EXECUTIVE SUMMARY

Third Largest coal producer

- India is the 3rd largest producer of coal. Coal production stood at 539 million tonnes in FY16. India has the 5th-largest estimated coal reserves in the world, standing at 60.6 billion tonnes in FY16 & with 1,878 operational mines during the same year.

Fourth-Largest iron ore producer

- India ranks 4th globally in terms of iron ore production. In FY16, production is expected to reach 140 million tonnes of iron ore. India has around 8 per cent of world’s deposit of iron ore.

Third largest steel producer in 2015

- India has become the 3rd-largest steel producer in FY16 with the production of finished steel at 90.63 million tonnes. India stood as the 3rd-largest crude steel producer in 2015, while its production increased to 90 million tonnes in FY16 as compared to 88 million tonnes in FY15.

Seventh-largest bauxite reserves

- According to Ministry of Mines, India has the 7th-largest bauxite reserves which was around 593 million tonnes in FY15. Aluminum production is estimated to be 4.7 million tonnes per annum during 2012–17 while the aluminum production is expected to increase by 6 per cent in FY16 from FY15.

Long duration mining lease

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

Source: Ministry of Coal, Worldsteel.org, BP, Ernst & Young, TechSci Research
Note: CAGR - Compound Annual Growth Rate
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
- 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
- In February 2017, the country’s coal ministry allowed private companies to engage into mining activities for commercial purposes

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
- Under the Union Budget 2016-17, the Government changed customs and excise duty on certain mineral fuels & mineral oils.

Source: Data Monitor, RBI, EY, TechSci Research
Notes: FDI - Foreign Direct Investment, MMDR Bill - Mines and Mineral (Development and Regulation) Bill, F – Forecast, 2016¹ – Data is for March to September 2016
METALS AND MINING

MARKET OVERVIEW AND TRENDS
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 seventh largest reserve of bauxite in the world in 2015
• Cumulative FDI inflows into mining sector, during April 2000 to March 2016, stood at around USD2,216.09 million
• 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 FY16 total finished steel imports were 11.21 million tonnes while the exports for the same year was 3.80 million tonnes

Source: World Steel Association (WSA), DIPP, DataMonitor, TechSci Research
Note: CAGR - Compound Annual Growth Rate
SEGMENTS OF METALS AND MINING INDUSTRY

- **Iron and steel**
  - 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.

- **Coal**
  - Coal market consists of primary coal (anthracite, bituminous, and lignite).

- **Aluminium**
  - Aluminium segment includes primary aluminium, aluminium extrusions, aluminium rolled products, alumina chemicals.

- **Bauxite**
  - Bauxites are sub-divided into two basic types based on the processing methods - Tropical bauxite and European bauxite.

- **Base metals**
  - Base metal market consists of lead, zinc, copper, nickel and tin.

- **Precious metals and minerals**
  - Precious metals market includes gold, silver, platinum, palladium, rhodium and diamond.
In FY16, India had 1,878 operative mines – excluding mining areas for minor minerals, crude petroleum, natural gas & 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)

During 2011-16, value of ore & mineral imports into India witnessed a negative growth at a CAGR of -0.028 per cent

By FY16, India’s iron ore imports are expected to decline by 60 per cent with the considerate improvement in the domestic production market

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>FY11</td>
<td>146.65</td>
</tr>
<tr>
<td>FY12</td>
<td>201.46</td>
</tr>
<tr>
<td>FY13</td>
<td>202.69</td>
</tr>
<tr>
<td>FY14</td>
<td>201.7</td>
</tr>
<tr>
<td>FY15</td>
<td>175.51</td>
</tr>
<tr>
<td>FY16</td>
<td>132.03</td>
</tr>
</tbody>
</table>

Source: Make in India, 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 2015, India stood as the third largest crude steel producer in the world, while the total crude steel production was 88 MT
- India accounted for 5.5 per cent of the total steel production in the world in the year 2015
- India is third largest producer of crude steel in the Asia-Pacific region in 2015. Total finished steel production (alloy+ non-alloy) in India is estimated to reach 90 million tonnes in FY16
- In FY16E, offshore region accounted for 20.20 per cent share in India’s share of states in value of mineral production.

