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**EXECUTIVE SUMMARY**

India is third largest producer of coal with projected production of 630.25 million tonnes in FY15. India has the fifth-largest coal estimated reserves in the world at 301.56 billion tonnes in FY14 with 3,108 operational mines.

India ranks fourth globally in terms of iron ore production. In FY14, the country produced 136.4 million tonnes of iron ore. India has around 8 per cent of world’s deposit of iron ore.

India has become the Third-largest steel producer in 2015 with the production of total finished steel at 91.46 million tonnes. India stood as the Fourth-largest Crude steel producer in 2014, while its production increased to 86.5 million tonnes as compared to 81.2 million tonnes in 2013.

In 2014, India has the sixth-largest bauxite reserves of about 3,290 million tonnes or 3.19 per cent of world deposits. Aluminum production is estimated to be 4.7 million tonnes per annum during 2012–17 while the estimated aluminum production by 6% in FY16 from FY15.

India has vast minerals potential with mining leases granted for longer durations of 20 to 30 years.

*Source: Ministry of Coal, 12th Five-Year Plan, Worldsteel.org, BP, Ernst & Young, TechSci Research*

*Note: CAGR - Compound Annual Growth Rate*
METALS AND MINING

ADVANTAGE INDIA

AUGUST 2015
Demand growth

- Rise in infrastructure development and automotive production driving growth in the sector
- Power and cement industries also aiding growth in the metals and mining sector
- Demand for iron and steel is set to continue, given the strong growth expectations for the residential and commercial building industry

Attractive opportunities

- There is significant scope for new mining capacities in iron ore, bauxite, and coal
- In 2014, untapped mineral reserves in India are to the tune of 80 billion tonnes
- Considerable opportunities for future discoveries of sub-surface deposits
- The Ministry of steel aims to increase the steel production capacity to 142.3 million tonnes by the end of 2017 indicating new opportunities in the sector

Competitive advantage

- India holds a fair advantage in cost of production and conversion costs in steel and alumina
- It’s strategic location enables convenient exports to developed as well as the fast-developing Asian markets
- India produces 88 minerals– 4 fuel-related minerals, 10 metallic minerals, 50 non-metallic minerals and 24 minor minerals

Policy support

- 100 per cent FDI allowed in the mining sector and exploration of metal and non-metal ores under the Automatic Route
- Mining lease granted for a long duration of minimum 20 years and up to 30 years
- Approval of MMDR Bill (2011) to provide better legislative environment for investment and technology
- In the Union Budget 2015-16 Ministry of Mines has been allocated USD94.65 Million

Source: DataMonitor, EY, TechSci Research

Notes: FDI - Foreign Direct Investment, MMDR Bill - Mines and Mineral (Development and Regulation) Bill, F - Forecast

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MARKET OVERVIEW AND TRENDS

AUGUST 2015
EVOLUTION OF THE INDIAN METALS AND MINING SECTOR

- Mining sector received a boost post independence under the impact of successive Five Year Plans
- Central Government promulgated Industrial Policy Resolution
- The exploration of minerals was intensified and the Geological Survey of India was strengthened
- Indian Bureau of Mines was established to look after the scientific development of mineral resources
- Mineral Exploration Corporation established to conduct exploration with focus on coal, iron ore, limestone, dolomite and manganese ore
- Indian mining sector was opened up to Foreign Direct Investment in 1993 after the announcement of the New Mineral Policy
- In the year 2012, crude steel production in the country was 53.357 MT while the major producers of crude steel were Rashtriya Ispat Nigam Limited, Steel Authority of India Limited, Tata Steel, Essar, JSW Steel, JSW Ispat Steel and Jindal Steel & Power
- India is the largest producer of sheet mica, the fourth largest producer of iron ore and has the sixth largest reserve of bauxite in the world in 2014
- Total finished steel production (alloy and non alloy) in India reached 91.46 million tonnes and stood as the third largest crude steel producer in the world in 2015
- In the year 2015 total finished steel imports were 9.32 million tonnes while the exports for the same year was 5.59 million tonnes

Source: World Steel Association (WSA), DataMonitor
Note: CAGR - Compound Annual Growth Rate

For updated information, please visit www.ibef.org
### SEGMENTS OF METALS AND MINING INDUSTRY

<table>
<thead>
<tr>
<th>Metals and mining</th>
<th>Iron and steel</th>
<th>Coal</th>
<th>Aluminium</th>
<th>Bauxite</th>
<th>Base metals</th>
<th>Precious metals and minerals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Iron and steel segment offers a product mix which includes hot rolled parallel flange beams and columns rails, plates, coils, wire rods, and continuously cast products such as billets, blooms, beam, blank, rounds and slab, and metallics and ferro alloy</td>
<td>Coal market consists of primary coal (anthracite, bituminous and lignite)</td>
<td>Aluminium segment includes primary aluminium, aluminium extrusions, aluminium rolled products, alumina chemicals</td>
<td>Bauxites are sub-divided into two basic types based on the processing methods - Tropical bauxite and European bauxite</td>
<td>Base metal market consists of lead, zinc, copper, nickel and tin</td>
<td>Precious metals market includes gold, silver, platinum, palladium, rhodium and diamond</td>
</tr>
</tbody>
</table>
STRONG GROWTH IN INDIA’S METALS AND MINING SECTOR OVER THE YEARS

