

METALS AND MINING



DECEMBER 2016

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METALS AND MINING

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EXECUTIVE SUMMARY

Third Largest coal producer

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

Fourth-Largest iron ore producer

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

Seventh-largest bauxite reserves

- According to Ministry of Mines, India has the seventh-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

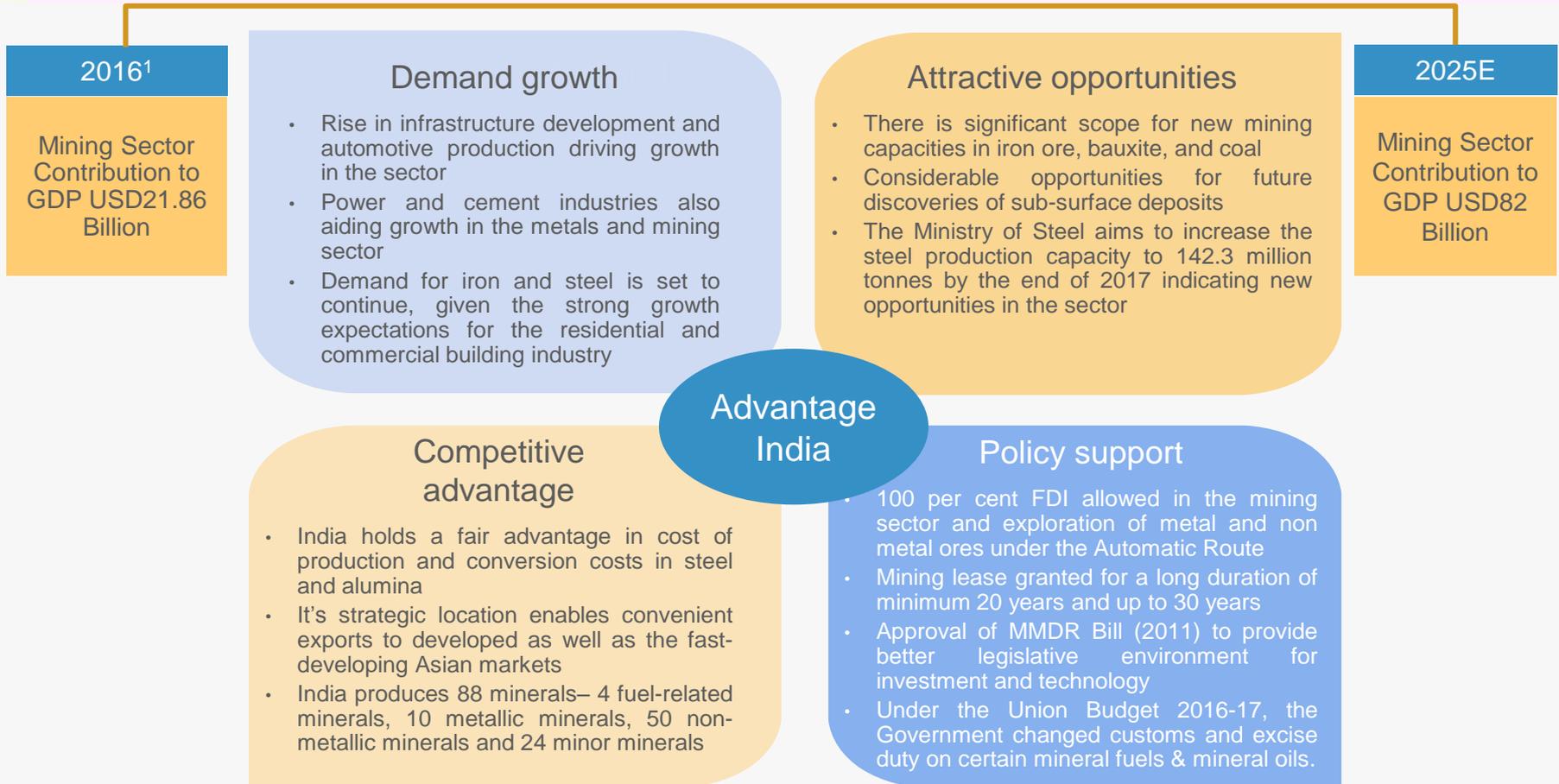
- India has vast mineral potential with mining leases granted for longer durations of 20 to 30 years

Source: Ministry of Coal, Worldsteel.org, BP, Ernst & Young, TechSci Research
Note: CAGR - Compound Annual Growth Rate

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ADVANTAGE INDIA



Source: Data Monitor, RBI, EY, TechSci Research

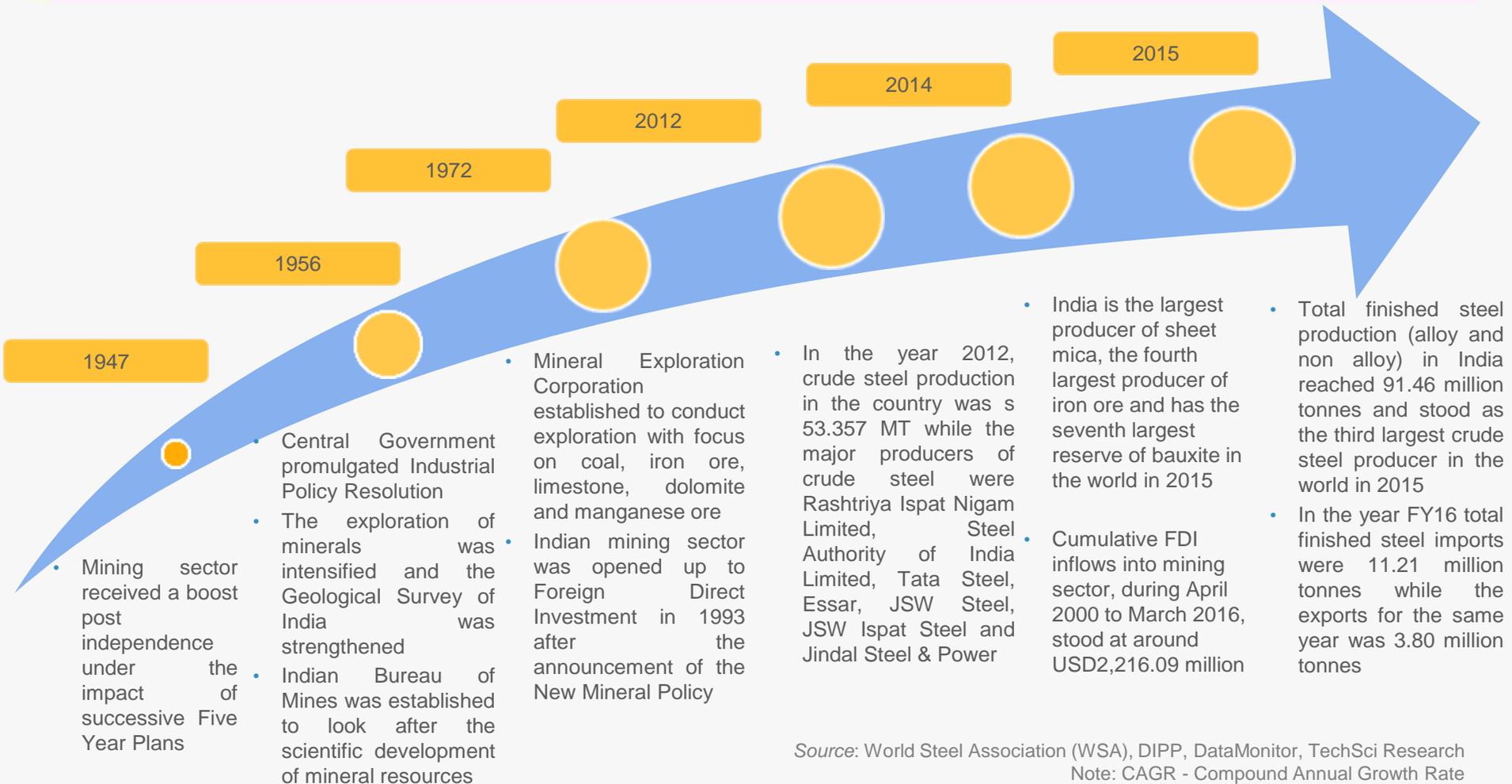
Notes: FDI - Foreign Direct Investment, MMDR Bill - Mines and Mineral (Development and Regulation) Bill, F – Forecast, 2016¹ – Data is for March to September 2015

