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Leading position globally

- In terms of value and production volume, Indian chemical industry is the 3\textsuperscript{rd} largest producer in Asia and 6\textsuperscript{th} by output in the world. Indian chemical industry could grow at 11 per cent p.a. to reach size of USD224 billion by 2017
- In 2015, India chemicals industry had a market size of USD144 billion
- By 2025, the Indian chemical industry is projected to reach USD403 billion.

High GDP share

- The chemical industry in India is a key constituent of Indian economy, accounting for about 2.11 per cent of the GDP
- More than 70,000 commercial products such as petrochemicals and basic chemicals are covered under chemical sector.

Global dye supplier

- India accounts for approximately 16 per cent of the world production of dyestuff and dye intermediates, particularly for reactive acid and direct dyes

Global player in specialty chemicals

- India is currently the world’s third largest consumer of polymers and third largest producer of agrochemicals
- India specialty chemical market is expected to reach USD70 billion by 2020

Increasing exports of inorganic and organic Chemicals

- Value exports of inorganic chemicals from India is estimated at USD1.21 billion in FY16, with the organic chemical market reaching USD11.51 billion in FY16. Exports of organic chemicals from India stood at USD4.02 billion in FY16\textsuperscript{(1)}

Source: Make in India, Confederation of Indian Industry, TechSci Research
Notes: PCPIR - Petroleum, Chemicals and Petrochemical Investment Regions; E – Estimates, \textsuperscript{(1)} April 2015-January 2016
CHEMICALS

ADVANTAGE INDIA
Growing demand

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Advantage India

Robust demand
- A large population, dependence on agriculture, and strong export demand are the key growth drivers for the chemicals industry.
- Per-capita consumption of chemicals in India is lower relative to Western peers and there exists a large latent demand.

Attractive opportunities
- Polymers and agrochemicals industries in India present immense growth opportunities.
- In FY15, India’s construction chemical market was valued at USD589.58 million, thereby representing ample growth opportunity in chemical sector.
- In 2015, India’s Plastic & Polymer market stood at USD22 billion, thus generating more opportunities.

Policy support
- In 2015, CII launched second phase of “Chemistry Everywhere” campaign to boost the growth of chemical industry in India.
- 100 per cent FDI is permissible in the Indian chemicals sector; manufacturing of most chemical products is de-licensed.
- Setting up of PCPIRs.
- The Government of India has launched the Draft National Chemical Policy, which aims to increase the share of chemical sector in the country’s GDP.

Increasing investments
- Lured by the size and returns of the Indian market, foreign firms have strengthened their presence in India.
- From April 2000 to March 2016, total FDI inflows into the Indian chemicals industry (excluding fertilisers) were USD11.90 billion.

Source: FICCI, Make in India, Department of Industrial Policy and Promotion (DIPP), TechSci Research
Notes: PCPIR - Petroleum, Chemicals and Petrochemical Investment Regions, CII – Confederation of Indian Industry; E – Estimates

Market size: USD144 billion

Market size: USD224 billion

2015

2017E

CHEMICALS

Advantage India

NOVEMBER 2016
CHEMICALS

MARKET OVERVIEW AND TRENDS
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EVOLUTION OF THE INDIAN CHEMICAL INDUSTRY

- Basic needs (1950-72)
  - Chemical products to protect crops
  - Agrochemicals, dyes, pharmaceuticals

- Establishment (1972-80)
  - Public sector companies were set up to develop the petrochemical industry
  - Plastic and fibres, petrochemical products

- Consolidation (1980-92)
  - Consolidation started from largely fragmented firms with small capacities and high cost structures
  - Paints, dyes, pharmaceuticals and detergents

- Liberalisation (1992-95)
  - Major investment plans by both Indian firms and MNCs
  - Lower tariff barriers
  - Diminishing role of public sector companies
  - Petrochemicals, engineering plastic, specialty fibres

- Expansion (1995 onwards)
  - In 2015, DCPC has announced to design a 16 point plan framework that would encourage the domestic production of chemicals
  - Alliances and partnerships to achieve scale
  - Licensing requirements removed except in the case of hazardous chemicals
  - Increasing investments by foreign players in India through mergers & acquisition and joint ventures
  - Allowed 100 per cent FDI in the chemicals Industry
  - In 2016, Partnership between Indian Chemical Council (ICC) and the Tamil Nadu Pollution Control Board (TNPCB) promoted development of chemical industry by launching "Responsible Care®" programme, which aims at achieving sustainable development in chemical industry

*Source: FICCI, Make in India, CII, TechSci Research
Note: MNC – Multinational Corporation, DCPC - Department of Chemicals and Petrochemicals

For updated information, please visit www.ibef.org
MAJOR SEGMENTS OF THE INDIAN CHEMICAL INDUSTRY

Base chemicals
- Petrochemicals, man-made fibres, industrial gases, fertilisers, chlor-alkali, and other organic and inorganic chemicals

Specialty chemicals
- Dyes and pigments, leather chemicals, construction chemicals, personal care ingredients and other specialty chemicals

Pharmaceuticals
- Active Pharmaceutical Ingredients (APIs) and formulations

Agrochemicals
- Insecticides, herbicides, fungicides and other crop protection chemicals

Biotechnology
- Bio-pharma, bio-agri, bio-services and bio-industrial products

Source: TATA Strategic Management Group, TechSci Research
## PRODUCT-WISE CLASSIFICATION OF THE INDIAN CHEMICAL INDUSTRY

