new technology and, thereby, meet growing demand from the local end-user industry.

<table>
<thead>
<tr>
<th>Player</th>
<th>Manufacturing capacity (MW)</th>
<th>Technology Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BHEL</td>
<td>20,000</td>
<td>Alstom (France)</td>
</tr>
<tr>
<td>L&amp;T · MHI</td>
<td>4,000</td>
<td>Mitsubishi Heavy (Japan)</td>
</tr>
<tr>
<td>Thermax · Babcock</td>
<td>3,000</td>
<td>Babcock &amp; Wilcox (US)</td>
</tr>
<tr>
<td>Ansaldo (Gammon)</td>
<td>1,000</td>
<td>Ansaldo (Italy)</td>
</tr>
<tr>
<td>BGR · Hitachi</td>
<td>4,000</td>
<td>Hitachi (Japan)</td>
</tr>
</tbody>
</table>

Source: CII - Capabilities, Opportunities and Challenges in BTG Industry - CII Sep 2013
Market growth drivers

- **High demand in end-user segments**
  - The boiler market is expected to derive growth from the demand arising from the rapidly expanding end-user segments, such as the oil and gas equipment industry and the electrical generation equipment market.

- **Strong inflow of investments from foreign players**
  - The boiler industry has witnessed significant investment from foreign players. These players are setting up joint manufacturing facilities in India to benefit from the India growth story.

- **Favourable government policy to help drive growth**
  - Domestic OEMs (including JVs) are expected to benefit significantly from the GoI’s efforts to encourage the bulk tendering of super-critical units for projects being developed by NTPC and DVC. The only eligibility clause for bidders is that they need to have mandatory domestic manufacturing presence and a valid technology transfer arrangement.

Key challenges

- **Significant competition from low-cost Chinese and foreign manufacturers, and limited new technology with domestic players**
  - Increasing demand for technologically advanced products such as super-critical boilers is expected to account for 60% of the market, as per the Twelfth Five-Year Plan. This has helped global players capture a dominant share, as domestic players are not able to step up. This is compounded by the cost differential between Chinese and domestic manufacturers, mainly due to disadvantages faced by domestic Industry, as well as subsidies/incentives provided to Chinese manufacturers by its Government.

- **Shortage of raw material and price volatility**
  - Raw material constitutes the majority of product cost (~70%-75%) in the BTG industry. Thus, constraint on the availability of a certain grade of steel and volatility in pricing are leading to lower margins for the domestic industry and poor quality.

- **Import of re-manufactured and second-hand goods**
  - The import of refurbished equipment is increasing due to the cost advantages offered by them over the procurement of newly manufactured goods.

- **Lack of proper support infrastructure**
  - Congestion on ports and transportation issues via both roadways and rail are leading to higher costs and increased delivery time.

Valve industry overview

- The valve market in India was valued at INR117,129 million in 2012. It is expected to be worth INR194,648 million by 2016, growing at a CAGR of 13.54%.

- The Indian industrial valve market is fragmented, with the unorganized sector contributing ~40% of the market.

- Oil and gas accounts for ~47% of the valves market, with valves forming an integral part of the upstream equipment and downstream distribution network.

- Large-size complex choke valves are extensively used in the exploration and production of oil. Hence, domestic manufacturers need to improve their technological capabilities to be able to address demand for complex valves from the oil and gas sector.

Chart 14: Valve market in India 2012–16

![Chart showing the valve market in India from 2012 to 2016 with a CAGR of 13.5%](chart.png)

Source: TechNavio (Pumps, Valves, and Compressors Market in India 2012 - 2016); Fx rate: USD 1 = INR60.553
Key players

More than 350 companies operate in the Indian industrial valves market. Audco India Limited, Tyco, Emerson, BDK Weir, MIL, NSSL, Microfinish are among the key players.

L&T-owned Audco India is the market leader in the Indian valve industry, with ~12.5% market share as of FY13.