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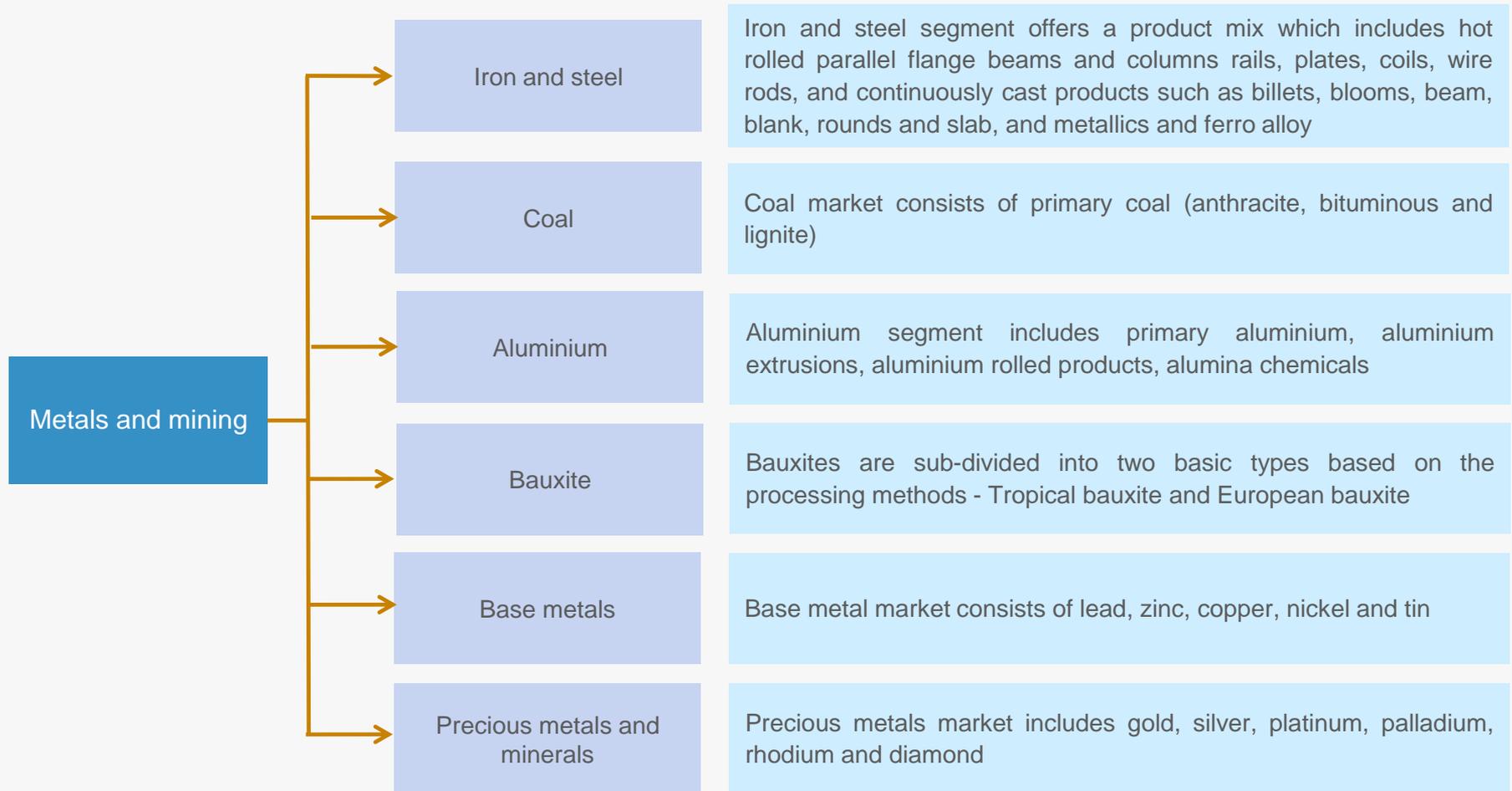


MARKET OVERVIEW AND TRENDS

EVOLUTION OF THE INDIAN METALS AND MINING SECTOR

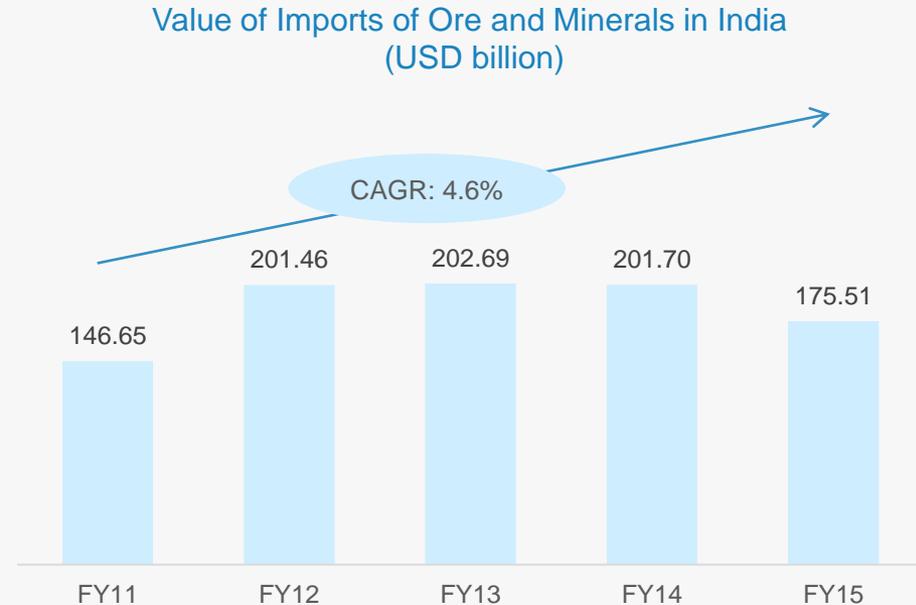


SEGMENTS OF METALS AND MINING INDUSTRY



STRONG GROWTH IN INDIA'S METALS AND MINING SECTOR OVER THE YEARS

- * In FY16, India had 1,878 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)
- * During 2011-15, value of ore and mineral imports into India witnessed growth at a CAGR of 4.6 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

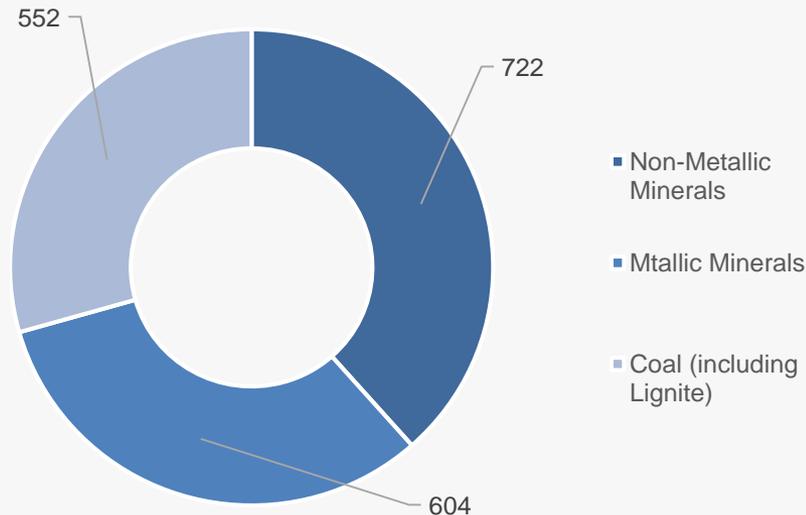


Source: Make in India, Ministry of Mines, TechSci Research
Note: CAGR - Compound Annual Growth Rate