<table>
<thead>
<tr>
<th><strong>Alkali chemicals</strong></th>
<th><strong>Inorganic chemicals</strong></th>
<th><strong>Organic chemicals</strong></th>
<th><strong>Pesticides &amp; insecticides</strong></th>
<th><strong>Dyes &amp; dyestuffs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Soda ash</td>
<td>Aluminum fluoride</td>
<td>Acetic acid</td>
<td>Dichlorodiphenyltrichloroethane (DDT)</td>
<td>Azo dyes</td>
</tr>
<tr>
<td>Caustic soda</td>
<td>Calcium carbide</td>
<td>Acetone</td>
<td>Malathion</td>
<td>Disperse dyes</td>
</tr>
<tr>
<td>Liquid</td>
<td>Carbon black</td>
<td>Phenol</td>
<td>Parathion</td>
<td>Fast colour bases</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Potassium chlorate</td>
<td>Methanol</td>
<td>Ethicon</td>
<td>Ingrain dyes</td>
</tr>
<tr>
<td></td>
<td>Titanium dioxide</td>
<td>Ortho Nitro Chlorobenzene (ONCB)</td>
<td>Endosulphan</td>
<td>Napthols</td>
</tr>
<tr>
<td></td>
<td>Red phosphorus</td>
<td>Isobutyl</td>
<td>Phosalone</td>
<td>Vat dyes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Para Nitro Chlorobenzene (PCNB)</td>
<td>Phorate</td>
<td>Reactive dyes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethyl</td>
<td>Acephate</td>
<td>Pigment Emulsion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alkyl Amines</td>
<td>Fenvalerate</td>
<td>Sulphur dyes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acetic Anhydride</td>
<td></td>
<td>Other dyes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formaldehyde</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: TechSci Research*
As on 2015, the National Chemical Policy of India which is expected to help in improving the chemical industry is in final stages and as a part of this, the Government is planning to launch Indian Bureau of Corrosion Control and setting up National Chemical Centre that could prevent losses from corrosion and act as a repository information center for the chemical industry.

- Strong economic growth and rise in per-capita income has meant a steady increase in demand for chemicals.
- Expected to clock a growth of 10-13 per cent over the coming years.
- The industry has left behind a low-growth and regulated environment to emerge more mature.
- There is strong government support towards R&D; this would benefit the sector.
- In 2015, Department of Chemicals and Petrochemicals added three new chemical and petrochemical products under its supervision.
- In 2016, Department of Chemicals and Petrochemicals, Ministry of Chemicals & Fertilizers, Govt. of India and Federation of Indian Chambers of Commerce & Industry (FICCI) launched, ‘India Chem-2016’ to develop Indian Chemical and Petrochemical Industry.
Total chemical production in India was 4808 MT in FY15 (upto September 2014) and reached to 4863 MT in FY16 (upto September 2015). The growth of 1.1 per cent was registered from FY15 to FY16.

Favourable demographics and strong economic growth are driving demand for chemicals.

External demand and specialty chemicals have also contributed strongly to the growth of the industry.

India’s growing per capita consumption and demand for agriculture-related chemicals offers huge scope of growth for the sector in the future.

The R&D spending of chemical industry is estimated to increase to around USD12 billion by 2017.

**Total production of major chemicals (000’ MT)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 11</td>
<td>9107</td>
</tr>
<tr>
<td>FY 12</td>
<td>9396</td>
</tr>
<tr>
<td>FY 13</td>
<td>9440</td>
</tr>
<tr>
<td>FY 14</td>
<td>9628</td>
</tr>
<tr>
<td>FY 15</td>
<td>9632</td>
</tr>
<tr>
<td>FY 16(1)</td>
<td>4863</td>
</tr>
</tbody>
</table>

Source: Department of Chemicals and Petrochemicals, TechSci Research
Note: MT - Metric Tonne
FY16: (1) – Data upto September 2015
With 69 per cent share in the total production, alkali chemicals accounted for the largest share in Indian chemical industry in FY16 (upto September 2015)

During FY16 (April to September 2015), production of alkali chemicals in India stood at 3,322 MT.

Production of major chemicals (000' MT)

Production share of major chemicals during FY16 (1)

Source: Department of Chemicals and Petrochemicals, TechSci Research
Notes: MT - Metric Tonne, Kg - Kilo gram,
CAGR - Compound Annual Growth Rate
Note: (1) - April to September 2015
Chemical exports from India stood at USD9.61 billion for FY16\(^{(1)}\).

Exports in the chemical industry grew from USD12.4 billion in FY13 to USD12.7 billion in FY15, registering a growth of 0.9%.
Total imports of chemicals grew from USD10.1 billion in FY13 to USD19 billion in FY15, a CAGR of 37.5%.

Total imports of chemicals reached USD14.47 billion in the FY16⁽¹⁾.

Source: Ministry of Commerce, DGCI&S, TechSci Research
Notes: FY16⁽¹⁾ - Data is for April ’15 – January ’16
CAGR - Compound Annual Growth Rate
During FY16\(^1\), organic chemicals accounted for a share of 41.84 per cent in India’s total chemical exports, followed by miscellaneous chemicals which accounted for a share of 18.59%, in overall chemical exports from India.

Within agrochemicals herbicide is the largest segment globally, however, consumption of insecticides in India is dominating. Growth of agro chemicals is largely driven by export demand.

**Shares in exports of chemicals in FY16\(^1\)**

- Organic 41.70%
- Dyes and Dye stuff 18.62%
- Agro Chemicals 16.84%
- Inorganic 17.46%
- Miscellaneous Chemicals 5.38%

*Source: Ministry of Commerce, TechSci Research*

Note: CAGR - Compound Annual Growth Rate

\(^1\) - Provisional data for April 2015- March 2016
Organic chemicals also dominate imports, with a share of 57.26%, followed by inorganic chemicals at 26.08 per cent in FY16\(^{(1)}\).

