

# BUSINESS

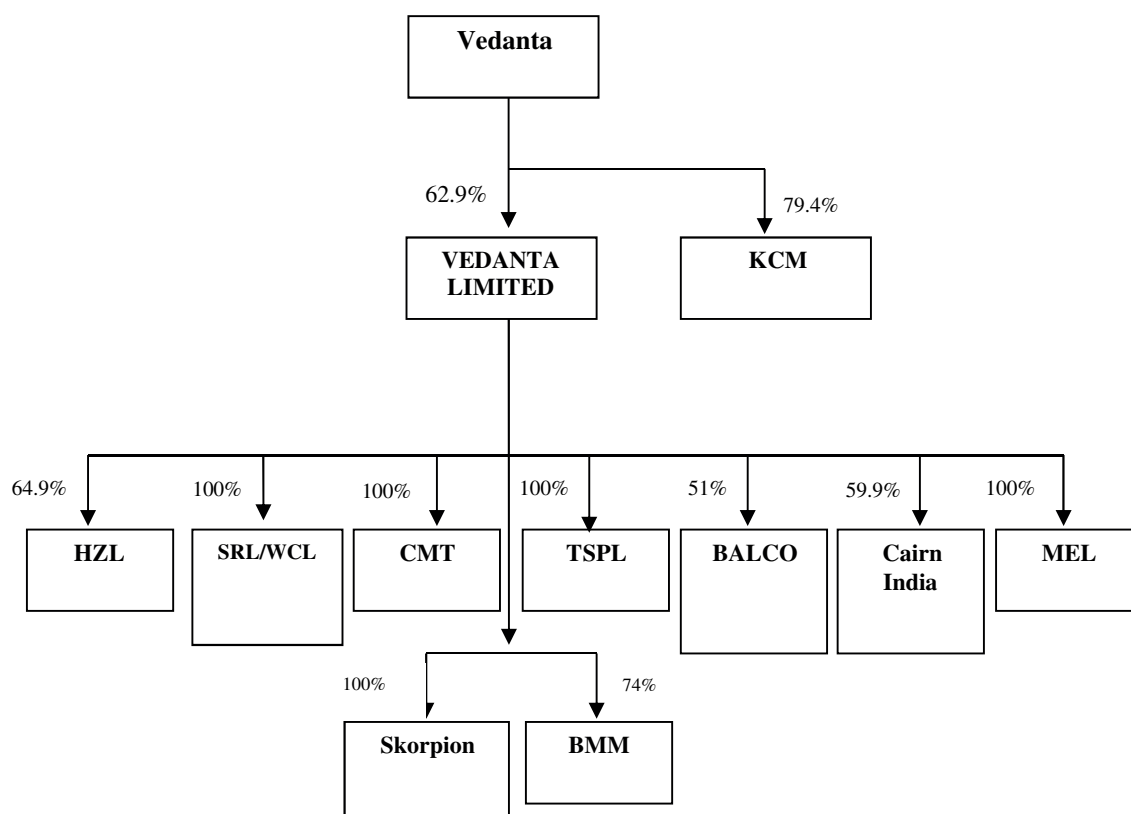
## Overview

Vedanta is an LSE-listed globally diversified metals and mining, oil and gas, power generation company. Its businesses are principally located in India, one of the fastest growing large economies in the world with a 7.6% increase in real GDP from the fiscal year 2015 to fiscal year 2016, according to the Central Statistical Organization of the GoI's Ministry of Statistics and Programme Implementation. In addition, Vedanta has assets and operations in jurisdictions such as Zambia, Namibia, South Africa and Fujariah a workforce of 70,000 people worldwide. Vedanta is primarily engaged in oil and gas, zinc, copper, iron ore, aluminium and commercial power generation businesses and is also developing port operation businesses and infrastructure assets. Vedanta has experienced significant growth in recent years through the ramp up of expansion projects for its oil and gas, copper, zinc, aluminium and iron ore businesses. Vedanta believes its experience in operating and expanding its businesses in India will allow it to capitalise on attractive growth opportunities arising from India's large mineral reserves, relatively low cost of operations and large and inexpensive labour and talent pools.

For fiscal years 2014, 2015 and 2016, Vedanta reported total revenue of \$12,945.0 million, \$12,878.7 million and \$10,737.9 million, respectively, and Vedanta EBITDA of \$4,491.2 million, \$3,741.2 million and \$2,336.4 million, respectively. For the six months ended 30 September 2015 and 2016, Vedanta reported total revenue of \$5,699.3 million and \$4,867.8 million, respectively, and EBITDA of \$1,285.7 million and \$1,233.1 million, respectively.

## Group Structure

The following chart depicts Vedanta's corporate structure as of 30 September 2016. Vedanta owns other subsidiaries that are not material and are not shown in the chart below.



On 14 June 2015, Vedanta announced an all-share merger of Cairn India with Vedanta Limited to be implemented by way of a scheme of arrangement under Indian law. Thereafter on 22 July 2016, Vedanta Limited and Cairn India announced the revised terms to the merger. As per the revised terms, on completion the non-controlling shareholders of Cairn India will receive for each equity share held in Cairn India, one equity share in Vedanta Limited of face value Re. 1 each, and four 7.5% Redeemable Preference Shares in Vedanta Limited with a face value of Rs. 10 each. No shares will be issued to Vedanta Limited or any of its subsidiaries for their shareholding in Cairn India. NSE and BSE have provided their 'No Objection' to the proposed merger and shareholders of Vedanta Limited, Cairn India and Vedanta and the secured and unsecured creditors of Vedanta Limited have approved the Scheme with requisite majority. The Scheme is now subject to the approval of the NCLT and other regulators.

As of 30 September 2016, Vedanta Limited has equity interests in Cairn India of 59.9%. and the Company has economic percentage holding in Cairn India of 37.6%. Following the implementation of the merger with Cairn India, the Vedanta's ownership in Vedanta Limited is expected to decrease to 50.1% from 62.9% shareholding, as of 30 September 2016 and Vedanta's economic holding in Cairn India is expected to increase from 37.6% as of 30 September 2016 to 50.1%.

## **Competitive Strengths**

Vedanta believes it has the following competitive strengths:

### ***Large, low-cost and diversified asset base***

Vedanta is a leading diversified natural resources company with assets primarily located in India. The Company believes that its business comprises of high quality assets of global size and scale.

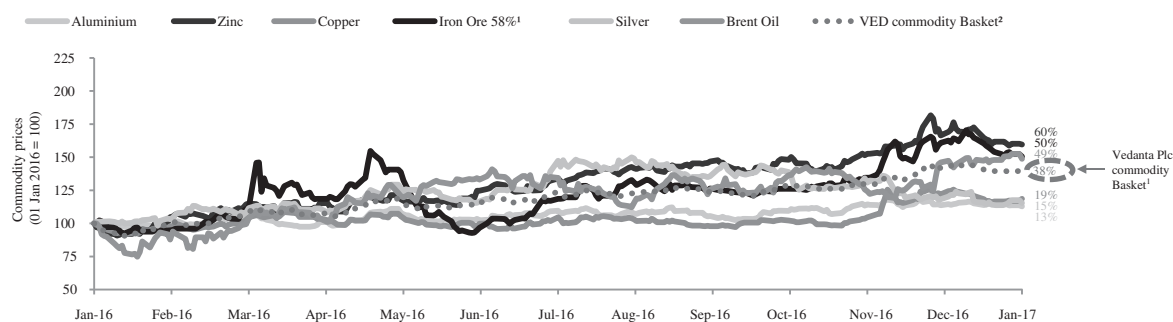
- **Zinc:** According to Wood Mackenzie, HZL is the second largest zinc miner globally with first quartile cost position. HZL owns six zinc mines of which Rampura Agucha mine is the largest zinc-lead mine globally. Under Zinc International operations, Vedanta operates the Black Mountain Mine and smelter operations in Namibia. It is also developing the Gamsberg mine, which is one of the world's largest undeveloped zinc deposits. The development of Gamsberg is being done in a modular and flexible manner to maximise value.
- **Oil and gas:** Cairn India is one of the largest independent oil and gas exploration and production companies in India. Cairn India operates approximately 27% of India's domestic crude oil production according to the Ministry of Petroleum and Natural Gas statistics as of March 2016. In fiscal 2016, Cairn India produced approximately gross 71.9 mmboe of oil (working interest production of 45.7 mmboe) and gross 2.7 mmboe of gas (working interest production of 1.2 mmboe). During the six months ended 30 September 2016, Cairn India produced approximately gross 34.8 mmboe of oil (a working interest of 22.4 mmboe) and gross 1.2 mmboe (a working interest of 0.5 mmboe) of gas.
- **Copper:** Vedanta Limited is one of only two custom copper smelters in India with highest primary market share by sales volume in India in fiscal 2016, according to ICPCI. According to Wood Mackenzie, the Tuticorin smelter is currently amongst the lowest quartile cost custom smelters in the world benefiting from economies of scale, low labour cost, and a captive power plant. Vedanta's Copper Zambia assets, includes the underground copper mine at Konkola which, according to Wood Mackenzie, contains one of the world's highest grade large-scale (defined as containing approximately 1.5 mt of contained copper) copper ore bodies in active production.

- **Aluminium:** Vedanta, through its subsidiaries BALCO and Vedanta Limited, is the largest primary producer of aluminium in India. Vedanta expects to reach an aluminium design capacity of 2,320,000 tpa, representing an increase of over 66% from its capacity as of 30 September 2016 of 1,395,000 tpa.
- **Power:** Vedanta has a total power portfolio of 9,000 MW, including 3,600 MW of commercial power generation capacity. This includes a new coal-fired power plant at Talwandi Sabo with a design capacity of 1,980 MW, currently in commissioning. The projects are strategically located with easy access to fuel and water, and are well connected by railways and roads. Vedanta has reduced production and pricing risks with long-term power off-take arrangements with state electricity boards and state-owned utilities.

Vedanta's costs of production in its oil and gas, zinc, copper and aluminium businesses are competitive compared with those of leading natural resources companies in the world, which Vedanta believes is enabled by its high quality assets, operational skills and experience and the integrated nature of its operations.

### *Attractive commodity mix*

The diversified nature of Vedanta's portfolio has helped in times of volatility and enabled us to maintain strong margins through the cycle. Vedanta's commodity basket has been much less volatile than the individual commodities, but at the same time has captured the rebound in commodity prices very well, being up 38% since 1 January 2016.



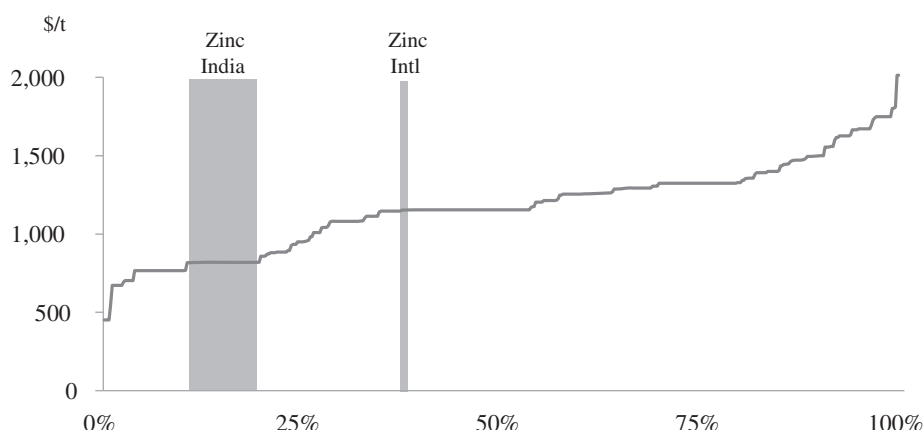
Source: FactSet and Bloomberg as of 3 January 2017

1. Iron ore spot price index 58% import fine ore in US\$
2. Vedanta Plc commodity Basket is a weighted average of commodity prices with weights based on actual FY2016 revenue mix. Copper India and Copper Zambia custom revenue based on realized Tc/Rc's. Excludes commercial power

Vedanta's portfolio is weighted towards zinc, with 44.2% of EBITDA coming from zinc operations during the six months ending September 2016. Zinc market has strong fundamentals, as global zinc concentrate and refined zinc market remain in deficit. Supply of zinc concentrate continues to be constrained, due to continued closure of mines, the latest being the Century and Vedanta's Lisheen mines in 2015. Inventory levels at the LME and SHFE are at 6-year lows. These fundamental and structural factors have continued to support the zinc prices.

Vedanta is ideally positioned to take advantage of the strength in this market, given the scale, high quality and low-cost nature of its HZL assets. HZL assets sit in the first quartile of the zinc mine cost curve, as per Wood Mackenzie.

### CY 2016E Zinc C1 composite cost curve

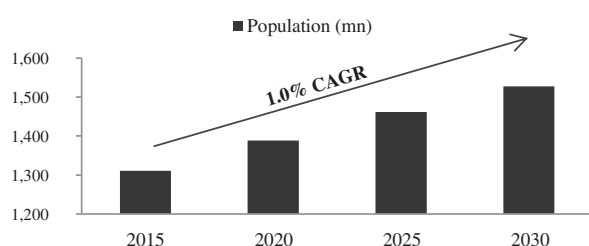


Source: Wood Mackenzie as of Q4 2016 (cost curve by Company)

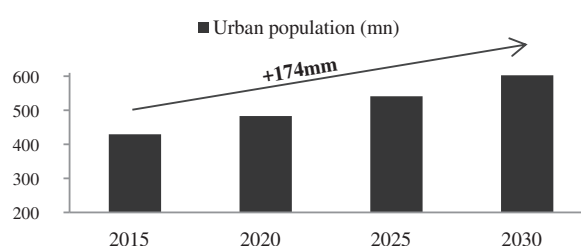
### Ideally positioned to capitalise on India's growth and natural resource potential

Vedanta believes that its experience in operating and expanding its business in India will allow it to capitalize on attractive growth opportunities arising from factors including:

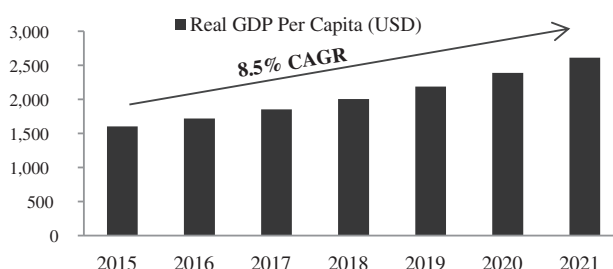
**India's economic growth.** India is one of the fastest growing large economies in the world with a 7.6% increase in GDP during fiscal 2016 (at constant (2011-12) prices), according to the Central Statistical Organisation of the GoI's Ministry of Statistics and Programme Implementation. According to the IMF, India's GDP per capita is expected to grow at a cumulative average growth rate of 8.5% during the period of 2015 to 2021. Expected growth rate in the total population of India is 1.0% (Source: World Bank) and the growth in urban population is expected to be 174 million during 2015 to 2030 (Source: World Bank).



Source: World Bank (May 2016)

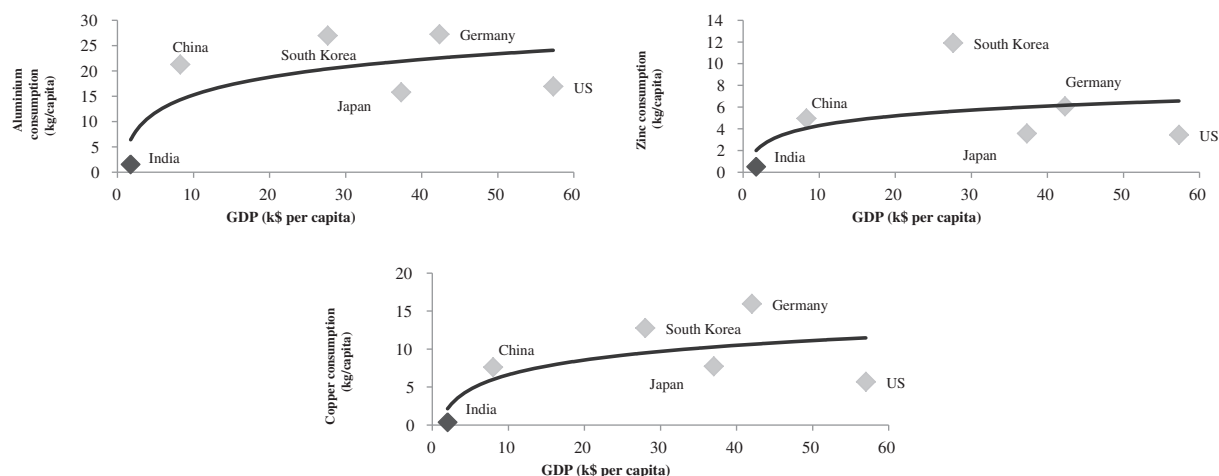


Source: World Bank (May 2016)



Source: International Monetary Fund (October 2016)

The metal intensity curves as shown in the below charts plot the historical metal consumption per capita against GDP per capita on a yearly basis for various countries. Extrapolating the positioning of China and other developed nations on these curves, it is clear that as India's per capita income grows, expected consumption of metals and energy would also increase.



Source: International Monetary Fund (October 2016), Wood Mackenzie LTO Q4 2016

**India's mineral resource base.** According to the USGS, Mineral Commodity Summaries (January 2016), India's zinc reserves are the sixth largest in the world with total reserves estimated at 10 million tonnes, bauxite reserves are the ninth largest in the world with total reserves estimated at 590 million tonnes, has the sixth largest iron ore reserves in the world at 8.1 billion tonnes. According to the BP Statistical Review of World Energy, India has the fifth largest coal reserves in the world at 61 billion tonnes.

**India's undeveloped oil and gas resource potential.** India is an attractive country for investment in the oil and gas exploration and production sector with domestic demand for hydrocarbons exceeding supply and expected to continue to do so in the foreseeable future. The GoI has continued to provide further growth opportunities through annual licensing rounds. According to the USGS, India has approximately 125 billion barrels of hydrocarbon resources in the yet-to-establish category, and only 7 of 26 basins are in production.

Vedanta is strongly positioned to benefit from this expected growth and resource potential, as 63.1% of FY2016 revenue comes from India. The Company has a long history of established operations and experience in the country. Vedanta also has a strong market share in India in its key commodities. As per ILZDA, Vedanta had a market share of 79% by sales volume in the Indian zinc market, #1 primary aluminium producer with a 40% market share according to the Aluminium Association of India, #1 copper producer with a 36% primary market share by sales volume according to ICPCI and the #1 crude oil producer operating 27% of the crude oil produced in India.

### Well invested assets driving cash flow growth

Vedanta has largely completed its capex program in all its businesses though the businesses are not fully ramped up. It is now ramping up its capacities in its Zinc, Aluminium, Iron Ore and Power businesses with incremental capex as described under the section "Management's Discussion and Analysis of Financial Condition and Results of Operations — Capital Resources — Project Capital Expenditures", with focus on strong cash flow growth.

- **Zinc:** At HZL, Vedanta has finalized the next phase of growth, which will increase mined metal production capacity to 1.2 million tonnes. The plan comprises developing a 3.75 mmtpa underground mine at Rampura Agucha mine and expanding the Sindesar Khurd mine from 2.0 mmtpa to 4.50 mmtpa, Zawar mines from 1.5 mmtpa to 4.0 mmtpa, Rajpura Dariba

mine from 0.6 mmtpa to 1.2 mmtpa and developing Kayad mine to 1.0 mmtpa. The growth plan will increase mined metal (MIC) production capacity to 1.2 mmtpa. The Company is also developing the Gamsberg project in South Africa, with a design capacity of 250,000 tonnes per annum and targeted first ore production in FY 2018 and ramp-up in subsequent years.

- Aluminium:** BALCO is setting up a 325,000 tonnes per annum aluminium smelter, the first 84 pots of which started commercial production in September 2014 and another 84 pots in August 2016. The remaining 168 pots will start commercial production by the end of fiscal year 2017. Vedanta Limited is also setting up another 1.25 mtpa aluminium smelter in Jharsuguda, The commissioning of pots at the first line of the 1.25 mtpa aluminium smelter at Jharsuguda was completed at the end of July 2016. Vedanta expects to reach a target aluminium capacity of 2,320,000 tpa, representing an increase of over 66% from its capacity as of 30 September 2016 of 1,395,000 tpa.
- Power:** As of September 30, 2016, Vedanta had total commercial power generating capacity of 3,600 MW including the new coal-fired Talwandi Sabo project which has a generation capacity of 1,980MW, which is being commissioned in three phases. The first 660 MW unit of the Talwandi Sabo power plant was capitalized in fiscal year 2015 and the second 660 MW unit was capitalized in December 2015 after the successful completion of trial runs. The third unit was commissioned in the second quarter of fiscal year 2017.
- Iron ore:** Vedanta's iron ore business has a design capacity of 20.5 million tonnes per annum production. The combined production from these mines is currently restricted to 7.8 million tonnes per annum.

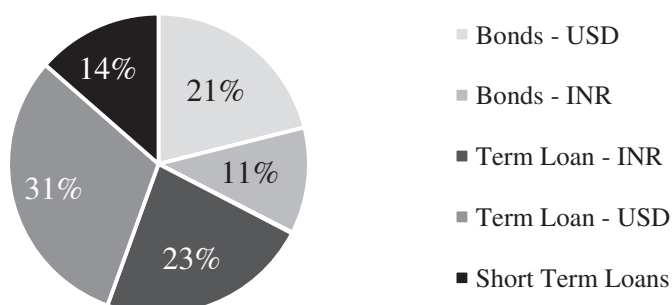
**Strong financial profile**

Vedanta generated total revenues of \$10.7 billion and EBITDA of \$2.3 billion during FY 2016. Through its diversified portfolio of assets, Vedanta has maintained strong EBITDA margins during this period of low and volatile commodity prices.

Vedanta also has a balanced debt portfolio, with a diversified range of funding sources. The Company maintains a strong relationship with its lending banks, which enables it to obtain funding at attractive rates.

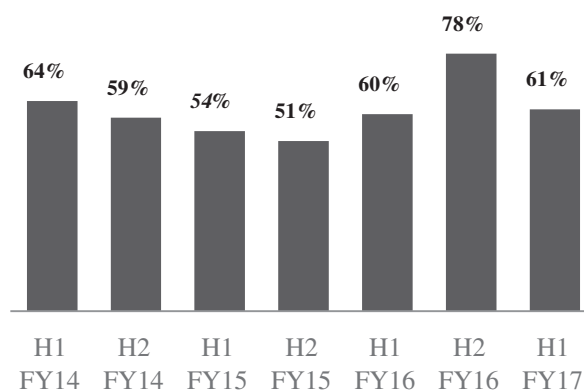
**Diversified Funding Sources for Term Debt (\$15.6bn)**

As of 30 Sep 2016



The focus on optimising operating and capital expenditure and working capital management contributed to strong free cash flow of US\$1.7 billion (after capital expenditure), during fiscal year 2016. Throughout this period of low commodity prices, Vedanta has maintained a strong EBITDA to cash flow conversion ratio.

## Strong cash flow conversion<sup>2</sup>



<sup>2</sup>. Calculated as (EBITDA less capex) / EBITDA

Vedanta also has a programme to deliver cost and marketing savings of \$1.3 billion, and has already achieved savings of an estimated \$536 million through these initiatives as of 30 September 2016.

### *Proven track record*

Vedanta has a strong track record of exploration, executing projects and delivering production growth. The Company has delivered 19% annualized production growth in copper equivalent terms since listing in fiscal year 2004.

- Cairn India has long and proven exploration expertise in India, having made 40 hydrocarbon discoveries since 1994. Cairn India has continued to add to its exploration portfolio and, in addition to accessing new opportunities, has been an active and successful participant in the NELP licensing rounds, as demonstrated by Cairn India being awarded two blocks in the NELP VIII round. Cairn India's executive management team has a proven track record of developing hydrocarbon resources which includes making 38 discoveries in the Rajasthan Block including the landmark Mangla field, commencing natural gas production in less than 28 months at the Lakshmi field in Cambay Basin, building the world's longest continuously heated and insulated crude oil pipeline, and executing the world's largest polymer flood project.
- Vedanta started its aluminium business with the acquisition of BALCO with an installed capacity for aluminium smelting of 100ktpa. It has since then expanded its aluminium business to include Design capacities for aluminium smelting of 375ktpa at BALCO and 1,750 ktpa at Jharsuguda.
- Vedanta acquired HZL in 2002, when its production was at 170kt pa and R & R life of 5 years. Through investments in technology and people with an innovative mindset and increasing productivity, HZL today has a R & R life of 25+ years with a 1.2mtpa production capacity, making HZL the second largest zinc miner in the world.
- Vedanta's senior management has significant experience in all aspects of its business which has contributed in transforming Vedanta into a leading diversified natural resources company that is listed on the LSE. Mr. Anil Agarwal, Vedanta's founder, remains involved in overseeing Vedanta's business as its Executive Chairman. Vedanta's executive management team focuses on group strategy and capital allocation, while operational and project goals are led by the experienced management teams overseeing each individual business.

- Vedanta's experienced and focused management and dedicated project execution teams have proven track record of successfully implementing capital-intensive projects to increase its production capacities. Vedanta utilises project monitoring and assurance systems to facilitate timely execution of its projects.