* In FY13, India had 3,108 operative mines – excluding mining areas for minor minerals, crude petroleum, natural gas and atomic minerals

* Much of the above growth in the industry’s value can be attributed to higher prices given that production volume growth was relatively lower at 3.2 per cent (total production stood at 716.3 million metric tonnes)

* Value of Imports has been growing steadily over the years – over 2010-14, it registered a CAGR of 15.07 per cent

Value of Imports of Ore and Minerals in India (USD billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (USD billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>115.04</td>
</tr>
<tr>
<td>2011</td>
<td>142.71</td>
</tr>
<tr>
<td>2012</td>
<td>173.90</td>
</tr>
<tr>
<td>2013</td>
<td>182.61</td>
</tr>
<tr>
<td>2014</td>
<td>201.68</td>
</tr>
</tbody>
</table>

CAGR: 15.07%

Source: DataMonitor, Ministry of Mines TechSci Research
Note: CAGR - Compound Annual Growth Rate
IRON & STEEL ACCOUNTS FOR A MAJOR SHARE IN INDIA’S METALS & MINING SECTOR

* In 2014, India stood as the fourth largest crude steel producer in the world, while the total crude steel production was 86.5 MT
* India accounted for 5.19 per cent of the total steel production in the world in the year 2014
* India is third largest producer of crude steel in the Asia-Pacific region in 2014. Total Finished steel production (alloy+non-alloy) in India reached 91.46 million tonnes in 2015

Shares in India’s mining sector (In terms of Reporting Mines, 2015E)

<table>
<thead>
<tr>
<th>Mineral Type</th>
<th>Value (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal (including Lignite)</td>
<td>575</td>
</tr>
<tr>
<td>Metallic Minerals</td>
<td>595</td>
</tr>
<tr>
<td>Non-Metallic Minerals</td>
<td>2148</td>
</tr>
</tbody>
</table>

India’s share of States in Value of Mineral Production (2015E)

- Offshore Region: 20.27%
- Rajasthan: 36.29%
- Gujarat: 11.49%
- Andhra Paradesh: 7.37%
- Chhatisgarh: 7.48%
- Jharkhand: 8.25%
- Remaining States: 8.85%

Source: DataMonitor, Ministry of Mines TechSci Research
Note: MMT - Million Metric Tonnes
E-Estimated
In the year 2015, India stood as the largest producer of direct reduced iron ore and world’s fourth largest iron ore producer (global share of 8 per cent)

Iron ore production is estimated to have declined at a CAGR of 2.72 per cent during FY07–15E. Total production in FY14 stood at 136 million tonnes. Private sector accounted for 67 per cent of India’s total iron ore production in FY14.

Iron ore production was expected to cross 155 million tonnes in FY15. In FY14, Odisha and Karnataka accounted for 57.9 per cent of India’s total iron ore production, however in 2015 Karnataka and Goa is expected to contribute to the increase in iron ore production while Odisha would limit the growth of iron ore production on account of production cap

Majority (over 85 per cent) of iron ore reserves are of medium to high-grade and are directly used in blast furnace and Direct Reduced Iron (DRI) plants in the form of sized lumps or sinters or pellets.

**Iron ore production (million tonnes)**

<table>
<thead>
<tr>
<th>Year</th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>188</td>
<td>213</td>
<td>213</td>
<td>219</td>
<td>207</td>
<td>167</td>
<td>136</td>
<td>136</td>
<td>155</td>
</tr>
</tbody>
</table>

**Grade-wise share of iron ore reserves in India (million tonnes), FY14**

- Medium: 67.5%
- High: 18.9%
- Low: 11.2%
- Other: 2.4%

Notes: CAGR- Compounded Annual Growth Rate, E- Estimate

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Iron ore is a key ingredient in steel production. In spite of decline in iron ore production in India, steel production expanded at a faster pace. In the year 2014 India became the net exporter of finished steel with the total exports exceeding the imports by 5.98 MT.

With the Indian economy expected to grow by approximately 7 per cent in the years to come, sectors such as infrastructure and automobiles will receive a renewed thrust, which would further generate demand for steel in the country.

Crude steel production has reached 87 million metric tonnes in 2014, expanding at a CAGR of 7.3 per cent over 2006–14 making it world’s third-largest producer of crude steel (2014), with a global share of 5.20 per cent.

Crude steel production (million metric tonnes)

<table>
<thead>
<tr>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15 *</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>53</td>
<td>58</td>
<td>63</td>
<td>67</td>
<td>72</td>
<td>77</td>
<td>81</td>
<td>87</td>
<td>62.39</td>
</tr>
</tbody>
</table>

CAGR: 7.3%

Shares in global crude steel production (2014)

- China: 49.41%
- Japan: 29.15%
- United States: 6.65%
- India: 5.20%
- Russia: 5.30%
- Others: 4.29%

Source: World Steel Association, TechSci Research
Note: CAGR - Compound Annual Growth Rate, E – Estimate, *-April to December
RISING DOMESTIC DEMAND PUTS PRESSURE ON SUPPLY OF IRON AND STEEL … (1/2)