**Shares in imports of chemicals in FY16\(^{(1)}\)**

- Organic Chemicals: 57.26%
- Inorganic Chemicals: 26.08%
- Dyes and Dyestuff: 5.43%
- Agro Chemicals: 5.11%
- Miscellaneous Chemicals: 6.12%

Source: Ministry of Commerce, TechSci Research
Note: CAGR - Compound Annual Growth Rate
\(^{(1)}\) - Data for April-January 2016
CHEMICALS

CHEMICAL INDUSTRY HOLDS A SIGNIFICANT POSITION IN THE ECONOMY

In 2025, chemical industry is expected to grow and reach USD403 billion mark

2.11 per cent of national GDP

3rd largest chemical industry in Asia, preceded by China and Japan

Government allows 100 per cent FDI in the chemical sector

India’s chemical industry (2013-15)

One of the most diversified sectors, covering more than 70,000 commercial products

12.17 per cent of total exports and 9.91 per cent of total imports in FY16(1)

Source: FICCI, TechSci Research

Notes: Figures mentioned above is taken from Dept. of Chemicals and Petrochemicals; FY16(1) - (April- December 2015)
HIGH GROWTH WOULD LEAD TO RISING GLOBAL POSITIONING

<table>
<thead>
<tr>
<th>2015</th>
<th>2017E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global chemical industry: USD3.26 trillion</td>
<td>Global chemical industry: USD4.5 trillion</td>
</tr>
<tr>
<td>India chemical industry: USD144 billion</td>
<td>India chemical industry: USD224 billion</td>
</tr>
</tbody>
</table>

Contribution to global chemical industry would increase

- 2015: 3.46% India, 96.54% Global
- 2017E: 4.98% India, 95.02% Global

Strong growth outlook for the Indian chemicals industry (USD billion)

- 2013: 118
- 2015: 144
- 2017E: 224

Source: FICCI, TechSci Research
Notes: CAGR - Compound Annual Growth Rate, E - Estimate
WIDESPREAD CHEMICAL INDUSTRY INFRASTRUCTURE ACROSS INDIA … (2/2)

Source: D&B, TechSci Research
KEY DOMESTIC AND INTERNATIONAL PLAYERS IN INDIAN CHEMICAL INDUSTRY

<table>
<thead>
<tr>
<th>Domestic company</th>
<th>Sales in FY16&lt;sup&gt;(1)&lt;/sup&gt; (USD billion)</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tata Chemicals Limited (TCL)</td>
<td>1.62</td>
<td>Soda ash, salt, marine chemicals, caustic soda, cement, etc.</td>
</tr>
<tr>
<td>United Phosphorus Limited (UPL)</td>
<td>0.91</td>
<td>Agrochemicals</td>
</tr>
<tr>
<td>Gujarat Heavy Chemicals Ltd (GHCL)</td>
<td>0.4</td>
<td>Soda ash</td>
</tr>
<tr>
<td>Gujarat Alkalies and Chemicals Ltd (GACL)</td>
<td>0.30</td>
<td>Caustic soda</td>
</tr>
</tbody>
</table>

- French specialty chemicals major, Arkema, plans to invest USD 15 million for setting up a new polyester powder resin manufacturing facility, the first of its kind in India.
- As of October 2016, industrial chemicals manufacturer, Thirumalai Chemicals Ltd., plans to enhance its production capacity of phthalic anhydride and fine chemicals in India.

Source: Company Annual Reports, TechSci Research
Notes: <sup>(1)</sup> For data upto 31<sup>st</sup> March, 2016,
**CHEMICALS**

**PORTER'S FIVE FORCES ANALYSIS**

**Competitive Rivalry**
- Chemical industry is highly fragmented with intense rivalry amongst companies
- Since, 100 per cent FDI is allow hence domestic companies face stiff competition from foreign competitors as well
- International companies may also dump chemicals at low price

**Threat of New Entrants**
- Huge capital requirements and patent protection are significant barriers
- Other barriers include - R&D and personnel requirements

**Substitute Products**
- Buyers tend to have specific chemical requirements
- There are no direct substitutes for a specific chemical requirement

**Bargaining Power of Suppliers**
- Small chemical companies rely on supplies from larger plants, or petrochemical units
- Inputs for a chemical plant cannot be easily substituted

**Bargaining Power of Customers**
- Customers have multiple sources of supply
- Chemical companies are bound by long-term contracts
- Niche specialty chemicals have some pricing power

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GROWTH DRIVERS
GROWTH DRIVERS OF THE INDIAN CHEMICAL INDUSTRY

- Huge growth potential for the domestic market
- World class engineering and strong R&D capabilities
- Rise in GDP and purchasing power
- Big infrastructural investment
- Government Policy support and increase in investment initiatives
- Low-cost manufacturing

Source: TechSci Research
ECONOMIC EXPANSION WOULD CONTINUE TO DRIVE GROWTH IN THE CHEMICAL INDUSTRY

- Being largely an intermediate product, strong economic growth is an important factor in sustaining demand for chemical products.
- Per capita consumption of most of the finished products under chemicals sector is far below the world average; this points to the vast potential for growth in the industry.
- As in a number of other industries in India, strong growth in discretionary income and changing lifestyles are counted as a few of the other major growth drivers of the chemicals sector.