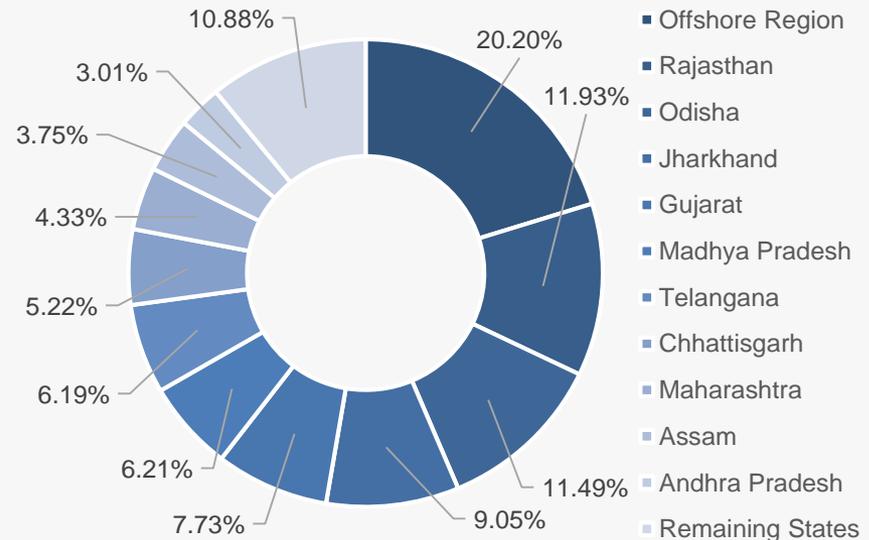
IRON & STEEL ACCOUNTS FOR A MAJOR SHARE IN INDIA'S METALS & MINING SECTOR

- * 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

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



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



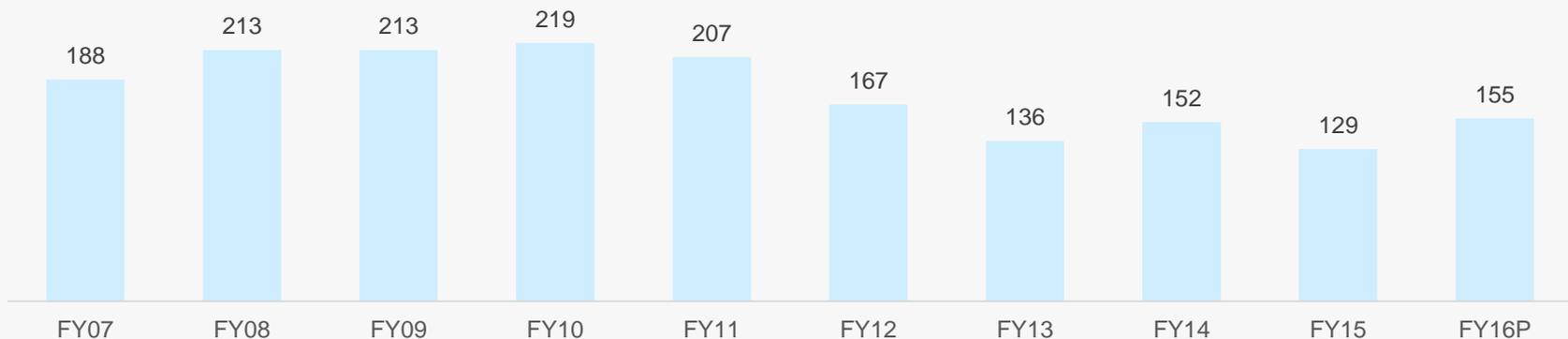
Source: DataMonitor, Ministry of Mines, TechSci Research
Note: MMT- Million Metric Tonnes, E-Estimated

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IRON ORE PRODUCTION

- * In 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)
- * 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
- * During FY 2016-17, iron ore exports from India increased to 7.5 MT, while metal imports into the country significantly declined to 1.59 MT (up to the month of August 2016)

Iron ore production (million tonnes)

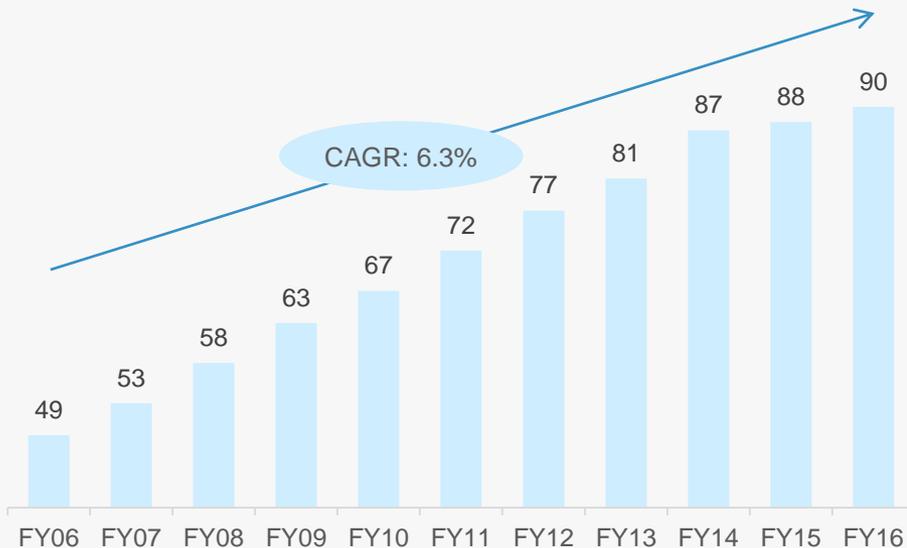


Source: Business Standard, Ministry of Mines (Annual Report), TechSci Research
Notes: CAGR- Compounded Annual Growth Rate, P – Provisional

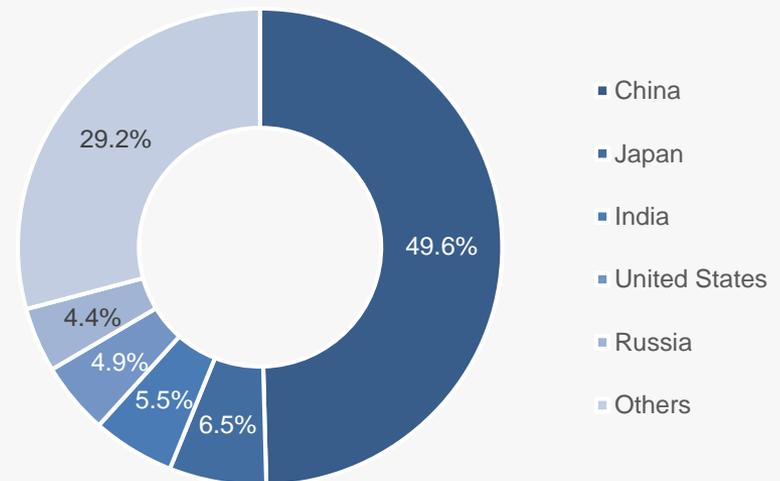
RISING STEEL DEMAND DRIVING GROWTH

- * 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 90 million metric tonnes in FY16, expanding at a CAGR of 6.3 per cent over 2006–16 making it world’s third-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)

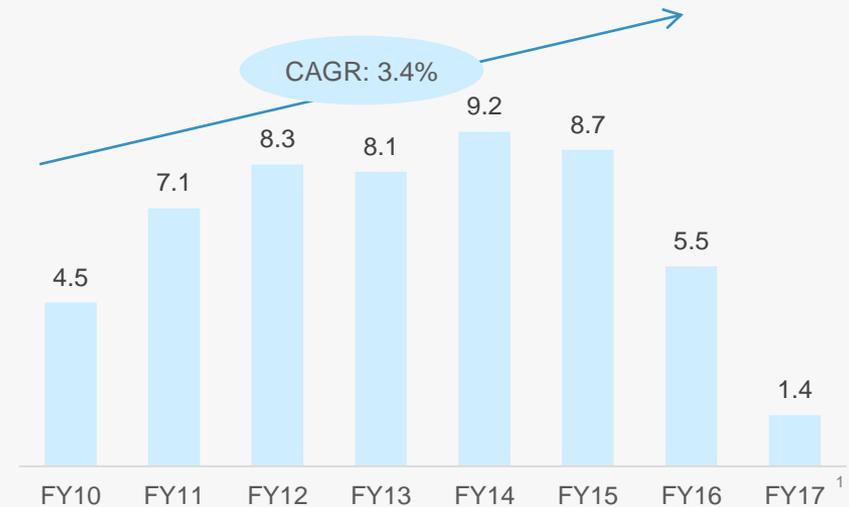


Source: World Steel Association, TechSci Research
Note: CAGR - Compound Annual Growth Rate

RISING DOMESTIC DEMAND PUTS PRESSURE ON SUPPLY OF IRON AND STEEL ... (1/2)

- * 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. 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 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 7.6 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.