Large-size complex valves such as choke valves or christmas tree valves are primarily imported due to the limited capabilities of domestic players. In addition, foreign players are increasingly interested in entering the Indian valve market. Domestic players are looking to leverage their technical expertise to meet the diversifying end-user demand, as well as to gain access to cost-effective manufacturing capabilities.

Chart 15: Industrial valve market in India, by end-user segmentation (FY13)

Chart 16: Vendor market share in the industrial valve industry in India (FY13)

Market drivers and key trends

Strong growth outlook in end-user segments to drive demand

The performance of the valves industry is directly correlated to that of end-use sectors such as power, and oil and gas. Given the increasing adoption of pipelines for transportation and the expanding downstream network, valves demand is expected to grow.

During the Twelfth Five-Year Plan, companies are likely to invest INR841.8 billion (including in the CGD network) to expand their oil and gas pipeline network.

Process plant modernisation to drive demand for customised valves

With the increasing complexity of plants and process equipment, technologically advance players that have the ability to customise valves would be in demand.
Key challenges

- Critical and complex valves are primarily imported
  - Due to low R&D spend and limited advanced manufacturing capabilities, domestic manufacturers are unable to meet demand for critical large-size complex valves that are predominantly used in the upstream oil and gas sector, including choke valves or Christmas tree valves.

Pipe industry overview

- Oil and gas is the largest end user of steel pipes and tubes, with pipeline being the major mode of transport for petroleum, oil and lubricant products. In 2011, ~46% of petroleum, oil and lubricant products were transported through pipelines. The percentage is expected to increase to ~53% in 2017.
  - The increasing use of pipelines in oil and gas directly translates into higher demand for steel pipes. Crude oil, gas and product pipelines have grown at a CAGR of ~10.5%, 11.7% and ~4.7% over 2008-2012, respectively. Steel pipe commands the largest share in the oil and gas sector, primarily because of its high pressure resistance properties.
- Production for steel pipes and tubes is estimated to have grown at a CAGR of ~7.2% over FY 2009-13 to 7.52 million tonnes. Domestic consumption is estimated to have increased to 6.19 million tonnes for the corresponding period. Steel pipes and tube production is expected to grow by a CAGR of 5% over the next 3 years.
- India remained a net exporter of steel pipes and tubes over FY09-13, with net exports amounting to ~INR59,600 million during FY 2013; however, imports of steel pipes and tubes increased at a CAGR of ~7.3% higher than the export CAGR of ~2.5% over the period FY2009-13.

Chart 17: Projected steel pipe and tube production (‘000 tonnes)

![Chart 17: Projected steel pipe and tube production (‘000 tonnes)](source: D&B research, 2013)

Chart 18: Steel pipe and tube turnover - export and import (FY09 - FY13)

![Chart 18: Steel pipe and tube turnover - export and import (FY09 - FY13)](source: India trade HS Codes Considered: 7303, 7304, 7305, 7306, D&B research)
21

Oil and gas equipment industry in India

Table 7: Summary of incremental pipeline additions under the Twelfth Five-Year Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Length (Kms.)</th>
<th>Capacity (MMTPA)</th>
<th>Capex (INR Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012 - 13</td>
<td>1878</td>
<td>18.9</td>
<td>41.66</td>
</tr>
<tr>
<td>2013 - 14</td>
<td>410</td>
<td>2.7</td>
<td>2.00</td>
</tr>
<tr>
<td>2014 - 15</td>
<td>664</td>
<td>4.2</td>
<td>13.98</td>
</tr>
<tr>
<td>2015 - 16</td>
<td>2645</td>
<td>9.1</td>
<td>32.66</td>
</tr>
</tbody>
</table>

Source: Ministry of Petroleum & Gas (Working Group Report 12th five year plan)

Key players

- The steel pipes and tubes industry is characterised by the presence of a large number of players, with the five key players accounting for ~34% of market share, by production, during FY1213.