## **Vedanta's Strategy**

Vedanta's strategic goal is to become one of the top diversified natural resources company in the world, and has the following five key strategic priorities:

### ***Production growth and asset optimization***

Vedanta strives to ramp up its assets with a disciplined approach towards cost, capex allocation and operating efficiency. Strict cost management and increases in productivity form an integral component of its day-to-day operations. Vedanta is placed in the lower half of the global cost curve in most of its operations, and intends to improve its cost position further. Highlights of Vedanta's recent achievements include:

- As of September 30, 2016, Vedanta's power business under TSPL became fully operational, with the capitalisation of the third 660MW unit during the second quarter of fiscal year 2017.
- Vedanta is ramping up its aluminum business to achieve the design capacity of 2.3 million tonnes. During FY 2017, three of the four 600MW units at the Jharsuguda started to supply power to the Jharsuguda-II smelter for its capacity ramp up.
- Vedanta's iron ore business is operating at the full capacity based on limits set by the Government.
- The transition to underground mine at Rampura Agucha, and a progressive ramp-up at Sindesar Khurd mine are on track to increase the overall capacity at Zinc India to 1.2mtpa from 1mtpa.
- EOR programs at the O & G business have commenced and Vedanta expects significant contribution from these to achieve higher production volumes.

### ***De-leveraging the balance sheet***

A key strategic priority for Vedanta is to reduce gross debt through strong cash flow growth through disciplined approach on capital allocation towards capital expenditure and operating expenditure; along with disciplined management of working capital. Despite low commodity prices recently, Vedanta continued to deliver strong EBITDA margins and free cash flows through a strong focus on its cost optimization plan. As Vedanta continues to ramp up its portfolio of diversified, low-cost and well-invested assets, Vedanta expects to generate significant organic free cash flow with minimal remaining capital expenditure.

### ***Simplifying Vedanta structure***

As a step towards simplifying its corporate structure, Vedanta announced the merger between Vedanta Limited and Cairn India in June 2015. It revised the offer terms for the minority shareholders of Cairn India in July 2016 and received approvals from both sets of shareholders and creditors. It believes that this merger will help generate long-term value for all shareholders. Vedanta is working towards all regulatory approvals for the merger and expects to complete it by the fourth quarter of fiscal year 2017.



## ***Creating Sustainable Value for all Stakeholders***

A key strategic priority and critical to its licence to operate, Vedanta continues to focus on embedding a culture of sustainability across the businesses, allocating resources, skills and financial contributions to support its people and the communities where it operates whilst minimizing its environmental impact. Although Vedanta's injury rates have declined over the years, the 12 fatalities recorded during fiscal year 2016 have heightened Vedanta's resolve to create a zero-harm culture across the organisation and raise the profile of health and safety by reviewing safety incidents at the board, business segment and operational levels. The business units have implemented and put forward behavioural based and technical programmes to avoid the reoccurrence of these incidents. Further safety investigations and follow-ups have been improved and quantitative risk assessments have been introduced for all critical areas.

Making a positive contribution to local communities in India and Africa remains a high priority for Vedanta, with around 2.25 million beneficiaries of community development programmes during fiscal year 2016, supported by over 250 partnerships with NGOs, local governments, academia and private hospitals. Vedanta's social investment reached US\$ 37 million and is aligned with its social vision and community need based approach.

Vedanta is committed to managing its environmental footprint seeking to control pollution, reduce water and energy consumption and protect bio-diversity around its operating sites. During fiscal year 2016, there were zero higher category environmental incidents and all subsidiary businesses have been assessed with environmental gaps identified in energy, water management, greenhouse gas emissions and biodiversity. The significant improvements and adoption of best practices in resource management, biodiversity and site closure practices along with awards like CII-Sustainable Plus platinum label, National Energy Conservation Award and Global IOD Awards for Excellence in Corporate Governance and Sustainability are testament to the focus and improvement, Vedanta has made towards environment sustainability.

### ***Identify next generation of resources***

Vedanta follows a disciplined approach to exploration and continues to enhance its exploration capabilities. Vedanta's strategic priority is to add to its reserves and resources by extending resources at a faster rate than deplete them, through a continuous focus on its drilling and exploration programme. In order to achieve this, the Company has formed an exploration cell - VEDEX under the guidance of senior leaders to build on the Company's reserve base across businesses.

## **History and Development of Vedanta**

In 1979, Mr. Anil Agarwal acquired Shamsher Sterling Corporation, which manufactured polyvinyl chloride power and control cables, overhead power transmission conductors and enamelled copper wire. Sterlite Cables Limited, in which the Agarwal family had a substantial interest, subsequently acquired this business and in 1986 changed its name to Sterlite Industries (India) Limited ("Sterlite").

- In 1988, Sterlite conducted an IPO in India.
- In 1995, Sterlite entered the aluminium production business by acquiring an 80% interest in The Madras Aluminum Company Limited ("MALCO")
- In 1997, Sterlite commissioned the first privately developed copper smelter in India
- In 2001, Sterlite acquired a 51% interest in BALCO
- In 2002, Sterlite acquired a 26% interest in HZL. In 2003, Sterlite increased its interest in HZL to 64.9%.

- In 2003, Vedanta was incorporated and re-registered as a public company and its name was changed to Vedanta Resources plc.
- In 2003, Vedanta was listed on the LSE.
- In 2004, Vedanta acquired a 51% interest in KCM.
- In 2006, Sterlite acquired Sterlite Energy Limited.
- In 2007, Vedanta acquired its iron ore business through the acquisition of a 51.2% interest in Sesa Goa Limited (“SGL”) (now Vedanta Limited).
- In 2007, Sterlite completed an IPO on the NYSE. Vedanta’s ownership interest in Sterlite decreased to 59.9%.
- In 2008, Vedanta increased its ownership interest in KCM to 79.4%.
- In 2009, Vedanta increased its ownership interest in MALCO to 94.8%.
- In 2009, Sterlite conducted a follow-on offering of its shares. Vedanta’s ownership interest in Sterlite decreased to 56.9%.
- In 2009, SGL acquired SRL, which increased Sesa Go Limited’s iron ore reserves and resources by an estimated 101.8 million tonnes.
- In 2010 and 2011, Vedanta acquired Skorpion, Black Mountain Mining, and Lisheen.
- In 2011, SGL acquired the steel plant assets in Karnataka of Bellary Steel & Alloys Limited.
- In 2011, SGL acquired 51% of WCL.
- In 2011, Vedanta acquired a 58.5% interest in Cairn India.
- In 2012, SGL acquired GEL.
- In 2012, SGL acquired the remaining 49% of WCL.

In 2014, Vedanta completed the reorganization transactions where in

- Sterlite merged with and into SGL;
- Aluminum business of Vedanta Aluminium Limited was demerged into SGL;
- Sterlite Energy Limited was merged with and into SGL;
- Power business of MALCO was demerged into Vedanta Aluminum Limited (now renamed as MALCO Energy Limited or MEL);
- Remaining MALCO was merged with and into SGL;
- Power business of Vedanta Aluminum Limited was slump sold to SGL;
- Group’s ownership in Cairn India was consolidated under SGL; and
- the name of SGL was changed to Sesa Sterlite Limited with effect from 18 September, 2013.

In 2015, the name of Sesa Sterlite Limited was changed to Vedanta Limited. In 2015, Vedanta Limited announced a proposed merger with Cairn India. In 2016, Vedanta Limited and Cairn India announced the revised terms to the merger.

### ***Oil and Gas Business***

Vedanta's oil and gas business is operated by Cairn India. Cairn India was incorporated in India in 2006 and was listed on the BSE and the NSE in 2007 and as of 30 September 2016, had a market capitalisation of Rs. 375 billion (\$5.6 billion). Cairn India's headquarters are in Gurgaon, India. Vedanta's total ownership interest in Cairn India is 59.9% as of 30 September 2016. Cairn India has a diversified asset base with eight production and exploration blocks, one in Rajasthan, two on the west coast of India, four on the east coast of India and one in South Africa.

### ***Zinc Business***

Vedanta's zinc India business is owned and operated by HZL. The international zinc business is operated by Skorpion in Namibia, Linseen in Ireland and Black Mountain Mining in South Africa.

***HZL.*** HZL was incorporated in Jaipur, India, and is headquartered in Udaipur in the State of Rajasthan. HZL's equity shares are listed and traded on the NSE and the BSE and as of 30 September 2016, had a market capitalisation of Rs. 986 billion (\$14.8 billion). As of 30 September 2016, Vedanta Limited directly owns 64.9% of the share capital of HZL and has management control. The remainder of HZL's share capital is owned by the GoI (29.5%) and institutional and public shareholders and employees of HZL (5.6%). HZL's fully integrated zinc operations include five lead-zinc mines at the Chanderiya, Darbia and Zawar facilities in the State of Rajasthan. Processing facilities are located at Haridwar, Punjab and Uttarakhand.

***THL Zinc Namibia Holdings (Pty) Ltd.*** Skorpion was incorporated in Namibia, and is headquartered near Rosh Pinah. Skorpion was acquired from Anglo American plc in May 2010. The acquisition of Skorpion was completed on 3 December 2010. Skorpion produces zinc ingots of LME grade.

***Vedanta Lisheen Holdings Limited.*** Lisheen was incorporated in Ireland, and is headquartered in Thurles. Lisheen was acquired from Anglo American plc in May 2010. The acquisition of Lisheen was completed on 15 February 2011. The Lisheen mine is located in County Tipperary, Republic of Ireland. Mining and milling activities at the Lisheen mine ceased in December, 2015 and the facility is currently in the process of implementing a mine closure plan in conjunction with statutory authorities.

***Black Mountain Mining (Pty) Ltd.*** Black Mountain Mining was incorporated in South Africa, and is headquartered in Aggeneys. Black Mountain Mining was acquired from Anglo American plc in May 2010 and its assets include the Black Mountain mine and the Gamsberg deposit in South Africa. On 4 February 2011, Vedanta Limited completed the acquisition of the 74.0% ownership interest in Black Mountain Mining. Black Mountain Mining consists of the Black Mountain mine and the Gamsberg Project which produces zinc, copper and lead in concentrate.

### ***Copper Business***

Vedanta's copper business comprises operations in India, Zambia and Australia. Vedanta's Indian and Australian copper business is operated by Vedanta Limited, while its Zambian copper business is owned and operated by KCM.

***Vedanta Limited.*** Vedanta Limited was incorporated in Kolkata, India, and is headquartered in Tuticorin in the state of Tamil Nadu. Vedanta Limited has been a public listed company in India since 1988. Its shares are listed and traded on the NSE and the BSE, and are also listed and traded on the

NYSE in the form of American Depositary Shares (“ADSs”). Vedanta, as of 30 September 2016 owns 62.9% of Vedanta Limited and has management control of the company. The remainder of Vedanta Limited’s share capital is held by institutional and public shareholders. Vedanta Limited operates the copper business in India and operates the Australian business through CMT.

*CMT.* CMT was incorporated in Belmont, Australia, and is headquartered in Queenstown, Tasmania. Vedanta Limited owns 100.0% of CMT as of 30 September 2016 and has management control of the company. The Company’s registered office is in Marin Place, Sydney.

*KCM.* KCM was incorporated in Lusaka, Zambia, and has its registered office in Chingola, Zambia. As of 30 September 2016, Vedanta owns 79.4% of KCM’s share capital through Vedanta’s wholly-owned subsidiary, VRHL, and has management control of the company. KCM’s other shareholder is ZCCM Investment Holdings Plc. The Government of Zambia has a controlling ownership interest in ZCCM Investment Holdings Plc.

### ***Iron Ore Business***

Vedanta’s iron ore business comprises operations in India and Liberia.

*Vedanta Limited:* Vedanta Limited operates Vedanta’s Iron Ore business in the states of Goa and Karnataka, India.

*Western Cluster Limited.* WCL was incorporated in Liberia and is headquartered in Monrovia, Liberia. WCL’s assets include development rights to the Western Cluster, a network of iron ore deposits in West Africa.

### ***Aluminium Business***

*BALCO.* BALCO was incorporated in New Delhi, India and is headquartered at Korba in the State of Chattisgarh. Vedanta Limited owned 51.0% as of 30 September 2016 of the share capital of BALCO and has management control of the company. The GoI owns the remaining 49.0%. BALCO operates two Bauxite mines in Chattisgarh, India.

*Vedanta Limited.* Vedanta Limited operates Vedanta’s aluminium business in the state of Odisha.

### ***Commercial Power Generation Business***

*Vedanta Limited.* Vedanta Limited operates the 2,400 MW coal based power plant facility in Jharsuguda in the state of Odisha. The three units of 600 MW each of coal-based thermal power plants in Jharsuguda have been converted from commercial power plants to captive power plants from 1 April 2016 and is now part of the aluminium business and one unit is an independent power plant for commercial power generation.

*TSPL* is a wholly-owned subsidiary of Vedanta Limited acquired by Vedanta Limited in September 2008. It is currently operating a 1,980 MW coal-based thermal commercial power plant at Talwandi Sabo, Punjab, India.

*MEL.* MEL is a wholly owned subsidiary of Vedanta Limited and operates a 106.5 MW coal based thermal power plant in Mettur Dam.

*BALCO.* BALCO operates a IPP 600 MW thermal power plant in Korba, Chattisgarh.

*HZL.* HZL operates wind power plants in Gujarat, Karnataka and Rajasthan with a combined capacity of 274.2 MW as of 30 September 2016.

## Description of the Businesses

### *Oil and Gas Business*

#### *Introduction*

Vedanta's oil and gas business is owned and operated by Cairn India, one of the largest independent oil and gas exploration and production companies in India. Cairn India was incorporated in India in 2006 and was listed on BSE and NSE on 9 January 2007. As of 30 September 2016, Cairn had a market capitalisation of Rs. 375 billion (\$5.6 billion).

Cairn India is primarily engaged in the business of exploration, development and production of crude oil, gas and related by-products. The Cairn India Group has rights to explore and develop oil exploration blocks in India and South Africa. Cairn India operates approximately 27% of India's domestic crude oil production and, to date, has opened four frontier basins with numerous discoveries.

Cairn India has a diversified asset base with eight production and exploration blocks: one in Rajasthan, two on the west coast of India, four on the east coast of India and one in South Africa. The following table sets forth details of Cairns India's assets including its percentage interest and its partners, as of 30 September 2016:

	<u>Asset</u>	<u>Basin</u>	<u>Cairn India's Interest (%)</u>	<u>Joint Operation Partners</u>	<u>Area (in km<sup>2</sup>)</u>
	<b>India</b>				
1	RJ-ON-90/1	Barmer	70%	ONGC	3,111
2	CB/OS-2	Cambay	40%	ONGC, Tata Petrodyne	207
3	PKGGM-1	KG Offshore	22.5%	ONGC, Ravva Oil, Videocon	331
4	KG-ONN-2003/1	KG Onshore	49%	ONGC	315
5	KG-OSN-2009/3	KG Offshore	100%	—	1,988
6	MB-DWN-2009/1	Mumbai Offshore	100%	—	2,961
7	PR-OSN-2004/1	Palar-Pennar	35%	ONGC, Tata Petrodyne	9,417
	<b>International</b>				
8	Block 1	Orange, South Africa	60%	Petro SA	19,898
	<b>Total</b>				<u><u>38,228</u></u>

Oil and gas is produced from the Rajasthan, Ravva and Cambay blocks. Gross production of Cairn India was 211.7 kboepd in fiscal years 2015 and 203.7 kboepd in fiscal year 2016. For the six months ended 30 September 2016, the Vedanta EBITDA and revenue for Vedanta's oil and gas segment was \$273.9 million and \$585.9 million respectively.

The Rajasthan RJ-ON-90/1 (“Rajasthan”) block is an onshore block. It is the principal production asset where Cairn owns a 70% participating interest pursuant to the production sharing contract that runs until May 2020. Joint operation partner, ONGC, has a 30% participating interest. The Rajasthan block is spread over 3,111 sq. kms west of Barmer district. The block consists of three contiguous development areas or DA: (i) DA 1, primarily comprising the Mangala, Aishwariya, Raageshwari and Saraswati or MARS fields; (ii) DA 2 primarily consisting of the Bhagyam, NI and NE and Shakti fields; and (iii) DA 3, comprising the Kaameshwari West fields.

The Mangala field was discovered in January 2004. This was followed by many other discoveries including the Aishwariya and Bhagyam fields. In the Rajasthan block, 38 discoveries have been established, since inception. The Mangala, Bhagyam and Aishwariya fields (collectively, the “MBA Fields”) are the largest in the Rajasthan Block and the Mangala field was the first to be developed, having commenced production of commercial crude oil in August 2009. In addition, Cairn India has completed the MPT, a centralised hub facility to handle crude oil production from the MBA Fields and other fields, such as Raageshwari, Saraswati and other satellite fields. Since June 2010, sales of crude oil from the Rajasthan Block are made through a pipeline (the “Pipeline”) of approximately 590 km running from the MPT to Salaya which further extends 73 km to Bhogat. In November 2015, the Salaya-Bhogat pipeline and terminal at Bhogat were commissioned and the first cargo of 500,000 barrels of Rajasthan crude oil was successfully loaded in December 2015 through the Bhogat terminal for Mangalore Refinery and Petrochemicals Limited (“MRPL”). The terminal provides access to a larger market for Rajasthan crude. The Bhogat terminal is a 160 hectare site located eight km from the Arabian Sea coast at Bhogat in Jamnagar District, Gujarat.

Outside of the Rajasthan Block, the two producing blocks are Ravva and the Cambay Basin Block.

Cairn India Group signed a farm-in agreement with the Petroleum Oil & Gas Corporation of South Africa Ltd. (“PetroSA”), the national oil company of South Africa, for the 19,922 km<sup>2</sup> off-shore Block 1, located in the geologically-proven Orange Basin in South Africa. As of 30 September, 2016, Cairn India Group holds a 60% interest in the block and is its operator. Following farm-in and assignment of participating interest in the block in early calendar year 2013, 1,981 sq. km of 3D seismic data was acquired in fiscal year 2014. Additionally, acquisition of 3,000 line km of 2D seismic data was concluded in early March, 2014. Cairn awaits a decision on proposed changes to the MPRDA and fiscal regime before considering a decision to progress into the second exploration license phase.

In addition, Cairn holds interest in the onshore block KG-ONN-2003/1 under development phase and offshore blocks KG-OSN-2009/3, MB-DWN-2009/1 and PR-OSN-2004/1 under exploration phase.

#### *Principal products*

*Oil.* Cairn India produces crude oil of various grades with different degrees and contents, depending on which field it has been extracted from. While, the crude oil in the majority of fields in the Rajasthan block is characterized by its high pour point and is medium sweet oil in nature, the crude oil produced from Ravva and Cambay oil blocks are light sweet in nature.

*Gas.* The Rajasthan, Ravva and Cambay blocks produce natural gas and natural gas commingled with crude oil. While gas is being sold from the offshore blocks of Ravva and Cambay, pursuant to the regulatory approval of March 2013, gas sales have commenced from the Rajasthan block in fiscal year 2014.

## Production

The table below sets out Cairn India's total production<sup>(1)</sup> and production results for the periods indicated:

	For the Year Ended 31 March			For the six months ended 30 September	
	2014	2015	2016	2015	2016
<b>Average Daily Gross Operated</b>					
<b>Production (boepd)</b> .....	218,651	211,670	203,703	207,538	196,629
Rajasthan.....	181,530	175,144	169,609	170,164	167,323
Ravva.....	27,386	25,989	23,845	27,303	19,228
Cambay.....	9,735	10,538	10,249	10,071	10,078
<b>Average Daily Working Interest</b>					
<b>Production (boepd)</b> .....	137,127	132,663	128,191	129,286	125,484
Rajasthan.....	127,071	122,601	118,726	119,115	117,126
Ravva.....	6,162	5,847	5,365	6,143	4,326
Cambay.....	3,894	4,215	4,100	4,028	4,031
<b>Total Oil and Gas (mmboe)</b>					
Oil & Gas-Gross.....	79.8	77.3	74.6	38.0	36.0
Oil & Gas-Working Interest .....	50.1	48.4	46.9	23.7	23.0

(1) See "Presentation of Information — Reserves and Production" for an explanation of the basis of preparation of production amounts.

The following table sets forth Cairn India's oil and gas production for the periods indicated.

	For the Year Ended 31 March			For the six months ended 30 September	
	2014	2015	2016	2015	2016
<b>Gross:</b>					
Oil (bopd) .....	209,378	204,761	196,955	200,692	190,088
Gas (mmscfd).....	56	41	40	41	39
Oil and gas (boepd).....	218,651	211,670	203,703	207,538	196,629
<b>Total:</b>					
Oil (mmbbls).....	76.4	74.7	72.1	36.7	34.8
Gas (mmboe).....	3.4	2.6	2.5	1.3	1.2
Oil and gas (mmboe).....	79.8	77.3	74.6	38.0	36.0

## Cairn India's Estimates of Hydrocarbons Initially in Place, Reserves and Contingent Resources

Cairn India uses various measures of hydrocarbons to make decisions regarding exploration priorities and investment in field developments. In the exploration phase, estimates of hydrocarbons initially in place, and the associated estimate of prospective resource are essentially speculative and subject both to a binary risk (probability of success or failure) and considerable uncertainty of volumetric magnitude. Following successful exploration and appraisal work, and as a field matures technically and commercially through development work and actual production, it becomes possible for Cairn India to make estimates, which may change over time, of the volumes of hydrocarbons or reserves that, in varying degrees of certainty or uncertainty, will ultimately be recoverable.

Cairn India relies primarily on estimates of 2P reserves for purposes of significant capital investment decisions.

Estimates of contingent resources are also used as a further measure of the potential commerciality of known accumulations of hydrocarbons in Cairn India's areas. The estimation of these resources, and the likelihood that they may be reclassified as reserves, depends on Cairn India's ability to prove commercial and technical viability of recovery within a reasonable timeframe. Cairn India employs reserves and resources definitions according to SPE/WPC International Standards which provide detailed descriptions for each category of reserves and resources.

The table below sets forth certain data regarding Cairn India's estimates of gross hydrocarbons initially in place, gross and net working interest reserves and contingent resources from fields within the Rajasthan Block, the Ravva Block and the Cambay Basin Block as of 31 March 2016. The estimates with respect to Rajasthan Block fields include resources which are based on the assumption that Cairn India will be granted an extension of the Rajasthan Block PSC beyond the expiration of the PSC in 2020. This assumption might not prove to be correct. Based on the fiscal year 2016 gross production, the gross 2P reserves and 2C resources of have a life of approximately 18 years.

	<b>Gross Proved Plus Probable Hydrocarbons Initially in Place</b>	<b>Gross Proved Plus Probable Reserves and 2C resources</b>	<b>Net Working Interest Proved Plus Probable Reserves and 2C resources</b>
	(mmboe)		
<b>Rajasthan Block</b>			
Total "MBA" Fields.....	2,208	496	347
Rajasthan EOR .....	225	158	
Rajasthan Block Other Fields .....	4,189	471	330
<b>Ravva Block</b> .....	706	39	9
<b>Cambay Basin Block</b> .....	215	23	9
<b>KG-ONN-2003/1</b> .....	481	74	36
Total (excluding EOR) .....	7,799	1,103	731
<b>Total (including EOR)</b> .....	7,799	1,328	889

*DeGolyer and MacNaughton's Estimates of Reserves and Contingent Resources*

DeGolyer and MacNaughton, independent petroleum engineering consultants, had been engaged to prepare estimates of the Proved, Probable, and Possible oil, condensate, and sales gas reserves and the contingent resources contained within the areas of Cairn India.

The estimation of oil and gas reserves and resources is uncertain and subjective and different, reasonable estimates may be produced by different engineers analysing the same geological, technical and commercial data. As a result, there are differences between Cairn India's estimates and DeGolyer and MacNaughton's estimates.



The table below sets forth a summary of the gross and net participating interest oil equivalent reserves reported in millions of barrels for certain properties which have been derived from estimates of gross oil and gas reserves prepared by DeGolyer and MacNaughton for fields within the Rajasthan Block, the Ravva Fields, and fields within the Cambay Basin Block as of 31 March 2016. In this table, gas has been converted into oil equivalent using a conversion factor of 6,000 standard cubic feet per barrel of oil equivalent.

	<b>Gross Proved Plus Probable Hydrocarbon Reserves (mmboe)</b>	<b>Net Participating Interest Proved Plus Probable Hydrocarbon Reserves (mmboe)</b>
<b>Rajasthan Block</b>		
Mangala.....	161.8	113.3
Bhagyam.....	35.6	24.9
Aishwariya.....	22.5	15.8
Total “MBA” Fields.....	219.9	153.9
Rajasthan Block Small Fields.....	19.6	13.0
Rajasthan Block Other Fields.....	3.1	2.2
<b>Ravva Block.....</b>	<b>14.4</b>	<b>3.2</b>
<b>Cambay Basin Block.....</b>	<b>9.5</b>	<b>3.8</b>

The difference in total gross “Proved plus Probable” hydrocarbon reserves estimates between Cairn India and D&M is approximately 3.5 mmboe (1.3%). The field by field differences are due to differences in the interpretations made by the estimating engineers. The largest difference between field estimates occurs for the Cambay Basin Block, where Cairn India’s estimate includes three technically justified infill wells awaiting approval, but the D&M estimate does not.