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



Source: Ministry of Commerce, DGFT – Directorate General of Foreign Trade, TechSci Research
Notes: CAGR - Compound Annual Growth Rate, FY17¹ – Data from April - June 2017
mt: million tonne; kt: kilo tonne

RISING DOMESTIC DEMAND PUTS PRESSURE ON SUPPLY OF IRON AND STEEL ... (2/2)

- * 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)

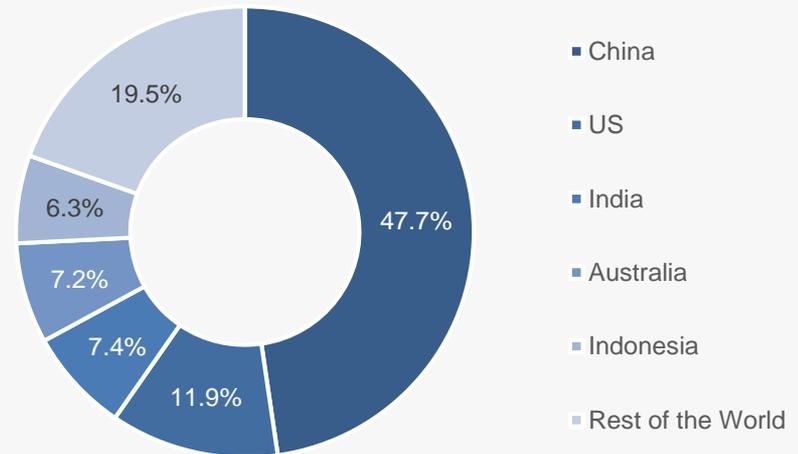


Source: Ministry of Commerce, DGFT – Directorate General of Foreign Trade, TechSci Research
Notes: CAGR - Compound Annual Growth Rate, FY17¹ – Data from April June 2017

INDIA'S ROLE IN GLOBAL COAL PRODUCTION

- * In 2015, India had the fifth-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)

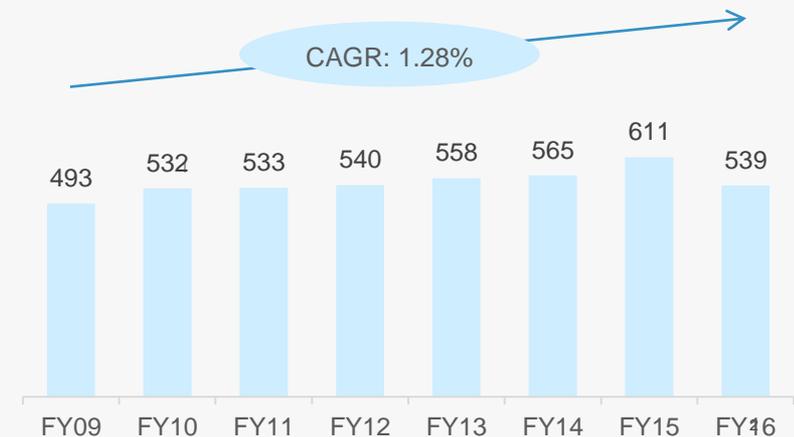


Source: BP Statistical Review of World Energy 2016, World Coal Production, TechSci Research

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 27.11 per cent to reach 212.10 million tonnes in FY15 as power producers imported more due to low prices and a domestic shortage.
- * In FY16, the import of coal is estimated to reach 160 million tonnes. Also, it is forecasted that by FY17 total quantity of imported coal in India would reach 150 million tonnes.
- * During FY 2016-17 (till October), 22 million tonnes of coal linkages have been auctioned for the non-regulated sector

Coal production (million tonnes)



Source: Ministry of Mines, TechSci Research
Notes: CAGR - Compound Annual Growth Rate,
FY17¹ - Data is for April-May 2016

KEY GEOLOGICAL COAL AND IRON ORE DEPOSITS IN INDIA

States with major coal deposits

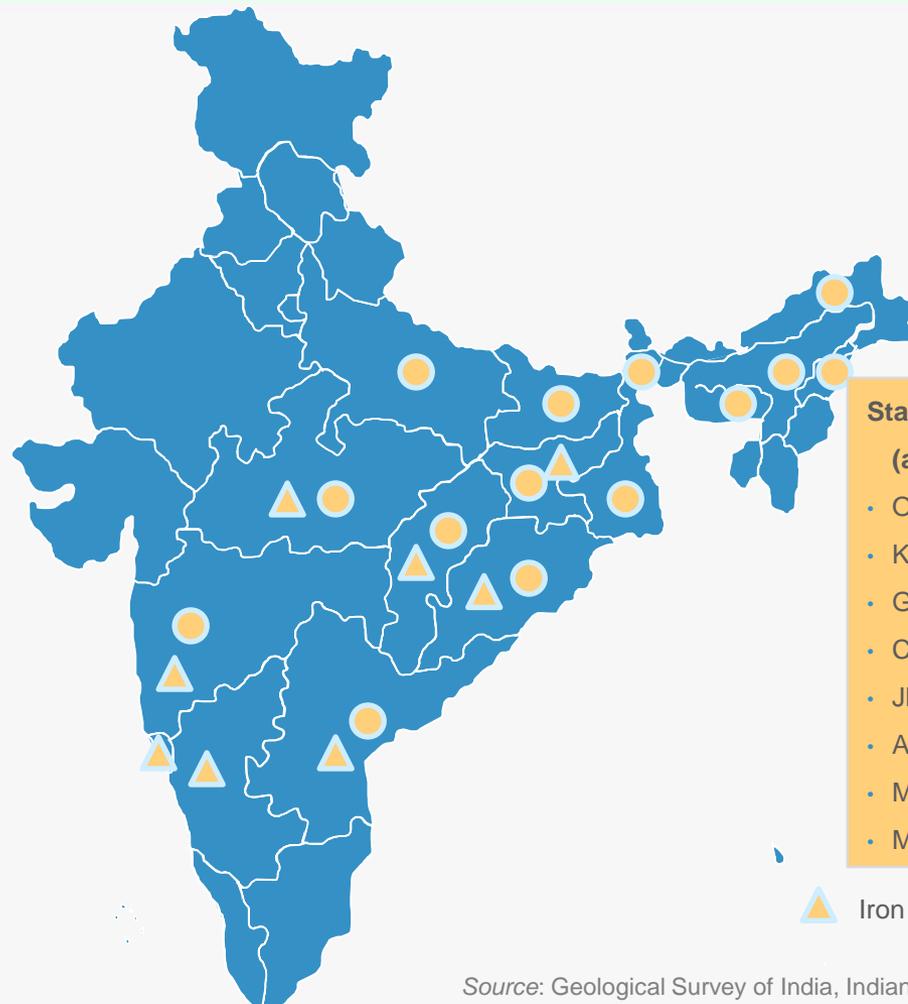
(as of 2015)

- 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)

 Coal deposits in million tonnes (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)

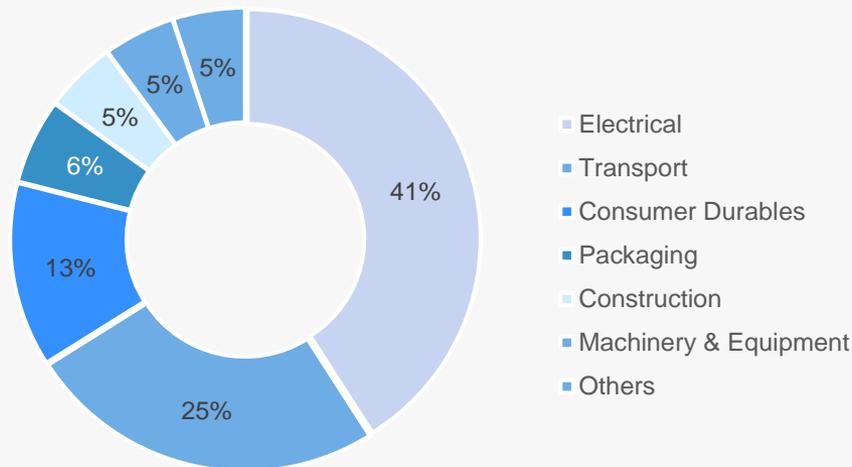
 Iron ore deposits in million tonnes (mt)