**Real GDP growth**

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</tr>
</thead>
<tbody>
<tr>
<td>Growth (%)</td>
<td>4.7%</td>
<td>5.0%</td>
<td>5.6%</td>
<td>7.2%</td>
<td>7.6%</td>
<td>9.3%</td>
<td>10.3%</td>
<td>8.5%</td>
<td>6.6%</td>
<td>7.7%</td>
<td>8.30%</td>
</tr>
</tbody>
</table>

**Per capita GDP growth**

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</tr>
</thead>
<tbody>
<tr>
<td>Growth (%)</td>
<td>2.50%</td>
<td>5.20%</td>
<td>3.70%</td>
<td>5.60%</td>
<td>6.10%</td>
<td>6.30%</td>
<td>6.60%</td>
<td>7.70%</td>
<td>8.70%</td>
<td>7.00%</td>
<td>7.68%</td>
</tr>
</tbody>
</table>
**POLICY SUPPORT FOR FOREIGN INVESTMENT**

* FDI inflow in chemicals sector (other than fertilisers) stood at USD11,900.29 million during April 2000- March 2016, accounting for 4.12 per cent of the total inflows

* Procedures relating to FDI have been simplified; most of the items in the chemicals sector fall under the automatic approval route for FDI/NRI/OCB investment up to 100%

Annual FDI inflow to the chemical industry (excluding fertilizer) (USD Million)

<table>
<thead>
<tr>
<th>Year</th>
<th>FDI Inflow (USD Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 11</td>
<td>2354</td>
</tr>
<tr>
<td>FY 12</td>
<td>4041</td>
</tr>
<tr>
<td>FY 13</td>
<td>292</td>
</tr>
<tr>
<td>FY 14</td>
<td>878</td>
</tr>
<tr>
<td>FY 15</td>
<td>10336</td>
</tr>
<tr>
<td>FY 16(1)</td>
<td>11900</td>
</tr>
</tbody>
</table>

Share of chemical industry in total FDI inflow (excluding fertiliser)

<table>
<thead>
<tr>
<th>Year</th>
<th>Share of Inflow (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 11</td>
<td>10.60%</td>
</tr>
<tr>
<td>FY 12</td>
<td>11.30%</td>
</tr>
<tr>
<td>FY 13</td>
<td>4.44%</td>
</tr>
<tr>
<td>FY 14</td>
<td>4.16%</td>
</tr>
<tr>
<td>FY 15</td>
<td>4.12%</td>
</tr>
<tr>
<td>FY 16(1)</td>
<td>4.12%</td>
</tr>
</tbody>
</table>

Source: Department of Industrial Policy & Promotion, Ministry of Commerce and Industry, TechSci Research

Note: (1) - Up to March 2016
GOVERNMENT SUPPORT TO THE SECTOR IS INCREASING … (1/2)

All figures are in USD million

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Project based support to PSUs</td>
<td>29.1</td>
<td>4.3</td>
<td>0.0</td>
<td>5.4</td>
<td>1.3</td>
<td>5.81</td>
<td>2.30</td>
<td>6.11</td>
</tr>
<tr>
<td>Support to autonomous bodies</td>
<td>19.2</td>
<td>0.1</td>
<td>0.2</td>
<td>8.3</td>
<td>23.80</td>
<td>16.79</td>
<td>16.60</td>
<td>10.08</td>
</tr>
<tr>
<td>Other ongoing schemes</td>
<td>44.2</td>
<td>165.8</td>
<td>183.4</td>
<td>292.8</td>
<td>167.32</td>
<td>5.7</td>
<td>2.78</td>
<td>8.25</td>
</tr>
<tr>
<td>New schemes initiated in XI plan</td>
<td>25.0</td>
<td>17.9</td>
<td>10.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>117.5</strong></td>
<td><strong>188.1</strong></td>
<td><strong>193.7</strong></td>
<td><strong>306.5</strong></td>
<td><strong>224.7</strong></td>
<td><strong>28.3</strong></td>
<td><strong>21.68</strong></td>
<td><strong>24.44</strong></td>
</tr>
</tbody>
</table>

Source: Department of Chemicals and Petrochemicals, TechSci Research
Notes: (1) - Budget Estimate
### CHEMICALS

**GOVERNMENT SUPPORT TO THE SECTOR IS INCREASING … (2/2)**

All figures are in USD million

<table>
<thead>
<tr>
<th>Name of the scheme</th>
<th>Non-plan outlay (FY10)</th>
<th>Non-plan outlay (FY11)</th>
<th>Non-plan outlay (FY12)</th>
<th>Non-plan outlay (FY13)</th>
<th>Non-plan outlay (FY14)</th>
<th>Non-plan outlay (FY15)</th>
<th>Non-plan outlay (FY16(1))</th>
<th>Non-plan outlay (FY17(2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assam Gas Cracker Project</td>
<td></td>
<td>130.48</td>
<td>127</td>
<td>254.17</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0.0015</td>
</tr>
<tr>
<td>Secretariat</td>
<td>2.21</td>
<td>2.52</td>
<td>2.79</td>
<td>2.3</td>
<td>2.4</td>
<td>2.30</td>
<td>1.74</td>
<td>2.58</td>
</tr>
<tr>
<td>Central Institute of Plastics Engg. &amp; Technology (CIPET)</td>
<td>0.63</td>
<td>0.10</td>
<td>0.10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bhopal Gas Leak Disaster</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>17.5</td>
<td>23.3</td>
<td>4.37</td>
<td>2.43</td>
<td>3.84</td>
</tr>
<tr>
<td>Institute of Pesticide Formulation Technology (IPFT)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
<td>0.6</td>
<td>0.59</td>
<td>38.11</td>
<td>0.0015</td>
</tr>
<tr>
<td>Others</td>
<td>0.50</td>
<td>0.54</td>
<td>0.63</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.77</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.34</strong></td>
<td><strong>133.64</strong></td>
<td><strong>130.52</strong></td>
<td><strong>274.57</strong></td>
<td><strong>42.3</strong></td>
<td><strong>7.26</strong></td>
<td><strong>46.05</strong></td>
<td><strong>6.42</strong></td>
</tr>
</tbody>
</table>

*Source: Department of Chemicals and Petrochemicals, TechSci Research*

*Note: (1) - As on December 31, 2015, (2) – Budget Estimate*
GROWTH, COMPETITIVENESS AND PROCESS INITIATIVES