* In 2015, India’s iron and steel exports were valued at USD5.1 billion. During FY2009-14 India’s exports of iron and steel declined at a CAGR of 6.15 per cent

* The new government would start stalled projects, after it pushes large flagship projects, including the freight and industrial corridors. This is expected to boost the demand for steel, which is expected to grow by 15 per cent annually after FY17

* Government of India imposes 30% export duty on all iron ore forms (Except the low grade iron ore ) and 5% export duty is levied on iron ore pellets

India’s exports of iron and steel (USD billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (USD billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY09</td>
<td>7.5</td>
</tr>
<tr>
<td>FY10</td>
<td>4.5</td>
</tr>
<tr>
<td>FY11</td>
<td>7.1</td>
</tr>
<tr>
<td>FY12</td>
<td>8.3</td>
</tr>
<tr>
<td>FY13</td>
<td>8.1</td>
</tr>
<tr>
<td>FY14</td>
<td>5.1</td>
</tr>
<tr>
<td>FY15</td>
<td>5.1</td>
</tr>
</tbody>
</table>

CAGR: 4.2%

Source: Ministry of Commerce, TechSci Research
Notes: CAGR - Compound Annual Growth Rate, * - Data is from April 2013 to Dec 2013
India has turned into a net importer of iron and steel due to strong growth in the manufacturing sector and rising infrastructure projects.

India’s transition into a net importer of steel despite the strong growth in domestic steel production shows the demand potential of the sector.

The impact of strong growth in domestic steel production has been most felt in the iron ore sector; with steel firms’ ever rising demand for the raw material, India’s imports of iron ore has been growing steadily (for example, iron and steel imports increased at a CAGR of 2.04 per cent over FY09-15).

India’s imports of iron and steel (USD billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY09</td>
<td>6.61</td>
</tr>
<tr>
<td>FY10</td>
<td>5.48</td>
</tr>
<tr>
<td>FY11</td>
<td>5.92</td>
</tr>
<tr>
<td>FY12</td>
<td>5.76</td>
</tr>
<tr>
<td>FY13</td>
<td>7.24</td>
</tr>
<tr>
<td>FY14</td>
<td>5.06</td>
</tr>
<tr>
<td>FY15</td>
<td>7.46</td>
</tr>
</tbody>
</table>

Source: Reserve Bank of India, Ministry Of Steel, TechSci Research
Notes: CAGR - Compound Annual Growth Rate,
* - Data is from April 2013 to Dec 2013
In 2014, India had the fifth-largest coal proved reserves globally, of which 92.57 per cent was Anthracite and Bituminous while 7.43 per cent was Sub Bituminous and Lignite.

In 2014, India contributed around 6.19 per cent of the world’s production of coal.

Coal India Ltd (CIL), a Government of India enterprise, is the world’s largest coal company based on raw coal production and coal reserves.

Shares in global coal production (2014)

- China: 46.90%
- US: 12.91%
- India: 19.70%
- Australia: 7.16%
- Indonesia: 7.14%
- Rest of the World: 6.19%

METALS AND MINING

COAL PRODUCTION GROWING AT A STEADY PACE

* In the coming years, coal production in the country is likely to receive a boost as the government plans to replace the country’s captive mining policy in coal and iron ore with an open bidding one.

* Coal imports increased 33.7 per cent to reach 168.43 million tonnes in FY2014 as power producers imported more due to low prices and a domestic shortage.

* Coal imports comprised of 77.93 per cent import of Non Coking Coal while the rest 22.07 percent consisted of Coking coal imports. In comparison to 2013, the imports of Non Coking Coal increased by 19.07 per cent while imports of Coking Coal increased by 4.59 percent.

Source: Ministry of Mines, TechSci Research
Notes: CAGR - Compound Annual Growth Rate,
P – Provisional
T-Target
KEY GEOLOGICAL COAL AND IRON ORE DEPOSITS IN INDIA

**States with major coal deposits**
- Jharkhand (76,963 mt)
- Odisha (66,307 mt)
- Chhattisgarh (46,682 mt)
- West Bengal (29,853 mt)
- Andhra Pradesh (22,016 mt)
- Madhya Pradesh (21,988 mt)
- Maharashtra (10,308 mt)

**States with lower coal deposits**
- Uttar Pradesh (1062 mt)
- Meghalaya (577 mt)
- Assam (387 mt)
- Nagaland (316 mt)
- Bihar (160 mt)
- Sikkim (101 mt)
- Arunachal Pradesh (90 mt)

**States with major iron ore deposits**
- Odisha (44.8 mt)
- Karnataka (34.3 mt)
- Goa (3.7 mt)
- Chhattisgarh (3.4 mt)
- Jharkhand (3.2 mt)
- Andhra Pradesh (0.8 mt)
- Madhya Pradesh (0.3 mt)
- Maharashtra (0.1 mt)


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INDIA’S ROLE IN GLOBAL ALUMINIUM PRODUCTION

※ Currently, aluminium is the second most used metal in the world after steel and the third most available element in the earth constituting almost 7.3 per cent by mass; India produced 4 million tonnes of aluminium in FY14. This increase was because of the capacity expansion by major producers which became operational in FY2014

※ The principal user segment in India for aluminium continues to be electrical & electronics sector followed by the automotive & transportation, building & construction, packaging, consumer durables, industrial and other applications including defence