Source: Geological Survey of India, Indian Bureau of Mines, TechSci Research

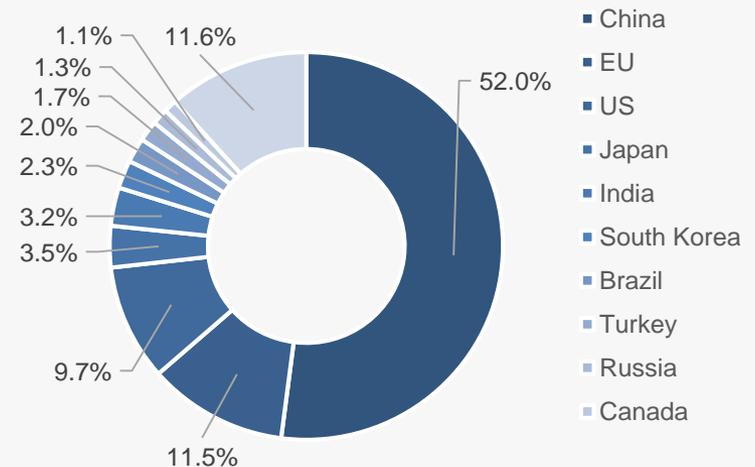
INDIA'S ROLE IN GLOBAL ALUMINIUM PRODUCTION

- * 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'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)



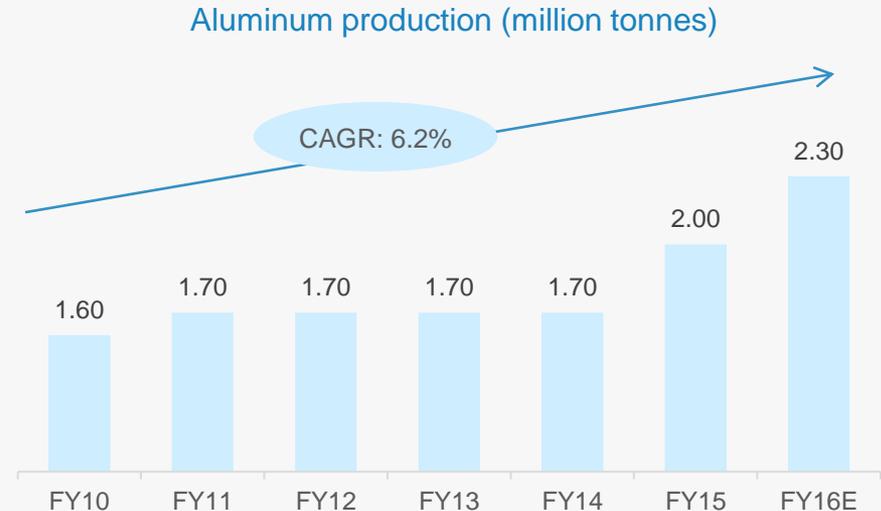
India's share in global aluminium production (2016E)



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

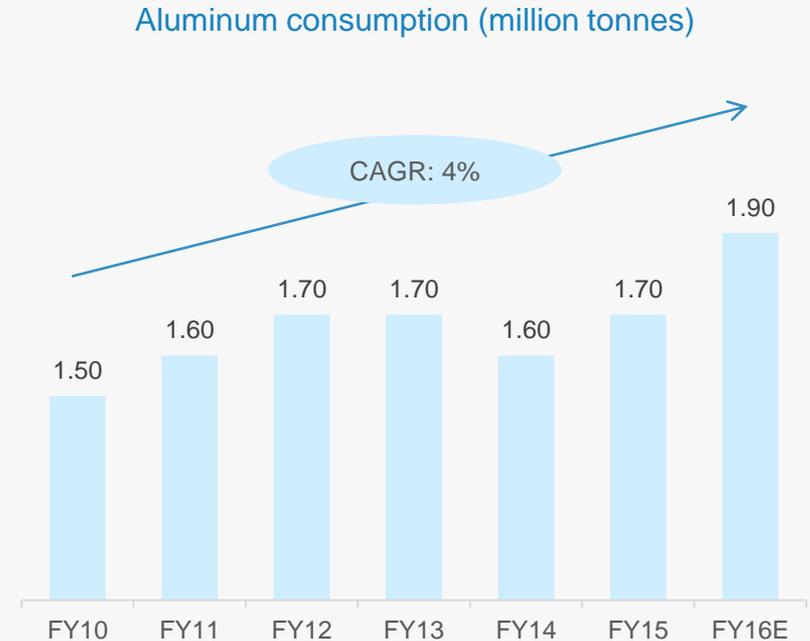
- * Demand for aluminium is expected to pick up as the scenario improves for user industries, like power, infrastructure and transportation
- * Aluminum production is estimated to be 4.7 million tonnes per annum during 2012–17
- * Production of aluminum increased at a CAGR of 6.2 per cent over FY10–16E
- * Total aluminum imports in India during FY16 stood at USD3.43 billion, whereas, in FY17¹ it reached USD0.82 billion
- * Vedanta plans to expand its alumina and aluminum production capacity over the next three years, with an investment of over USD 2.3 billion



Source: World Bureau of Metal Statistics (WBMS), EIU, ICRA Management Consulting Services Ltd (IMaCS), DGFT – Directorate General of Foreign Trade, TechSci Research
Notes: ICRA - Information Credit Rating Agency Ltd, CAGR - Compound Annual Growth Rate
E- Estimated, FY17¹ – Data from April June 2017

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 1.9 million tonnes in FY16, and is expected to reach to 10 million tonnes by 2020



Source: WBMS, EIU, TechSci Research
Note: CAGR - Compound Annual Growth Rate
Note E – Estimate

MAJOR METALS AND MINING PLAYERS IN THE COUNTRY

Segment	Major player	Market share	Other players
Iron and Steel		NA	Sesa Goa, SAIL, Orissa Minerals
Coal	 कोल इण्डिया लिमिटेड Coal India Limited भारत सरकार का उपक्रम Government of India Undertaking एक महान कोयला A Mahan Coal Company	80 per cent	Singareni Collieries Company, Reliance Natural Resources
Aluminium	 HINDALCO ADITYA BIRLA GROUP	60 per cent	National Aluminium Company (NALCO), Bharat Aluminium Company (BALCO)

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, USD341.74 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 USD3.41 billion in FY16