- The government has announced a number of measures to improve competitiveness in the sector
- Share of manufacturing approved by the Cabinet as per the erstwhile Planning Commission would contribute 25 per cent of the GDP by 2025
- Approval is granted for FDI up to 100 per cent in the chemicals sector, excise duty reduced from 14 per cent to 10%, strong laws on anti-dumping to further promote the industry
- Cumulative FDI inflows into chemical industry reached USD11,900.29 million, during April 2000-March 2016
- Policies that have been initiated to set up integrated Petroleum, Chemicals and Petrochemicals Investment Regions (PCPIR) are revised by the end of 2015-2016. The land requirement for a PCPIR would go down from 250 square kilometers to 50 square kilometers.
- The capital and technology intensive projects under PCPIR that are likely to be operational within 10-15 years are estimated to draw an investment of USD116.54 billion.
- Kerala, Karnataka and Maharashtra are new applicants for PCPIR
- For setting up of PCPIRs, the government approved states including Odisha (Paradip), Gujarat (Dahej), Tamil Nadu (Cuddalore- Nagapattinam) and Andhra Pradesh (Vishakhapatnam-Kakinada).
- New initiatives are likely to attract large investments, both domestic and foreign, with requisite improvements in infrastructure and competition

Industry-level initiatives

- The Indian Chemical Council (ICC) is the nodal agency/signatory representing India under the ‘Responsible Care Initiative’
- ICC has prepared codes and guidance for implementation of process safety, employee health and safety, pollution prevention, emergency response, and product safety
- Member companies of ICC are encouraged to interact with local communities and groups such as students, teachers, fire/police personnel

Firm-level initiatives

- Indian chemical firms have strived to increase their market share through global presence
- They have in place technical agreements with multinational firms to keep abreast of technological progress in the global chemical industry

Source: EXIM Bank of India, TechSci Research
Note: PCPIR - Petroleum, Chemicals and Petrochemicals Investment Regions
# MILESTONES PROPOSED FOR 12th FIVE-YEAR PLAN

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Feedstock</th>
<th>R&amp;D and technology</th>
<th>Sustainability</th>
<th>Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Make PCPIRs a reality</td>
<td>• Implementation of strategy for sourcing and allocation of feedstock</td>
<td>• Setting up of technology upgradation fund of USD100 million</td>
<td>• Development of the first set of chemical usage standards for the industry addressing key issues related to water supply, environmental impact, raw materials supply, safety over lifecycle, and energy use</td>
<td>• Committee to frame regulatory structure and eliminate redundancies</td>
</tr>
<tr>
<td>• Provide infrastructure support to the industry by constructing roads, ports and other similar facilities</td>
<td>• Allocation of 10 percent share of the USD1 billion National Innovation Fund to chemicals</td>
<td></td>
<td></td>
<td>• Setting up of a national chemical inventory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Setting up of technology upgradation fund of USD100 million</td>
<td></td>
<td>• Government has rationalised and removed various tax exemptions and incentives to improve the administration and to reduce tax disputes</td>
</tr>
</tbody>
</table>

Source: TechSci Research

Note: PCPIR - Petroleum, Chemicals and Petrochemicals Investment Regions

For updated information, please visit [www.ibef.org](http://www.ibef.org)
## RECENT MAJOR M&A DEALS IN THE INDIAN CHEMICAL INDUSTRY …

<table>
<thead>
<tr>
<th>Acquirer</th>
<th>Target/ JV partner</th>
<th>Valuation</th>
<th>Synergies/ drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inbound</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jun-15</td>
<td>Evonik Industries</td>
<td>Monarch Catalyst Pvt. Ltd.</td>
<td>-</td>
</tr>
<tr>
<td>April-14</td>
<td>Yanmar Ltd/ Mitsui Ltd</td>
<td>Coromandel International Ltd</td>
<td>-</td>
</tr>
<tr>
<td>April-14</td>
<td>Axiall LLC</td>
<td>Shriram Vinyl Polytech Pvt Ltd</td>
<td>USD6 million</td>
</tr>
<tr>
<td>December-13</td>
<td>Multiplast Polymer</td>
<td>Soft Clad Laminates</td>
<td>-</td>
</tr>
<tr>
<td><strong>Outbound</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>September-14</td>
<td>Brenntag</td>
<td>Pioma Chemicals</td>
<td>NA</td>
</tr>
<tr>
<td>April-14</td>
<td>Asian Paints Ltd</td>
<td>Kadisco Chemical Industry PLC</td>
<td>-</td>
</tr>
</tbody>
</table>

* In April 2016, AkzoNobel (leading player in monochloroacetic acid market) and Atul Limited (leading supplier of crop protection chemicals using MCA) planned to set up a manufacturing joint venture to install monochloroacetic acid (MCA) plant in Gujarat.

* As of April 2016, Pidilite Industries Limited and Industria Chimica Adriatica Spa (ICA), entered into a joint venture, wherein Pidilite announced to have 50 per cent of the shareholding in the Joint Venture Company (JVC), Wood Coat Private Limited.

* In October 2016, Gujarat Narmada Valley Fertilizers and Chemicals (GNFC) is entering into a JV with Belgian firm Ecophos SA to set up a 2,00,000 MTPA di-calcium phosphate (DCP) project at Dahej in Gujarat at an estimated cost of US$ 80.35 million.

* As of November 2016, Competition Commission approved the acquisition of Mitsubishi Chemicals Corporation (MCC) PTA India by Kolkata based- The Chatterjee Group.