※ India has 3,290 million tonnes of bauxite reserves, the sixth-largest deposit of bauxite globally

Aluminium demand by sector (2014)

- Transport 25%
- Construction 13%
- Packaging 6%
- Electrical 5%
- Consumer Durables 5%
- Machinery and Equipment 41%
- Others 5%

India’s share in global aluminium production (FY2014)

- China 29.8%
- India 42.7%
- Russia 3.5%
- US 3.3%
- Australia 7.4%
- Brazil 7.9%
- UAE 3.4%
- Rest of the World 2.0%

Source: World Bureau of Metal Statistics (WBMS), Aluminium Association of India, Economist Intelligence Unit (EIU), ICRA Management Consulting Services Ltd (IMaCS), TechSci Research

Note: ICRA - Information Credit Rating Agency Ltd
GROWING DOMESTIC DEMAND TO SUPPORT ALUMINIUM PRODUCTION

* Demand for aluminium is expected to pick up as the scenario improves for user industries, like power, infrastructure, and transportation.

* Aluminum production is estimated to be 4.7 million tonnes per annum during 2012–17.

* Production of aluminum increased at a CAGR of 25.7 per cent over FY10–14.

* Total aluminum imports in FY14 was 2.08 million tonnes.

Aluminum production (million tonnes)

Source: World Bureau of Metal Statistics (WBMS), 12th Five Year Plan, EIU, ICRA Management Consulting Services Ltd (IMaCS), TechSci Research

Notes: ICRA - Information Credit Rating Agency Ltd, CAGR - Compound Annual Growth Rate
STRONGER ECONOMIC GROWTH TO SUPPORT ALUMINIUM CONSUMPTION

* Demand of aluminium in India is expected to grow at 10-12 per cent per annum and this will be driven by growth in sectors like electricity, transport, building and construction and packaging.

* Consumption of aluminium in India was expected to be about 5 million tonnes by 2015, and 10 million tonnes by 2020.

Aluminum consumption (million tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY10</td>
<td>1.5</td>
</tr>
<tr>
<td>FY11</td>
<td>1.6</td>
</tr>
<tr>
<td>FY12</td>
<td>1.7</td>
</tr>
<tr>
<td>FY13</td>
<td>2</td>
</tr>
<tr>
<td>FY14</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Source: WBMS, EIU, TechSci Research
Note: CAGR - Compound Annual Growth Rate
Note *- Expected
## Major Metals and Mining Players in the Country

<table>
<thead>
<tr>
<th>Segment</th>
<th>Major player</th>
<th>Market share</th>
<th>Other players</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron and Steel</td>
<td>[Image]</td>
<td>NA</td>
<td>Sesa Goa, SAIL, Orissa Minerals</td>
</tr>
<tr>
<td>Coal</td>
<td>[Image]</td>
<td>80 per cent</td>
<td>Singareni Collieries Company, Reliance Natural Resources</td>
</tr>
<tr>
<td>Aluminium</td>
<td>[Image]</td>
<td>60 per cent</td>
<td>National Aluminium Company (NALCO), Bharat Aluminium Company (BALCO)</td>
</tr>
</tbody>
</table>
Captive mining for coal

- In captive mining for coal, companies are permitted to set up coal washeries and for specified end uses, including the setting up of power plants, fertilizers and steel units
- Under the captive route, the government has allocated 198 coal blocks with geological reserves of about 42 billion tonnes to various public and private sector companies

Longer duration leases

- In the last few years, India has seen a significant growth in minerals with the government granting leases for longer durations of 20 to 30 years

Focus on domestic market

- The demand for metal and metal products is rising in the domestic market with India being a net importer in the metals segment

Overseas ventures

- In search of greater mineral opportunities, an increasing number of Indian mining companies are venturing overseas in a bid to secure stable, long-term supplies of minerals especially in the areas of coal and iron ore
- Coal India plans to export 10 MT of coal from Mozambique to India in the next 10 years; the company is seeking more license blocks in Mozambique

Outlook of Metal and Mining

- Year 2015, is expected to bring positivity to the industry with the Gold prices to increase and iron ore industry to increase at a slow but steady pace
### METALS AND MINING

**PORTER’S FIVE FORCES ANALYSIS**

<table>
<thead>
<tr>
<th>Competitive Rivalry</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Commodity prices are set internationally and individual players have no control over it</td>
</tr>
<tr>
<td>• Competition is high to identify commodity reserves leading to more market share</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threat of New Entrants</th>
<th>Substitute Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Exploration and development of mines requires large capital investment</td>
<td></td>
</tr>
<tr>
<td>• Threat of substitute products is low</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bargaining Power of Suppliers</th>
<th>Bargaining Power of Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Highly regulated industry</td>
<td></td>
</tr>
<tr>
<td>• Difficult to get mining permits</td>
<td></td>
</tr>
<tr>
<td>• Demand/supply imbalance determines the price of commodities.</td>
<td></td>
</tr>
<tr>
<td>• Major customers typically negotiate prices based on current market levels</td>
<td></td>
</tr>
</tbody>
</table>