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

METALS AND MINING



PORTERS FIVE FORCES ANALYSIS

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

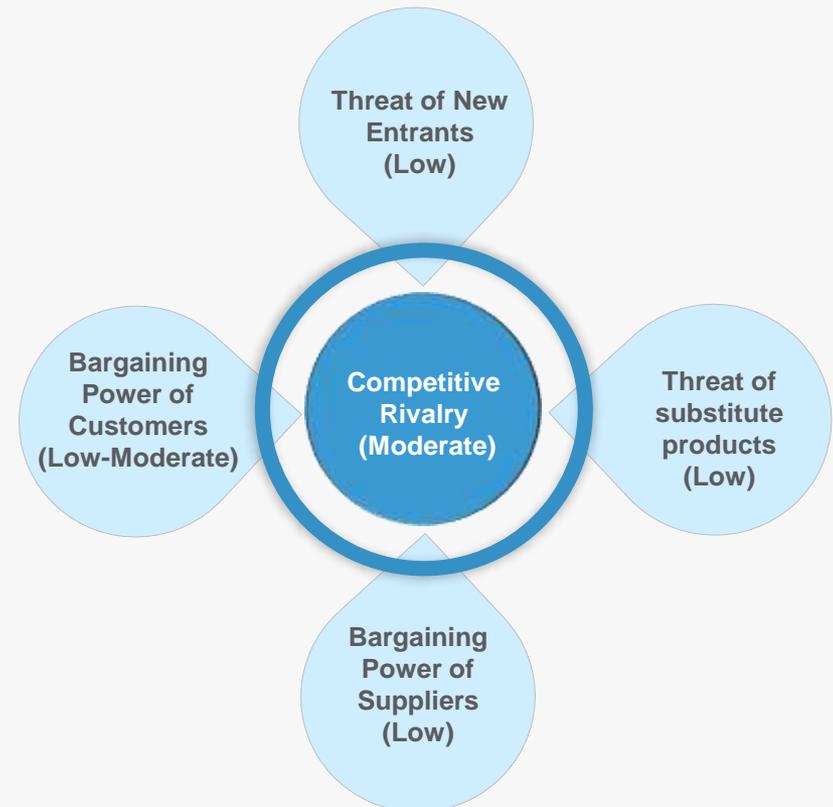
- Threat of substitute products is low

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

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

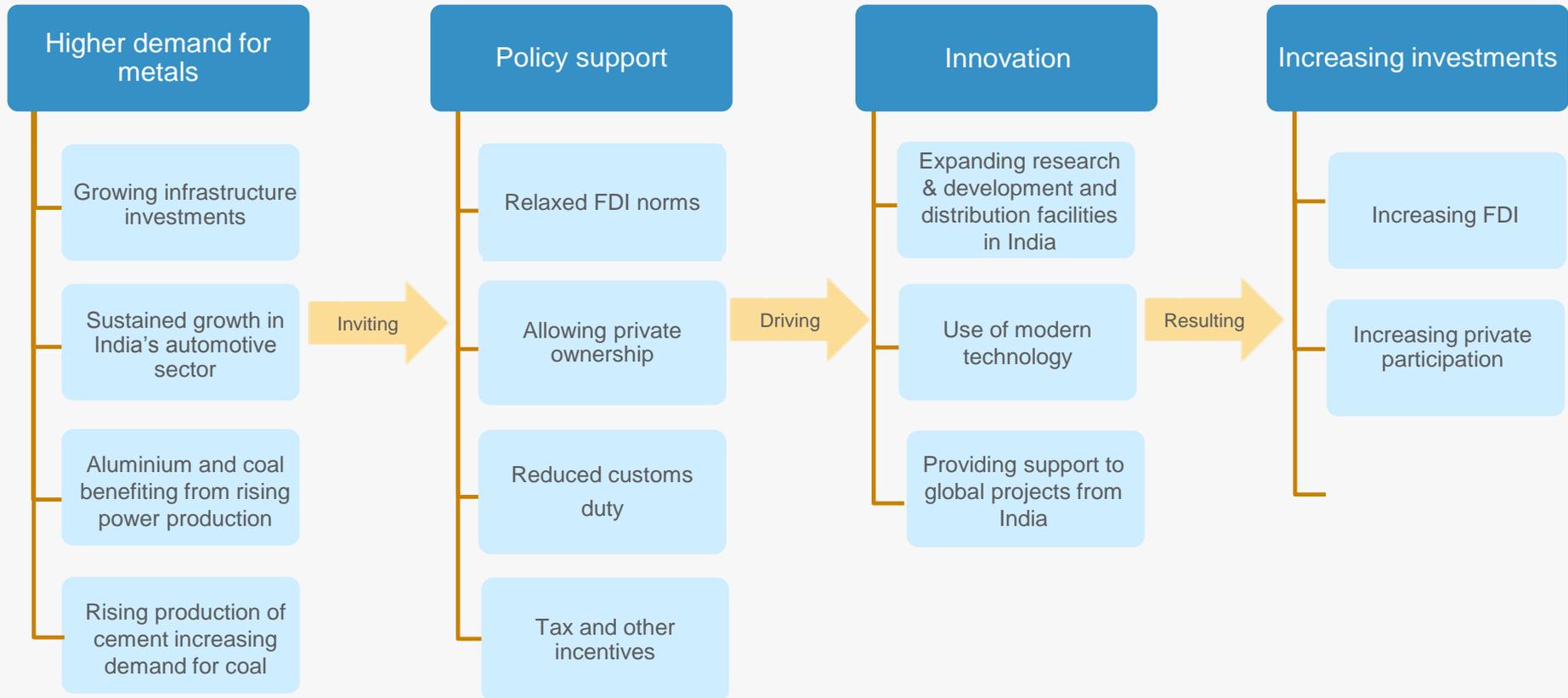
Source: SAIL Company website, Business Standard, TechSci Research
Notes: MoU – Memorandum of Understanding,
GPS – Global Positioning System, GPRS - General Packet Radio Service

METALS AND MINING



GROWTH DRIVERS

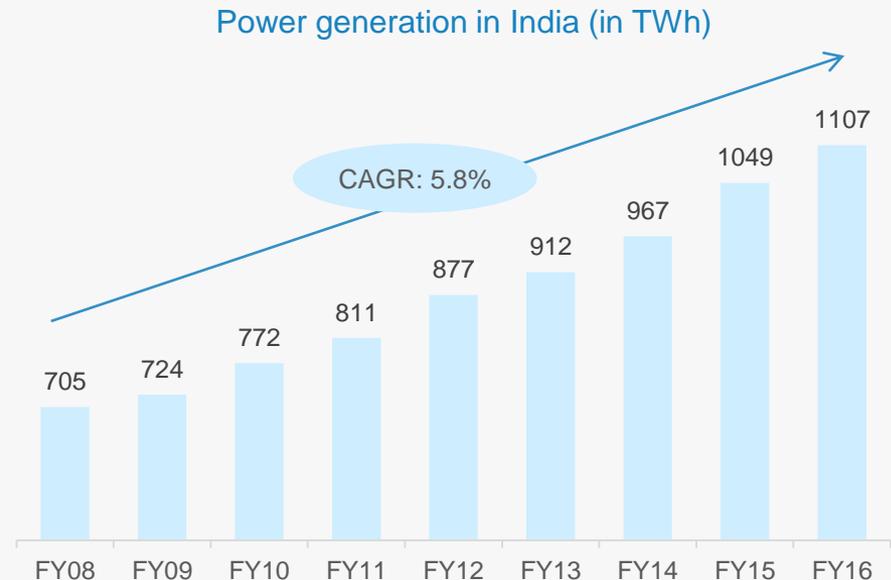
STRONG FUNDAMENTALS AND POLICY SUPPORT AIDING GROWTH



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

POWER AND AUTOMOTIVE PRODUCTION FUELLING DEMAND ... (1/2)

- * 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 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 88,537 MW in the Twelfth 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 and nuclear plants contributed 14.1 per cent, 14.1 per cent and 2 per cent respectively in FY16

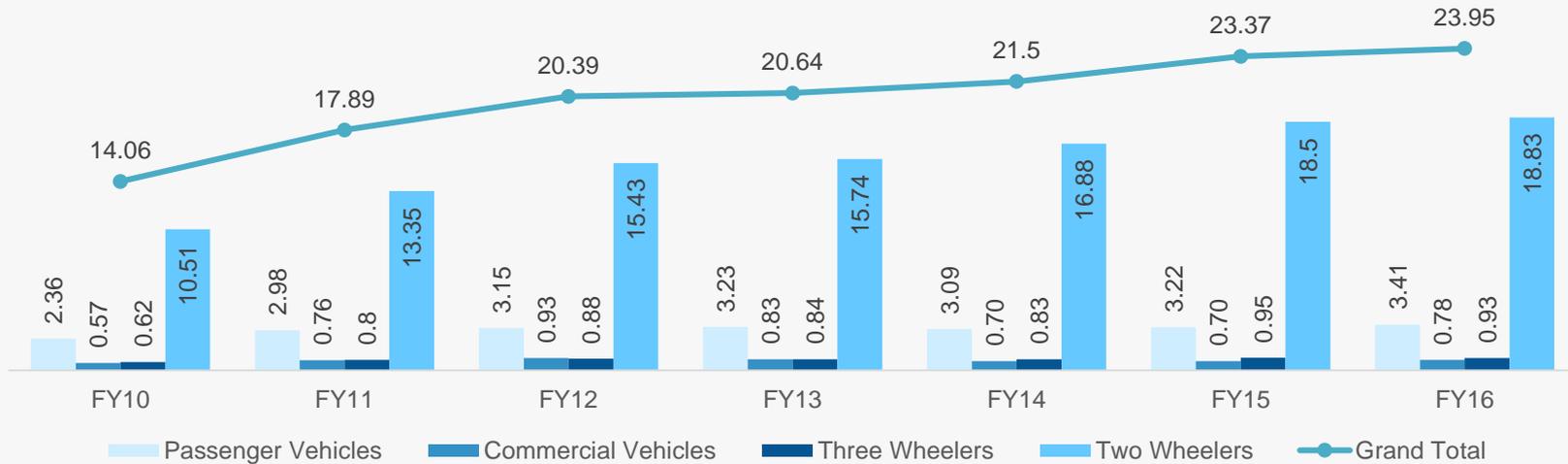


Source: Ministry of Power, Central Electricity Authority (CEA), TechSci Research
Notes: TWh - Terawatt-hour, P - Provisional, CAGR – Compounded Annual Growth Rate