- The key pipe manufacturers in India, by product offered, include:
  - Seamless pipes: Maharashtra Seamless, Jindal Saw, BHEL, Remi Metals, ISMT ltd. Ratnamani
  - HSAW / LSAW: Jindal Saw, Welspun, Man Industries
  - ERW: Maharashtra Seamless, Jindal Pipes, BHEL, Surya Roshni, Welspun

Growth drivers

- Strong pipeline additions planned and increasing end-mile connectivity
  - Increasing end-mile connectivity in the distribution of oil and gas and the construction of new pipelines to gather crude oil from new drilling sites situated at a large distance from refining plants are expected to drive demand for steel pipes.

- Lower losses and transmission cost savings
  - The increasing use of pipeline would help lower transmission costs and plug leakages from wastage and spilling during road or rail transportation. This would lead to better efficiency.
Chapter 6: Tax-related challenges in the capital goods industry

Indirect taxation

The capital goods industry is being subjected to various indirect taxes, depending on the source of procurement. An overview of the various indirect taxes applicable on the procurement of capital goods have been provided in the below table.

<table>
<thead>
<tr>
<th>Tax</th>
<th>Taxing Authority</th>
<th>Applicable on</th>
<th>Headline tax rate overall country basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customs duty</td>
<td>Central Government</td>
<td>Import of goods into India</td>
<td>General effective Customs duty - 23.55%</td>
</tr>
<tr>
<td>Excise duty</td>
<td>Central Government</td>
<td>Manufacture of goods in India</td>
<td>10.30%</td>
</tr>
<tr>
<td>Value Added Tax (VAT)</td>
<td>State Government</td>
<td>Sale of goods within the state</td>
<td>Varies from state to state; generally ranges between 4% and 15%</td>
</tr>
<tr>
<td>Central Sales Tax (CST)</td>
<td>Central Government</td>
<td>Inter-state sale of goods</td>
<td>2% or VAT rate applicable on the goods in the state where the movement of goods commences</td>
</tr>
<tr>
<td>Entry tax/local bodies tax (LBT)</td>
<td>State government/ local authority</td>
<td>Entry of goods in a state/local area for consumption/sale</td>
<td>Varies state wise; ranges 0.1%-30%</td>
</tr>
</tbody>
</table>

The GoI has provided various exemptions/concessional rate of duties on the import and indigenous procurement of capital goods. Exemptions/con rate are available depending on the goods imported or procured indigenously.

The key exemptions/concessional rate of duties available in oil and gas industry have been provided below.

► **Project Import Scheme:** A project can be registered with the relevant authorities under the Project Import Scheme and, thereafter, imports for the project can be made at a concessional rate.

► **Free Trade Agreements (FTA):** India has entered FTAs with various countries. Specified goods from such countries can be imported at a concessional rate of customs duty, subject to the fulfilment of certain conditions.

► **Exemption from customs duty:** Subject to the fulfilment of certain conditions, exemption from customs duty is available on the import of specified goods to be used for specific oil and gas exploration and exploitation projects.

► **Concessional rate of customs duty:** A concessional rate of customs duty has been provided on the import of specified goods for setting up a crude petroleum refinery.

Indirect tax issues

Apart from being subject to high tax rates, the oil and gas industry encounters various issues in the procurement of capital goods, as follows:

► Indirect taxes paid by oil and gas companies are available as credit to them for being set off against output tax liabilities. However, authorities have been consistently disputing tax credit on the construction of immovable structures.

► Moreover, due to the non-availability of inter-sectoral credits (i.e., adjustment of excise duty and service tax credit with VAT and vice versa), indirect taxes paid by the oil and gas industry results in credit retention for companies if they do not have an output tax liability within the same sector (e.g., midstream sector companies transporting oil and gas do not have any output VAT liability. Accordingly, VAT paid on the procurement of capital goods is a cost for them).
Chapter 7: Bridging the gap between domestic manufacturers and end-user demand

Establishing a level-playing field for domestic manufacturers and encouraging domestic procurement

- The Government is looking to create a level-playing field between domestic oil and gas equipment manufacturers and their global counterparts by improving the tax, duty and regulatory structure. Furthermore, to facilitate technology transfer and promote domestic manufacturing, regulatory mechanisms could be modified to stipulate the minimum value addition limit for large-value imports within a systematic technology transfer agreement on an Indian company in the form of a JV. Other incentives such as allowing higher depreciation and tax holidays for companies using equipment manufactured in India or setting up production base in India could help encourage domestic procurement.