**Source**: TechSci Research

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METALS AND MINING

STRATEGIES ADOPTED

AUGUST 2015
### Cost optimisation

- Players in the industry are trying to minimise cost to gain competitive advantage
- For example, SAIL is trying to reduce cost by
  - Entering into MoU for coal bed methane and propane gas to reduce cost of energy
  - Optimization of the input resources, increasing operating efficiency for handling the assets available with the company, reducing overhead costs and stabilization of newly formed operation units

### Focus on technology

- Players in the industry are focusing on optimising technology to increase process efficiency
- Coal India Limited is focusing on making best use of technology. It has ambitious plans of using GPS/GPRS based vehicle tracking system to enhance productivity. It also has services such as E-Auction, E-Procurement of goods and services

### Build strategic alliances

- Alliance with global and domestic players help companies to improve their operational performance through technological improvement and cost optimisation

Source: SAIL Company website, Business Standard, TechSci Research
Notes: MoU – Memorandum of Understanding, GPS – Global Positioning System, GPRS - General Packet Radio Service
METALS AND MINING

STRONG FUNDAMENTALS AND POLICY SUPPORT AIDING GROWTH

**Higher demand for metals**
- Growing infrastructure investments
- Sustained growth in India’s automotive sector
- Aluminium and coal benefiting from rising power production
- Rising production of cement increasing demand for coal

**Policy support**
- Relaxed FDI norms
- Allowing private ownership
- Reduced customs duty
- Tax and other incentives

**Innovation**
- Expanding research & development and distribution facilities in India
- Use of modern technology
- Providing support to global projects from India

**Increasing investments**
- Increasing FDI
- Increasing private participation

Source: TechSci Research
Notes: M&A - Mergers and Acquisitions, FDI - Foreign Direct Investment

AUGUST 2015
POWER AND AUTOMOTIVE PRODUCTION FUELLING DEMAND … (1/2)

The power sector accounts for a large share of the consumption of coal in the country.

Until June 2015, power generation in India was 271.09 TWh. Power generation in India expanded at a CAGR of 5.8 per cent during FY08–15.

In FY14, total power generation capacity stood at 237,742.92 MW, with capacity addition of 12,539 (April 2013-February 2014) MW during the year.

In the Eleventh Plan, India is estimated to have added around 60,000 MW of generation capacity at an investment of USD11.5 billion.

To meet growing power demand, the Power Ministry has targeted capacity addition of 85,000 MW in the Twelfth Plan (2012-17) period.

With a huge reserve of coal, around 69.7 per cent of total power generation was done through thermal power plants, while hydro, renewable and nuclear plants contributed 16 per cent, 12.4 per cent and 1.9 per cent respectively in 2014.

**Power generation in India (in TWh)**

<table>
<thead>
<tr>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16*</th>
</tr>
</thead>
<tbody>
<tr>
<td>705</td>
<td>724</td>
<td>772</td>
<td>811</td>
<td>877</td>
<td>912</td>
<td>967.15</td>
<td>1048.67</td>
<td>271.09</td>
</tr>
</tbody>
</table>

Source: Ministry of Power, Central Electricity Authority (CEA), TechSci Research
Notes: TWh - Terawatt-hour, P - Provisional, CAGR – Compounded Annual Growth Rate
Note: *-Up to June 2015
Sustained growth in India’s automotive sector has been driving demand for steel and aluminum.

Production of automobiles increased at a CAGR of 10.70 per cent over FY10–15.

Two wheelers was the fastest-growing segment, representing a CAGR of 11.97 per cent between FY10–15.

India is expected to become the world’s third-largest auto market by 2020F.

Total production of automobiles in India (million units)

Source: SIAM, TechSci Research

Notes: FY - Indian Financial Year (April - March), CAGR – Compounded Annual Growth Rate
A FAST-EXPANDING CONSTRUCTION SECTOR HAS AIDED GROWTH ... (1/2)

* India is witnessing a sustained growth in infrastructure build up. The construction industry has been witness to a strong growth wave powered by large spends on housing, road, ports, water supply, rail transport and airport development

* Infrastructure projects continue to provide lucrative business opportunities for steel, zinc and aluminium producers

* India’s infrastructure sector is expected to grow at a CAGR of 15.6 per cent over FY08-17

* During 12th Five Year Plan, India’s Planning Commission has projected an investment of USD1 trillion for the infrastructure sector with 40 per cent of the funds coming from the private sector

India’s expanding infrastructure industry (USD billion)

CAGR: 15.6%


Source: Business Monitor International's (BMI) Report on infrastructure industry in India, TechSci Research
Notes: F - Forecasts (by BMI), CAGR – Compounded Annual Growth Rate
Growth in the sector is set to increase in the next few years; forecasts put the CAGR for FY12-17 at 14.5 per cent

Iron and steel being a core component of the real estate sector, demand for these metals is set to continue given strong growth expectations for the residential and commercial building industry

Total housing shortage in the country stood at about 18.78 million at the start of the Twelfth Five Year Plan. This provides a big investment opportunity for residential building construction in coming years

Residential and non-residential building industry (USD billion)

Source: Business Monitor International’s (BMI) Report on infrastructure industry in India, TechSci Research
Note: F - Forecasts (by BMI)
CAGR – Compounded Annual Growth Rate
YoY – Year on Year

For updated information, please visit www.ibef.org
India is the world’s second-largest producer of cement accounting for about 8 per cent of the total global production; the sector’s strong expansion over the past decade has been a key contributor to rising coal demand.