POWER AND AUTOMOTIVE PRODUCTION FUELLING DEMAND ... (2/2)

- * 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 2020F

Total production of automobiles in India (million units)

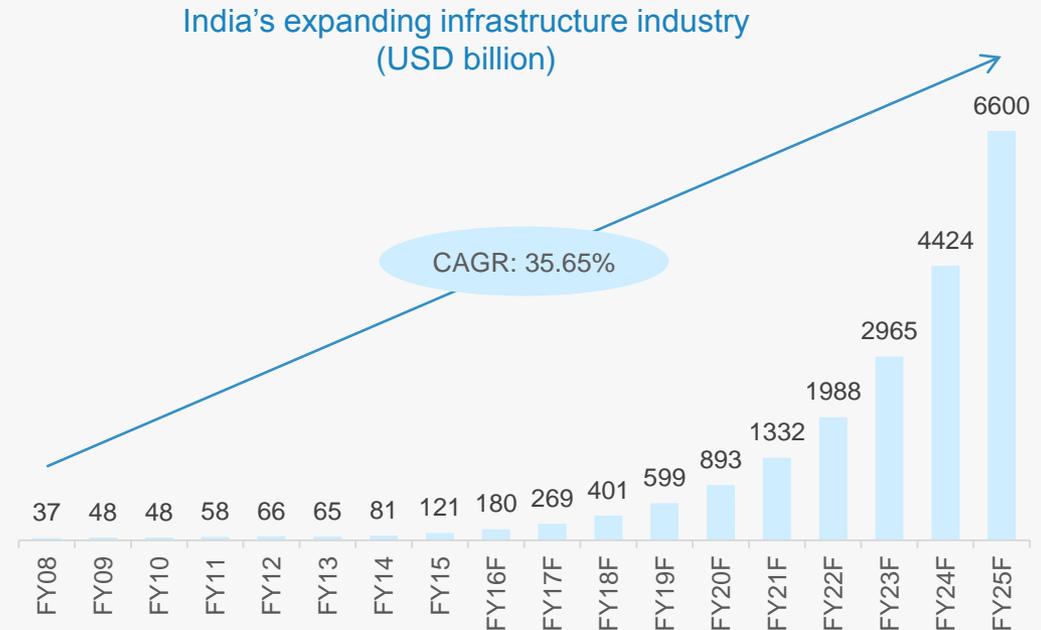


Source: SIAM, TechSci Research

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

A FAST-EXPANDING CONSTRUCTION SECTOR HAS AIDED GROWTH ... (1/2)

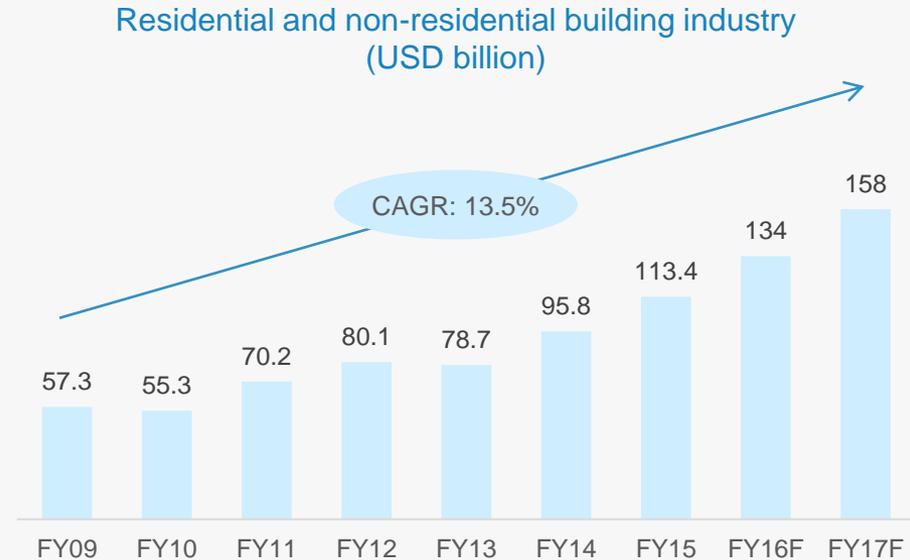
- * India is witnessing a sustained growth in infrastructure build up. The construction industry has been witness to a strong growth wave powered by large spends on housing, road, ports, water supply, rail transport and airport development
- * Infrastructure projects continue to provide lucrative business opportunities for steel, zinc and aluminium producers
- * India's infrastructure sector is expected to grow at a CAGR of 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

A FAST-EXPANDING CONSTRUCTION SECTOR HAS AIDED GROWTH ... (2/2)

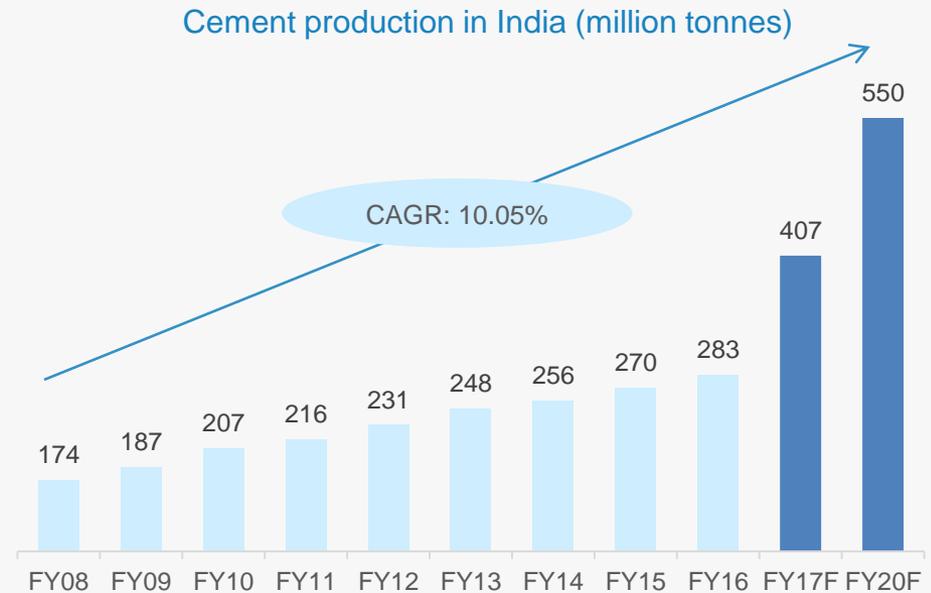
- * Growth in the sector is set to increase in the next few years; forecasts put the CAGR for FY12-17 at 14.5 per cent
- * Iron and steel being a core component of the real estate sector, demand for these metals is set to continue given strong growth expectations for the residential and commercial building 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



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

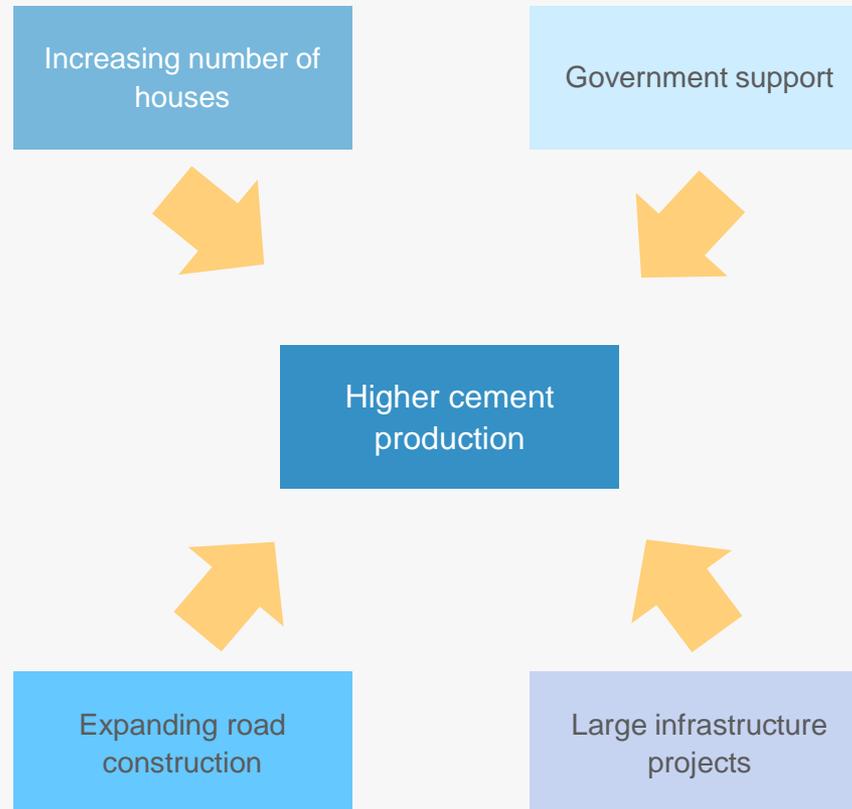
RISING CEMENT PRODUCTION – CONTRIBUTOR TO GROWING COAL DEMAND

- * 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



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 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