Source: Department of Chemicals and Petro Chemicals, TechSci Research

For updated information, please visit [www.ibef.org](http://www.ibef.org)
CHEMICALS OPPORTUNITIES
GROWTH VALUE PROPOSITION OF THE INDIAN CHEMICAL INDUSTRY

Critical size of the domestic market

Established process know-how and strong R&D capability

Indian chemicals sector

Customised application development

Availability of reliable and competitive feedstock supply

Source: KPMG International 2011, TechSci Research
SPECIALTY CHEMICALS: LUCRATIVE OPPORTUNITIES IN THIS SEGMENT

* Specialty chemicals market has expanded at a CAGR of about 12 per cent over FY07–11; the figure is expected to rise by 9.43 per cent from FY14 to reach USD90 billion by FY23, India is also gaining traction as an outsourcing hub

* The Indian middle-class household is expected to grow from 31 million in 2008 to 148 million by 2030, leading to a huge demand for specialty chemicals in automotives, water treatment and construction

* Compared to developed markets, current usage of specialty chemicals in India is very low, with an increased focus on improving products and usage intensity of specialty chemicals, the industry is poised for strong growth in future

Specialty chemical growth outlook by FY23 (USD billion)

<table>
<thead>
<tr>
<th></th>
<th>FY14</th>
<th>FY20F</th>
<th>FY23E</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAGR: 9.43%</td>
<td>40</td>
<td>70</td>
<td>90</td>
</tr>
</tbody>
</table>

Major sub-segments and their growth outlook by FY17 (USD billion)

<table>
<thead>
<tr>
<th></th>
<th>FY11</th>
<th>FY17E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paints and Coatings</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>Speciality Polymers(2)</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Construction Chemicals(1)</td>
<td>0.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Textile Chemicals</td>
<td>0.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Water Chemicals</td>
<td>0.6</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Note: (1) - Value is for 2014
Notes: (2)- Value is for 2015
E: Estimated Value

For updated information, please visit www.ibef.org
WITHIN SPECIALTY CHEMICALS, CONSTRUCTION CHEMICALS IS LIKELY TO SHINE

* India’s construction chemical market stood at USD573.2 million in 2014, which grew to USD649.75 million in 2015.
* With the construction sector expected to pace ahead due to strong economic growth, the fundamentals for construction chemicals are sound.
* By 2019, the construction chemicals sector is set to touch USD1146.4 million.
* India’s construction chemical sector consists of a variety of products ranging from admixtures to sealants. Admixtures form the largest segment with a 42 per cent share, followed by 18 per cent share of adhesives & sealants.

Construction chemical growth outlook (USD million)

<table>
<thead>
<tr>
<th>Year</th>
<th>FY 09</th>
<th>FY 14</th>
<th>FY 15</th>
<th>FY 19E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admixtures</td>
<td>311.2</td>
<td>573.2</td>
<td>649.75</td>
<td>1146.4</td>
</tr>
</tbody>
</table>

Specialty chemicals segments in 2014

- Admixtures: 42%
- Adhesives & Sealants: 14%
- Flooring: 14%
- Waterproofing: 14%
- Repair and Rehabilitation: 18%

Source: FICCI, TechSci Research
Note: E-Estimate
CHEMICALS

KEY GROWTH DRIVERS OF SPECIALTY CHEMICALS

Construction industry in India has been registering a CAGR of about 17 per cent over the last few years and is likely to gather momentum in the near future. Adoption of advanced coating, ceiling and polymer-based reinforcing material in construction will drive the demand for related chemicals.

Automotive sector in India has been expanding at a CAGR of ~12 per cent over the last five years. Automotive sector growth will drive demand for automotive components and consequently for plastics, paints and coatings used in their production.

Water treatment chemicals are widely used in purification of water and also in large power plants, refineries and fertiliser factories.

Source: TechSci Research
Polymer chemicals

* India is currently the world’s third largest consumer of polymers, behind China and the US, India’s polymer consumption is 6.2 million tonnes which constitutes 3 percent of the global consumption.

* Per capita consumption of polymer in India is 5.2 kg whereas China’s per capita polymer consumption is 30 kg.

* Indian Polymer market has grown at a CAGR of 23.02 per cent over 2005-15 to USD1310 million.

* The sector is expected to grow at a higher rate due to growth in plastic demand resulting from increased usage in packaging, construction and automotive sectors.

* Due to increasing environmental concerns and cost, replacement of wood, metal and glass by plastic will also augment demand.

* Polymer production in India is around 9 million tonnes and imports stand at 2.8 million tonnes.

* In FY 16(1), polymer production in India is stood at around 3.75 million tonnes, witnessing Y-o-Y growth at a rate of 17.9%, over the previous year.
**AGROCHEMICALS: THE FUTURE LOOKS BRIGHT… (1/2)**

- India is the third largest producer of agrochemicals, globally, and ranks fourth in terms of production of crop protection chemicals. The market for crop protection chemicals in India is expected to reach USD7.5 billion by FY19, registering an exports of about 50 per cent of Indian crop protection industry.

- Agrochemical industry in India is set to grow at a significant pace; increasing population, decreasing per capita availability of arable land and focus on increasing agricultural yield will fuel the demand for agrochemicals.

- India’s per hectare agrochemical consumption is set to rise in the coming years, given the above-mentioned factors.

- In 2015, India has become one of the largest exporters of agrochemicals globally.

- Insecticides India Ltd launched a mobile app for its customers, to provide them important updates and information about products offered by the company. Insecticides India Ltd, a leading agrochemical company plans to invest USD22.9 million in the next two years to expand its production capacity.

### Agrochemical industry growth outlook (USD billion)

<table>
<thead>
<tr>
<th></th>
<th>FY14</th>
<th>FY19E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>FICCI, India Chem, TechSci Research</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>E - Estimates, CAGR - Compound Annual Growth Rate</td>
<td></td>
</tr>
<tr>
<td>Note</td>
<td>(1) - Data is of 2014</td>
<td></td>
</tr>
</tbody>
</table>

### Pesticide consumption (kg/ha)

<table>
<thead>
<tr>
<th>Country</th>
<th>FY14</th>
<th>FY19E</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>0.6</td>
<td>5</td>
</tr>
<tr>
<td>UK</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>France</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Korea</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>USA</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taiwan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: FICCI, India Chem, TechSci Research Notes: E - Estimates, CAGR - Compound Annual Growth Rate Note: (1) - Data is of 2014*
AGROCHEMICALS: THE FUTURE LOOKS BRIGHT… (2/2)

The seven states including Andhra Pradesh (AP), Maharashtra, Punjab, Madhya Pradesh & Chhattisgarh, Gujarat, Tamil Nadu and Haryana account for usage of over 70 per cent crop protection chemicals in India; wherein Andhra Pradesh is a leading consumer of agrochemicals with a market share of 24%.