#### *The Rajasthan Block*

The majority of the estimated hydrocarbons in place, 2P reserves and contingent resources attributable to fields in which Cairn India has an interest are contained in the Rajasthan Block. The block consists of three contiguous DAs: (i) DA 1, primarily comprising the Mangala, Aishwariya, Raageshwari and Saraswati or MARS fields; (ii) DA 2 primarily consisting of the Bhagyam, NI and NE and Shakti fields; and (iii) DA 3, comprising the Kaameshwari West fields.

The Mangala, Bhagyam, Aishwariya, Saraswati, Raageshwari, NI and NE oil fields are under production. As of 31 March 2016, Cairn India estimates the gross hydrocarbons initially in place and the gross 2P reserves plus 2C resources of 6.4 bnboe and 1.2 bnboe, respectively and as of 31 March 2016. Additionally, for the fiscal year 2016 two private sector buyers constituted 78.2% of total oil sales for Rajasthan block.

As of 31 March 2016, Cairn India estimates that the MBA fields (including EOR) contained gross hydrocarbons initially in place and the gross 2P reserves plus 2C resources 2.2 bnboe and 0.7 bnboe respectively. The other fields in Rajasthan block contained gross hydrocarbons initially in place and the gross 2P reserves plus 2C resources 4.2 bnboe and 0.5 bnboe.

Set out below is the gross production from the Rajasthan Block and Cairn India’s net participating interest with regard to such production for the periods indicated:

<b>Average Daily Production</b>	<b>Units</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>30 September 2015</b>	<b>30 September 2016</b>
Gross operated .....	Boepd	181,530	175,144	169,609	170,164	167,323
Net operated .....	Boepd	127,071	122,601	118,726	119,115	117,126
Oil.....	Bopd	126,221	121,554	117,086	117,685	115,283
Gas .....	Mmscfd	5.1	6.3	9.8	8.6	11.1

Cairn India is working in partnership with its joint venture partner ONGC, in the Rajasthan Block. The Rajasthan Block PSC was signed in May 1995 between the GoI and a consortium consisting of ONGC and SIPD.

Cairn India acquired its interest in the Rajasthan Block PSC in three stages, eventually acquiring a 100.0% beneficial interest in the assets and liabilities as of May 2002 and acquiring legal title to this 100.0% interest on 20 June 2003. Under the Rajasthan Block PSC, the GoI has an option to acquire a participating interest of 30.0% in any development area containing a commercial discovery. The GoI exercised this right in all three development areas, specifically, DA 1 in 2005, DA 2 in 2007 and DA 3 in 2009, acting through its nominee ONGC, and acquired a 30.0% participating interest.

Under the Rajasthan Block PSC, until such time as India attains self-sufficiency in its crude oil supply, Cairn India is required to sell to the GoI, or its nominee, all of Cairn India's entitlement to crude oil and condensate extracted from the Rajasthan block in order to assist in satisfying domestic Indian crude oil demand. The GoI has the option but not an obligation to purchase the whole or part of crude oil produced from the Rajasthan block, and accordingly the GoI is entitled to appoint a nominee to purchase all of the contractor's entitlement of the crude oil and condensate produced from the Rajasthan block. However, the GoI has granted permission to Cairn India to sell the remaining quantities of crude oil, over and above those allocated to government nominees to other domestic private refineries and as of 30 September 2016, Cairn India sells crude oil to both private refineries and the public sector undertakings refineries. As of 31 March 2016, commercial sales arrangements are in place for over 200,000 bopd with public sector undertakings and private refineries with public sector undertakings and private refineries. Any additional sales to the public sector undertakings refineries, special economic zone refineries and overseas are subject to approval from the GoI.

The Rajasthan Block PSC established a management committee for the Rajasthan Block which consists of four members, two of whom are nominated by and represent the GoI and the licensee, namely ONGC, taken together, and two of whom are nominated by and represent Cairn India. The management committee must unanimously approve annual work programmes, budgets, proposals for the declaration of a discovery as commercial, field development plans, and the delineation of or additions to a development area, while all other matters only require a majority vote.

The Rajasthan Block PSC is valid until May 2020, but it may be extended subject to mutual agreement among the parties for up to an additional ten years in the case of commercial production of non-associated natural gas or up to five years otherwise. There is also provision to further extend the PSC by agreement of the parties if production of crude oil or of natural gas is expected to continue after the relevant period.

The Rajasthan Block has benefited from a tax holiday of seven years from fiscal 2009 (the year of commencement of commercial production from the Rajasthan Block) to 31 March 2016. However, during the seven-year tax holiday, minimum alternate tax rules were applicable resulting in a taxation of book profits computed in accordance with the generally accepted accounting principles as used in India ("Indian GAAP"). Any minimum alternate tax paid can be carried forward (at current rates) for a total period of ten years from the year of credit and used to reduce corporate tax to be paid in future years in excess of minimum alternate tax payable in those years.

Under the Rajasthan Block PSC, all sales are to be valued at a weighted average FOB selling price per barrel of a basket of international crude oils as agreed by all parties which is quoted in Platts, a provider of energy information. For any delivery period in which sales take place, the price will be set at an average price per barrel determined by calculating the average for such delivery period of the mean of the high and low FOB prices of the basket for each day adjusted for differences in quality, delivery time, quantity, payment terms and other contract terms to the extent known. In agreeing to an appropriate basket, the parties shall attempt, so far as is reasonably practicable, to choose a mixture

and weighting of crude oils which would produce a quality similar to the quality of crude oil expected to be produced from that development area, and to agree what quality adjustment (if any) to the basket price is appropriate. In determining the quality of crude oil, account is to be taken of all relevant characteristics including gravity, sulphur and metal content, pour point and product yield.

The crude oil produced at the Rajasthan Block is benchmarked to Bonny Light, an international low sulphur crude oil published in Platt's Crude Oil Market Wire on a daily basis. The pricing formula also adjusts for differences in yield and quality.

In the event that there is a dispute between the parties to the Rajasthan Block PSC as to the basis of, or mechanism for, the calculation of the crude oil price, then any party may refer the matter to a sole expert who is to be an independent and impartial person of international standing with relevant qualifications and experience. Under the provisions of the Rajasthan Block PSC, the decision of the sole expert is final and binding on the parties and not subject to arbitration.

*Northern Fields — Mangala.* The Mangala field which was discovered in 2004, is the largest field in the Barmer Basin in the state of Rajasthan.

The main reservoir unit in the Mangala field is of the late Palaeocene Age Fatehgarh group which is also common to the other Northern Fields. The Fatehgarh sequence consists of stacked reservoir units of interbedded sands and shales. The Fatehgarh sandstones exhibit reservoir characteristics, with porosities ranging from 21% to 26% and in-situ permeability averaging more than two Darcies. The structure is a simple tilted fault block, bounded to the West and North by first and second order faults respectively, with the field structure dipping at around nine degrees toward the South-East. The depth of the crest of the structure is only 600 metres below sea level, with crude oil-water contact at 960 metres below sea level. Ground elevations are in the order of 200 metres above mean sea level. The Fatehgarh crude oil column covers an area in excess of 13 km<sup>2</sup>.

Mangala crude oil is waxy and sweet, having a low sulphur content, averaging 27.3 degrees API and a relatively high pour point of 40 degrees Celsius to 45 degrees Celsius. The reservoir is normally pressured and hot water flooding is implemented to maintain reservoir pressure and efficiently improve oil recovery.

The Mangala field development plan recommended drilling of wells from the well pads will significantly reduce their overall footprint and environmental impact. Consequently, all wells are deviated to some extent. As of 30 September 2016, a total of 18 well pads were in place and production was originating from wells equipped with artificial lifts, such as jet pumps and electrical submersible pumps.

The Mangala field development plan envisaged drilling 162 development wells, out of which 12 were horizontal producers which have since been drilled and completed. Of these, 111 wells were producing and 51 were injector wells injecting water into the reservoirs. The commercial production in the Mangala field commenced in 2009 and reached 150,000 bopd in 2012, which is the peak rate approved by the field development plan. Additionally, 48 infill wells were also drilled as pre-producers to be converted later on into polymer injectors during polymer phase. An additional 3 horizontal wells have also been drilled to support field performance.

To increase the ultimate oil recovery and aid to production volumes, efforts are being made to embark on an enhanced oil recovery or EOR project, which was successfully executed with encouraging results during fiscal year 2016. The first polymer injection at the Mangala field started in October 2014. By end of fiscal year 2016, polymer injection was ramped up to the target levels of 400,000 blpd and, going forward, the plan is to maintain injection at this rate. EOR alone led to an increased oil recovery averaging about 47,000 boepd in the six months ended 30 September 2016. The integrated drilling programme was completed for 93 new wells during the year. In October 2015, the central polymer facility was made fully operational with five trains preparing polymer solution.

The alkaline surfactant polymer enhanced oil recovery pilot commenced during fiscal year 2015 and has shown positive results with better mobilization of un-swept oil. Preliminary analysis suggested that the alkali surfactant polymer pilot wells produced approximately 10-15% incremental oil of the pilot stock tank of oil in place over polymer flood.

#### *Northern Fields — Bhagyam.*

Bhagyam is the second largest discovery, after Mangala, in the Northern Barmer Basin in the state of Rajasthan.

The main reservoir unit in the Bhagyam field is of the late Palaeocene Age Fatehgarh group. The Fatehgarh sequence consists of stacked reservoir units of interbedded sands and shales deposited in fluvial environment. The Fatehgarh group reservoir at Bhagyam is of high quality, with porosities ranging between 20% to 26% and absolute rock permeability averaging four to five Darcies. The structure is a simple tilted fault block, bounded to the West and North by first and second order faults, respectively, with the field structure dipping at around 10 to 12 degrees toward the East-South-East. The depth of the crest of the structure is about 250 metres below sea level, with crude oil-water contact at 450 metres below sea level. Ground elevations are in the order of 200 metres above mean sea level. The Fatehgarh crude oil column covers an area of 4.5 km<sup>2</sup>.

Bhagyam crude oil is waxy and sweet, and of medium gravity, averaging 26 degrees API and has a pour point of 40 to 45 degrees Celsius which is similar to the pour point of the crude oil from the Mangala field.

Further, there is slightly more variation in crude oil type with depth at Bhagyam than in the other Northern Fields with a variation from 21 degrees API close to the oil-water-contact and up to 33 degrees API at the crest of the structure. Moreover, the Bhagyam field has a very small gas cap in the Fatehgarh Group accounting for less than 1% of the total reservoir hydrocarbon pore volume.

The reservoir is normally pressured and peripheral hot water flooding has been implemented to maintain reservoir pressure and efficiently sweep the oil. Artificial lifts have been installed in almost all the production wells in the Bhagyam field.

Crude oil production from Bhagyam commenced in 2012. In Bhagyam, a total of 153 development wells have been drilled as of 30 September 2016, of which 112 are producer wells and 41 are injector wells. Crude oil is transported via the Bhagyam trunk line to the MPT for processing and further export through the main section of the Pipeline.

#### *Northern Fields — Aishwariya.*

The Aishwariya field is located in the northern Barmer Basin in the state of Rajasthan, immediately south of the Mangala field and was discovered in March 2004.

The basin is a tertiary rift, consisting predominantly of Palaeocene-Eocene sediments. The main reservoir unit in Aishwariya is of the Fatehgarh group, consisting of stacked reservoir units of interbedded sands and shales. The reservoir characteristics of the Fatehgarh sands vary from moderate to excellent with porosities ranging from 12% to 26% and *in-situ* permeabilities ranging from 10 milli-Darcies to over 20 Darcies. The Aishwariya structure is a simple tilted fault block, dipping at around 12 degrees to the east.

Aishwariya crude oil is waxy and sweet, having a low sulphur content, with an API gravity ranging from 27 degrees to 32 degrees API. Like the Mangala field, the crude oil has a relatively high pour point of 40 to 45 degrees Celsius. The reservoir is normally pressured and hot water flooding is planned to be implemented to maintain reservoir pressure and efficiently sweep the oil.

The Aishwariya FDP included a drilling programme of 51 development wells, namely 36 producer wells and 15 injector wells, to recover the reserves using the water flood method. Additional 20 infills were drilled to fully exploit the potential of the field. Production from the Aishwariya field commenced in 2013.

*Northern Fields — Raageshwari Deep Gas Field.*

The Raageshwari deep gas field was initially designed to supply gas to meet the energy requirements at the MPT and the Pipeline. A revised field development plan was approved by the GoI in December 2014 for commercial gas sales and internal fuel consumption. As of 30 September 2016, 30 wells have been drilled and completed with multistage hydraulic fractures and are being brought progressively under production. Hydraulic fracturing operations have also been completed in all the wells with 5-7 zones fractured in each well. These fracturing operations have increased the flow rates, with wells having flow rates of up to 8 to 10 mmscfd, which is 1.5-2.0 times the rate previously achieved from this reservoir. The processed gas is transported to GSPL grid through midstream pipeline and MPT through fuel gas pipelines for captive consumption.

*Southern Fields — Raageshwari.* The Raageshwari crude oil field is located at the northern end of the Central Basin High within the Barmer Basin and was discovered in 2003.

A 3D seismic survey over this area of the Rajasthan Block has identified that the Raageshwari crude oil field is separated into various fault blocks which are likely to require individual drain points to develop the field's resources.

The shallow Thumbli sandstone reservoir is the primary reservoir in the field. The Thumbli section is a relatively low permeability sandstone formation of laminated sands and shales. The typical porosity ranges from 20% to 35%, with permeability varying from 10 milli-Darcies to 250 milli-Darcies.

The Raageshwari field also has a gas cap which provides natural pressure support while the oil field is under production, and the gas cap will serve as a source of production in the future, once the oil recovery has been optimised.

The crude oil from the Raageshwari field has a crude oil gravity of 35 degrees API, a high wax content and a relatively high pour point. though not as high as the crude oil found in the Northern fields.

The Raageshwari field commenced production in 2012. As of 30 September 2016, 5 development wells have been drilled.

The approved field development plan focuses on the use of the minimum facilities to provide separation, metering, and flow lines with the associated infrastructure and utilities. Crude oil, water and associated gas from the well heads will be processed through production and separation units on each of the planned pads.

*Southern Fields — Saraswati.* The Saraswati field was discovered by Cairn India in 2001. There are two reservoir types in this field, the Fatehgarh Group Sandstone Reservoir and the Barmer Hill Formation sandstones. The Fatehgarh formation at this location is approximately 65 km south of the Mangala field, at a deeper depth and lower quality as compared to the Northern Fields with porosity of 15% to 20% and permeability of between 50 milli-Darcies to 100 milli-Darcies. The Barmer Hill formation is tight but there is evidence of a fracture system at Saraswati which would increase its production potential.

Saraswati crude oil is light and sweet, having a low sulphur content, and has a typical crude oil gravity of 40 degrees API. Similar to crude oil from the other fields in the Rajasthan Block, it has a high wax content, but its pour point is lower, at 30 degrees Celsius.

The Saraswati field commenced production in 2011. As of 30 September 2016, 5 development wells have been drilled.

This oil is being processed at the MPT and is being co-mingled with the Mangala oil sold through the Pipeline. The development facilities provide for separation, metering, and flow lines with the associated utilities and infrastructure. Crude oil, water and associated gas are processed through production and separation units on each of the planned pads.

*Barmer Hill and Other Fields.* In addition to the MBA, Raageshwari and Saraswati fields, Cairn India has discovered 33 other fields (including the Barmer Hill formation) that contain hydrocarbons.

The Barmer Hill formation is present throughout the basin overlying the Fatehgarh formation. The Barmer Hill is an extensive low-permeability formation that contains substantial oil in place and was discovered in 2004 with the Mangala and Aishwariya field discoveries.

During fiscal year 2016, the Barmer Hill appraisal campaign was successfully completed. A total of 15 wells were drilled, a combination of seven vertical and eight horizontal wells, across Mangala and Aishwariya formations in fiscal year 2015. Until February 2016 production from these fields was through the existing 8 wells of Mangala BH and 7 wells of Aishwariya BH. An order to cease production from these fields, pending submission and approval of an FDP, was received from the Director General of Hydrocarbons (the "DGH") in February 2016. The fields are currently not in production. CIL is preparing FDPs with phased developed plans, the first phase of which would use the existing wells. The NI and NE fields are currently in production with 4 and 2 wells respectively.

#### *Further Potential Exploration*

In fiscal year 2016, Cairn India announced a new discovery and the total discoveries made till date are 38. Since resumption of exploration in Rajasthan from 2013, the company has announced 13 new discoveries till 30 September 2016, Cairn India has discovered 1.7 billion boe of drilled and tested hydrocarbons initially in place with an additional 0.45 billion boe of hydrocarbons initially in place drilled but yet to be tested. Exploration successes in Rajasthan have led to the addition of over 200 mmoeb of 2C Resources since 2013. Exploration activities will continue focussing on seismic data processing and interpretation. In order to enhance the current portfolio, efforts are on integration of all available data and identification of high impact new plays.

#### *The Mangala Processing Terminal*

The MPT is spread over an area of 1.6 sq. kms and is a core asset. The MPT processes crude oil produced from the Rajasthan block. Following processing, the crude oil is transported to refineries through a 24 inch diameter continuously heated and insulated pipeline. The MPT's integrated production facilities support the field development plan approved production, which is in line with Cairn India's unified Rajasthan block off-take capability.

During fiscal 2016, the capacity of the injection water system was upgraded to around 700,000 barrels of water per day. A new water well has been drilled at Thumbli and hooked up with the MPT through a new 30 inches pipeline. An injection water pump was also installed as part of the additional facility, which will augment injection water capacity. This will increase the voidage replacement ratio, thereby maintaining field pressure and enhancing recovery rates from the field. In addition, this would improve the reliability and efficiency of water injection at the Rajasthan Block as well as create spare capacity.

#### *The Mangala development pipeline or MDP*

The MDP is designed to evacuate the crude oil and transport gas from the Rajasthan block. Beginning at the MPT and Raageshwari terminal respectively, the 24 inch crude oil and 8 inch gas

pipeline passes through eight districts across two states, Rajasthan and Gujarat. The pipeline ends at Bhogat near Jamnagar on the western coast of India. There are buffer crude storage terminals at Radhanpur and Viramgam for sales to Indian Oil Corporation and off-take lines at Salaya for sales to the Reliance India Limited and Essar Oil refineries in Jamnagar.

Since its commissioning, total cumulative crude oil sales of 332 million barrels have been achieved through the existing pipeline facilities up to 31 March 2016. With the use of drag reducing agents, the proven dispatch capacity of the Mangala development pipeline has been enhanced to around 250,000 bbls per day. Given its length, the Mangala development pipeline incorporates a pipeline intrusion detection system to provide surveillance along its entire length by using fibre optics. Vedanta's pipeline operations received the prestigious Oil Industry Safety Directorate award for 'Best Near-Miss reporting' and accreditation of both OHSAS: 18001 and ISO: 14001 systems.

In fiscal year 2014, gas sales commenced through the 8 inch gas line. Capacity was further enhanced through installation of higher capacity gas compressors at Raageshwari and Viramgam terminals to nearly double gas sales capability and modification of impellers of the mainline booster pumps at Viramgam. During fiscal year 2016, stabilization of the compressors and optimization of plant operations aided the production.

In November 2015, the Salaya-Bhogat pipeline and terminal at Bhogat were commissioned and the first cargo of 500,000 barrels of Rajasthan crude oil was successfully loaded in December 2015 through the Bhogat terminal for Mangalore Refinery and Petrochemicals Limited or MRPL. The terminal has provided the access to larger market for Rajasthan crude. This should enable us to diversify customer mix and reduce dependence on limited number of customers.

The Bhogat terminal in the Jamnagar district of Gujarat, is a 160 hectare site located eight kms from the Arabian Sea coast. The terminal will facilitate the storage and evacuation of crude oil by sea. The terminal consists of tankages with storages capacity of about 2.1 million barrels of Rajasthan crude. It also has associated facilities for operation of terminal and marine export of crude. Evacuation facility includes two 24 inch sub-sea export pipelines from the Bhogat landfall point to the single point mooring system to enable crude transfer and a single point mooring system and sub-sea pipeline end manifold in deep sea to enable tanker berthing and loading.

#### ***The Ravva Block — Krishna Godavari Basin***

Cairn India is the operator of the Ravva field in the Ravva Block, which lies in the Krishna Godavari Basin mostly off the coast of the state of Andhra Pradesh in eastern India in water depths of between approximately 5 and 40 metres isobaths. ONGC discovered the Ravva field in 1987 and production commenced in 1993.

As on 30 September 2016, Ravva field had produced more than 280 mmbbls of crude oil and 347 bcf of gas since it commenced production, significantly more than the initial expectations achieving approximately 50% recovery.

#### ***The Ravva PSC***

The production sharing contract for the exploration, development and production of the Ravva block (the "Ravva PSC") was signed on 28 October 1994 between GoI and a consortium consisting of ONGC, Videocon Industries Limited (formerly Videocon Petroleum Limited), Ravva Oil and Cairn Energy India Pty Limited (formerly known as Command Petroleum (India) Pty Limited) ("Command Petroleum") with Command Petroleum being designated as the operator. In 1996, Cairn Energy Plc acquired Command Petroleum, including its interest in the Ravva block, and Cairn India became the operator.

Cairn India holds a 22.5% working interest in the Ravva field with the remaining interests currently held by ONGC (40%), Videocon Industries (25%) and Ravva Oil (12.5%) (together, the

“Ravva JV). The PSC is currently valid until 27 October 2019, but may be extended by the GoI for up to an additional ten years in the case of commercial production of non-associated natural gas or up to five years otherwise. The MoPNG, the notification dated 28 March 2016, issued a policy for the grant of an extension to the PSCs signed by the GoI awarding small, medium sized and discovered fields to private joint ventures (“Extension Policy”). The Extension Policy defines the framework for the granting of extension and covers 28 small and marginal fields, including the Ravva field.

Under the Ravva PSC, Cairn India is entitled to recover 100% of exploration, development and costs of production from crude oil and natural gas sales before any profit is allocated among the parties. Further, until such time as India attains self-sufficiency in its crude oil supply, Cairn India is required to sell in the domestic Indian market all of its entitlement to crude oil extracted from the Ravva field to assist in satisfying domestic Indian crude oil demand. All sales to the GoI nominees are to be valued at a FOB selling price per barrel in US dollars, ascertained on Platts, of one or more crude oils of similar characteristics and quality or through the spot market for such crude oils, whichever price is determined by the parties to reflect more truly the current value of the sale. See “Risk Factors — Business Risks”.

The Ravva PSC also provides that royalties and cess are payable on production. The royalty rate on crude oil and casing head condensate is set at Rs. 481 per metric tonne (\$1.0 per barrel), regardless of the value of the crude oil. A levy on the production of crude oil under the provisions of the Oil Industry (Development) Act, 1974 of India (the “OIDA Cess”) is set by the Ravva PSC at Rs. 900 per tonne of crude oil production (\$1.8 per barrel). A further Rs. 27 per barrel (\$0.1 per barrel) (representing a 3% increase in the OIDA Cess) is levied against members of the Ravva JV as educational cess and senior and higher secondary educational cess until November 2013. From December 2013, the educational cess and senior and higher secondary educational cess levied was discontinued as per the circular from the Ministry of Finance.

The royalty payable on natural gas is 10% of the wellhead value of the natural gas (typically 9% of natural gas revenue). OIDA Cess is not payable on natural gas production. Royalties and OIDA Cess are capped by the Ravva PSC at these levels regardless of the generally prevailing royalty and OIDA Cess rate. Royalty and OIDA Cess payments are recoverable under the Ravva PSC before any profit is allocated among the parties. As ONGC originally discovered the Ravva field, Cairn India and the other members of the Ravva JV are obliged to make a series of production payments to ONGC based on cumulative crude oil production. The method of calculating the production payments is set out below.