**Shares in India’s mining sector (In terms of Reporting Mines, FY16E)**

- Non-Metallic Minerals
- Metallic Minerals
- Coal (including Lignite)

**India’s share of States in Value of Mineral Production (FY16E)**

- Offshore Region: 20.20%
- Rajasthan: 11.93%
- Odisha: 10.88%
- Jharkhand: 9.05%
- Gujarat: 7.73%
- Madhya Pradesh: 6.21%
- Telangana: 6.21%
- Chhattisgarh: 6.19%
- Maharashtra: 5.22%
- Assam: 4.33%
- Andhra Pradesh: 3.75%
- Remaining States: 3.01%

Source: DataMonitor, Ministry of Mines, TechSci Research
Note: MMT- Million Metric Tonnes, E-Estimated

For updated information, please visit www.ibef.org
**Iron Ore Production**

- In 2015, India stood as the largest producer of direct reduced iron ore & world’s 4th largest iron ore producer (global share of 8 per cent)
- Total production of iron ore in FY15 stood at 129 million tonnes. Private sector accounted for 61 per cent of India’s total iron ore production in FY15
- In FY16, Odisha’s iron ore production increased by 50 per cent reaching 80.86 million tonne (mt), whereas, iron ore production in Karnataka is estimated to reach 25 million tonne (mt), during the same period
- 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>FY15</th>
<th>FY16P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>188</td>
<td>213</td>
<td>213</td>
<td>219</td>
<td>207</td>
<td>167</td>
<td>136</td>
<td>152</td>
<td>129</td>
<td>155</td>
</tr>
</tbody>
</table>

Notes: CAGR- Compounded Annual Growth Rate, P – Provisional*
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 FY16, India had a net export of 3.80 MT of finished steel where as imports stood at 11.21 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 almost 67 million metric tonnes in FY16, expanding at a CAGR of 3.18 per cent over 2006–16, making it world’s 3rd-largest producer of crude steel (2015), with a global share of 5.5 per cent.

**Crude steel production (million metric tonnes)**

**Shares in global crude steel production (2015)**

- China: 49.6%
- Japan: 29.2%
- India: 4.4%
- United States: 4.9%
- Russia: 5.5%
- Others: 6.5%

Source: World Steel Association, TechSci Research

Note: CAGR - Compound Annual Growth Rate
In FY16, India’s iron and steel exports were valued at USD5.5 billion. During FY10-16, India’s exports of iron and steel increased at a CAGR of 3.4 per cent.

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

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

During September 2016, the consumption of finished steel in the country was recorded at 6.7 mt, showing a 7 per cent year on year (y-o-y) growth. Exports on year on year basis, increased sharply by 111 per cent to 655 kt during the same month.

Notes: CAGR - Compound Annual Growth Rate, FY17¹ - Data from April – August 2016
mt: million tonne; kt: kilo tonne
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 4.3 per cent over FY10-16)

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY10</td>
<td>8.8</td>
</tr>
<tr>
<td>FY11</td>
<td>11.0</td>
</tr>
<tr>
<td>FY12</td>
<td>13.7</td>
</tr>
<tr>
<td>FY13</td>
<td>13.6</td>
</tr>
<tr>
<td>FY14</td>
<td>9.1</td>
</tr>
<tr>
<td>FY15</td>
<td>12.3</td>
</tr>
<tr>
<td>FY16</td>
<td>11.3</td>
</tr>
<tr>
<td>FY17</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Notes: CAGR - Compound Annual Growth Rate, FY17¹ – Data from April -August 2016
INDIA’S ROLE IN GLOBAL COAL PRODUCTION

In 2015, India had the 5th-largest coal proved reserves globally, of which 92.6 per cent was Anthracite and Bituminous while 7.4 per cent was Sub Bituminous and Lignite.

In 2015, India contributed around 7.4 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 (2015)

- China: 47.7%
- US: 19.5%
- India: 11.9%
- Australia: 7.2%
- Indonesia: 6.3%
- Rest of the World: 7.4%

**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.

* During FY 2016-17 (till October), 22 million tonnes of coal linkages have been auctioned for the non-regulated sector.