**Source:** FICCI, TechSci Research

Note: F - Forecast, AP – Andhra Pradesh, MP – Madhya Pradesh

⁽¹⁾ - Provisional data for April - March 2016

State Wise Agrochemical Consumption in 2015
CHEMICALS

SUCCESS STORIES
TATA CHEMICALS: DIVERSIFYING THEIR WAY TO SUCCESS … (1/3)

- Tata Chemicals Limited (TCL) is one of the leading chemical companies in India, with significant operations in India and Africa
- Second-largest soda ash producer in the world and the largest in India
- A market leader in edible salt; largest STPP player in the country
- Most energy-efficient urea fertiliser manufacturer in India; amongst the most efficient globally
- 1/3rd stake holder in IMACID, Morocco, assured supply of key inputs
- Soda Ash market holds the maximum share of 38 per cent followed by Complex Fertilizers and Urea with 21 per cent and 13 per cent respectively; Soda ash market in India saw a growth of 10 per cent during the period 2014-15

Revenue breakup of TATA chemicals (FY16)

- 36% Soda Ash
- 22% Complex Fertilizers
- 20% Urea
- 12% Vacuum and Iodised Salt
- 7% Cement
- 2% Others
- 1% Other Income

Source: Company Annual Report, TechSci Research
Notes: STPP (1) - Sodium Tripolyphosphate
IMACID - Indo Maroc Phosphore S.A.
**CHEMICALS**

**TATA CHEMICALS: DIVERSIFYING THEIR WAY TO SUCCESS … (2/3)**

- **2009**
  - Acquires controlling stake in Rallis India Limited
- **2010**
  - Acquires South Africa’s Grown Energy
- **2011**
  - Tata Chemicals Europe Ltd acquires British Salt, producing approximately half of the UK’s pure salt
- **2012**
  - India’s first iodine plus iron fortified salt launched by Tata Chemicals
- **2013**
  - Tata Chemicals wins two awards at the Brand Leadership Award 2013 for ‘Emerging Brand’ and ‘50 Most Talented Brand Leaders of India’
- **2014-15**
  - Tata Chemicals was awarded ‘Dun & Bradstreet Corporate Awards 2015’ in the fertilizer’s sector
  - Tata Chemicals announced the launch of a new brand “Tata Sampann for providing quality food products
- **2015-16**
  - Tata Chemicals was awarded India’s Best Employer Award 2016, by Aon
  - Tata Chemicals in 2016 launched crop nutrition product “Tata Paras Farmoola Foliar” for apple crop production.

*Source: Company website, TechSci Research*
* Tata Chemicals Limited (TCL) earned net profit of USD119.18 million in FY16 (¹)

Source: Tata Chemicals Annual Report, TechSci Research
Note: (1) : Data upto 31st March, 2016
UNITED PHOSPHORUS LIMITED (UPL): AN AGROCHEMICAL SUCCESS … (1/2)

- UPL is mainly engaged in the business of agrochemicals, other industrial chemicals, and chemical intermediates
- Agrochemicals account for 96 per cent of the total sales of the company, while the industrial chemicals and intermediates segments together account for 4%
- UPL has 28 manufacturing sites – 13 in India and 15 outside India (international)
- The company has also strengthened its distribution reach and access to new markets through strategic alliances with agrochemical manufacturers in other countries
- The company is planning to launch innovative technology, farming solutions, and new products through its other arms such as Advanta and Golden Seeds
- UPL has been ranked the fifth largest agrochemical company globally

Total sales (USD million)

Source: United Phosphorus Limited (UPL) Annual Reports, TechSci Research
Notes: CAGR - Compound Annual Growth Rate
**CHEMICALS**

**UNITED PHOSPHORUS LIMITED (UPL): AN AGROCHEMICAL SUCCESS … (2/2)**

- UPL Limited comprises of UPL, Advanta and UEL companies that are listed in the Indian Stock Exchange
- In 2015, UPL Mumbai won the Dun & Bradstreet Corporate Award in the agrochemicals sector

**Income by region - FY16**

- India: 27%
- Latin America: 15%
- North America: 19%
- Europe: 14%
- Rest of World: 25%

**EBITDA (USD billion)**

<table>
<thead>
<tr>
<th>Year</th>
<th>EBITDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY08</td>
<td>0.18</td>
</tr>
<tr>
<td>FY09</td>
<td>0.21</td>
</tr>
<tr>
<td>FY10</td>
<td>0.22</td>
</tr>
<tr>
<td>FY11</td>
<td>0.26</td>
</tr>
<tr>
<td>FY12</td>
<td>0.31</td>
</tr>
<tr>
<td>FY13</td>
<td>0.32</td>
</tr>
<tr>
<td>FY14</td>
<td>0.36</td>
</tr>
<tr>
<td>FY15</td>
<td>0.39</td>
</tr>
<tr>
<td>FY16</td>
<td>0.15</td>
</tr>
</tbody>
</table>

**Source:** Company Annual report, TechSci Research

**Notes:** EBITDA - Earnings Before Interest, Taxes, Depreciation and Amortisation
ASIAN PAINTS: A COLORFUL GROWTH PATH

* In 1942, Asian Paints started manufacturing in a Mumbai garage; now, with total installed capacity of nearly 1 million kilo-litre, Asian Paints is amongst the largest paint manufacturing companies in the world.