	<b>Gross Payment Owed to ONGC</b>	<b>Net Payment by Cairn India</b>
	(\$ million)	
For every 25 million barrels produced up to 75 million barrels.....	9.0	3.4
For every 5 million barrels produced between 75-100 million barrels .....	1.8	0.7
For every 5 million barrels produced between 100-225 million barrels.....	1.7	0.6
For every 5 million barrels produced between 225-250 million barrels.....	1.4	0.5
For every 5 million barrels produced over 250 million barrels .....	1.0	0.2

From time to time, disputes have arisen between the joint venture over the interpretation of the Ravva PSC which have required arbitration. For example, a dispute arose between the GoI and Ravva Joint Operating Partners on the issue of excess cost recovery made by Ravva joint operation partners against the base development cost as mentioned in the Ravva PSC which has limited the escalation of such costs for cost recovery purposes. The Ravva joint operation partners (excluding ONGC) initiated arbitration proceedings and the arbitral tribunal announced its award on 18 January 2011, broadly allowing companies including Cairn India to recover base development cost spent amounting to \$278 million and disallowed an over-run of \$22.3 million spent in respect of base development cost and



directed 50.0% legal cost on the GoI. The High Court of Kuala Lumpur, on 30 August 2012, dismissed the GoI's application for setting aside the award with costs.. The GoI further filed an appeal before the Court of Appeal, Kuala Lumpur, which was dismissed on June 27, 2014. The GoI thereafter filed an application for a leave to appeal against the Court of Appeal's order before the Federal Court, which was dismissed by the Federal Court of Malaysia on 17 May 2016. Meanwhile, GoI issued a show-cause notice in this matter which Cairn India Limited replied to and subsequently also filed an application for enforcement of the award before the Delhi High Court as an additional measure of caution. The next hearing in the matter is scheduled for 15 February 2017. Additionally, on 14 August 2015, the GoI filed a suit and obtained an ex-parte 'stay-order' from the Delhi High Court against the determination of 'quantum of costs' by the arbitral tribunal. Cairn India filed an appeal before the Court against the 'stay order' and the 'stay-order' obtained by the GoI in this matter was set aside on 3 May 2016. The next hearing before the Court in the GoI's civil suit is scheduled for 21 April 2017. GoI has also filed an SLP before the Supreme Court against the Division Bench Order of the High Court, dated 3 May, 2016, setting aside the 'stay-order' obtained by the GoI, which is due for hearing on 31 January 2017 See "Business — Litigation — Arbitration proceedings on issues related to the cost recovery of the Ravva block."

The Ravva JV operates eight unmanned offshore platforms and a 225 acre onshore processing facility at Surasaniyanam, Andhra Pradesh, for processing the natural gas and crude oil produced from the offshore field. The Ravva onshore terminal operates in internationally recognized environmental standard (ISO 14001) and occupational health and safety standard (OHSAS18001). The onshore facility has the capacity to handle 70,000 bopd of crude oil, 95 mmscfd of natural gas and 110,000 bbls of water injection per day. The terminal also has the capacity to store 1.0 mmbbls of crude oil and captive power generation capacity of 10 MW.

#### *Production from the Ravva Field*

During fiscal year 2016, the block produced 23,845 boepd on a gross basis, with a plant uptime of 99.7% and was supported by coil tubing based rig-less well intervention programmes contributing significantly to the total field production. Production optimisation efforts such as deeper gas lift valve installation in oil wells and the de-bottlenecking of the water separation unit also assisted in realising higher production, thus arresting the average field decline during the year. Sustained water injection rates through acid stimulation in five water injection wells and deeper gas lift injection have also supported production from oil wells.

The following table sets out the net average oil and gas daily production from the Raava block for the years ended 31 March 2014, 2015 and 2016 and for the 6 months ended 30 September 2015 and six months ended 30 Septmber 2016.

<b>Average Daily Production</b>	<b>Units</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>30 September 2015</b>	<b>30 September 2016</b>
Gross operated .....	Boepd	27,386	25,989	23,845	27,303	19,228
Net operated .....	Boepd	6,162	5,847	5,365	6,143	4,326
Oil .....	Bopd	4,796	5,077	4,690	5,369	3,797
Gas .....	Mmscfd	8.2	4.6	4.1	4.6	3.2

#### *The Cambay Basin Block — Lakshmi, Gauri and CB-X*

The Cambay CB/OS-2 ("Cambay") block is an offshore block which is located in the Cambay Basin of the state of Gujarat in western India. Vedanta's operations in the Cambay block are centered on the Lakshmi and Gauri oil and gas fields and the CB-X development area. Based on exploration and development activities undertaken by us, the Cambay block has yielded natural gas discoveries in its offshore Lakshmi and Gauri fields and onshore CB-X field and crude oil discoveries in the former two fields. Gas production commenced from the Lakshmi gas field in 2002 and from the Gauri field in 2004. Production of co-mingled crude oil, which consists of crude oil plus condensate, from the

Gauri field commenced in 2005. The Lakshmi and Gauri offshore fields cover areas of 121.1 sq. kms and 50.7 sq. kms, respectively, in the Cambay Basin and lie off the coast of the state of Gujarat in water depths of approximately 20 meters. CB-X is an onshore gas field situated in the Cambay block and covers an area of 33.28 sq. kms.

As of 30 September 2016, the block has produced ~ 27 mmbbls of crude oil and ~ 228 bcf of gas with an overall recovery of 30% since inception.

An 82-acre onshore processing facility at Suvali processes natural gas and crude oil from the Lakshmi and Gauri fields. This facility has a capacity to process 150 mmscfd of natural gas and 10,000 bopd of crude oil and includes a three stage separator oil processing train, four storage tanks of combined capacity of 37,700 bbls and a 4.8 MW captive power generation capacity. As part of the asset's long term facility augmentation plan, a storage tank to expand the crude storage capacity at Suvali terminal and an offshore gas lift compressor package to provide artificial lift to the wells have been commissioned during the year. The processing plant and offshore infrastructure are certified to ISO 14001 and OHSAS 18001 standards.

#### *Cambay Basin PSC*

Exploration, development and production of the Cambay Basin Block is governed by a PSC between the GoI and a consortium consisting of ONGC, Tata Petrodyne Limited and Cairn India (the "Cambay Basin JV") which was signed on 30 June 1998 (the "Cambay Basin PSC") and runs until 2023 and can be extended up to a period of 35 years in case of commercial production if non-associated natural gas or for a period not exceeding five years. Cairn India's participating interest in the Cambay Basin JV consists of a 40% interest in the Lakshmi, Gauri and CB-X development areas. The remaining interests in these development areas are held by ONGC (50%) and Tata Petrodyne (10%).

#### *Production from the CB/OS-2 Field*

During fiscal year 2016, the block produced 10,249 boepd, with an uptime of 99.9%. Production was supported by effective reservoir management practices offsetting its natural decline. A successful well intervention campaign carried out during the first quarter of fiscal year 2016, which helped improve the deliverability of producer wells. Commissioning of an artificial gas lift system and better reservoir performance also added to the production. Cleaning and intelligent pigging of the 24" diameter 36 km long sub-sea pipeline in Cambay was accomplished with minimal downtime during the year.

The following table sets out the net average oil and gas daily production from the CB/OS-2 block for the years ended 31 March 2014, 2015 and 2016 and during the six months ended 30 September 2015 and 30 September 2016.

<b>Average Daily Production</b>	<b>Units</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>30 September 2015</b>	<b>30 September 2016</b>
Gross operated .....	Boepd	9,735	10,538	10,249	10,071	10,078
Net operated .....	Boepd	3,894	4,215	4,100	4,028	4,031
Oil .....	Bopd	3,099	3,419	3,538	3,484	3,409
Gas .....	Mmscfd	4.8	4.8	3.4	3.3	3.7

#### *Exploration Blocks*

In addition to the Rajasthan Block, Ravva Block and Cambay Basin Block, Cairn India also holds interests in five other blocks where there is currently no production but which are in various stages

of exploration or early development. The main basins where Cairn India is currently actively involved in exploring include the Orange Basin, the Barmer Basin, Mumbai Offshore Basin, the Krishna Godavari Basin, and the Palar Pennar Basin. This section provides a summary of the exploration interests.

*Krishna Godavari Basin — Block KG-ONN-2003/1 (49% participating interest)*

The onshore block KG-ONN-2003/1, located in the Krishna Godavari basin in the state of Andhra Pradesh, was awarded in NELP V round to a joint venture between Cairn India and ONGC. Cairn India and ONGC entered into a PSC on 23 September 2005 (the “KG-ONN-2003/1 PSC”). As of 30 September 2016, Cairn India has 49% ownership interest in the block. Nagayalanka-1Z was the first discovery in the block. Following this discovery, the joint operation (with ONGC) for the block opted to enter phase-II of the exploration license. The second exploration well, Nagayalanka-SE-1, was drilled which resulted in a light oil discovery in the onshore part of the KG basin.

The Declaration of Commerciality for the two Nagayalanka discoveries (Nagayalanka-1z and Nagayalanka SE-1) was approved at the Management Committee meeting held in July 2014. Operatorship was then transferred to ONGC as per the KG-ONN-2003/1 PSC. ONGC has submitted the Field Development Plan or FDP to the Management Committee and the FDP is being reviewed by the Management Committee.

*Krishna Godavari Basin — Block KG-OSN-2009/3 (operator, 100% participating interest)*

The offshore block KG-OSN-2009/3 covers an area of 1,988 km<sup>2</sup> and is located in the Krishna Godavari Basin off the coast of the state of Andhra Pradesh. It was awarded to Cairn India, which holds 100% of the interests, as of 30 September 2016. Block KG-OSN-2009/3 is a shallow water block with water depths within the block ranging between near shore to 400 metres. The PSC was signed on 30 June 2010 and the PEL was granted in August 2010.

100% of the planned 1,075 km<sup>2</sup> of 3D seismic data acquisition was completed during fiscal year 2015. During fiscal year 2016, seismic processing and interpretation projects were carried out, resulting into identification of four prospects and a number of smaller leads over different play types. Cairn continues to engage with the MoPNG for an extension contingent upon full lifecycle clearance from Ministry of Defence. Phase-I was up to 8 March 2016.

*Palar Pennar Basin — Block PR-OSN-2004/1 (operator, 35% participating interest)*

Block PR-OSN-2004/1 is located in the Palar Pennar basin, south of the Krishna Godavari basin and north of the Cauvery basin off the east coast of India. Water depths in the block range from a few metres (near shore) to 400 metres at the eastern boundary of the block. The block covers an area of approximately 9,417 km<sup>2</sup>.

Cairn India has a 35.0% ownership interest in the block and is the operator, while the consortium members, ONGC and Tata Petrodyne, hold interests of 35.0%, and 30.0%, respectively.

The block was under force majeure since fiscal year 2010 as the location was falling within the prohibited zone notified by government authorities and permission to carry out exploration and petroleum operations in this area was not considered appropriate by the Department of Space, GoI. However, the application for the shift of the restricted boundary has been accepted by government authorities paving the way for further exploration activity. Approval for a special dispensation period in the block was granted for 30 months effective from January 1, 2015 and date of the expiry of Phase-1 is expected to be 30 June 2017. The prospect inventory description of the block has been completed. The program for drilling the commitment wells is being advanced and drilling is planned to commence in the fourth quarter of fiscal year 2017.

*Mumbai Offshore Basin — Block MB-DWN-2009/1. (operator, 100% participating interest)*

This block was awarded under the NELP VIII licensing round and is located in the Mumbai Offshore Basin. Cairn India operates and holds a 100% interest in the block. MB-DWN-2009/1 has water depths of between 1,000 metres to 2,200 metres.

The processing of the acquired 2,128 line km of 2D broadband seismic was completed in fiscal year 2015. During fiscal year 2016, regional prospectively analysis has been completed, together with interpretation of the newly acquired PSTM processed broadband 2D seismic data. Due to poor prospects and high levels of risk revealed through the analysis, Cairn India has applied for the relinquishment of the block. The first exploration phase expired on 16 April 2016 and the formalities related to the relinquishment of the block are in progress.

*Block 1 — Orange Basin, South Africa (operating through a subsidiary, 60% participating interest)*

Cairn India signed a farm-in agreement with PetroSA, the national oil company of South Africa, for the 19,898 km<sup>2</sup> off-shore block 1 (“Block 1”), located in the Orange Basin in South Africa. A wholly owned subsidiary, Cairn South Africa Pty. Limited, a wholly owned subsidiary of Cairn India holds a 60% participating interest in Block 1 and is the operator.

Following farm-in and assignment of participating interest in the block in early calendar year 2013, 1,981 km<sup>2</sup> of 3D seismic data was acquired in fiscal year 2014. Additionally, acquisition of 3,000 line km of 2D seismic data was concluded in early March, 2014. Both the 3D seismic and 2D seismic surveys were completed without incident and on time.

A robust inventory of exploration prospects has been identified based on fiscal year 2014 3D seismic survey, which covers the outboard portion of Block 1. The outboard region is interpreted as oil-prone, constituting a play fairway that has not been tested by historical exploration drilling. Assessment of exploration potential of inboard plays is ongoing to provide other drilling options. Cairn India awaits a decision on the proposed changes to the Mineral and Petroleum Resources Development Act, 2002 and fiscal regime before considering a decision to progress into the second exploration license phase.

***Distribution, logistics and transport***

*Rajasthan*

The MPT has been designed as a centralised hub facility to handle crude oil production from the fields in the Rajasthan Block. Once crude oil reaches the MPT, generally via the Pipeline, it is processed and transported to public-sector undertakings or private refineries as per sales agreement.

Gas produced from Raagehswari fields is sold to a Government allocated fertilizer unit located in Gujarat.

*Cambay*

The 82-acre onshore processing facility at Suvali processes natural gas and crude oil from the Lakshmi and Gauri fields. It has a capacity to process 150 mmscfd of natural gas and 10 kbopd of crude oil and includes a three stage separator oil processing train, four storage tanks of combined capacity of 37,700 bbls as well as 4.8 MW captive power generation capacity. The processing plant and offshore infrastructure are certified to ISO 14001 and OHSAS 18001 standards.

The crude oil produced from Suvali Onshore Terminal is transported via truck tankers approximately 15 km to Adani Hazira Port Private Limited. Thereafter, the crude cargo is sold to coastal refineries via sea tankers.

The processed natural gas is sold through the Gujarat State Petronet Limited pipeline facility to CLP India Private Limited and Gujarat Gas Corporation Trading Limited.

### *Ravva*

Currently, there are eight unmanned offshore platforms and a 225 acre onshore processing facility at Surasaniyanam for processing the natural gas and crude oil produced from the offshore field. The Ravva onshore terminal operates as per the internationally recognized environmental standard (ISO 14001) and the occupational health and safety standard (OHSAS18001). Onshore facility has the capacity to handle 70 kbopd of crude oil, 95 mmscfd of natural gas and 110,000 bbls of water injection per day. The terminal also has the capacity to store 1.0 mmbbls of crude oil.

The crude produced from the wells in the Ravva block is sent to the onshore processing terminal via subsea pipelines. The oil is processed and stored in the storage tanks at the terminal. Thereafter, the crude oil is transported to local refineries (nominated by GoI) via 20 inch export line (approximately 16 km long) from the terminal to a ship tanker, which is moored to the single point mooring buoy located in the field. The single point mooring buoy and associated equipment are together termed as tanker mooring and loading facility.

Natural gas from the wells after treatment is transported to buyer's (GAIL) pipeline.

### ***Sales and marketing***

Cairn India's 10 largest customers accounted for approximately 100% of its revenue in fiscal years 2014, 2015 and 2016 respectively. Four of Cairn India's customers accounted for greater than 90.0% of Cairn India's business revenue in fiscal years 2014, 2015 and 2016. In fiscal year 2016, Cairn India sold 100% of the oil and gas it produced in the Indian market.

100% of the oil and gas that Cairn India produced in fiscal year 2016 was sold under annual/monthly contracts specifying quantity and price. For Rajasthan and Cambay blocks, crude oil price is benchmarked to Bonny Light, West African low sulphur crude that is frequently traded in the region, with appropriate adjustments for crude quality. Similarly, for Ravva block, crude oil price is benchmarked to Tapis and Minas, South Asian crude. The crude oil price benchmarks are based on crude oil sales agreement.

### ***Projects and Developments***

Cairn India intends to spend \$100 million on working interest capital expenditure split between 20% for exploration and 80% for development activities in fiscal year 2017. The activities mainly include Raageshwari gas development, Mangala enhanced oil recovery completion activities, pre-engineering work for Bhagyam & Aishwariya enhanced oil recovery and Aishwariya Barmer Hill. All the projects will be financed from internal sources. A number of our principal projects are set out below.

#### *MBA fields — enhanced oil recovery project including drilling campaign and facilities upgrade*

During fiscal year 2016, the water injection capacity was upgraded at the MPT to 700,000 barrels of water per day by addition of Thumbli pipeline and an injection water pump. This will aid in enhancing recovery rates from the field and has also improved the overall integrity of Vedanta's water injection systems.

Successful execution of polymer flood has yielded positive results with an increase in oil production and stabilization of water cut. At the end of fiscal year 2016, polymer injection ramped up to planned levels of 400,000 bpd and, going forward, plans are being made to maintain the injection at this rate. Enhanced oil recovery led to an increased oil recovery averaging about 47,000 boepd in the first half of fiscal year 2017.

### *Barmer Hill and Satellite field development*

The development of Barmer Hill and Satellite Fields is a key growth driver for Cairn India, with a focus on increasing non-MBA production through the development of these fields. The Barmer Hill formation can be classified into two major development opportunities: Barmer Hill North, consisting of oil prone porcellanite rocks, and Barmer Hill South, consisting of muddy porcellanites.

During fiscal year 2016, Barmer Hill appraisal campaign was successfully completed. A total of 15 wells were drilled, a combination of seven vertical and eight horizontal wells, across Mangala and Aishwariya formations in fiscal year 2015. A combination of different completion types has been tested in both vertical and horizontal wells to permit optimization. The wells were put on long term testing to ascertain decline rates and deliverability. Valuable data gathered through the programme is now being used towards a full field development plan. A set of advanced technologies was deployed to delineate key parameters.

Appraisal activities produced significant learning on fraccability and well productivity in Mangala and Aishwariya. Wells at Aishwariya showed greater productivity (800 to 1,000 bopd) and consequently full field development at Aishwariya has been prioritized. Cairn India achieved sub-surface technical alignment with ONGC, its joint venture partner, and is progressing on technical alignment for the surface facility.

The Satellite Fields produced 1.3 mmbbl of oil during fiscal year 2016. The focus here is to improve productivity, reduce operating expenditure and to bring more wells online. Several optimisation interventions have helped reduce total cost of production and enabled the project to withstand current oil price conditions.

In fiscal year 2016, Cairn India successfully concluded appraisal work in the Guda field. A total of eight wells were tested and modular quick production facilities were deployed in a number of well pads. Long term testing of the wells has yielded positive indication and a revised field development plan is being prepared for monetising this field.

### *Gas development*

During fiscal year 2016, Cairn India achieved progress regarding the pipeline connectivity from its Raageswari Deep Gas terminal by signing a framework agreement with GIGL and GSPL. As per the agreement, Cairn India shall be provided with tie-in connectivity to the pipeline grid, which is being developed by GIGL pursuant to authorization by PNGRB.

Cairn India is also working on a phased ramp-up of gas production. The first phase includes low cost augmentation of the existing facility and installation of additional gas compressor stations. Completion of Phase-1 is expected to increase the gas production to 40-45 mmscfd by end of the first half of the calendar year 2017. For the second phase, Cairn India is progressing well on its tendering process for new gas processing terminal and rig services. Completion of Phase-2 will increase the gas production upwards of 100 mmscfd and condensate production to about 5,000 boepd.

As a result of the successful application of hydro frac technology and better reservoir characterisation, the expected ultimate recovery from the RDG field has been upgraded by 26% as of 30 September 2016. During this hydro frac campaign, Cairn India has successfully placed the largest frac in India in one of the RDG wells.

### *Market share and competition*

The oil and gas exploration and production industry in India is competitive. In seeking to obtain desirable exploration and development prospects, competition is faced from Indian companies, including ONGC and Reliance Industries Limited, and major integrated and large independent multinational companies. GOI has major stake in ONGC, which has won majority of the exploration

blocks offered by the GoI in the nine New Exploration & Licensing Policy rounds held thus far. Many of these competitors have access to financial or other resources substantially in excess of those available to us and accordingly may be better positioned to acquire and exploit prospects, hire personnel and market production. In addition, many of Vedanta's competitors may be better able to withstand the effect of external changes in industry conditions such as worldwide crude oil and natural gas prices and levels of supply and the application of government regulations, which affect Vedanta's business and which are beyond Vedanta's control.

Vedanta is a significant contributor to India's domestic crude oil production, operating approximately 27% as derived from the Ministry of Petroleum and Natural Gas statistics of March 2016.

## ***Zinc Business***

### *Introduction*

Vedanta's fully integrated zinc business in India is owned and operated by HZL, India's leading primary zinc producer with a 79.1% market share by sales volume in India in fiscal year 2016, according to ILZDA.

HZL's fully-integrated zinc operations include five lead-zinc mines, one rock phosphate mine, four hydrometallurgical zinc smelters, two lead smelters, one pyrometallurgical lead-zinc smelter, seven sulphuric acid plants and six captive power plants at the Chanderiya, Dariba and Zawar facilities in the state of Rajasthan, processing and refining facilities for zinc at Haridwar and processing and refining facilities for zinc and lead, as well as a silver refinery at Pantnagar, both located in the State of Uttarakhand in northern India. HZL sources almost all of its concentrate requirements from its mines and HZL also exports surplus zinc and lead concentrates. HZL's annual production of zinc and lead for year ended 31 March 2016 was 758,938 tonnes and 151,576 tonnes, respectively.

In 2016, HZL was one of the top five lead mining companies based on production volumes and in the lowest cost quartile in terms of all zinc mining operations worldwide, according to Wood Mackenzie. In addition, HZL's Rampura Agucha mine was the largest zinc mine in the world on a production basis and its Chanderiya hydrometallurgical zinc smelter was the fourth largest smelter on a production basis worldwide in 2016, according to Wood Mackenzie.

As of 30 September 2016, Vedanta Limited has a 64.9% ownership interest in HZL, with the remainder owned by the GoI (29.5%) and institutional and public shareholders (5.6%). Vedanta Limited exercised a call option in 2009 to acquire the GoI's remaining ownership interest in HZL although the exercise is subject to dispute and an alternative offer authorised by the Company's shareholders has not yet been accepted by the GoI. Accordingly, the acquisition might not proceed. See "— Litigation — Vedanta Limited has commenced proceedings against the GoI, which has disputed Vedanta Limited's exercise of the call option to purchase its remaining 29.5% ownership interest in HZL."

In recent years, HZL has improved its operating performance by:

- its ability to maintain a high share of concentrate from its Rampura Agucha mine by consistently adding to the capacity of the mine and the concentrator and by also adopting the technique of underground mining, as its open cast capacity has started to decline;
- commissioned a concentrator at Sindesar Khurd mine of 1.5 mmtpa in 2011 and increased capacity to 2.8 mmtpa in fiscal year 2016; also increased capacity of Sindesar Khurd mine to 3.0 mmtpa in fiscal year 2016;
- commenced ore mining Kayad mine since fiscal year 2013 and has a capacity of 1 mmtpa in fiscal year 2016;

- continuing its initiatives to improve operational efficiencies at its existing operations;
- reducing power costs by building on-site captive power plants rather than relying on state power grids;
- reducing the size of its workforce including through voluntary retirement plans;
- increasing productivity and upgrading existing technology; and
- increasing recovery from its residue and waste.

HZL pays royalties to the state government of Rajasthan based on its extraction of lead-zinc ore. The royalty rate is 10% of the LME zinc metal price payable on the zinc metal contained in the concentrate produced and 14.5% of the LME lead metal price payable on the lead metal contained in the concentrate produced. For silver, the royalty rate is 7.0% of the silver London Bullion Market Association price chargeable on silver-metal produced. Since September 2015, the MMDRA Amendment Act provides for a royalty of one third of the base royalty rate to be contributed to the DMF for the benefit of people affected by mining and an additional 2% of the base royalty rate to the NMET. Vedanta also pays royalties in connection with its zinc operations in Namibia at 3% of sale value the product, Ireland and South Africa.

In addition to ongoing exploration activities, HZL has finalised plans for the next phase of development growth, which will involve the sinking of underground shafts and developing underground mines. The plan comprises developing a 3.75 mtpa underground mine at Rampura Agucha, expanding the Sindesar Khurd mine from 2.0 mtpa to 4.50 mtpa, expanding the Zawar Group mines from 1.2 mtpa to 4.0 mtpa, expanding the Rajpura Dariba mine from 0.6 mtpa to 1.2 mtpa and developing a new mine at Kayad with capacity of 1.0 mtpa.

Vedanta's Zinc International business comprises assets held by Vedanta Limited, namely (i) Skorpion, which owns the Skorpion mine and refinery in Namibia, (ii) a 74%, (as of 30 September 2016) ownership interest in Black Mountain Mining, which has assets that include the Black Mountain mine and the Gamsberg Deposit, in South Africa and (iii) Lisheen, which owns the Lisheen mine in Ireland, which ceased operations in December 2015 and is in the process of being shut down. Vedanta has commenced the closure operation in April, 2014 and expects to receive the closure certificate in March, 2020.

### ***Principal products***

*Zinc.* HZL produces and sells zinc ingots in all four international standard grades: Special High Grade (99.995%) ("SHG"), High Grade (99.95%) ("HG"), Continuous Galvanising Grade (99.5%) ("CGG") and Prime Western (98.0%) ("PW"). HZL sells most of its zinc ingots to Indian steel producers for galvanising steel to improve its durability and also in the export markets. Some of its zinc is also sold to alloy, dry cell battery, die casting and chemical manufacturers. Skorpion produces SHG zinc ingots of LME grade. Skorpion offers the product to customers through one-year contracts and also through spot contracts with market-determined premiums, covering the sale of all zinc ingots produced at the integrated mine and refinery of Skorpion. Black Mountain produces zinc in concentrate which is sold through market priced off-take concentrate sales contracts with international customers and also in the spot market.