Strengthen policy against the import of second-hand equipment

- Regulatory measures such as strict safety guidelines and energy-efficiency requirements could be enforced to strengthen the policy against the import of second-hand equipment. This is leading to loss of business for domestic manufacturers.

Establishment of industry clusters to help drive cost savings for domestic players

- Establishing industry clusters with common manufacturing facilities, dedicated R&D, new product development and testing facilities could help achieve cost savings. Clusters will help establish an efficient supply chain, lower logistic costs, bring manufacturing efficiency through focus and mass manufacturing, and facilitate easy availability of a skilled labour pool. Clusters formation will also lead to the consolidation of manufacturing in the vicinity of suppliers, since they will encompass all the players present in the value chain ranging from a component manufacturing SME to large integrated end-equipment manufacturer. This will ensure better cooperation among manufacturers, thus reducing lead time and assisting in new product development as per the evolving needs of end-user sectors.

Export promotion by offering financial support and credit lines

- Export promotion and enhanced marketing would help enable domestic manufacturers to capture an increasing share in the export market. To rationalize credit costs and help domestic manufacturer bag new overseas projects, the Government could provide additional support by establishing dedicated funds. Another major push to exports would come from offering export incentives such as preferential tax treatment and reduction in custom duties for export-oriented goods.
Oil and gas equipment industry in India
2. World Bank, GDP ranking data, July 2014; “India displaces Japan to become third-largest world economy in terms of PPP: World Bank,” The Economics Times, 1 May 2014, via Factiva © 2014 The Times of India Group
3. “India 2014 - Enabling the prospects,” EY Publication
7. BP Statistical Review of World Energy June 2014, World Bank Population Data2013; Ernst & Young analysis
32. “Capital Goods in India Call for action,” Confederation of Indian Industry, http://cii.in/PublicationDetail
34. “Capital Goods in India Call for action,” Confederation of Indian Industry, http://cii.in/PublicationDetail
39. IEEMA - Indian Electrical Equipment Industry Under-Utilisation of Capacity; Reasons and Remedy Thereof
43. “Pumps, Valves, and Compressors Market in India 2012-2016,” TECHNAVIO INSIGHTS, August 2013
50. “Sectoral Risk outlook: Steel pipes & tubes” D&B Research, July 2013
51. “Sectoral Risk outlook: Steel pipes & tubes” D&B Research, July 2013
52. “Sectoral Risk outlook: Steel pipes & tubes” D&B Research, July 2013
53. “Sectoral Risk outlook: Steel pipes & tubes” D&B Research, July 2013
Notes
Our services

Assurance, Tax, Transactions, Advisory

A range of high-quality services to help you navigate your next phase of growth

Read more on www.ey.com/India/Services

Sector focus

Centers of excellence for key sectors

Our sector practices help to ensure that our work with you is tuned to the realities of your industry.

Read about our sector knowledge at ey.com/India/industries

Stay connected

Easy access to our knowledge publications

www.ey.com/subscription-form

Webcasts and podcasts

http://webcast.ey.com/thoughtcenter/

Follow us @EY_India

Join EY’s business network

For more information, visit www.ey.com/in
About EY
EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. We develop outstanding leaders who team to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world for our people, for our clients and for our communities.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. For more information about our organization, please visit ey.com.

Ernst & Young LLP is one of the Indian client serving member firms of EYGM Limited. For more information about our organization, please visit www.ey.com/in.

Ernst & Young LLP is a Limited Liability Partnership, registered under the Limited Liability Partnership Act, 2008 in India, having its registered office at 22 Camac Street, 3rd Floor, Block C, Kolkata - 700016

© 2014 Ernst & Young LLP. Published in India.
All Rights Reserved.