![Graph showing coal production (million tonnes) with CAGR: 1.28% from FY09 to FY16](image)

**Coal production (million tonnes)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY09</td>
<td>493</td>
</tr>
<tr>
<td>FY10</td>
<td>532</td>
</tr>
<tr>
<td>FY11</td>
<td>533</td>
</tr>
<tr>
<td>FY12</td>
<td>540</td>
</tr>
<tr>
<td>FY13</td>
<td>558</td>
</tr>
<tr>
<td>FY14</td>
<td>565</td>
</tr>
<tr>
<td>FY15</td>
<td>611</td>
</tr>
<tr>
<td>FY16</td>
<td>539</td>
</tr>
</tbody>
</table>

**Source:** Ministry of Mines, TechSci Research

**Notes:** CAGR - Compound Annual Growth Rate, FY17¹ - Data is for April-May 2016
METALS AND MINING

KEY GEOLOGICAL COAL AND IRON ORE DEPOSITS IN INDIA

States with major coal deposits (as of 2015)
- 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 (as of 2015)
- 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)

Coal deposits in million tonnes (mt)
Iron ore deposits in million tonnes (mt)


For updated information, please visit www.ibef.org
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’s aluminum production is estimated to reach 2.3 million tonnes in FY16. This increase is likely to occur due to capacity expansion by major producers, which became operational in FY15.

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 593 million tonnes of bauxite reserves, the seventh-largest deposit of bauxite globally.

Aluminium demand by sector (2014)

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

India’s share in global aluminium production (2016E)

- China: 52.0%
- EU: 11.6%
- US: 11.5%
- Japan: 9.7%
- India: 5.5%
- South Korea: 4.0%
- Brazil: 3.2%
- Turkey: 3.1%
- Russia: 2.3%
- Canada: 1.7%
- Others: 1.1%

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 6.2 per cent over FY10–16E.
- Total aluminum imports in India during FY16 stood at USD3.43 billion, whereas, in FY17¹ it reached USD0.82 billion.

Aluminum production (million tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY10</td>
<td>1.60</td>
</tr>
<tr>
<td>FY11</td>
<td>1.70</td>
</tr>
<tr>
<td>FY12</td>
<td>1.70</td>
</tr>
<tr>
<td>FY13</td>
<td>1.70</td>
</tr>
<tr>
<td>FY14</td>
<td>1.70</td>
</tr>
<tr>
<td>FY15</td>
<td>2.00</td>
</tr>
<tr>
<td>FY16E</td>
<td>2.30</td>
</tr>
</tbody>
</table>

CAGR: 6.2%

Notes: ICRA - Information Credit Rating Agency Ltd, CAGR - Compound Annual Growth Rate
E- Estimated, FY17¹ – Data from April to August 2016
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, construction & packaging

* Consumption of aluminium in India was expected to be about 1.9 million tonnes in FY16, and is expected to reach to 10 million tonnes by 2020

Aluminum consumption (million tonnes)

Source: WBMS, EIU, TechSci Research
Note: CAGR - Compound Annual Growth Rate
Note E – Estimate
## 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>NA</td>
<td></td>
<td>Sesa Goa, SAIL, Orissa Minerals</td>
</tr>
<tr>
<td>Coal</td>
<td>Coal India Limited</td>
<td>80 per cent</td>
<td>Singareni Collieries Company, Reliance Natural Resources</td>
</tr>
<tr>
<td>Aluminium</td>
<td>Hindalco</td>
<td>60 per cent</td>
<td>National Aluminium Company (NALCO), Bharat Aluminium Company (BALCO)</td>
</tr>
</tbody>
</table>
## NOTABLE TRENDS IN THE METALS AND MINING SECTOR

### 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.
- As per government, USD 341.74 million of revenue was generated from 74 coal mines till May 2016.

### 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.
- Adani Enterprises announced construction on its USD 21.7 billion Carmichael mine in Australia, is expected to begin by mid 2017.

### Outlook of Metal and Mining
- In March FY16, the index of mineral production was 148.8 and the total value of mineral production stood at USD 3.41 billion in FY16.