*Lead.* HZL produces and sells lead ingots of 99.99% purity primarily to battery manufacturers and to a small extent to chemical manufacturers. Black Mountain produces lead in concentrate, which is sold through market-priced off-take concentrate sales contracts with international customers and in the spot market.

### ***By-products***

*Sulphuric acid.* HZL sells sulphuric acid to fertiliser and cement manufacturers and other industries.



*Silver.* HZL produces and sells silver ingots primarily to industrial users, jewellery manufacturers and traders of silver. Black Mountain also produces silver as a by-product.

*Copper.* Black Mountain produces copper in concentrate as a by-product, which is sold through market-priced off-take concentrate sales contracts with international customers and in the spot market.

### Production

The following table sets out Vedanta's total production<sup>(1)</sup> from its Chanderiya, Debari, Dariba and Vizag facilities for the periods indicated:

Facility	Product	Year Ended 31 March			Six months ended 30 September	
		2014	2015	2016	2015	2016
(Tonnes, except for silver which is in moz)						
<b>Chanderiya:</b>						
ISP <sup>(TM)</sup> pyrometallurgical lead-zinc smelter .....	Zinc	78,032	91,000	86,908	41,235	35,686
	Lead <sup>(2)</sup>	15,901	26,898	21,517	10,284	9,841
Hydrometallurgical zinc smelters .....	Zinc	398,919	373,724	401,562	213,017	131,644
Ausmelt <sup>(TM)</sup> lead smelter .....	Lead	30,586	6,110	23,045	18,923	952
Sulphuric acid plants .....	Sulphuric acid	586,919	547,165	618,426	316,921	230,183
<b>Dariba:</b>						
Hydrometallurgical zinc smelter .....	Zinc	197,715	199,694	203,704	103,512	79,625
Sulphuric acid plant .....	Sulphuric acid	459,026	480,542	499,222	250,922	188,036
Lead smelter.....	Lead	76,109	94,135	100,357	41,894	44,435
<b>Debari:</b>						
Hydrometallurgical zinc smelter .....	Zinc	74,501	69,385	66,764	40,510	5,124
Sulphuric acid plant .....	Sulphuric acid	282,565	251,408	224,675	133,754	37,166
Pantnagar Silver Refinery.....	Silver <sup>(3)</sup>	11.24	10.53	13.65	6.01	6.29
<b>Skorpion:</b>						
Zinc refinery .....	Zinc	124,924	102,188	82,029	42,495	46,770
Total.....	Zinc	874,091	835,991	840,967	440,769	298,849
	Lead	122,596	127,143	144,919	71,101	55,228
	Silver	11.24	10.53	13.65	6.01	6.29
	Sulphuric acid	1,328,510	1,279,115	1,342,323	701,597	455,385

(1) See "Presentation of Information — Reserves and Production" for an explanation of the basis of preparation of production amounts.

(2) Excludes lead contained in lead with high content of silver (High Silver lead) produced from the pyrometallurgical lead-zinc smelter for captive use, which was 7,262 tonnes, 7,755 tonnes, 6,657 tonnes, 3,451 tonnes and 3,698 tonnes in fiscal year 2014, 2015 and 2016, and for the six months ended September 2015 and 2016 respectively.

(3) Excludes silver contained in lead with high content of silver (High Silver Lead) produced from pyrometallurgical zinc-lead smelter for captive use which was 1.35 moz, 1.42 moz, 1.22 moz 0.67 moz and 0.35 moz in fiscal years 2014, 2015 and 2016, and in the six months ended September 2015 and 2016, respectively.

The following table sets out Vedanta's total ore, zinc concentrate and lead concentrate production<sup>(1)</sup> for the periods indicated:

Mine (Type of Mine)	Product	Year Ended 31 March			Six months ended 30 September	
		2014	2015	2016	2015	2016
<b>(Tonnes, except percentages)</b>						
Rampura Agucha (Open-pit and Underground) <sup>(3)</sup> .....	Ore mined	5,953,138	5,823,320	5,464,735	3,065,442	1,640,988
	Ore grade — Zinc	12.3%	12.7%	11.6%	11.9%	10.5%
	Lead	1.7%	1.7%	1.8%	1.8%	1.4%
	Recovery — Zinc	90.7%	91.7%	88.8%	90.0%	92.4%
	Lead	59.0%	61.4%	60.0%	60.2%	63.1%
	Zinc concentrate	1,290,376	1,279,421	1,158,281	655,074	316,882
	Lead concentrate	96,137	98,694	101,662	57,326	25,783
Zawar Group (Underground).....	Ore mined	1,003,600	1,056,000	1,349,850	616,075	831,075
	Ore grade — Zinc	2.8%	2.8%	2.8%	3.0%	2.7%
	Lead	1.7%	1.7%	2.1%	2.2%	2.1%
	Recovery — Zinc	90.8%	90.3%	90.4%	90.4%	89.9%
	Lead	90.2%	89.8%	90.4%	90.5%	90.5%
	Zinc concentrate	0	0	0	0	3,139
	Lead concentrate	0	0	0	0	2,772
	Bulk Concentrate <sup>(3)</sup>	68,432	74,186	102,987	49,975	53,521
Sindhesar Khurd (Underground)....	Ore mined	1,723,253	1,910,055	2,969,587	1,188,576	1,810,300
	Ore grade — Zinc	3.5%	3.6%	3.9%	3.8%	3.8%
	Lead	2.1%	1.9%	2.2%	2.2%	1.8%
	Recovery — Zinc	87.8%	89.8%	91.0%	90.7%	90.3%
	Lead	85.5%	86.8%	89.0%	88.7%	88.3%
	Zinc concentrate	105,562	126,952	176,761	78,764	121,366
	Lead concentrate	60,128	61,630	92,611	44,422	51,655
Rajpura Dariba (Underground).....	Ore mined	610,242	573,284	668,777	298,699	368,844
	Ore grade — Zinc	5.3%	5.3%	5.1%	5.2%	5.0%
	Lead	1.3%	1.3%	1.2%	1.3%	1.2%
	Recovery — Zinc	82.8%	83.4%	83.4%	83.7%	83.7%
	Lead	67.7%	70.1%	70.3%	72.0%	69.0%
	Zinc concentrate	52,212	43,359	52,351	20,153	31,414
	Lead concentrate	12,241	10,647	12,407	4,871	7,834
	Bulk Concentrate <sup>(2)</sup>	0	9,832	8,941	8,457	0
Skorpion (Open-pit).....	Ore mined	1,252,092	1,344,272	1,245,198	579,656	748,042
	Ore grade — Zinc	10.2%	9.0%	7.5%	7.9%	8.3%
	Recovery — Zinc	90.1%	88.2%	85.5%	85.9%	85.3%
Lisheen (Underground) <sup>(4)</sup> .....	Ore mined <sup>(5)</sup>	1,401,741	1,375,069	849,618	623,517	0
	Ore grade — Zinc	11.8%	10.5%	9.5%	9.6%	0
	— Lead	2.2%	1.9%	1.5%	1.4%	0
	Recovery — Zinc	91.3%	90.3%	89.2%	89.4%	0
	— Lead	68.5%	72.5%	68.5%	69.0%	0
	Zinc concentrate	282,159	244,354	135,611	101,710	0
	Lead concentrate	34,409	30,956	14,371	10,068	0

Mine (Type of Mine)	Product	Year Ended 31 March			Six months ended 30 September	
		2014	2015	2016	2015	2016
		(Tonnes, except percentages)				
Black Mountain (Underground).....	Ore mined	1,395,534	1,437,562	1,579,633	824,340	852,013
	Ore grade — Zinc	2.7%	2.5%	2.5%	2.4%	2.3%
	— Lead	3.2%	2.6%	2.6%	2.5%	3.3%
	Recovery — Zinc	78.0%	74.2%	75.0%	74.0%	73.6%
	— Lead	87.4%	84.8%	84.6%	85.1%	85.9%
	Zinc concentrate	59,942	54,445	59,006,	28,339	26,797
	Lead concentrate	53,221	45,129	48,091	23,572	31,476
Totals .....	Ore mined	13,339,600	13,519,562	14,127,398	7,196,305	6,251,262
	Zinc concentrate	1,790,251	1,748,531	1,582,010	884,040	499,598
	Lead concentrate	256,136	247,056	269,142	140,259	119,520
	Bulk Concentrate <sup>(3)</sup>	68,432	84,018	111,928	58,432	53,521

(1) See “Presentation of Information — Reserves and Production” for an explanation of the basis of preparation of production amounts.

(2) Bulk concentrate is concentrate that contains both zinc and lead.

(3) Includes mining operations at Kayad mine.

#### Ore Reserve base

The following table sets out Vedanta’s Proved and Probable zinc and lead Ore Reserves<sup>(1)</sup> as of 31 March 2016:

	Proved Reserve			Probable Reserve			Total Proved and Probable Reserves		
	Quantity	Zinc Grade	Lead Grade	Quantity	Zinc Grade	Lead Grade	Quantity	Zinc Grade	Lead Grade
	(Million tonnes)	(%)		(Million tonnes)	(%)		(Million tonnes)	(%)	
Rampura Agucha .....	4.9	13.5	2.1	46.2	14.0	1.8	51.1	14.0	1.8
Rajpura Dariba .....	6.4	6.1	1.6	2.9	6.7	1.5	9.3	6.3	1.6
Zawar Group .....	3.4	3.5	1.8	6.2	3.4	1.7	9.5	3.4	1.7
Kayad.....	0.7	13.8	1.8	3.3	13.4	1.8	3.9	13.4	1.8
Sindesar Khurd.....	8.5	4.3	2.5	24.7	4.8	3.4	33.2	4.7	3.2
Skorpion.....	1.15	8.00	—	3.23	9.9	—	4.38	9.4	—
Black Mountain .....	42.4	6.90	0.5	7.67	5.9	0.5	50.1	6.76	0.5
Total.....	67.5	6.9	1.0	94.2	9.8	2.0	161.5	8.6	1.6

(1) See “Presentation of Information — Basis of Presentation of Reserves and Resources” for an explanation of the basis of preparation of reserve amounts.

## Description of operations

*Smelters and refineries.* The following table sets out the total capacities<sup>(1)</sup> as of 30 September 2016 at Vedanta's Chanderiya, Debari, Dariba, Zawar, Pantnagar and Skorpion facilities:

Facility	Capacity				
	Zinc	Lead	Silver	Sulphuric Acid	Power Plant
	(tpa)				(MW)
Chanderiya <sup>(2)(3)</sup>	525,000	85,000	—	828,500	247.7
Debari	88,000	—	—	419,000	7.4
Dariba <sup>(3)</sup>	210,000	100,000	—	710,500	174.3
Zawar Group	—	—	—	—	80.0
Pantnagar	—	—	518	—	—
Skorpion	150,000	—	—	335,000	—
<b>Total</b>	<b>973,000</b>	<b>185,000</b>	<b>518</b>	<b>2,293,000</b>	<b>509.4</b>

(1) See "Presentation of Information — Reserves and Production" for an explanation of the basis of preparation of production amounts.

(2) The Haridwar plant refines and processes zinc ingots from zinc cathodes produced in the Chanderiya and Dariba smelters and therefore its production capacity does not increase the total production capacity of HZL's facilities.

(3) The Pantnagar plant refines and processes zinc and lead ingots from zinc and lead cathodes that are produced in the Chanderiya and Dariba smelters and silver ingots from lead residues in the Dariba lead smelter. Accordingly, it does not contribute to the total production capacity of HZL's facilities.

*Chanderiya.* The Chanderiya facility is located approximately 120 km east of Udaipur in the State of Rajasthan in northwest India. The Chanderiya zinc smelter is the fourth largest smelter on a production basis worldwide in 2016, according to Wood Mackenzie. The facility contains four smelters, two associated captive power plants, two sulphuric acid plants and one silver refinery:

- An ISP<sup>(TM)</sup> pyrometallurgical lead-zinc smelter with a capacity of 105,000 tpa of zinc ingots and 35,000 tpa of lead ingots that was commissioned in 1991;
- Two hydrometallurgical zinc smelters with 210,000 tpa capacity each that were commissioned in May 2005 and December 2007 and expanded in April 2008 together with associated captive power plants;
- An Ausmelt<sup>(TM)</sup> lead smelter with a capacity of 50,000 tpa that was commissioned in February 2006;
- Associated 154 MW and 80 MW coal-based thermal captive power plants commissioned in May 2005 and April 2008, respectively;
- A 14.5 MW captive power plant which was commissioned at Debari in March 2003 and transferred from Debari to Chanderiya in March 2009;
- Two sulphuric acid plants with a total capacity of 828,500 tpa sulphuric acid; and
- A silver refinery with a capacity of 168 tpa silver ingots.

The 154 MW, 80 MW and 14.5 MW captive power plants provide all of the power for the Chanderiya facilities. The captive power plant requires approximately 100,000 metric tonnes of coal per month, which is currently met through imports, mostly from Indonesia.

HZL was also awarded 1.2 million tonnes of coal linkage by the Ministry of Coal, which will enable it to source coal from mines of Coal India Limited (“Coal India”) (catering to approximately a quarter of its total coal requirements), although access to this coal has been stopped since April 2013. HZL’s operations source their back-up power from liquid fuel-based captive power plants or from local power companies. The liquid fuel is sourced from third-party suppliers on yearly contracts.

*Debari.* The Debari hydrometallurgical zinc smelter is located approximately 12 km east of Udaipur in the State of Rajasthan, India. The hydrometallurgical zinc smelter was commissioned in 1968, uses RLE technology and has a capacity of 88,000 tpa. The Debari facility also includes a 419,000 tpa sulphuric acid plant. A majority of the power requirements of the facility is sourced from the coal-based thermal captive power plant at Chanderiya and the balance is sourced from an on-site liquid fuel-based 14.5 MW captive power plant commissioned in March 2003. The liquid fuel is procured from domestic oil-producing companies through a tender process for a yearly contract.

*Vaizag.* Operations at the Vaizag plant shut down since July 2013.

*Haridwar.* The 210,000 tpa zinc ingot melting and casting plant in Haridwar in the State of Uttarakhand was commissioned in July 2008. This plant refines and processes zinc ingots from zinc cathodes produced in the Chanderiya and Dariba smelters and therefore its production capacity does not increase the total production capacity of HZL’s facilities. After the start of the second stream, the capacity of Haridwar Zinc Plant is 292,000 tpa. The plant is no longer in operation and operations are expected to commence in March, 2017.

*Zawar Group.* The Zawar Group facility does not have a smelter. The captive power plant at this facility provides power to the mine.

*Dariba.* The Dariba hydrometallurgical zinc smelter is located in the Rajsamand district of Rajasthan which was commissioned in March 2010 and has a capacity of 210,000 tpa. The Dariba facility also includes a 306,000 tpa sulphuric acid plant. In July 2011, a new 100,000 tpa lead smelter was commissioned, which also included a 98,500 tpa sulphuric acid plant. A majority of the power requirements of the facility is sourced from the 160 MW coal-based captive power plant at Dariba. A new roaster was commissioned in April 2013 in the Dariba facility with an associated sulphuric acid plant capacity of 306,000 tpa. Zinc cathodes are sent to its refining facilities at Pantnagar in Uttarakhand state for finishing and casting. The anode slime obtained as a residue from lead smelting at this smelter is refined and casted into silver ingots at the Pantnagar plant.

*Pantnagar.* The Pantnagar plant, which is located in Pantnagar in the State Uttarakhand, India, includes facilities for the refining and processing of zinc, lead and silver. The silver refinery has a capacity of 518 tpa and was commissioned in December 2011. The 465,000 tpa zinc ingot and 100,000 tpa lead ingot melting and casting plant were commissioned in March 2012. This plant was established to convert zinc and lead cathodes from the Chanderiya and Dariba hydrometallurgical smelters, as well as silver-rich lead residues from the Dariba lead smelter, into ingots.

*Skorpion.* The Skorpion mine and refinery are located 25 kms of Rosh Pinah town in Namibia. The Skorpion mine is an open cast oxide deposit mine, which feeds material directly to the refinery. The refinery uses a leaching process due to the oxide feed from the mine. Metal is casted in the electro-winning-circuit as ingots or otherwise according to customer requirement. The Skorpion refinery runs on oxide feed.

## *Mines*

*Rampura Agucha.* The Rampura Agucha lead-zinc mine is located near Gulabpura in the north-west State of Rajasthan. The good ore mineralogy of the mine provides a high metal recovery ratio and a low overall cost of production for zinc concentrate extracted from the mine. The mining and processing facilities are modern and in good condition. The ore body is mined by open-pit and underground methods. The capacity of the mine and concentrator was expanded between 2003 and 2010 from 2.4 million tpa to 6.2 million tpa for mine and 6.5 million tpa for mill through the purchase of additional mining equipment, upgrades to the truck fleet, improvements to the operational efficiency of the plant and the installation of a new semi-autogenous, or SAG, mill and ball mill circuit.

Open pit mining at Rampura Agucha is a simple drill and blast, load and haul sequence using 221 metric tonne trucks and 34 cubic meter excavators. Ore is fed to the primary crusher and waste is dumped at the waste dump. The mining equipment is largely owner-operated. The processing facility is a conventional crushing, milling and differential lead-zinc flotation plant. Ore from the open-pit is crushed in a series of crushing circuits and then milled in four streams, one rod mill-ball and three other sag mill-balls in closed circuit. The milled ore is then sent to the lead flotation circuit which includes roughing, scavenging and three stages of cleaning. The lead concentrates are thickened and filtered ahead of storage and transport to the Chanderiya and Dariba lead smelter. The lead flotation tails proceed to zinc flotation which comprises roughing, scavenging and four stages of cleaning. Zinc concentrates are thickened and filtered ahead of storage and transported to different HZL zinc smelters. Zinc flotation tails are thickened ahead of disposal to the tailings dam.

Since 2004, exploration at Rampura Agucha has resulted in significant increases in the reserves at the mine. Following an extensive drilling program to convert mineralized material to reserves, better definition of the ore body boundaries, addition of mineralized material and the conduct of open-pit re-optimization, as well as the commencement of underground mine project work, the reserves were 51.1 million tonnes as of 31 March 2016 with an average grade of 14.0% zinc, 1.8% ore. The drill spacing for the definition of proven reserves were approximately 50 meters by 50 meters while for probable reserves was 100 meters by 100 meters. HZL commenced production at the mine in 1991. Since inception, approximately 74.9 million tonnes of ore, with an ore grade of 12.6% zinc and 1.9% lead, respectively, have been extracted from the open-pit mine. HZL is continuing to evaluate the potential of this deeper mineralization. As of 31 March 2016, HZL estimates the remaining mine life at Rampura Agucha to be 13 years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan.

In fiscal year 2016, 4.7 million tonnes of ore at 12.0% zinc and 1.8% lead were mined from Rampura Agucha, which produced approximately 1.0 million tonnes of zinc concentrate at 49.9% zinc and 96,768 tonnes of lead concentrate at 57.6% lead. Approximately 62.6 million tonnes of waste was removed giving a strip ratio of 11.0 tonnes of waste per tonne of ore mined. The expansion of the mine from 5 mtpa to 6.2 mtpa was completed in 2010 and has resulted in a significant increase in the strip ratio as there was dimensional change in the pit with the ultimate depth of the mine increasing to 421 meters. During fiscal year 2016, approximately 88.7% of the zinc was recovered to the zinc concentrate, while 60.9% of the lead and 65.5% of the silver was recovered from the metal contained in the ore mined. The strip ratio is expected to increase to about 17.7 times in fiscal year 2017, considering the anticipated overburden removal of about 56.9 million tonnes and ore production of 3.2 million tonnes from the open-pit. The Rampura Agucha mine is in the midst of transition from open pit to underground mine production, with the underground project picking up pace after a slower than planned ramp up due to difficult geotechnical conditions. The main shaft has reached a depth of 860 meters (out of a planned depth of 950 meters) with completion of the north and south vent work.

The gross book value of the Rampura Agucha mine's fixed assets and mining equipment (including assets related to the Rampura Agucha's underground mining operations and the Kayad mine) was Rs. 51,924 million (\$778.9 million) as of 31 March 2016. The mining lease of Rampura Agucha mine is up to March 2020. Power is mainly supplied from the HZL's captive thermal power plants with two backup 5 MW generators on-site.

*Rajpura Dariba.* Rajpura Dariba is a medium sized underground lead-zinc mine and processing facility located northeast of Udaipur in the Rajsamand district in the state of Rajasthan, northwest India.

Mining at Rajpura Dariba commenced in 1983 and is carried out using the vertical crater retreat method and blasting hole mining method with mined out stopes backfilled with cemented classified mill tailings. In certain areas the ground conditions adversely affect slope stability and dilution. These ground conditions are the result of the weak graphitic nature of the shear zone combined with the dissolution of fractured and sheared dolomites by percolating acidic groundwater derived from overlying adjacent oxidized zones. HZL's Rajpura Dariba's mine lease is valid until May 2030. The mine is serviced by two vertical shafts approximately 600 meters deep. The main shaft is 6 meters in diameter and the auxiliary shaft is 4.5 meters in diameter. The main shaft has the capacity to hoist 0.7 million tpa of ore and is equipped with a modern multi-rope koepe winder. All personnel and materials are hoisted in a large counterbalanced cage which is operated by the koepe winder. The surface infrastructure includes ventilation fans, compressors and ore loading facilities. A 2.2 km surface decline was commissioned in September 2013 to increase the ore production.

The ore is crushed underground before being hoisted to the surface. It is then crushed again and milled before undergoing a lead flotation process incorporating roughing, scavenging and includes three stages of cleaning of rougher concentrate to get final lead concentrate. Lead flotation tails are sent to the zinc flotation process which incorporates roughing, scavenging and includes three stages of cleaning of rougher concentrate to get final Zinc concentrate. In one flotation the Zinc rougher concentrate is being cleaned in column flotation cells. Then Zinc flotation tails proceed to a backfill plant where final tails are cycloned with the underflow proceeding to intermediate storage where cement is added in preparation for use as underground fill. The cyclone overflow is thickened to recover water ahead of disposal in the tailings dam. The final lead and zinc concentrates are thickened, filtered and stored before they are sent to HZL's smelters.

Power for the mine is supplied largely from HZL's 160 MW captive power plants at Dariba and through a contract with a state-owned entity.

The gross book value of the Rajpura Dariba mine's fixed assets and mining equipment is approximately Rs. 5,441 million (\$81.6 million) as of 31 March 2016.

As of 31 March 2016, HZL estimates the remaining mine life at Rajpura Dariba to be around eight years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan which includes assumed production expansion. An exploration program is also underway to identify new resources with the potential to be upgraded to reserves, and has been and continues to be focused on maintaining the reserve position after annual mining depletion. The drill spacing for proved reserves was approximately 30 meters while for probable reserves was less than 60 meters.

The average grade for each individual stope was defined using standard parameters for internal waste and dilution and a geological cut-off grade of 3.0% combined lead and zinc, though the mineralization generally has a sharp natural contact. The in-situ quantities and qualities were adjusted by applying a mining loss factor of 10.0%, a dilution factor of between 12.0% and 20.0% depending on ground conditions. These parameters are based on a reconciliation of historical production. Stopes with average grades below this economic cut-off grade were excluded from the reserve estimate. The final reserve estimate is the sum of the stopes with an average grade above the economic cut-off limit. As the stopes are all accessed using the existing infrastructure and as there is sufficient capacity on the tailings dam, the capital expenditure was limited to the replacement of mining equipment and was therefore considered not to have a material impact on the cut-off grade.

In fiscal year 2016, 668,777 tonnes of ore at a grade of 5.1% zinc and 1.2% lead ore was mined at Rajpura Dariba mine which produced 59,054 tonnes of zinc concentrate at 48.2% zinc, 15,784

tonnes of lead concentrate at 40.9% lead and 1,702 grams per tonnes of silver, with 83.5% of the zinc being recovered in the zinc concentrate and 70.7% of the lead and 69.6% of the silver. The bulk concentrate produced during fiscal year 2016 was 8,941 tonnes at 37.2% zinc and 9.7% lead with 85.8% of the zinc being recovered and 82.8% of the lead and 81.5% of the silver.

*Sindesar Khurd.* The Sindesar Khurd mine is a large scale underground mine deposit that was explored during 1992 to 1995. Mine production began at the Sindesar Khurd mine in April 2006 and HZL's mining permit is valid until March 2029. The Sindesar Khurd mine lies on the same geological belt as the Rajpura Dariba mine. The mine is approachable from Rajpura Dariba mines by road.

The mineralization has been traced over almost 2.5 kilometers along strike and 1.3 kilometer vertical extension. In the mine area, dip is steep westerly, while the dip turns into easterly direction in the lower-southern part of the deposit. The current mine block extends over 1,500 meters along strike and up to 420 meters depth extension.

The deposit has been drilled to a depth of approximately 1,300 meters below surface and the ore body is traced over approximately 2 kilometers along the strike with a 1,100 meters vertical extension. While the deposit is still open in depth in the southern extension of the present mine block, the area below the mine block and towards the north extension only has narrow and low to moderate grade mineralization intersected.