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

FOREIGN INVESTMENTS FLOWING IN INDIA ... (1/2)

- * 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 – March 2016, cumulative FDI inflows into the metals and 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 – March 2016

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



Source: Department of Industrial Policy & Promotion, TechSci Research

MERGER AND ACQUISITIONS

M&A activities (till May 2016)		
Acquirer	Target	Acquisition price (USD million)
JSW Energy Ltd	Jindal Steel and Power Ltd	976
SAIL	Reiterated its interest to acquire majority stake in Neelachal Ispat Nigam Limited(NINL) in Jajpur, Odisha	-
Joint Venture between Vedanta Resources and Sesa Goa	Merger of Sterlite Industries (Indian subsidiary of Vedanta Resources) and Sesa Goa	3,900
GVK Power & Infrastructure Ltd	Hancock Coal-Queensland Coal	1,260.0
Sesa Goa Ltd	Cairn India Ltd	1,175.9
JFE Steel Corp	JSW Steel Ltd	1,029.1
Lanco Resources Australia	Griffin Coal Mining Co Pty Ltd	722.7

Source: Thomson Banker, Deal Tracker, TechSci Research

METALS AND MINING



OPPORTUNITIES

OPPORTUNITIES

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 six-seven years

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

- India has the world's seventh-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

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

- 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 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

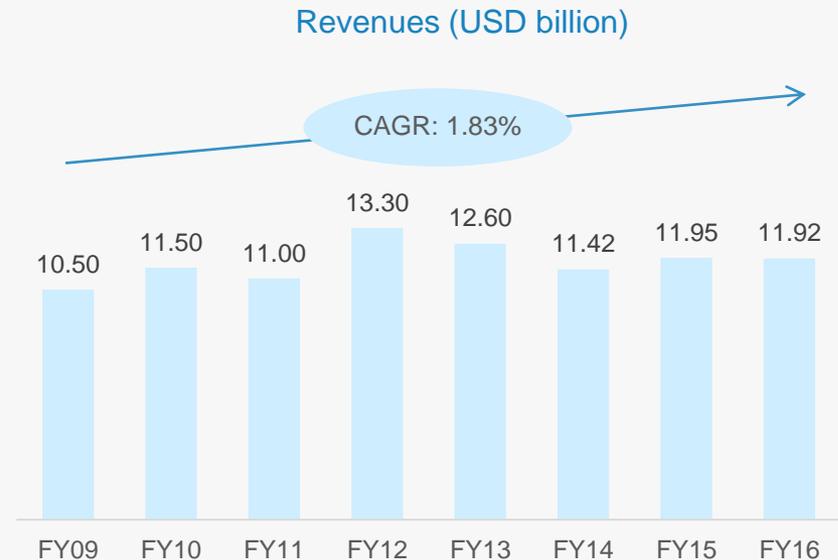
METALS AND MINING



SUCCESS STORIES

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



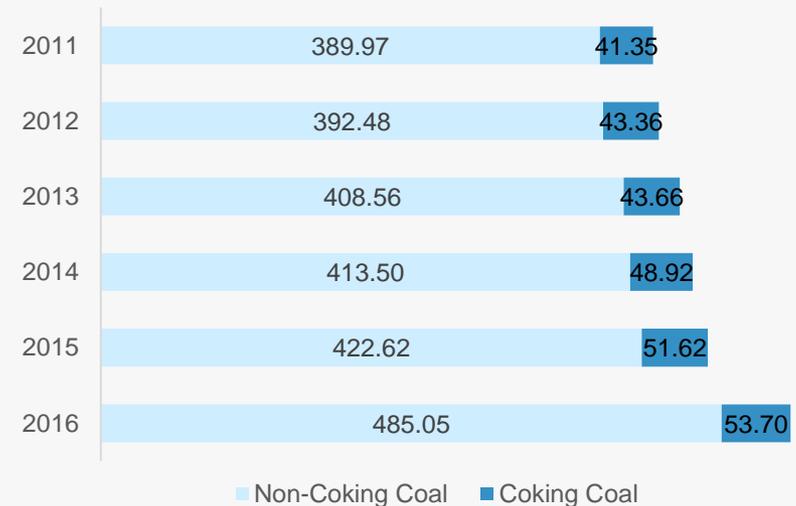
Source: Bloomberg, TechSci Research
Notes: MT - Million Tonnes, CAGR - Compound Annual Growth Rate,
¹ – Data from April to March for the year

- 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

COAL INDIA LIMITED (CIL): LEADER IN MINING INDUSTRY IN INDIA ... (2/2)

- * 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 and Education (ICFRE) for effective monitoring of environment related issues in coal mining projects

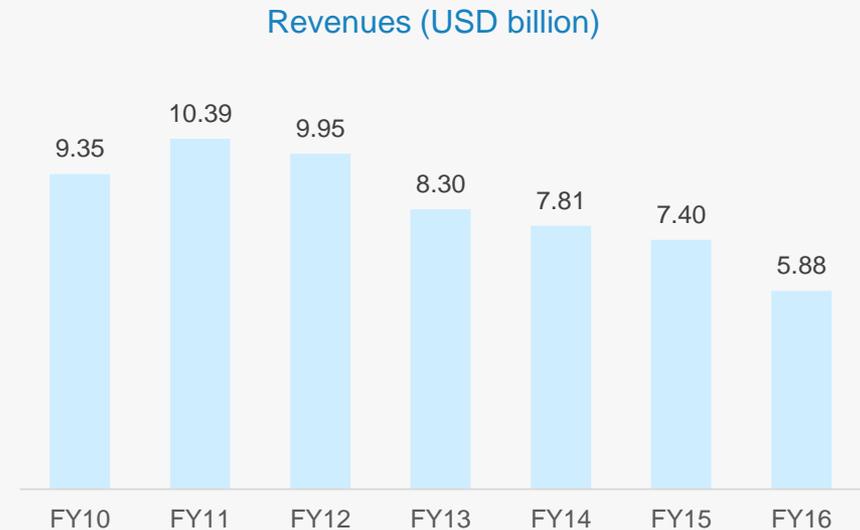
Coal production (in million tonnes) 2011-16



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



Source: Company website, TechSci Research

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

STEEL AUTHORITY OF INDIA LTD (SAIL): A STORY OF STEEL ... (2/2)

- * 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

Total saleable steel production (million tonnes)



Source: Company website, TechSci Research
Notes: SAIL – Steel Authority of India Ltd.

METALS AND MINING



USEFUL INFORMATION

INDUSTRY ASSOCIATIONS

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

- * **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

Exchange rates (Fiscal Year)

Year	INR equivalent of one USD
2004–05	44.81
2005–06	44.14
2006–07	45.14
2007–08	40.27
2008–09	46.14
2009–10	47.42
2010–11	45.62
2011–12	46.88
2012–13	54.31
2013–14	60.28
2014-15	61.06
2015-16	65.46
2016-17 (E)	66.95

Exchange rates (Calendar Year)

Year	INR equivalent of one USD
2005	43.98
2006	45.18
2007	41.34
2008	43.62
2009	48.42
2010	45.72
2011	46.85
2012	53.46
2013	58.44
2014	61.03
2015	64.15
2016 (Expected)	67.22

Source: Reserve bank of India,
Average for the year

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