Source: TechSci Research, Mining Global Inc.
Note: MT - Metric Tonnes

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### PORTER’S FIVE FORCES ANALYSIS

#### Competitive Rivalry
- Commodity prices are set internationally and individual players have no control over it
- Competition is high to identify commodity reserves leading to more market share

#### Threat of New Entrants
- Exploration and development of mines requires large capital investment

#### Substitute Products
- Threat of substitute products is low

#### Bargaining Power of Suppliers
- Highly regulated industry
- Difficult to get mining permits

#### Bargaining Power of Customers
- Demand/supply imbalance determines the price of commodities.
- Major customers typically negotiate prices based on current market levels

Source: TechSci Research
METALS AND MINING

STRATEGIES ADOPTED
**METALS AND MINING**

**STRATEGIES ADOPTED**

- **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
      - Optimisation 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
    - The Ministry of Mines has put in motion the Mining Surveillance System (MSS), a pan-India surveillance network using latest satellite technology, to check illegal mining.
    - During October 2016, MSTC Limited, one of the country’s leading e-commerce service providers launched ‘M3 Metal Mandi’, a virtual market for metal transactions. The portal primarily aims to benefit micro small & medium enterprises (MSMEs).

- **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*

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METALS AND MINING

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

In FY16, power generation in India was 1107 TWh. Power generation in India expanded at a CAGR of 5.8 per cent during FY08–16.

In June 2016, total power generation capacity stood at 303,118.21 MW, with capacity addition of 86,565.72 MW (upto June 2016) during the year.

In the 11th 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 88,537 MW in the 12th Plan (2012-17) period.

With a huge reserve of coal, around 69.8 per cent of total power generation was done through thermal power plants, while hydro, renewable & nuclear plants contributed 14.1 per cent, 14.1 per cent and 2 per cent respectively in FY16.

NTPC & NALCO, will form a 50:50 joint venture for setting up 2400 MW coal project in Dhenkanal, Odisha.
Sustained growth in India’s automotive sector has been driving demand for steel and aluminum.

Production of automobiles increased at a CAGR of 9.3 per cent over FY10–16.

Two wheelers was the fastest-growing segment, representing a CAGR of 10.2 per cent between FY10–16.

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

Source: SIAM, TechSci Research

Notes: FY - Indian Financial Year (April - March), CAGR – Compounded Annual Growth Rate
F – Forecast

For updated information, please visit www.ibef.org
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 & airport development

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

* India’s infrastructure sector is expected to grow at a CAGR of 35.65 per cent over FY08-25

* During 12th Five Year Plan, NITI Aayog has projected an investment of USD1 trillion for the infrastructure sector with 40 per cent of the funds coming from the private sector in India.

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 & 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 & 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.

Source: Business Monitor International’s (BMI) Report on infrastructure industry in India, TechSci Research
Note: E - Estimated F - Forecasts (by BMI)
CAGR – Compounded Annual Growth Rate
YoY – Year on Year
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 is expected to increase at a CAGR of 10.05 per cent over FY08–20F.

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, F - Forecasted
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 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 & exploit all non-fuel & non-atomic minerals & process all metals as well as for metallurgy
- FDI caps for coal & 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 & 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 & 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 & 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 & metallurgy under the automatic route for all non-fuel & non-atomic minerals including diamonds & precious stones.

During April 2000 – September 2016, cumulative FDI inflows into the metals & mining sector stood at USD11.91 billion.

The sector accounted for 4.13 per cent of total cumulative FDI inflows during the period April 2000 – September 2016.

Cumulative FDI inflows into metals and mining over April 2000–September 2016 (USD million)

| Source: Department of Industrial Policy & Promotion, TechSci Research | Coal Production | 27.73 |
| | Diamond, Gold Ornaments | 851.34 |
| | Mining | 2218.79 |
| | Metallurgical Industries | 9337.63 |

For updated information, please visit www.ibef.org
## 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>JSW Energy Ltd</td>
<td>Jindal Steel and Power Ltd</td>
<td>976</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
### Untapped market with strong growth potential

- India’s per capita steel consumption was 60 kg in 2015 compared with the global average of 222 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 6-7 years

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

- India has the world’s 7th-largest reserve base of bauxite & 4th-largest base of iron ore respectively, and accounts for about 7 per cent & 11 per cent respectively, of total world production
- Moreover, India has the world’s 5th-largest coal reserves & 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 & steel segment offers a product mix which includes hot rolled parallel flange beams & columns, rails, plates, coils, wire rods, & continuously cast products such as billets, blooms, beams, blanks, rounds & slabs as well as metallics & 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
METALS AND MINING

OPPORTUNITIES IN THE IRON ORE SECTOR

Exploration in proposed exploration zones

- Odisha: Bonai (Keonjhar belt) & Tomka (Daitari & 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

- Mineral production reached USD41.1 billion in FY16
  - 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 & technology
  - Through the auction route, players can get access to coal mines & iron ore reserves
  - Introduction of mines & minerals (Development & Regulation) Amendment Bill, 2015 to encourage investments & introducing viable mining practices

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

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

* In 2016¹, CIL produced 485.05 MT of non-coking coal and 53.70 MT of coking coal, rising from 422.62 MT and 51.62 MT in year 2015¹.