Exploration at the south part of Sindesar Khurd has been continuing since March 2005 with a drilling program aimed at increasing the size of the ore body. A continuous exploration program from underground is also underway with the aim to upgrade the reserve status so that the stopes planned to be mined out shall be extracted with maximum recovery and thereby reducing mining losses. The drill spacing for proven reserves was 12.5-25 meters while for probable reserves was less than 25-50 meters.

The proven and probable ore reserves for the Sindesar Khurd mine as of 31 March 2016 is 33.2 million tonnes with 4.7% zinc and 3.2% lead. The in-situ quantities are adjusted by applying a mining loss factor of 5.0% and dilution factor of 12%.

Access to the mine is through an incline shaft and declines (north and south) from the surface while ore is hauled through the declines by low profile dump truck or LPDTs. The ore body is accessed via horizontal drives on number of levels. The mine currently utilizes blast holes toping with back filling mining method with stope panels varying from 25 to 50 metres in strike.

Ore produced from the mine is treated at 2.0 mmtpa beneficiation plant commissioned in 2011 at Sindesar Khurd. Beneficiation plant has undergone debottlenecking in January 2015 to increase its capacity from 2 to 2.8 mtpa at Sindesar Khurd. Lead and zinc concentrates are sent to their respective high rate thickeners installed separately for lead concentrate and zinc concentrate generated from the concentrator. Tailing dewatering and disposal section comprises of hydro cyclone, tailing thickener, neutralization tank, pumping of tailing to tailing pond and reclaimed water pumping. Lead and zinc concentrates are thickened, filtered and stored before they are sent to HZL's smelters.

The gross book value at this mine is approximately Rs. 21,290 million (\$319.4 million) as of 31 March, 2016.

As of 31 March 2016, HZL estimates the remaining mine life at Sindesar Khurd to be around 9 years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan which includes assumed production expansion. Power for the mill and the mine is supplied from HZL's captive power plant located at Dariba itself.



In fiscal year 2016, 2,969,587 tonnes of ore at a grade of 3.9% zinc and 2.2% lead ore was mined at the Sindesar Khurd mine. As there was mismatch in the mining and beneficiation capacity, the part of the ore produced at Sindesar Khurd mine was treated at Rampura Agucha mine and Rajpura Dariba mine being HZL's mines. Out of the total ore produced at Sindesar Khurd mine, 2,567,816 tonnes of ore was treated at Sindesar Khurd mine beneficiation plant which produced 176,761 tonnes zinc concentrate at a grade of 51.5% zinc and 92,611 tonnes lead concentrate at a grade of 53.2% lead with 2,686 grams of silver in lead concentrate. In addition, 291,568 tonnes of Sindesar Khurd mine ore was treated at Rampura Agucha mine which produced 20,171 tonnes of zinc at a grade of 48.7% zinc and 7,363 tonnes of lead at a grade of 56.9% lead with a 2,456 grams of silver per tonne of lead concentrate and 100,777 tonnes of Sindesar Khurd mine ore was treated at Rajpura Dariba mine beneficiation plant which produced 6,703 tonnes zinc concentrate at a grade of 48% zinc and 3,377 lead concentrate at a grade of 45.9% lead with 1,947 grams of silver in lead concentrate.

*Zawar Group.* Zawar consists of four mines namely, Mochia, Balaria, Zawar Mala and Baroi. The deposit is located near Udaipur city, in Rajasthan in northwest India. The deposits lie within a 36.2 square kilometers mining lease granted by the state government of Rajasthan which is valid until 31 March 2030.

Ore processing is carried out in a conventional comminution and flotation plant having facility for "differential" as well as "bulk flotation" of zinc and lead metals. The ore is crushed primarily underground and then hoisted to the surface. Thereafter, the ore is crushed to 12 to 15mm in size before being milled to 74 microns. In the differential flotation process, milled ore is conveyed separately to two lead flotation circuits and undergoes a process incorporating roughing, scavenging and cleaning. Lead flotation tails proceed to two zinc flotation circuits comprising roughing, scavenging and cleaning. Zinc flotation tails are disposed in slurry form in designated tailings disposal area. Lead and zinc concentrates are thickened, filtered and then stored before they are sent to HZL's smelters. In the bulk flotation process, milled ore is conveyed to the flotation circuit and undergoes a process incorporating roughing, scavenging and cleaning. Final bulk concentrate is thickened, filtered and then stored before it is sent to the lead zinc smelter at Chanderiya. Bulk flotation tails are disposed in slurry form in designated tailings disposal areas.

In fiscal year 2016, approximately 1,349,850 tonnes of ore at 2.8% zinc and 2.1% lead was mined which produced 102,987 tonnes of bulk concentrate at 32.3% zinc and 24.2% lead. The recovery of zinc and lead during fiscal year 2016 was 90.4% and 90.4%, respectively.

The gross book value of the Zawar fixed assets and mining equipment was approximately Rs. 4,600 million (\$69.0 million) as of 31 March 2016 and of the 80 MW coal-based thermal captive power plant at Zawar was Rs. 3,220 million (\$48.3 million).

Power is supplied through a combination of an 80 MW thermal coal-based captive power plant commissioned in December 2008 and a 6 MW captive power plant.

As of 31 March 2016, HZL estimates the remaining mine life of the Zawar mine to be 5 years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan which includes assumed production expansion. The focus of mine exploration at Zawar is to replenish the ore reserves that are being depleted through exploration activities and to look for new mineralized areas to enhance production capacity. A surface drilling program is underway to locate deeper resources below -100 meter reduce level up to 500 meter reduce level. Underground exploratory drilling is carried out on a grid of between 25 meters and 30 meters which is then infilled to 12.5 meters/15 meters after completing the development for final delineation of ore bodies. Past exploration has outlined additional in-mine mineral resources which require further delineation to add to reserves and further extend the mine life.

The proven and probable reserves for the Zawar Group as of 31 March 2016 is 9.5 million tonnes with 3.4% zinc and 1.7% lead.

*Kayad.* The Kayad lead-zinc mine is located in Ajmer, in the state of Rajasthan.

The Kayad lead-zinc deposit was initially prospected by Airborne Mineral Survey and Exploration wing of Geological Survey of India and drilling commenced in August 1988 and was completed in December 1991. Mineral Exploration Corporation Limited worked on the project on promotional basis, started the exploration and a total of 9,585 meters of drilling was achieved in 42 completed bore holes between 1994 and 1997. The detailed exploration of Kayad deposit was commenced by HZL in 1999 and continues as of today with a total of 162 kilometers in 919 drill holes. According to the reserve report, the proven and probable reserves for Kayad mine as on March 31, 2016 was 3.9 million tonnes at 13.4 % zinc and 1.8% lead. As of 31 March 2016, HZL estimates the remaining mine life of the Kayad mine to be over 4 years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan which includes assumed production expansion.

The ground breaking of the mine commenced on 11 June 2011. The access is through a decline which then divides into two declines at 420 meter reduce level. Development ore production was achieved in the second quarter of fiscal year 2013, and the mine started operations in fiscal year 2014. The mining method practiced in Kayad is long hole open stoping with cemented rock filling/rock filling in the steeper portions of the deposit; while transverse stoping method at flat portion along with rock filling/cemented rock filling. About 47 kilometers of development is planned by 2021. The mining is highly mechanized with twin boom jumbo drills used for face drilling, rock bolting machines used for support and 10 T and 17 T diesel load haul dump vehicles coupled with 30 T/50 T low profile dump trucks for loading and hauling. For production drilling Simba Drills are being used. The run of mine is stacked in the surface ore stock pile and transported by trucks to the Rampura Agucha mine for beneficiation.

A mine lease of 480.45 hectares was granted to Kayad mine by the state of Rajasthan and is valid until February 2048, subject to further renewal. Surface land rights over 49.8 hectares have been obtained. Mine plan approval from the Indian Bureau of Mines have been obtained and received environmental clearance from the MoEF for an increase in lead zinc ore production capacity from 0.35 million tonnes per annum to 1.0 million tonnes per annum. Consents under various environmental laws to operate the mine, including from the Rajasthan State Pollution Control Board have also been obtained.

A 33 KV power line was commissioned on 2 February 2012 to meet the constructional power requirements of the mine. Currently, most of the power is being taken from captive power plant, Zawar and some power is taken from state grid. A one megavolt amperes diesel generator is kept as a backup power supply for emergency operations in the event of power failure. For proper power distribution 2 megavolt amperes underground sub station is commissioned in North and south section each.

*Skorpion.* The Skorpion mine and refinery is located in the Karas region of southern Namibia, comprising an open pit mine. As of 31 March 2016, the remaining mine life of the Skorpion mine is approximately 4.57 years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan, which includes assumed production expansion. The Skorpion mine has an attached electrolytic refinery producing approximately 150,000 tonnes of SHG zinc ingots annually. Further opportunities to extend the life of the mine are currently being evaluated based on the sulphide ore bodies in the nearby areas. Skorpion is also working towards expanding the refinery from stand-alone oxide ore treatment to sulphide ore treatment also.

According to Wood Mackenzie, the Skorpion mine has consistently been one of the largest zinc producing mines in the world and in 2016, it ranked tenth in the world in terms of production volume with a cost base in the lower half of the zinc industry cost curve. The Skorpion mine produces only high-grade, high purity SHG zinc ingots that are registered on the LME. Exploration of nearby ore bodies is underway to extend the life of mine beyond 2021.

The mineral rights over the Skorpion zinc deposit are currently held under mining licence ML 108 and exclusive prospective licence 2229. The EPL was originally issued by the Government of Namibia to Erongo Mining and Exploration Company, which covered 33,192 hectares. An extension to the south was subsequently granted, which increased the exclusive prospective licence area to 98,683 hectares. Mining licence number 108 of July 2000 is valid for 25 years up to July 2025. The licence covers 951 hectares and includes the site for the refinery. Skorpion is also the holder of another mining licence covering the limestone mining area, ML 127, which is valid until February 2026.

The Skorpion deposit lies within the volcano sedimentary rocks of the late Proterozoic Port Nolloth zone of the pan-African Gariep Belt. The ore body consists of secondary oxide zinc mineralisation, including silicates, clays and carbonates. It is covered by a 10 to 20 km thick layer of sand, calcrete, boulder beds and silcrete and is hosted by weakly metamorphosed, quartz-rich clastic sediments. Commonly, mineralisation occurs in the lower portion of the sedimentary package immediately overlaying a unit of impure limestone and calcareous sandstone. A steep dipping zone of sheared sericite schist cuts through the ore and the surrounding host rocks, roughly following the long axis of the mineralised body. Quartz sericite schist, believed to be a weathered product of a felsic volcanic unit, occurs in the north eastern portion of the open pit. Towards the west, black shale, amphibolite and quartz biotite schist underlies the body. Down hole geophysical logging indicates that the water table lies at about 175 metres below the surface.

Although the geology of the deposit is complex and the ore, limestone and arkose interface requires careful separation, the mine has managed this with accurate grade control and selective mining.

The processing at the Skorpion mine is unique, using solvent-extraction/electrowinning from zinc oxide ore. In this process, mined ore is crushed, homogenised and milled before acid leaching in agitated tanks at the refinery. Clarified liquor is purified by solvent extraction and zinc is electrolytically plated on to aluminium cathodes. Zinc is periodically stripped from these cathodes before being melted and cast as ingots for export.

Zinc at the Skorpion mine is cast into ingots for export and transported from the refinery to the port of Luderitz, approximately 300 km away, by trucks each having a maximum capacity of 35 tonnes.

The maximum power demand of the Skorpion mine is 85 MW and power is supplied from South Africa and is governed by a trilateral US dollar-denominated fixed price contract between Namibia Power Corporation (Proprietary) Limited, Eskom Holdings Limited and Skorpion, that currently links the annual increases in power costs to a US inflationary index.

The Skorpion mine used 65,412 tonnes of sulphur in fiscal year 2016, of which 96.0% was imported in bulk and shipped to Namibia through the port of Luderitz while the remaining sulphur was brought from South Africa in molten form by road. During the year ended 31 March 2016, 1.2 million tonnes of ore at 7.53% zinc were mined from the Skorpion mine, which produced approximately 81,938 tonnes of zinc metal.

*Lisheen.* The Lisheen mine is located in County Tipperary, Republic of Ireland and when operational consisted of an underground mine, concentrator and backfill plant, with a related capacity of approximately 131,000 tonnes of zinc in concentrate annually. The Lisheen mine also included approximately 19,000 tonnes of lead in concentrate annually. Mining and milling activities ceased in December 2015 and the facility is currently in the process of implementing a mine closure plan in conjunction with the statutory authorities. Management is actively exploring further business opportunities and ways to utilize the existing resources and skills at Lisheen following the cessation of normal mining activities and a task force has been established to facilitate this.

During fiscal year 2016, 849,618 tonnes of ore at 9.5% zinc and 1.5% lead were processed at the Lisheen mine, which produced approximately 135,611 tonnes of zinc concentrate and 14,371 tonnes of lead concentrate, containing 71,825 tonnes and 8,726 tonnes of zinc and lead, respectively.

The Lisheen zinc deposit is located in the Rathdowney Trend, which comprises sedimentary rocks, mainly limestone, which was formed approximately 320 million years ago. The Lisheen deposit owes its existence to the presence of several faults in the district, which played a major role in the formation, morphology and location of the ore bodies. It is believed that these fractures in the strata acted as conduits for the hydrothermal mineralizing fluids which carried metals upwards from extreme depths.

Mining activities at the Lisheen mine ceased in December, 2015. Closure operations commenced in April, 2014 and are expected to be complete by September, 2017. Vedanta expects to procure the required mine closure certificate in March 2020. After successfully closing down the mine, Vedanta will continue to provide care and maintenance for at least 30 years as required under Irish law.

*Black Mountain.* The zinc mine at Black Mountain is an underground operation, mining a polymetallic ore body, with an attached concentrator producing approximately 38,577 tonnes of zinc, 48,883 tonnes of lead, 3,799 tonnes of copper and 51 tonnes of silver in concentrate, annually. Exxaro Resources (through its wholly owned subsidiary, Exxaro Base Metals) holds the remaining 26.0% interest in Black Mountain.

The Black Mountain mine is operated pursuant to mining right 58/2008 MR granted pursuant to the Mineral and Petroleum Resources Development Act, 28 of 2002 of South Africa which entitles Black Mountain Mining to mine for lead, copper, zinc and associated minerals in, on and under an area in the district of Namaqualand measuring 24,195 hectares for a period of 30 years from 2008 to 2038.

Four major stratiform exhalative sediment hosted base metal deposits are located in a 10 by 30 km area, centred on Aggeneys. The deposits are situated in the supracrustal rocks of the mid-Proterozoic age Bushmanland group of the Namaqualand metamorphic complex. The deeps ore body, which is currently being mined, is considered to start at 166 metres above mean sea level, with a down plunge extent of 1.1 km with the deepest position of the ore body being 1,680 metres below the surface. Mineralisation in the deeps is hosted by iron formations, massive sulphide and sulphide quartzite. The massive sulphide rock is either banded, massive or occurs as fine grained mylonite. Banding is expressed as 1-5 m thick sulphide bands alternating with quartz rich bands of similar thickness.

Underground drilling of the deeps ore body started in 2000 and was completed in 2012. Based on Ore Reserves and Mineral Resources as of 31 March 2016 and current production levels, Black Mountain Mine estimates the remaining life of the mine of the deeps ore body to be over 14 years.

The predominant mining method is ramp in stope cut and fill. The planned production rate is 1.8 mtpa plant feed and the shaft hoisting capacity is approximately 1.44 mtpa from Deeps mine and 0.36 mtpa from Swartberg. All production stopes in the Deeps mine are backfilled and waste filled, integrated into the mining sequence.

The mining process includes primary crushing underground before being hoisted to surface coarse ore silos for stockpile. Coarse ore is screened before secondary and tertiary crushing, from where it is fed into a milling plant. The slurry product from the grinding mills passes directly to the flotation circuits from which copper concentrates, lead concentrates and, finally zinc concentrates are floated off. The concentrates are dewatered by thickening and subsequent pressure filtration to reduce moisture content to shipment requirements. The dewatered concentrates are discharged onto conveyors, before being transferred to separate copper, lead and zinc concentrate stockpiles. From the stockpiles, the concentrates are hauled by truck to a dedicated railway siding 170 kms away, where they are loaded onto rail cars for outbound shipping.

Power at the zinc mine at Black Mountain is supplied from two 40 MVA transformers at the Eskom Aggeneys substation. Water is supplied by the Pelladri Water Board, which supplies potable water to the mine from the Orange River for both human consumption and industrial water requirements.

Zinc, lead and copper concentrate from the mine are road hauled to a dedicated railway siding along a 170 km gravel road, which is owned by the provincial authorities but maintained by Black Mountain. The concentrate is then transported by train to Saldanha on the Sishen-Saldanha railway with delivery terms to export customers on a cost, insurance and freight basis.

During fiscal year 2016, 1,579,633 tonnes of ore at 2.47% zinc and 2.56% lead were mined from the Black Mountain mine, which produced approximately 59,006 tonnes of zinc concentrate and 48,091 tonnes of lead concentrate, containing 29,272 tonnes of zinc and 34,114 tonnes of lead respectively. In addition, the Black Mountain mine also produced 4,729 tonnes of copper in concentrate and 41 tonnes of silver in concentrate.

### ***Principal raw materials***

The principal inputs of HZL's zinc smelting business are zinc and lead concentrates and power. HZL has in the past been able to secure an adequate supply of the principal inputs for its business.

*Zinc and lead concentrates:* Zinc and lead concentrates are the principal raw material of HZL's smelters. HZL's lead-zinc mines have provided nearly all of its requirements for zinc and lead concentrates in the past. However, a marginal portion of the metal is being produced through sourced concentrates. In fiscal year 2016, 3.1% of the lead production was through sourced concentrates. Vedanta expect HZL's mines to continue to provide nearly all of its zinc and lead concentrate requirements for the foreseeable future.

*Power:* Most of HZL's operations are powered by the coal-based captive power plants at Chanderiya, Dariba and Zawar. HZL imports the required thermal coal from a number of third party suppliers and part of the requirement is sourced by way of linkage with South Eastern Coalfields Ltd (which is a subsidiary of Coal India). HZL was awarded 2.43 million tonnes of coal linkage by Ministry of Coal. However, due to limited coal availability, Coal India has been supplying only 50.0% of the 2.4 million tonnes linkage quantity. As of April 2013, the coal supplies to Chanderiya have stopped due to pending decision at Ministry of Coal on the linkages for plants which have been allocated coal blocks. In February 2014 the coal block allocated to the Chanderiya lead zinc smelter captive power plant was deallocated by the Ministry of Coal. As in January 2016 the coal supplies to Dariba captive power plant has stopped due the expiry of the existing fuel supply agreement and further renewal of fuel supply agreement has not been sanctioned by South Eastern Coalfields Limited as 30 September 2016. If the FSA is not renewed, HZL will source its entire coal supplies through imports. Linkage coal supplies to HZL's power plants at Zawar are continuing and the linkage quantity for these plants has been restricted to 50% of 0.4 million tons. The remaining coal requirements are met via import of coal from various countries which is currently priced lower than linkage coal on a landed basis.

HZL's remaining operations source their required power from liquid fuel-based captive power plants or from local power companies. The liquid fuel is sourced from third party suppliers on yearly contracts.

*Metallurgical coke:* In addition, HZL's pyrometallurgical smelter at Chanderiya requires metallurgical coke that is used in the smelting process. HZL currently sources its metallurgical coke requirements from third parties under long-term contracts and the open market.

### ***Distribution, logistics and transport***

Zinc and lead concentrates from HZL's lead-zinc mines are transported to the Chanderiya and Debari smelters by road. Zinc and lead ingots, silver and sulphuric acid by-products are transported primarily by road to customers in India directly or via HZL's depots. Zinc and lead cathodes are mostly

transported by rail to its processing and refining facilities in Uttarakhand state in northern India. Zinc and lead ingots are transported for exports to ports in India primarily by rail, from where they are loaded on ships. The facilities in Uttarakhand also serve as finished goods center for nationwide distribution of its finished products.

Zinc at the Skorpion mine is cast into ingots for export and transported from the refinery to the port of Luderitz, approximately 300 km away by trucks each having a maximum capacity of 35 tonnes.

Zinc concentrate, lead concentrate and copper concentrate from the Black Mountain mine is hauled by road to a dedicated railway siding along a 170 km gravel road, which is owned by the provincial authorities but maintained by Black Mountain Mining. The concentrate is then transported by train to Saldanha on the Sishen-Saldanha railway with delivery terms to export customers on a cost, insurance and freight basis.

Lisheen transports the zinc concentrates it produces to the port at Cork (135 km from mine site) via on-site haulage contracted with a single supplier. Lisheen is within close proximity to international airports (Dublin 157 km, Cork 135 km), the national highway network and nearby towns. The nearest motorway is 10 km from the mine site and provides direct motorway access to the port facility in Cork.

### ***Sales and marketing***

HZL's 10 largest customers accounted for approximately 41.2%, 40.5% and 36.5% of its revenue in fiscal years 2014, 2015 and 2016 respectively. No customer accounted for greater than 10.0% of HZL's zinc business revenue in fiscal years 2014, 2015 and 2016.

HZL's marketing office is located in Mumbai, and it has field sales and marketing offices in most major metropolitan centers in India. In fiscal year 2016, HZL sold approximately 70.2% of the zinc and lead metal it produces in the Indian market and exported approximately 29.8% of Vedanta's zinc India segment revenue

In fiscal year 2016, HZL sold approximately 96.9% of the zinc metal in the domestic market and exported approximately 56.1% under annual contracts specifying quantity, grade and price, with the remainder sold on the spot market. The contract sales price is linked to prevailing LME price with an additional physical market premium. Thus, the price that HZL receives for its zinc is dependent upon, and subject to fluctuations in the LME price.

Skorpion's 10 largest customers accounted for approximately 100%, 99.9% and 79.9% of its revenue in fiscal years 2014, 2015 and 2016 respectively. Three of Skorpion's customers accounted for approximately 85%, 85% and 64% of Skorpion's revenue in fiscal years 2014, 2015 and 2016. Skorpion's marketing office is located in Rosh Pinah. Most of the zinc metal that Skorpion produced in fiscal year 2016 was sold under bi-annual/annual contracts. About 30% of the metal produced is sold in the Southern African Customs Union market and balance is sold to other regions. The contract sales price is linked to prevailing LME price with an additional market premium. Thus, the price that Skorpion receives for its zinc is dependent upon and is subject to fluctuations in the LME price.

Black Mountain Mining produces zinc, lead and copper concentrates that are sold in the international markets on spot basis and through long term contracts. The commercial terms negotiated on an annual basis include taking into account the percentage of payable metals, treatment and refining charges and applicable prices. Some of the customers of Black Mountain mine are Trafigura Beheer B.V., MRI Trading and Ocean Partners UK Limited. Approximately 80% of the zinc and lead metal that BMM produced in fiscal year 2016 was sold under annual contracts specifying quantity, grade and price, with the remainder sold on the spot market. The contract sales price is linked to the prevailing LME price with an additional market premium. Thus, the price that BMM receives for its zinc and lead is dependent upon and is subject to fluctuations in the LME price.

## ***Projects and developments***

HZL has been actively conducting exploration, which has resulted in net ore reserves of 107.1 million tonnes across all mines in fiscal year 2016. Based on long-term evaluation of assets and in consultation with mining experts, Vedanta has finalized the next phase of growth, which will involve sinking of underground shafts and developing underground mines. The plan comprises developing a 3.75 mmtpa underground mine at Rampura Agucha mine and expanding the Sindesar Khurd mine from 2.0 mmtpa to 4.50 mmtpa, Zawar mines from 1.5 mmtpa to 4.0 mmtpa, Rajpura Dariba mine from 0.6 mmtpa to 1.2 mmtpa and Kayad mine from 0.35 mmtpa to 1.0 mmtpa. The growth plan will increase mined metal (MIC) production capacity to 1.2 mmtpa. The estimated cost for these projects amounts to Rs. 86,700 million (\$1,300.6 million). HZL spent Rs. 10,420 million (\$156.3 million) on these projects in fiscal year 2016. These projects are financed from internal sources.

### ***Gamsberg Project***

The Gamsberg ore body is a large undeveloped zinc deposit situated approximately 22 kms from Black Mountain. The Gamsberg Project was officially approved by Vedanta's Board in November 2014. In April 2015, the Project Schedule was revised after optimizing the Mining Cost. The mining and milling capital cost reduced mainly on engineering improvements and negotiations.

During fiscal year 2016, pre strip mining started from July 2015 and to 31 March 2016 6.5 million tonnes of waste has been mined. A total of \$80.6 million of commitments have been made, with the total spend being \$15.1 million. Other infrastructure jobs such as Residential Housing, Pre start Infrastructure is under progress as planned.

The estimated production capacity of the mine is expected to be 250 ktpa.

In fiscal year 2017, the project activities will cover the ordering of plant and infrastructure packages followed by construction activities. The initial ore production is planned for fiscal year 2018 with ramp up to full production expected in subsequent years .