Cement production increased at a CAGR of 7.84 per cent to 370 million tonnes over FY08–15.

Production is expected to reach 407 million tonnes by FY17, as per the 12th Five-Year Plan.

Cement demand is likely to increase to 550-660 MTPA in 2020.

Source: Indiastat, Planning Commission, TechSci Research
Notes: E - Estimate, MTPA - Million Tonnes Per Annum, CAGR - Cumulative Annual Growth Rate
FACTORS BEHIND RISING CEMENT PRODUCTION IN INDIA

- Increasing number of houses
- Government support
- Higher cement production
- Expanding road construction
- Large infrastructure projects

Source: TechSci Research
STRONG POLICY SUPPORT GIVES METAL AND MINING SECTOR A BOOST

The Mines and Minerals (Development and Regulation) Amendment Act, 2015
- The MMDR Act of 1957, witnessed amendments in the year 2015 for the promotion and development of the mining industry in India, that includes making auctions the sole method for the allotment of mineral concessions and mandating the establishment of District Mineral Foundation (DMF)

Relaxed FDI norms
- FDI of up to 100 per cent is permitted under the Automatic Route to explore and exploit all non-fuel and non-atomic minerals and process all metals as well as for metallurgy
- FDI caps for coal and lignite has been increased to 100 per cent under the automatic route

Allowing private ownership
- Government of India is encouraging private ownership for steel operations and other high priority industry

Investment incentives
- Profits of companies producing specified metals are given tax concession under the Income Tax Act
- Low custom duty on the capital equipment used for minerals
- Companies who do mining in backward districts are eligible for complete tax holiday for a period of 5 years from the commencement of production and 30 per cent tax holiday for 5 years thereafter

Reduced custom duty
- Government of India significantly reduced the duty payable on finished steel products and has streamlined the associated approval process

Source: TechSci Research
Note: FDI - Foreign Direct Investment
METALS AND MINING

MMDR ACT

General restrictions and mineral concessions

- Reservation of areas for PSUs removed
- State governments to set up special courts to expedite prosecution in illegal mining
- Statutory Coordination cum Empowered Committee at central and state levels to decide upon stringent penalties for offences

Process of revenue collection and usage

- Central government to establish National Mineral Fund; respective state governments to establish State Mineral Fund(s)
- District Mineral Foundation will be set up by the state government which will work for the interest and benefit of persons or families affected by mining related operation in the district and will be managed by a governing council
- The mining tax collected will be spent within the district

Relaxation on duties

- The Basic Customs Duty (BCD) on
  - ships imported for breaking up is being reduced from 5 per cent to 2.5 per cent
  - coal-tar pitch is being reduced from 10 per cent to 5 per cent
  - battery waste and battery scrap is being reduced from 10 per cent to 5 per cent
  - steel grade limestone and steel grade dolomite is being reduced from 5 per cent to 2.5 per cent
FDI upto 100 per cent is allowed in exploration, mining, minerals processing and metallurgy under the automatic route for all non-fuel and non-atomic minerals including diamonds and precious stones.

During April 2000–May 2014, cumulative FDI inflows into the metals and mining sector stood at USD8.62 billion.

The sector accounted for 3.74 per cent of total cumulative FDI inflows during the period.

FDI inflows into metals and mining over April 2000–May 2015 (USD million)

<table>
<thead>
<tr>
<th>Category</th>
<th>USD million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal Production</td>
<td>27.73</td>
</tr>
<tr>
<td>Diamond, Gold Ornaments</td>
<td>714.39</td>
</tr>
<tr>
<td>Mining</td>
<td>1,671.87</td>
</tr>
<tr>
<td>Metallurgical Industry</td>
<td>8,620.54</td>
</tr>
</tbody>
</table>

*Source: Department of Industrial Policy & Promotion, TechSci Research*
## METALS AND MINING

### MERGER AND ACQUISITIONS

<table>
<thead>
<tr>
<th>Acquirer</th>
<th>Target</th>
<th>Acquisition price (USD million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated Stone Industries Ltd</td>
<td>Al Rawasi Rocks and Aggregates (in November 2014)</td>
<td>5.9</td>
</tr>
<tr>
<td>SAIL</td>
<td>Reiterated its interest to acquire majority stake in Neelachal Ispat Nigam Limited (NINL) in Jajpur, Odisha</td>
<td>-</td>
</tr>
<tr>
<td>Joint Venture between Vedanta Resources and Sesa Goa</td>
<td>Merger of Sterlite Industries (Indian subsidiary of Vedanta Resources ) and Sesa Goa</td>
<td>3,900</td>
</tr>
<tr>
<td>GVK Power &amp; Infrastructure Ltd</td>
<td>Hancock Coal-Queensland Coal</td>
<td>1,260.0</td>
</tr>
<tr>
<td>Sesa Goa Ltd</td>
<td>Cairn India Ltd</td>
<td>1,175.9</td>
</tr>
<tr>
<td>JFE Steel Corp</td>
<td>JSW Steel Ltd</td>
<td>1,029.1</td>
</tr>
<tr>
<td>Lanco Resources Australia</td>
<td>Griffin Coal Mining Co Pty Ltd</td>
<td>722.7</td>
</tr>
</tbody>
</table>

Source: Thomson Banker, Deal Tracker, TechSci Research
METALS AND MINING

OPPORTUNITIES

AUGUST 2015
## Untapped market with strong growth potential

- India’s per capita steel consumption was 60 kg in 2014 compared with the global average of 217 kg.
- Rural per capita steel consumption is likely to reach around 20 kg from 13 kg currently.
- An amount equal to USD25 billion to USD33 billion is expected to be invested in steel sector over the next six-seven years.