* CIL aims to increase its output to 1 billion metric tonne (MT) by FY19 from 538.75 MT in FY16.

* Revenue increased at a CAGR of 1.83 per cent to USD11.92 billion over FY09–16.

---

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

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Notes: MT - Million Tonnes, CAGR - Compound Annual Growth Rate, 2016¹ – Data from April to March for the year

Source: Bloomberg, TechSci Research

Revenues (USD billion)

<table>
<thead>
<tr>
<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>10.50</td>
<td>11.50</td>
<td>11.00</td>
<td>13.30</td>
<td>12.60</td>
<td>11.42</td>
<td>11.95</td>
<td>11.92</td>
</tr>
</tbody>
</table>

CAGR: 1.83%
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.

Non-Coking Coal production increased at a CAGR of 4.5 per cent over 2011-16, whereas, Coking coal production rose at a CAGR of 5.4 per cent.

By March 2016, Coal India Limited produced 538.75 million tonnes of coal, growing at a YoY of 13.6 per cent in comparison to 2015.

During the first seven months of FY2016-17, the company produced 273.57 million tonnes (MT) of coal.

In September 2016, the company signed an MoU with Indian Council of Forestry Research & Education (ICFRE) for effective monitoring of environment related issues in coal mining projects.

### Coal production (in million tonnes) 2011-16

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Coking Coal</th>
<th>Coking Coal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>389.97</td>
<td>41.35</td>
</tr>
<tr>
<td>2012</td>
<td>392.48</td>
<td>43.36</td>
</tr>
<tr>
<td>2013</td>
<td>408.56</td>
<td>43.66</td>
</tr>
<tr>
<td>2014</td>
<td>413.50</td>
<td>48.92</td>
</tr>
<tr>
<td>2015</td>
<td>422.62</td>
<td>51.62</td>
</tr>
<tr>
<td>2016</td>
<td>485.05</td>
<td>53.70</td>
</tr>
</tbody>
</table>

*Source: CIL Company website, TechSci Research*

*Notes: CAGR - Compound Annual Growth Rate, MT - Million Tonnes*
STEEL AUTHORITY OF INDIA LTD (SAIL): A STORY OF STEEL … (1/2)

* 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 revenue reached USD5.88 billion in FY16

* 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

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* Incorporated in 1954, Steel Authority of India Ltd (SAIL) is India’s largest producer of steel and second largest producer of iron ore

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For updated information, please visit www.ibef.org
SAIL was largest steel producer in India in FY16

It was also awarded the “Best in CSR & Sustainability as well as the most eco-friendly Public Sector Unit (PSU) among all Maharatna category” at the 2014 India Today Group PSU Awards

Sale of sealable steel by SAIL, reached 12.1 million tonnes, by FY16

**Source**: Company website, TechSci Research

**Notes**: SAIL – Steel Authority of India Ltd.
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Fax: 91-80-25594535
E-mail: aluminium@eth.net

Federation of Indian Mineral Industries
FIMI House, B-311, Okhla Industrial Area
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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
METALS AND MINING

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>
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<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>
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<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>
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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>2016–17 (E)</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>43.62</td>
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<td>2009</td>
<td>48.42</td>
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<td>2010</td>
<td>45.72</td>
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<tr>
<td>2011</td>
<td>46.85</td>
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<td>2012</td>
<td>53.46</td>
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<td>2013</td>
<td>58.44</td>
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<tr>
<td>2014</td>
<td>61.03</td>
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<tr>
<td>2015</td>
<td>64.15</td>
</tr>
<tr>
<td>2016 (Expected)</td>
<td>67.22</td>
</tr>
</tbody>
</table>

Source: Reserve bank of India, Average for the year

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