### ***Market share and competition***

HZL is the only integrated zinc producer in India and had a market share by sales volume of the Indian zinc market of 79.1% in fiscal year 2016, according to ILZDA. Imports and secondary sources accounted for the remaining 20.9% market share, according to ILZDA. Zinc is a commodity product and HZL competes primarily on the basis of price, time of delivery and location. Zinc metal also faces competition as a result of substitution of materials, including aluminium, stainless steel and other alloys, plastics and other materials being substituted for galvanized steel and epoxies, paints and other chemicals being used to treat steel in place of galvanization in the construction market.

HZL is the only primary lead producer in India, with competition coming from imports which provide a substantial majority of the lead consumed in India. Lead is a commodity product and HZL competes primarily on the basis of price, time of delivery and location.

### ***Copper Business***

#### ***Introduction***

Vedanta's copper business comprises operations in India, Zambia and Australia. Vedanta's Indian and Australian copper business is operated by Vedanta Limited, while its Zambian copper business is owned and operated by KCM. As of 30 September 2016, the Company owned 62.9% of the share capital of Vedanta Limited through Twin Star and MEL and 79.4% of the share capital of KCM. According to Wood Mackenzie, KCM is one of the world's highest grade copper mines, in terms of contained copper in 2016. Vedanta's custom smelting and refining business forms 40% of the total Indian capacity according to the Indian Minerals Yearbook 2014. KCM is one of Africa's largest integrated copper producers.

Vedanta's Indian copper business is principally a custom smelting business, which includes a smelter, refinery, phosphoric acid plant, sulphuric acid plant, copper rod plant and three captive power plants at Tuticorin in southern India, a refinery and two copper rod plants at Silvassa in western India, a precious metal refinery that produces gold and silver, a doré anode plant, and a copper rod plant at Fujairah in the UAE. According to Wood Mackenzie, Vedanta Limited's Tuticorin smelter was one of the world's top ten, in terms of production volumes in 2016.

In addition, Vedanta Limited owns the Mt. Lyell copper mine in Tasmania, Australia, which provides a small percentage of its copper concentrate requirements. The operation of Mt Lyell mine was suspended in January 2014, following a mud slide incident. Subsequently, the operations at Mt. Lyell copper mine has been placed under care and maintenance since 9 July 2014 following a rock falling on the ventilation shaft in June 2014.

As a custom smelter, Vedanta Limited buys copper concentrate at LME-linked copper prices less TcRc that it negotiates with suppliers. Vedanta Limited sells refined copper at LME-linked prices in domestic and export markets. Vedanta Limited receives a discount from its suppliers in the form of aTcRc, which is influenced by the global copper concentrate demand, supply of copper smelting and refining capacity, LME trends, LME-linked price participation and other factors. Vedanta Limited sources its concentrate from various global suppliers and its Mt. Lyell copper mine.

In recent years, Vedanta Limited has improved the operating performance of its copper business by improving operational efficiencies and reducing unit costs, including reducing power costs by constructing a captive power plant at Tuticorin. Vedanta Limited intends to further improve the operating performance of its copper business by continuing to reduce unit operating costs through improvements in recovery rates, lowering power and transport costs, achieving economies of scale and the achievement of other operational efficiencies. The copper business in Zambia is owned and operated by KCM which is largely an integrated copper producer. KCM's Zambian operations comprise various facilities at Konkola, Nchanga, Nkana and Nampundwe. KCM's operations at Nchanga include a number of open-pit mines, a large underground mine, TLP with the associated solvent extraction electro winning ("SX-EW") facility, a smelter with a cobalt recovery furnace, and a sulphuric acid plant and copper concentrators comprising two main processing units and a refractory ore stockpile. At Konkola, KCM operates a large underground mine and a concentrator on site. There is also a refinery at Nkana and a pyrite mine and concentrator at Nampundwe. In fiscal year 2016, the KCM mines provided approximately 53% of KCM's copper concentrate requirements for its smelting operations, with the remainder of KCM's copper concentrate requirements being obtained from third parties. As of 30 September 2016 Vedanta had spent over three billion since 1 April 2005 on its asset base.

Since the acquisition of KCM in 2004, Vedanta has implemented or is in the process of implementing various projects and expansions to improve KCM's operating performance. These include:

- the Konkola Deep Mining Project (the "KDMP"), a comprehensive project developing mining infrastructure to access the large copper ore body available at deeper levels at KCM's Konkola mine, which Vedanta estimates will increase the output of KCM's Konkola underground mine to approximately 7.5 mtpa at full ramp-up; It is a flagship asset with a life of 169 years.
- de-bottlenecking the TLP at Nchanga to increase its capacity from 15.1 mtpa to up to 17.3 mtpa;
- installing a second cobalt recovery furnace at the Nchanga smelter to double cobalt recovery;



- upgrading and modernising the east and west mill processing plants at the Nchanga concentrator, including upgrading the west mill Nchanga underground mine concentrator with a new 3.0 mtpa concentrator and the east mill Nchanga open-pit concentrator with a new 6.5 mtpa concentrator;
- commissioning a 311,000 tpa direct-to-blister flash smelter at Nchanga with a cobalt recovery furnace;
- commissioning a 6 mtpa concentrator at Konkola to enhance mining output, improve recovery and improve the concentrate grade of its copper;
- expanding the Nkana refinery to a production capacity of 300,000 tpa of copper cathode; and
- commissioning a 640,000 tpa sulphuric acid plant at Nchanga to produce acid for use in the TLP.

KCM intends to further improve its operating performance by:

- substantially developing its open-pit mines at Nchanga, including the opening of additional pits and the mining of cobalt ore at the Nchanga open-pit;
- expanding capacity at, and extending the life of, the existing Nchanga underground mine by extracting as yet unmined ore in the upper ore body of the Nchanga ore deposit; and
- accelerating development at KDMP for ramping to its full potential.

Total revenue from Vedanta's copper businesses during fiscal year 2016 was \$4,163.5 million.

### *Principal products*

*Copper cathode.* Vedanta's copper cathodes from the Tuticorin and Nkana refinery are square shaped with purity levels of 99.9% copper. These cathodes meet international quality standards and are registered as LME "A" Grade. KCM also produces Kabundi copper cathode, which is marketed as "KBC" from SX-EW TLP at Nchanga. The major uses of copper cathodes are in the manufacture of copper rods for the wire and cable industry and copper tubes for consumer durable goods. Copper cathodes are also used for making alloys like brass, bronze and alloy steel, with applications in transportation, electrical appliances and machinery in defence and construction.

*Copper rods.* Vedanta's copper continuous cast rods meet all the requirements of international quality standards including the ASTM B 49: 2010 or the BS EN 1977:1998 standards. Vedanta's copper rods are currently used primarily for power and communication cables, transformers and magnet wires.

*Sulphuric acid.* Vedanta Limited and KCM produce sulphuric acid at their sulphuric acid plants through conversion of sulphur dioxide gas that is generated from the copper smelter. A significant amount of the sulphuric acid produced at the Tuticorin smelter is consumed by the phosphoric acid plant in the production of phosphoric acid, and the remainder is sold to fertiliser manufacturers and other industries. Sulphuric acid produced at the sulphuric acid plants at the Nchanga smelter is used in the TLP to extract oxide copper minerals from the current and old tailings and any surplus sulphuric acid is sold in the region.

*Phosphoric acid.* Vedanta Limited produces phosphoric acid at its phosphoric acid plant by chemical reaction of sulphuric acid and rock phosphate, Vedanta Limited imports. Phosphoric acid is then sold to fertiliser manufacturers and other industries.

*Other by-products.* Other by-products of Vedanta Limited's copper smelting operations are gypsum, bismuth and anode slimes, which Vedanta Limited sells to third parties. Copper cobalt alloy is a by-product of KCM's copper mining operations, which KCM also sells to third parties. KCM is also pursuing potential opportunities to extract sales from the slag produced at its Nchanga smelter.

### Production

Copper anode is an intermediate product produced by copper smelters and is generally not sold to customers except KCM where copper anodes are sold to customers. Approximately one tonne of copper anode is required for the production of one tonne of copper cathode. Sulphuric acid is used as a starting material for phosphoric acid. Approximately 2.8 tonnes of sulphuric acid is required for the production of one tonne of phosphoric acid. Copper cathode is produced at the TLP at Nchanga using current tailings from the Nchanga west concentrator and reclaimed tailings sourced from the decommissioned tailings storage facilities. The Nchanga smelter produces copper in the form of copper-cobalt alloy, which accounts for approximately 8% to 10% of the smelter's total design capacity of 311,000 tpa. Nampundwe currently produces pyrite concentrate which is blended with copper concentrate at the Nchanga smelter when required. Copper cathode is used as a starting material for copper rods. Approximately one tonne of copper cathode is required for the production of one tonne of copper rods. The table below sets out Vedanta's total production<sup>(1)</sup> from Tuticorin, Silvassa, Nkana, Nchanga and Nampundwe for the periods indicated.

Facility	Product	Year Ended 31 March			six months ended 30 September	
		2014	2015	2016	2015	2016
		(Tonnes)				
Tuticorin .....	Copper anode	274,573	334,367	345,374	167,157	163,126
	Copper cathode	151,592	194,019	201,864	103,123	104,075
	Copper rods	22,105	53,400	68,685	35,629	36,093
	Sulphuric acid	835,798	1,006,692	1,070,786	513,217	517,632
	Phosphoric acid	116,340	189,353	198,779	102,783	93,729
Silvassa .....	Copper cathode	142,842	168,353	182,183	89,652	93,710
	Copper rods	100,948	116,938	142,114	67,408	72,942
Nkana refinery .....	Copper cathode	97,477	92,525	60,092	37,109	4,008
Nchanga (smelter and TLP) .....	Copper anodes <sup>(2)</sup>	102,852	97,242	99,661	48,196	58,948
	Copper cathode <sup>(3)</sup>	60,737	55,232	60,985	30,110	29,254
	Sulphuric acid	234,726	234,879	237,308	120,326	106,290
Nampundwe .....	Pyrite concentrate	12,827	14,275	15,810	5,387	3,242
Total .....	Copper anode	377,425	431,609	445,035	215,326	222,074
	Copper cathode	452,648	510,129	505,124	259,994	231,137
	Copper rods	123,053	170,338	210,799	103,037	109,035
	Sulphuric acid	1,070,524	1,241,571	1,308,094	633,543	623,922
	Phosphoric acid	116,340	189,353	198,779	102,783	93,729
	Pyrite concentrate	12,827	14,275	15,810	5,387	3,242

(1) See "Presentation of Information — Reserves and Production" for an explanation of the basis of preparation of production amounts.

(2) During fiscal years 2016, and the six months ended 30 September 2015 and 2016, 39,942 tonnes, 12,045 tonnes and 49,200 tonnes, respectively, of copper anode were not processed into copper cathode and sold as Copper anode and anode slags.



The table below sets out the Proved and Probable copper Ore Reserves<sup>(1)</sup>, as applicable, at Konkola and Nchanga as of 31 March 2016:

	Proved Reserve		Probable Reserve		Reserves	
	Quantity	Total Copper Grade	Quantity	Total Copper Grade	Quantity	Total Copper Grade
	(Million tonnes)	(%)	(Million tonnes)	(%)	(Million tonnes)	(%)
Konkola.....	21.4	3.38%	24.8	2.99%	46.2	3.17%
Nchanga (Underground).....	—	—	—	—	—	—
Nchanga (Open-Pit) .....	—	—	11.3	1.10%	11.3	1.10%
Other .....	—	—	30.5	1.16%	30.5	1.16%
Stockpiles.....	0.0	0.69%	—	—	0.0	0.69
Refractory Ore.....	—	—	121.1	0.85	121.1	0.85
Tailings Dams.....	46.1	0.68%	—	—	46.1	0.68%
Total.....	67.5	1.53%	187.7	1.20%	255.2	1.29%

See “Presentation of Information — Basis of Presentation of Reserves and Resources”.

Nampund we has total Ore Reserves 1.6 Mt grading 11.2% S comprising, Proved Ore Reserves of 0.2 Mt grading 10.3% S and 1.3 Mt grading 11.3% S.

### *Description of operations*

#### *Smelters and Refineries*

The table below sets out Vedanta’s total capacities from the Tuticorin, Silvassa, Nkana and Nchanga facilities as of 30 September 2016:

	Capacity					
	Copper Anode <sup>(1)</sup>	Copper Cathode <sup>(2)</sup>	Copper Rods <sup>(2)</sup>	Sulphuric Acid <sup>(3)</sup>	Phosphoric Acid <sup>(3)</sup>	Captive Power Plant
			(tpa)			(MW)
Tuticorin .....	400,000	205,000	90,000	1,300,000	230,000	191.5
Silvassa .....	—	200,000	172,000	—	—	—
Nchanga.....	311,000	80,000	—	582,750	—	—
Total .....	<u>711,000</u>	<u>485,000</u>	<u>262,000</u>	<u>1,882,750</u>	<u>230,000</u>	<u>191.5</u>

(1) Copper anode is an intermediate product produced by copper smelters and is generally not sold to customers except in case of KCM where copper anodes are sold to customers. It is used for the production of copper cathode by copper refineries. Approximately one tonne of copper anode is required for the production of one tonne of copper cathode.

(2) Copper cathode is used as a starting material for copper rods. Approximately one tonne of copper cathode is required for the production of one tonne of copper rods.

(3) Sulphuric acid is used as a starting material for phosphoric acid. Approximately 2.8 tonnes of sulphuric acid are required for the production of one tonne of phosphoric acid.

*Tuticorin facility.* The Tuticorin facility, commissioned by Vedanta Limited in 1997 and is located approximately 17 km inland from the port of Tuticorin in the State of Tamil Nadu in southern India. Tuticorin is one of India's largest copper smelters based on production volume. As of 30 September 2016, the Tuticorin facility consists of a 400,000 tpa copper smelter, a 205,000 tpa copper refinery, a 90,000 tpa copper rod plant, a 1,300,000 tpa sulphuric acid plant, a 230,000 tpa phosphoric acid plant, and three complete captive power plants with capacities of 160 MW, 22.5 MW and 24 MW, respectively. The proposed expansion of the existing capacity of the 400,000 tpa copper smelter at Tuticorin to 800,000 tpa by building a 400,000 tpa copper smelter is pending environmental clearances. The coal based power plant of 160 MW is primarily used for captive consumption and Vedanta Limited have also entered into a power purchase agreement with the Tamil Nadu Electricity Board for selling power in excess power over the captive consumption.

Presently, the captive power plants have a total capacity of 191.5 MW, excluding the 15 MW power generating power plant shifted to HZL for the Pantnagar operations. Further, we also have a 11.2 MW of power generated from a smelter waste heat boiler. Coal for the 160 MW power plant is imported, and other captive power plants at Tuticorin operate on furnace oil. With captive power plants with a total capacity of 206.5 MW, which, together with a further 11.2 MW generated from the smelter waste heat boiler, Tuticorine facility will meet most of the facility's power requirements once the proposed expansion to 800,000 tpa is complete.

In addition, on 29 March 2013, the TNPCB ordered the closure of the copper smelter at Tuticorin due to complaints about a noxious gas leak by local residents. On 1 April 2013, Vedanta Limited (then Sterlite) filed a petition in the NGT challenging the order of the state pollution control board on the basis that the plant's emissions were within permissible limits. See "Business — Litigation — Writ petitions filed against Vedanta alleging violation of certain air, water and hazardous waste management regulations at Vedanta's Tuticorin plant."

*Silvassa refinery.* The Silvassa facility, commissioned in 1997, comprises a refinery and two copper rod plants and is located approximately 140 km from Mumbai in the union territory of Dadra and Nagar Haveli in western India. Its refinery uses IsaProcess<sup>(TM)</sup> technology to produce copper cathode and its copper rod plants use Properzi CCR copper rod technology. Silvassa facility consists of a 200,000 tpa copper refinery and two copper rod plants with a total installed capacity of 172,000 tpa of copper rods. Vedanta Limited's Silvassa facility draws on the state power grid to satisfy its power requirements.

*Fujairah precious metal refinery.* The Fujairah Gold FZE facility is located in Fujairah Free Zone-2. It is strategically located 130 km east of Dubai, on the coast of the Arabian Sea. The precious metals refinery at the Fujairah Gold FZE facility was completed in March 2009 and it began production in April 2009. The precious metals refinery has a capacity of 20 million tonnes ("mt") of gold and 100 mt of silver. The technology for the refinery was supplied by Outotec Oyj, Finland, a pioneer in providing technology for the extraction and refining of precious metals. The Fujairah Gold FZE facility also has a copper rod plant with an annual capacity of 100,000 tpa. Production commenced in May 2010. Continuous-Properzi S.p.A., Italy supplied the rod mill equipment for this project, and the copper cathode required for the copper rod plant is expected to be sourced from the smelters of KCM. Additionally, the doré anode plant which was previously located at Tuticorin has been relocated to the precious metals refinery at Fujairah in June 2012 for smelting of "anode slime" to "doré anode" which is the raw material used by the Fujairah precious metal refinery.

*Nkana facility.* The Nkana facility, commissioned in 1932, primarily comprises a smelter, as refinery and a sulphuric acid plant, of which smelter and sulphuric acid plant have been dismantled. The Nkana operations are located in Kitwe approximately 360 km from Lusaka in the Copperbelt Province of Zambia and approximately 55 km from Chingola where the Nchanga facilities are located.

The Nkana refinery produces finished copper in the form of cathodes. It also produces anode slime as a by-product, which contains copper and smaller amounts of certain precious metals, such as gold, silver, platinum, and palladium. The Nkana refinery uses the conventional electrolytic refining

process to produce copper cathode and starter sheets. The starter sheets produced at the Nkana refinery are used at the Nkana and Nchanga TLP for electro-refining and electro-winning, respectively. The Nkana refinery utilises conventional processes to produce copper cathode that is LME-registered REC brand which is at a minimum 99.99% pure copper. Capacity at the Nkana refinery has been expanded from approximately 220,000 tpa to 300,000 tpa and this expansion was completed in November 2009.

*Nchanga facility.* The Nchanga facility, initially commissioned in 1971, comprises a TLP and SX-EW facility and a state-of-the-art smelter commissioned in 2008 with a capacity of 311,000 tpa in the form of copper in copper anode and copper in copper-cobalt alloy and sulphuric acid plant capacity of 1,850 tonnes per day. It processes reclaimed tailings sourced from the Nchanga surfaces sources operations and the current tailings from the Nchanga concentrator for the production of copper cathode with an installed capacity of 80,000 tpa, as of 30 September 2016.

The TLP comprised an acid leach SX-EW circuit which treats both reclaimed tailings and mine tailings from the copper flotation circuits at the west mill.

During fiscal year 2013, the west mill Nchanga underground mine concentrator was upgraded with the commissioning of a new 3.0 mtpa concentrator and the east mill Nchanga open-pit concentrator was upgraded with the commissioning of a new 6.5 mtpa concentrator. Additionally, a cobalt recovery furnace was commissioned.

### *Mines*

*Mt. Lyell.* The Mt. Lyell mine is located at Queenstown, Australia. It comprises of an underground copper mine and a copper processing facility and is owned and operated by CMT. The Mt. Lyell mine is owned and operated under the terms and conditions as stipulated in Mining Leases 9M/2013 (earlier 1M95) and 10M/2013 (earlier 5M95) granted by the state government of Tasmania. Mining Lease 9M/2013 was granted on 1 January 1995 for a period of 15 years and the mining lease 10M/2013 was granted on 1 February 1995 for a period of 14 years and 11 months. Both leases have been renewed for a period of 18 years and are valid up to December 30, 2027. The mine is also covered by the Copper Mines of Tasmania (Agreement) Act 1999, which, in conjunction with an agreement between the state government of Tasmania and CMT entered into pursuant to that Act, limits CMT's environmental liabilities to the impact of current operations, thereby insulating CMT from any historical legacy claims. The operation of Mt Lyell mine was suspended in January 2014, following a mud slide incident.

Monte Cello acquired CMT in 1999 from Mt. Lyell Mining Company Limited. Since Monte Cello took over the mine, annual production has increased from 2.2 million tpa in fiscal year 2000 to 2.5 million tpa in fiscal year 2013. Vedanta Limited acquired Monte Cello, and CMT, from a subsidiary of Twin Star in the year 2000.

The principal deposits in the Mt. Lyell region are all of the volcanic disseminated pyrite-chalcopyrite type which accounts for approximately 86.0% of the known ore in the region. The geology of the Mt. Lyell mine consists of a series of intercalated felsic to mafic-intermediate volcanics. Lithologies are highly altered quartz-sericite-chlorite volcanics with individual units delineated largely by the relative abundance of phyllosilicates. Volcaniclastic and rhyolitic lithologies occur sporadically throughout the sequence, as does pervasive iron mineralisation in the form of haematite, magnetite and siderite.

Chalcopyrite is the principal ore mineral and occurs chiefly in higher grade lenses enveloped by lower grade halos. The overall structure of Mt. Lyell is that of a steeply dipping overturned limb of a large anticline. The hanging wall (stratigraphic footwall) of the ore body consists of weakly mineralised chloritic schists with disseminated pyrite. The footwall is sharply defined by the Great Lyell Fault — Owen Conglomerate contact which truncates the ore body at its southern end.

The Mt. Lyell mine is under care and maintenance following a rock falling on the ventilation shaft in June 2014. All mining operations at CMT, when operational were undertaken by contractors while the processing and mill maintenance operations are undertaken by CMT employees. A sub-level caving underground mining method is used at the Prince Lyell ore body. Ore is loaded into trucks and then transported to the underground crusher and skip loading area. Crushed ore is then hauled by the Prince Lyell shaft and unloaded onto a conveyor feeding the ore bin at the Mt. Lyell processing plant. At the processing plant, the ore is crushed and ground prior to processing by flotation to produce copper concentrate which is then filtered to form a cake and trucked to the melba flats railway siding for transport to the port of Burnie. The concentrate is stored at Burnie until it is loaded into ships for transport to the port of Tuticorin from where it is trucked to the smelter. CMT has an active exploration and evaluation program at Mt. Lyell which involves upgrading resources below the Prince Lyell reserves and testing additional exploration targets on the mining lease. The western tharsis deposit lies to the west of the Prince Lyell ore body, but CMT has not yet committed to its development. Additional targets include Tasman and Crown, Glen Lyell, Copper Clays and NW Geophysics. The tailings dam is a valley-fill type and excess water is discharged via a spillway. The water quality is sampled before the water is released from the site. The tailings are deposited on beaches around 300 metres from the dam spillway. CMT's accepted closure plan is to flood the tailings which will require CMT to raise the tailings dam wall and such plan is currently in progress.

The processing plant is approximately 30 years old and has been partially refurbished following CMT's acquisition with the addition of crushers, a float cell and a regrind mill at the surface. While the condition of the plant is ageing, maintenance is carried out as required to ensure that the process plant remains in safe and efficient condition.

Power at the mine is supplied through an electricity supply agreement with Aurora Energy Proprietary Limited and Hydro Tasmania Proprietary Limited to supply approximately 112 giga watts per hour. Aurora Energy Proprietary Limited supplies electricity on a spot price basis and Hydro Tasmania Proprietary Limited is under a fixed arrangement. There is ample supply of mine water and storm water captured on the tailings dam.

The gross and net value of fixed assets, including capital works-in-progress was approximately AUD 161.0 million (\$124 million) and AUD 5.7 million (\$4.4 million) respectively, as of 31 March 2016.

The cut-off grades are based on copper grades with the gold credit deducted from the operating costs. The reserves are derived from stopes which are designed such that the limits of the stope are defined by a cut-off grade of 0.8% copper and have an average grade that exceeds 0.8% copper. The revenue derivation of the cut-off grade includes the gold credit. The break-even cut-off grade of 0.65% copper is the grade that makes enough margin to cover the fixed and variable costs while the actual or operational cut-off grade used is 0.55% copper. CMT operates on a 0.8% copper operational cut-off grade in practice, which prefers to take higher revenue at the expense of a longer mine life.

At the time of finalization of reserve statement as on 30 September 2016, no mineral reserves have been determined due to government statutory restrictions imposed post the mud slide incident in January 2014.

The reserves at CMT in the proven reserve category are defined as the portion that can be economically mined of the measured in-situ resource, which has gold drill coverage (<50 metres) and is on or within the 50 metre zone below the lowest active production level. The probable in-situ reserve is the material which has been defined as the portion that can be economically mined and has good drill coverage but is outside the 50 metre zone from the lowest active production level. The ex-situ probable reserve is the portion of ex-situ indicated resource which can be economically recovered with the mining of the in-situ reserves; this is applied as a modifying factor.

CMT does not use a copper equivalent calculation for the determination of stope limits as the relationship between the copper and gold grades is essentially linear, allowing the gold credits to be deducted from operating costs.

CMT has identified additional mineral deposits in the Mt. Lyell mine and had engaged in drilling, scoping and feasibility studies on these deposits and has completed scoping study of Prince Lyell North Flank bottom block/lift and Copper Chert prospect and feasibility of Prince Lyell North Flank top block.

*KCM mines.* KCM's mining operations are located in the Copperbelt Province of Zambia and consist of the Nchanga open pits and Nchanga underground mines, concentrator and TLP, the Konkola underground copper mine and concentrator, the Nchanga smelter with a copper recovery furnace and sulphuric acid plant, and the Nkana smelter and refinery. The Zambian Copperbelt ore deposits lie along a 50-km wide strip of country that extends for 150 km from Chililabombwe in the northwest to Luanshya in the southeast. The Nampundwe pyrite mine and the concentrator are located in the Central Province approximately 50 km from Lusaka.