## Scope for new mining capacities in iron ore, bauxite and coal

- India has the world’s sixth-largest reserve base of bauxite and fourth-largest base of iron ore respectively, and accounts for about 7 per cent and 11 per cent respectively, of total world production.
- Moreover, India has the world’s fifth-largest coal reserves and accounts for 7.5 per cent of total global production.

## Rapid growth of user-industries to drive demand for metals and minerals

- Strong long-term demand from the steel industry is expected to further boost the iron ore industry.
- Increasing power production is likely to catapult demand for coal.
- Booming construction, automobiles, and packaging industries are expected to lend substantial support to the metals and mining sector.

## Expansion of product line by existing players

- The iron and steel segment offers a product mix which includes hot rolled parallel flange beams and columns rails, plates, coils, wire rods, and continuously cast products such as billets, blooms, beams, blanks, rounds and slabs as well as metallics and ferro alloy. Looking at the expected growth in sector, existing manufacturers have a huge opportunity to expand their product line in new segments.

Source: WSA, Ernst and Young, TechSci Research

Note: kg - Kilograms

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METALS AND MINING

OPPORTUNITIES IN THE IRON ORE SECTOR

Exploration in proposed exploration zones

- Odisha: Bonai (Keonjhar belt) and Tomka (Daitari and Umerkoke belts)
- Jharkhand: All major high-grade ore deposits contain low-grade lateritic ores
- Karnataka: Bagalkot, Tumkur, and Chitradurga districts
- Maharashtra: Sindhudurg, Gadchiroli, and Gondia
- Chhattisgarh: All 14 deposits of Bailadila range, Dantewada district
- Andhra Pradesh: Kadapa, Kurnool, Karimnagar, Adilabad, and Guntur districts

Opportunities for value-add projects and agglomeration plants for fines utilisation

- Mines production was approximately 1,300 Tonnes in FY14
  - Pelletisation capacity is about 27.64 MTPA
  - Sintering capacity is about 39 MTPA
- Scope for domestic and foreign firms in upcoming PPP opportunities
  - Joint Venture or technical participation with midcap players with lease/license and seeking capital, expertise and technology
  - Through the auction route, players can get access to coal mines and iron ore reserves
  - Introduction of mines and minerals (Development and Regulation) Amendment Bill, 2015 to encourage investments and introducing viable mining practices

Source: PwC, TechSci Research
Notes: MT - Metric Tonnes, MTPA - Metric Tonnes Per Annum

AUGUST 2015

For updated information, please visit www.ibef.org
COAL INDIA LIMITED (CIL): LEADER IN MINING INDUSTRY IN INDIA … (1/2)

* In 2015, CIL produced 422.616 MT of Non Coking Coal and 51.62 MT of Coking Coal in 2015 rising from 462.42 MT in year 2014

* CIL, which aims to increase its output to 1 billion metric tonne (mt) by FY19 from 494.24 mt in FY15.

* Revenue increased at a CAGR of 2.18 per cent to USD11.95 billion over FY09–15

Set up in 1967, Coal India Limited (CIL) is the largest coal mining company in India

Coal India contributes around 81 per cent of total coal production in India

Source: Bloomberg, TechSci Research
Notes: MT - Million Tonnes, MoU - Memorandum of Understanding, CAGR - Compound Annual Growth Rate,
The company's strategic overseas ventures with Colombia and US enabled it to meet India's rising energy demand.

CIL has drawn up a five-year investment plan (2012-17) worth USD10.67 billion, half of which would be capital investments, including the acquisition of overseas coal assets.

Government has recently allocated 116 coal blocks to CIL for expansion.

Coal production increased at a CAGR of 3.46 per cent to 462.4 MT over 2011–2015.

**Coal production (in million tonnes) 2011-15**

<table>
<thead>
<tr>
<th>Year</th>
<th>Non Coking Coal</th>
<th>Coaking Coal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>422.616</td>
<td>51.622</td>
</tr>
<tr>
<td>2014</td>
<td>413.504</td>
<td>48.918</td>
</tr>
<tr>
<td>2013</td>
<td>408.555</td>
<td>43.656</td>
</tr>
<tr>
<td>2012</td>
<td>392.48</td>
<td>43.36</td>
</tr>
<tr>
<td>2011</td>
<td>389.97</td>
<td>41.35</td>
</tr>
</tbody>
</table>

*Source: CIL Company website, TechSci Research*

Notes: CAGR - Compound Annual Growth Rate, MT - Million Tonnes
In 2015, ArcelorMittal, and SAIL signed Memorandum of Understanding (‘MoU’) for setting up an automotive steel manufacturing facility in Joint Venture.

In 2015, SAIL modernised and expanded its IISCO Steel facility at Burnpur.