* Asian Paints has grown at an excellent pace over the years; a CAGR of 13.27 per cent from FY09–15 and net profit after tax earned for FY16 (during April – September 2015) is at USD144.4 million.

* In 2015, Asian Paints was awarded as the “Most Impactful Companies of the Decade” by CNBC. The company was listed on India’s Super 50 companies in the July 2015 issue by Forbes India.

Asian Paints geography wise sales (FY16)

- Middle East & Africa (Egypt, Oman, Bahrain, UAE & Ethiopia)
- Asia (Bangladesh, Nepal, Sri Lanka, Singapore & Indonesia)
- Caribbean (Barbados, Jamaica, Trinidad & Tobago)
- South Pacific (Fiji, Solomon Islands, Samoa, Tonga & Vanuatu)

Asian Paints Revenue (USD million)

<table>
<thead>
<tr>
<th>FY 09</th>
<th>FY 10</th>
<th>FY 11</th>
<th>FY 12</th>
<th>FY 13</th>
<th>FY 14</th>
<th>FY 15</th>
<th>FY 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100</td>
<td>1200</td>
<td>1600</td>
<td>1900</td>
<td>2000</td>
<td>2100</td>
<td>2322.9</td>
<td>2342</td>
</tr>
</tbody>
</table>

Source: Company Annual report, TechSci Research
Notes: KL - Kilo Litre, CAGR - Compound Annual Growth Rate
Established in 1983, India Glycols is the only company that manufactures green technology-based bulk, specialty and performance chemicals and natural gums, spirits, industrial gases, sugar and nutraceuticals in India.

The company operates in five segments, including Chemicals which forms the largest segment.

The company exports to more than 40 countries including the US, Japan, and countries in Europe and Latin America.

During FY09–16, the company’s sales have increased at a CAGR of 7.84 per cent to USD380.9 million.

The company registered a sales of USD380.9 million in FY16 against sales of USD418.8 million in FY15.

**India Glycols Limited sales (USD million)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (USD million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 08</td>
<td>334.2</td>
</tr>
<tr>
<td>FY 09</td>
<td>224.5</td>
</tr>
<tr>
<td>FY 10</td>
<td>252.9</td>
</tr>
<tr>
<td>FY 11</td>
<td>386.9</td>
</tr>
<tr>
<td>FY 12</td>
<td>576.4</td>
</tr>
<tr>
<td>FY 13</td>
<td>632.1</td>
</tr>
<tr>
<td>FY 14</td>
<td>479.0</td>
</tr>
<tr>
<td>FY 15</td>
<td>418.8</td>
</tr>
<tr>
<td>FY 16</td>
<td>380.9</td>
</tr>
</tbody>
</table>

*Source: Company Annual Report, TechSci Research*

Notes: CAGR - Compound Annual Growth Rate, TTM – Trailing Twelve Months.
Indian Chemical Council
Sir Vithaldas Chambers, 16-Mumbai Samachar Marg,
Mumbai – 400023
Phone: 91 22 22047649/ 22846852
Fax: 91 22 22048057
Website: www.icmaindia.com

Alkali Manufacturers Association of India
3rd Floor, Pankaj Chambers, Preet Vihar Commercial Complex,
Vikas Marg, New Delhi – 110092
Phone: 91 11 22432003, 22410150, 55253401
Fax: 91 11 22468249
Website: www.ama-india.org

Indian Specialty Chemical Manufacturers' Association
1156, Bole Smruti, Suryavanshi Kshatriya Sabhagriha Marg,
Off. Veer Savarkar Marg, Dadar (West)
Mumbai – 400 028
Tel: 91 22 2446 5003
Website: www.iscma.in
GLOSSARY

* **OCB**: Overseas Corporate Bodies

* **NRI**: Non-Resident Indian

* **FY**: Indian Financial Year (April to March)
  
  * So FY10 implies April 2009 to March 2010

* **NA**: Not Available

* **STPP**: Sodium Tripolyphosphate

* **MT**: Metric Tonnes

* **USD**: US Dollar

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

<table>
<thead>
<tr>
<th>Year</th>
<th>INR equivalent of one USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004–05</td>
<td>44.81</td>
</tr>
<tr>
<td>2005–06</td>
<td>44.14</td>
</tr>
<tr>
<td>2006–07</td>
<td>45.14</td>
</tr>
<tr>
<td>2007–08</td>
<td>40.27</td>
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<tr>
<td>2008–09</td>
<td>46.14</td>
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<tr>
<td>2009–10</td>
<td>47.42</td>
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<tr>
<td>2010–11</td>
<td>45.62</td>
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<tr>
<td>2011–12</td>
<td>46.88</td>
</tr>
<tr>
<td>2012–13</td>
<td>54.31</td>
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<tr>
<td>2013–14</td>
<td>60.28</td>
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<tr>
<td>2014–15</td>
<td>61.06</td>
</tr>
<tr>
<td>2015–16</td>
<td>65.46</td>
</tr>
<tr>
<td>2016–2017E</td>
<td>66.95</td>
</tr>
</tbody>
</table>

### Exchange rates (Calendar Year)

<table>
<thead>
<tr>
<th>Year</th>
<th>INR equivalent of one USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>43.98</td>
</tr>
<tr>
<td>2006</td>
<td>45.18</td>
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<tr>
<td>2007</td>
<td>41.34</td>
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<td>2008</td>
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<td>2009</td>
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<tr>
<td>2010</td>
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<td>2011</td>
<td>46.85</td>
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<td>2012</td>
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<td>2013</td>
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</tr>
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<td>2014</td>
<td>61.03</td>
</tr>
<tr>
<td>2015</td>
<td>64.15</td>
</tr>
<tr>
<td>2016 (Expected)</td>
<td>67.22</td>
</tr>
</tbody>
</table>
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