SAIL was awarded Good Corporate Citizen Award by PHD Chamber in 2014.

In 2013, company floated a global tender, inviting bids from potential partners, to install a 1.2 mtpa cold rolling mill complex at Rourkela Steel Plant.

Revenue increased at a CAGR of 1.86 per cent to USD7.81 billion over FY11–14.

Revenues (USD billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (USD billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY10</td>
<td>9.35</td>
</tr>
<tr>
<td>FY11</td>
<td>10.39</td>
</tr>
<tr>
<td>FY12</td>
<td>9.95</td>
</tr>
<tr>
<td>FY13</td>
<td>8.30</td>
</tr>
<tr>
<td>FY14</td>
<td>7.81</td>
</tr>
</tbody>
</table>

Source: Company website, TechSci Research

Notes: Viswakarma Award is for outstanding achievement or good performance on the part of workers in increasing productivity, quality, safety, working conditions, import substitution etc., CAGR - Compounded Annual Growth Rate, * - Growth in INR terms, ITmk3 - Ironmaking Technology Mark 3, MOIL - Manganese Ore India Limited, NTPC - National Thermal Power Corporation, DVC - Damodar Valley Corporation
SAIL was largest steel producer in India in FY2014

It was also awarded the “Company with Best CSR & Sustainability Practices Award 2013” by Asian Centre for Corporate Governance & Sustainability

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**Total saleable steel production (million tonnes)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 08</td>
<td>13</td>
</tr>
<tr>
<td>FY 09</td>
<td>12.5</td>
</tr>
<tr>
<td>FY 10</td>
<td>12.6</td>
</tr>
<tr>
<td>FY 11</td>
<td>12.9</td>
</tr>
<tr>
<td>FY 12</td>
<td>12.4</td>
</tr>
<tr>
<td>FY 13</td>
<td>12.4</td>
</tr>
<tr>
<td>FY 14</td>
<td>12.9</td>
</tr>
<tr>
<td>FY 15</td>
<td>9.4</td>
</tr>
</tbody>
</table>

*Source: Company website, TechSci Research*

Notes: *-April to December 14*
Aluminium Association of India
118, 1st Floor, Ramanashree Arcade
18, M. G. Road
Bengaluru, Karnataka-560 001
Phone: 91- 80-25582197, 25582757
Fax: 91-80-25594535
E-mail: aluminium@eth.net

Federation of Indian Mineral Industries
FIMI House, B-311, Okhla Industrial Area
Phase-I, New Delhi-110 020
Phone: 91-11- 26814596
Fax: 91-11- 26814593
E-mail: fimi@fedmin.com

Indian Stainless Steel Development Association
L -22/4, DLF Phase–II
Gurgaon, Haryana-122 002
Phone: 91-124 - 4375501
Fax: 91-124 - 4375509
E-mail: nissda@gmail.com
BMI’s Mining Business Environment Ratings

★ **Market structure:** It takes into consideration mining output in USD billion, sector value growth, per cent y-o-y r, mining sector, per cent of GDP

★ **Country structure:** It takes into consideration labour market infrastructure, physical infrastructure r, tax, and scope of state

★ **Market risks:** It considers metals prices, 5-year, forecast average, metals price forecast, average 5-year growth, regulatory framework, legal framework

★ **Country risk:** It considers, long-term external risk, corruption, bureaucracy, long-term policy continuity

★ **Mining ratings:** It shows the overall scores of the above indicators
GLOSSARY

* CAGR: Compound Annual Growth Rate
* FDI: Foreign Direct Investment
* FY: Indian Financial Year (April to March)
  * So FY10 implies April 2009 to March 2010
* GOI: Government of India
* IBM: The Indian Bureau of Mines
* MoU: Memorandum of Understanding
* PPP: It could denote two things (mentioned in the presentation accordingly) –
  * Purchasing Power Parity (used in calculating per-capita GDP)
  * Public Private Partnership (a type of joint venture between the public and private sectors)
* PE: Private Equity
* 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>
</tr>
<tr>
<td>2008–09</td>
<td>46.14</td>
</tr>
<tr>
<td>2009–10</td>
<td>47.42</td>
</tr>
<tr>
<td>2010–11</td>
<td>45.62</td>
</tr>
<tr>
<td>2011–12</td>
<td>46.88</td>
</tr>
<tr>
<td>2012–13</td>
<td>54.31</td>
</tr>
<tr>
<td>2013–14</td>
<td>60.28</td>
</tr>
<tr>
<td>2014-15(Expected)</td>
<td>60.28</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>
</tr>
<tr>
<td>2007</td>
<td>41.34</td>
</tr>
<tr>
<td>2008</td>
<td>43.62</td>
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<tr>
<td>2009</td>
<td>48.42</td>
</tr>
<tr>
<td>2010</td>
<td>45.72</td>
</tr>
<tr>
<td>2011</td>
<td>46.85</td>
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<tr>
<td>2012</td>
<td>53.46</td>
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<tr>
<td>2013</td>
<td>58.44</td>
</tr>
<tr>
<td>2014</td>
<td>61.03</td>
</tr>
<tr>
<td>2015(Expected)</td>
<td>61.03</td>
</tr>
</tbody>
</table>

Average for the year
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