The geological setting of the Zambian Copperbelt is unusual compared to other worldwide copper deposits in that it occurs in sedimentary host rocks that have high carbonate content. The presence of dolomite in the geological sequence effectively eliminates any risk of acid mine drainage. The dominant structural feature of the Zambian Copperbelt is the Kafue Anticline, a Northwest — Southeast striking structure, the core of which is comprised of granite, schist and gneiss of the basement complex.

The focus of KCM's exploration has been the maintenance of resources and reserves following mining depletions.

*Konkola.* The Konkola mine is situated about 26 km north of Chingola and is the most northerly of KCM's Copperbelt mines. These mining operations currently exploit the Kirila Bombwe ore body by underground methods and have historically been focused on two existing shaft systems, the Kirila Bombwe South ore body (the "No. 1 shaft") and the Kirila Bombwe North ore body (the "No. 3 shaft"). Additionally, in June 2006, KCM commenced sinking of the No. 4 shaft in the Kirila Bombwe South ore body as part of the KDMP. The No. 4 shaft lies approximately 130 metres due north of the No. 1 shaft. The mid-shaft loading station of the No. 4 shaft was commissioned in April 2010. The mid-shaft loading station of the No. 4 shaft was commissioned in April 2010. Construction of the bottom shaft sinking, which included the continued development of the No. 4 shaft to a design depth of approximately 1,500 metres, was completed during fiscal year 2012.

The Konkola mine commenced production in 1957. KCM acquired the mine in April 2000 from Zambia Consolidated Copper Mines Limited. At Konkola, KCM holds large scale mining licence ("LML") number 7076-HQ-LML for its operations, which expires on 31 March 2025. The licence permits the mining of copper, cobalt, gold, silver, sulphur, selenium and tellurium within the leasehold area. KCM's mining licence is valid until 31 March 2025, but operating permits must be renewed annually.

The operating units at the Konkola mine are the underground mine (No. 1 shaft, No. 3 shaft and new No. 4 shaft, along with a number of ventilation shafts as well as the pipe shaft) and the Konkola east and west concentrators.

The dominant features of the mine are the Kirila Bombwe Anticline in the southeast and the Konkola Dome in the northwest. The ore body in the No. 1 shaft area lies on the southern flank of the Kirila Bombwe Anticline and has an average thickness of about nine metres. The No. 1 shaft ore body generally strikes to the northwest-southeast and dips steeply southwest. It has a strike length of



approximately 4,000 metres with an average dip of 50 degrees. The ore body at the No. 3 shaft lies across the axis of the Kirila Bombwe Anticline and has an average thickness of 13 metres. The dips at the No. 3 shaft generally range from 15 degrees to 55 degrees. The ore body at the No. 3 area has been traced to a depth of 1,100 metres and is open-ended at that depth.

Historically, the No. 1 and No. 3 shafts have been managed as two separate mines. Underground haulage connections between the two mines were developed mainly for cross tramming and de-watering purposes. The separate treatment of the two mines was due to their Ore Reserves being physically divided by the presence of a barren gap in the ore body that extended from the surface down to about 720 metres. Below that level the ore body is continuous along a strike length of approximately 10 km and this large ore body forms the basis of the KDMP. The total capacity of the Konkola underground mine has been expanded by the KDMP.

Mine developments consist of primary and secondary developments at both the No. 1 and No. 3 shafts. Primary developments involve mining haulages, drain drives, access ramps, footwall ventilation raises and rock passes on main levels. Secondary development includes the mining of drives, crosscuts and raises in ore and waste on the sublevel to prepare the ore body for stoping. The mining operations are constrained by the necessity to de-water from both hangingwall and footwall aquifers at an overall pumping rate of approximately 350,000 m<sup>3</sup> per day.

The ore body limits are defined by mining as well as diamond drilling on a 30 metres by 30 metres pattern. The stope limits are contained within the ore body defined using a 1.0% total copper cut-off. Other stope dimensions are worked out using geomechanical properties of the rocks.

Appropriate actions are taken while designing the blast holes as well as during blasting to minimise dilution from the sub-economic areas outside the ore body limits. However, due to the stratified nature of the rocks some dilution does take place. Dilution generally ranges from 5.0% to 40.0%, depending on the rock condition.

Mining methods employed at the Konkola mine include overcut and bench drift and fill, post pillar cut and fill and longitudinal room and pillar. The total rock hoisting capacity at the Konkola mine is 645 kilo tonnes per month (“ktpm”) which comprises 160 ktpm from the No. 1 shaft, 135 ktpm from the No. 3 shaft and 350 ktpm from the No. 4 shaft. On reaching the surface run of the mine (“RoM”) ore from the No. 1 shaft is conveyed via conveyor belt directly to the Konkola concentrator and the RoM ore from the No. 3 shaft is transported three km to the Konkola concentrator using 85 tonne off-highway trucks.

The 6 mtpa Konkola concentrator processes RoM ore sourced from the Konkola underground mine using froth flotation to produce copper concentrate for smelting at the smelter in Nchanga. RoM ore hoisted from the new No. 4 shaft, through the mid-shaft loading station is transported to the plant through conveyor belts.

The 6 mtpa concentrator comprises two streams of 3 mtpa. KCM commissioned the first stream of 3 mtpa in October 2008 and the second stream of 3 mtpa in February 2010. The Konkola concentrator utilises SAG & Ball mill comminution and beneficiation by froth flotation processing. The nominal capacity of the milling circuit is 6.6 mtpa, which with a 10.0% design allowance yields a maximum milling capacity of 7.3 mtpa.

The crushed RoM ore is fed directly into the concentrator’s SAG mill with final milling being performed in the Ball mill prior to flotation. The concentrates are thickened and filtered to produce a final concentrate with a grade of approximately 36.0% to 40.0%.

The concentrates are then transported 30 km southwest of Chililabombwe by road to the Nchanga smelter in Chingola. Approximately 60.0% of the residual tailings from the concentrator are thickened and pumped straight to the Lubengele tailings dam situated approximately 4.5 km north of the plant, while approximately 40.0% of the tailings are pumped to the backfill plant to produce backfill for underground mining operations.

During fiscal year 2016, Konkola mined and processed approximately 1,677,116 million tonnes of ore, to produce 136,748 tonnes of copper concentrate containing 3.25% tonnes of copper in ore. Based on Ore Reserves and Mineral Resources as of 31 March 2016 and anticipated production, the Konkola mine has an estimated mine life of over 50 years from fiscal year 2016, a significant position of which is contributed from Inferred Mineral Resources.

Power at the mine is supplied by Copperbelt Energy Corporation PLC (“CEC”) with fixed rates subject to index adjustment based on the US Producer Price Indices until 2020. The maximum demand for Konkola is currently 90 MW, but Vedanta estimates that it will rise to 120 MW as it ramps up the KDMP. On-site emergency power is available from two 10 MW diesel generators owned and operated by CEC. This power is mainly utilised for running the de-watering pumps underground. Water pumped from underground is utilised for the plant. The power infrastructure at Konkola is being upgraded to meet the enhanced requirements of the KDMP project. In addition, in anticipation of any power failure, KCM has installed three diesel generator sets of 8 MW each to meet the power requirements of its Konkola mining operations and the KDMP project.

Mine water as well as water from the nearby Kafue river is utilised for domestic requirements. Mulonga Water and Sewerage Company handles the domestic water supply.

*Nchanga.* The Nchanga mine is situated in the Copperbelt Province of Zambia, in the vicinity of the town of Chingola. Nchanga’s operating units comprise two operational open-pit mines, a large underground mine (currently on care and maintenance), a TLP with the associated SX-EW facility, a sulphuric acid plant, copper concentrators comprising two main processing units and a recently commissioned direct blister flash smelter. At Nchanga, KCM holds LML number 7075-HQ-LML for its operations which expires on 31 March 2025. The licence allows KCM to mine copper, cobalt, gold, silver, sulphur, selenium and tellurium within the leasehold area. Under its mining licence, KCM is required to obtain an operating permit on an annual basis. The current mining licence is valid until 31 March 2025.

Following exploration in 1923, development in 1927 and the cessation of operations due to flooding and low copper prices in 1931, mining at the Nchanga underground mine recommenced in 1937. Surface mining operations from the Nchanga open-pit commenced in 1957.

Access to the underground operations is by a series of vertical and inclined primary and sub-vertical shafts. The combined rock hoisting capacity is 292 ktpm. The current operations are projected to extend to 920 metres below the surface. Mine de-watering at Nchanga requires pumping approximately 75,000 m<sup>3</sup> of water per day, a component of which is derived from inflow through the open-pit during the wet months. Underground operations are currently under care and maintenance status and there are zero audited Ore Reserves as on 31 March 2016.

The Nchanga deposit is situated on the northern end of the southwest margin of the Kafue anticline in the vicinity of Chingola. The mineralisation is hosted within two stratigraphic horizons being the Lower Ore Body (“LOB”) and Block “A”. Block “A” lies to the southwest of LOB and has a similar deposit with a slightly more gentle dip of about 20 degrees. The underground Mineral Resources are defined using an assay footwall and an assay hanging wall with a cut-off grade of 1.5% total copper.

The Nchanga mining licence areas also have stockpiles of Chingola Refractory One (“CRO”) with a high refractory material content in mica which is not treatable by conventional methods. These stockpiles add up to approximately 121.1 million tonnes of Probable Ore Reserves with an average grade of 0.85% total copper.

The mining method currently employed at Nchanga is block carving using a continuous advancing long wall caving method. The ore body and the rocks above the areas where the long wall caving method is used are very weak and as a result no development takes place within it. Ore body limits are primarily defined by diamond drilling from the access established below the ore body. The

drill holes are located on a 30 metres by 30 metres pattern. Extreme care is taken to ensure that core recovery from diamond drilling remains high (in excess of 85.0%) and contamination is avoided by use of double or triple tube core barrels. Logging, sampling and assaying are carried out in accordance with quality assurance/quality control procedures. An external cut-off of 1.5% total copper is taken to define the ore body limits. The cut-off is reduced to 1.0% total copper where the ore body is thin and richly mineralised. For the Nchanga open-pit ore bodies, a cut-off grade of 0.5% total copper is used.

Sub-economic dilution is practically zero at the initial stages, but it increases as the extraction increases. Depending upon the in situ grade, a dilution in excess of 50.0% may be recorded at the time when the grade of material from a finger raise has fallen below 1.0% exhausted finger raises are barricaded with timbers.

Open-pit mining has historically been exploited near surface ore bodies, including the LOB, UOB, River Lode, Luano and Chingola Ore Bodies. The mining operations are heavily mechanised using surface drilling techniques, electric shovel loading and hydraulic excavators for loading and 240 tonnes off-highway rear dump trucks. The mining operations at Nchanga are currently exclusively owner operated with the exception of stockpile dumps which are outsourced to meet mill requirements.

The Nchanga mining licence areas also have stockpiles of CRO with a high refractory material content in mica which is not treatable by conventional methods. These stockpiles add up to approximately 121.1 million tonnes of Probable Ore Reserves with an average grade of 0.85% total copper.

As part of growth projects for the Open pits, Mimbula II open pit which is located south — east of Chingola, about 12 km from the Chingola-Chilabombwe highway, and along the Mimbula Chabunyama syncline is being considered for exploitation. In fiscal year 2006, further exploration work was done at Mimbula II area indicating a north extension to the existing Mimbula II open pit and also led to the upgrade of the existing mineral resource. Viability of the resource is understudy and provides good potential for open pits

The Nchanga concentrator comprises two main processing units; the east mill and the west mill. The east mill is a conventional comminution circuit with a RoM capacity of 6.5 mpta which treats copper ore from the open-pits to produce a thickened product which is pumped to the west mill situated approximately two km away for further processing. The west mill comprises two distinct circuits: the copper comminution circuit for underground ore, the copper flotation circuit for open-pit and underground. The copper comminution circuit crushes and mills ore from the Nchanga underground mine ahead of the flotation circuit and has a RoM capacity of approximately 3.0 mpta. The copper flotation circuit treats milled ore from the Nchanga underground mine (copper comminution circuit) and milled ore from the Nchanga open-pit (east mill) to produce concentrates. Residues from the concentrator are pumped to the TLP for hydrometallurgical processing. The concentrates are transported to the Nchanga smelters except bulk copper-cobalt concentrates which are sold in the market.

During fiscal year 2013, the west mill Nchanga underground mine concentrator was upgraded with the commissioning of a new 3.0 mpta concentrator and the east mill Nchanga open-pit concentrator was upgraded with the commissioning of a new 6.5 mpta concentrator. For the six months ended 30 September 2016, the Nchanga underground mine mined and processed approximately 0.11 million tonnes of ore at a grade of 1.3% copper and the Nchanga open-pit mines mined and processed approximately 0.06 million tonnes of cobalt ore at a grade of 1.14% copper and 0.27% of total cobalt. For the six months ended 30 September 2016, the Nchanga open pits and underground mine concentrators processed ore to produce 41,003 tonnes of copper concentrates containing 7,010 tonnes of copper.

From 2014 through to 2015, the Nchanga underground mine was making losses entity due to high cost of production emanating from high power tariffs, low mine grade due to mining in the fringe and patchy lower ore body compounded with low copper price at LME. Hence, NUG was put under managed Care & Maintenance in November 2015.

Power at the mine is supplied by CEC with fixed rates subject to index adjustment based on the US Producer Price Indices until 2020. Nchanga's maximum demand is 97 MW.

*Nampundwe.* The Nampundwe mining operating assets are the Nampundwe pyrite underground mine and concentrator. These are located in the Central Province of Zambia, approximately 50 km west of Lusaka. Nampundwe exploits iron pyrite rich ore bodies containing 11.0% in situ sulphur and has capacity to produce 60,000 tpa of pyrite concentrate that is blended with copper concentrate for smelting. As of 31 March 2016, the Nampundwe mine also had a reserve of 6.4 mt of Sulphur, which is a material used in the smelting process.

### **Principal raw materials**

The principal inputs of Vedanta's copper business are copper concentrate, rock phosphate, power, fuel and sulphuric acid. Other inputs include coke, lime, reagents and oxide ore. Vedanta has in the past been able to secure an adequate supply of the principal inputs for its copper production.

*Copper concentrate.* Copper concentrate is the principal raw material of Vedanta Limited's copper smelters. During fiscal year 2016, Vedanta Limited sourced 100% of its copper concentrate requirements from third-party suppliers, either through long-term contracts or on spot markets. Vedanta Limited purchases copper concentrate at the LME price less a TcRc that it negotiates with its suppliers but which is influenced by the worldwide prevailing market rate for the TcRc. Vedanta Limited expect the percentage it purchases from third party suppliers to increase in future periods as the Mt. Lyell copper mine has been placed under care and maintenance. It is also expected that the percentage that is purchased from third party suppliers to also increase in future periods to the extent sought to increase the copper smelting and refining capacity.

During fiscal year 2016, KCM sourced 50% of its copper concentrates requirements (in terms of copper content) from third-party suppliers and sourced 50% of its copper concentrates requirements (in terms of copper content) from its own mines in Zambia, respectively. KCM purchases copper concentrate at the LME price less a TcRc that KCM negotiates with its suppliers, but which is influenced by the worldwide prevailing market rate for the TcRc.

In general, Vedanta Limited's long-term agreements run for a period of three to five years and KCM's agreements run for a period of one year, and are renewable at the end of the period. The quantity of supply for each contract year is fixed at the beginning of the year and terms like TcRc and freight differential are negotiated each year depending upon market conditions. As of 30 September 2016, Vedanta Limited and KCM sourced approximately 60.9% and 100%, respectively, of their copper concentrate requirements through long-term agreements.

Vedanta Limited also purchases copper concentrate on a spot basis to fill any gaps in its requirements based on production needs for quantity and quality. These deals are struck on the best possible TcRc during the period and are specific for short-term supply. In fiscal year 2016, Vedanta Limited sourced approximately 19.5% of its copper concentrate requirements through spot purchases

*Rock phosphate.* Vedanta Limited's rock phosphate is sourced primarily from Jordan at spot prices. Vedanta Limited is currently exploring the sourcing of rock phosphate from countries such as Morocco, Nauru, Togo, Algeria and Israel to diversify its supply base.

*Power.* The electricity requirements of Vedanta Limited's copper smelter and refinery at Tuticorin are primarily met by the on-site captive power plants. The first 80 MW of a new 160 MW coal-fired thermal power plant was commissioned in the first quarter of fiscal year 2014. Vedanta

Limited's other captive power plants at Tuticorin operate on furnace oil that is procured through long-term contracts with various oil companies. Vedanta Limited has outsourced the day-to-day operation and maintenance of its captive power plants at Tuticorin. Vedanta Limited's Silvassa facility relies on the state power grid for its power requirements.

KCM's Nkana, Nchanga and Konkola operations receive their electricity requirements pursuant to a long-term agreement with CEC. KCM also has an agreement with the national utility company of Zambia, Zambia Electricity Supply Corporation Limited ("ZESCO"), to provide power to Nampundwe on substantially the same terms as its agreement with CEC. ZESCO transmits power from hydroelectric generating stations at Kariba North, Kafue Gorge and Victoria Falls to the central switching station in Kitwe and at the Luano substation outside Chingola at 330 KV, which is sold in bulk to CEC. The 330 KV voltage is stepped down to 220 KV and 66 KV and distributed by CEC throughout the Zambian Copperbelt. ZESCO also supplies electricity directly to the mining operations at Nampundwe in the Central Province of Zambia. In addition, in anticipation of any power failure, KCM has installed a diesel generator set of 24 MW to meet the power requirements of its Konkola mining operations and the KDMP project.

KCM agreed to a 33.0% increase in its tariff under the terms of its electricity supply agreement with CEC. This increase became effective on 1 January 2008 and remained fixed for a period of three years. A 50.0% tariff increase effective from 2011 and spread over a period of five years was signed with CEC. Effective from 1 January 2016, Zambia has increased power tariffs for mining companies in a bid to lure companies to invest in power generation. The increase in prices by 25% comes as the country is facing severe electricity crisis, which has worsened by a drought.

*Fuel.* KCM's fuel supply is completely dependent on imports. In the past, Zambia has faced fuel shortages. KCM has addressed these fuel shortages by entering into a light fuel supply agreement with BP Zambia Limited on 1 September 2010, which expired on 31 December 2013. Fuel supplies through imports under spot market. In addition to the light fuel supply agreement with BP Zambia Limited, KCM is also party to a heavy fuel oil supply agreement with Kobil Zambia Limited. .

*Sulphuric acid.* The sulphuric acid for KCM's TLP is largely supplied by the Nchanga smelter.

### ***Distribution, logistics and transport***

Copper concentrate from the Mt. Lyell processing facility is transported by road to a rail head and then transported by rail to the port of Burnie, Tasmania, from which it is shipped to the port of Tuticorin in India. Copper concentrate sourced from both the Mt. Lyell processing facility and from third parties is received at the port of Tuticorin and then transported by road to the Tuticorin facility.

Once processed at the Tuticorin facility, copper anodes are either refined at Tuticorin or transported by road to Silvassa. Copper cathodes, copper rods, sulphuric acid, phosphoric acid and other by-products are shipped for export or transported by road to customers in India.

KCM's finished copper in the form of copper cathodes are mainly sold to overseas markets in the Middle East, Southeast Asia and the Far East with very little copper being sold locally in Zambia. The metal is transported to these markets by road and rail to the Indian Ocean ports of Dar-es-Salaam in Tanzania and Durban in South Africa and, more recently, Beira in Mozambique.

### ***Sales and marketing***

The ten largest customers of Vedanta's India copper business accounted for approximately 42.6%, 32.8% and 30.6% of Vedanta's revenue from the copper business in fiscal years 2014, 2015 and 2016,. No customer accounted for greater than 10.0% of Vedanta's copper business revenue in fiscal years 2014, 2015 and 2016 and for the six months ended 30 September 2016.

Vedanta Limited's copper sales and marketing head office is located in Mumbai, and it has field sales and marketing offices in most major metropolitan centres in India. KCM does not maintain any significant sales offices as sales are effected mainly through contracts executed at its corporate offices in Chingola, Zambia. Vedanta Limited sells its copper rods and cathodes in both domestic and export markets. KCM primarily sells its products in export markets. Domestic sales in Zambia form an insignificant portion of KCM's sales. In fiscal years 2014, 2015 and 2016, exports accounted for approximately 61.2%, 58.6% and 60.5%, respectively. Vedanta's export sales were primarily to China, Japan, the Philippines, Singapore, South Korea, Taiwan, Thailand and various countries in the Middle East. Vedanta Limited also sells phosphoric acid and other by-products in both domestic and export markets. Vedanta's exports of copper anode slimes are predominately sold to Europe.

Domestic sales by Vedanta Limited in India are broadly based on the LME spot price plus regional premiums, as well as domestic supply and demand conditions. A majority of Vedanta's sales are made pursuant to existing supply agreements. The price for the copper Vedanta Limited sells in India is normally higher than the price it charges in the export markets due to the tariff structure on costs, smaller order sizes that domestic customers place and the packaging, storing and truck loading expenses that it incurs when supplying domestic customers.

Vedanta Limited's export sales of copper are made on the basis of both long-term sales agreements and spot sales. The prices of Vedanta Limited's copper exports include the LME price plus a producer's premium. Vedanta Limited does not enter into fixed price long-term copper sales agreements with its customers. In fiscal year 2016, 54% of KCM's sales were through annual contracts priced on the monthly average LME price plus a premium.

### ***Market share and competition***

Vedanta Limited owns one of the two custom copper smelters in India and had a 36% primary market share by sales volume in India in fiscal year 2016, according to International Copper Association (India). The other major custom copper smelter in India is owned by Hindalco, with the remainder of the primary copper market in India primarily served by imports and Hindustan Copper Limited.

Copper is a commodity product and Vedanta Limited competes primarily on the basis of price and service, with price being the most important consideration when supplies of copper are abundant. Vedanta Limited's metal products also compete with other materials, including aluminium and plastics that can be used in similar applications by end-users. Copper is sold directly to consumers or on terminal markets such as the LME. Prices are established based on the LME price, though as a regional producer Vedanta Limited is able to charge a premium to the LME price which reflects the cost of obtaining the metal from an alternative source.

### ***Projects and developments***

#### ***Tuticorin.***

Vedanta Limited had undertaken expansion projects to setup Copper smelter plant at Tuticorin costing Rs. 16,820 million (\$252.3 million) to increase its total copper capacity to 800,000 tpa. The expansion of the smelter is on hold as required approvals from the state government have not yet been received. Specifically, the proposed capacity expansion at Tuticorin had been on hold, pending environmental clearances. Vedanta Limited has incurred Rs. 6,423 million (\$96.4 million) on these projects as of 30 September 2016.

*KDMP.* The KDMP was approved by KCM's board of directors in July 2005, at a total initial capital outlay of approximately \$357.0 million. This project is expected to contribute to the productivity of KCM's underground copper deposit. All governmental approvals for the KDMP have been received. The mid-shaft loading station of the No. 4 shaft was commissioned in April 2010. Construction of the bottom shaft sinking, which included the continued development of the No. 4 shaft to a design depth of approximately 1,500 metres, the bottom-shaft loading and waste hoisting was completed during fiscal year 2012. The KDMP was originally planned to increase the ore production of the Konkola mine from 1.8 mtpa of ore to approximately 6 mtpa, and its scope and configuration was subsequently revised. This revised scope and configuration plans an increase in target output of up to an estimated 7.5 mtpa at full ramp-up by accessing its rich underground ore body. The increase in target output, changes in commodity prices and other project work have resulted in an increase in the estimated project cost from \$357.0 million to \$674.0 million, as of 31 March 2016. The cost has since been revised upward to \$974.0 million primarily due to an increase in the scope of the project and consequent extra time required, weak ground conditions at the site resulting in additional engineering costs, commodity price increases and appreciation of the South African rand to the US dollar.

The Konkola Deep Mine Project (KDMP) started to bring copper ore from its mid-level in 2010 and from the bottom of the shaft in 2014. The infrastructure for the KDMP project is now complete and mine development to ramp-up production is underway.

## ***Iron Ore Business***

### *Introduction*

Vedanta's iron ore business is carried out in the states of Goa and Karnataka through Vedanta Limited. Vedanta Limited's iron ore business includes exploration, mining and processing of iron ore. During fiscal year 2016, Vedanta Limited produced approximately 5.2 million dmt of saleable iron ore fines and lumps. The sales for fiscal year 2016 were at 5.3 million dmt (including sales of ore purchased through e-auction of the ore confiscated by the government prior to the suspension) as compared to sales of 1.3 million dmt in fiscal year 2015. According to the Federation of Indian Mineral Industries, Vedanta Limited has been India's largest exporter of iron ore in the private sector by volume since 2003. As of 31 March 2016, Vedanta Limited and its subsidiaries owned or had the rights to ore reserves consisting of 193.6 million tonnes of iron ore at an average grade of 55.4% and 190.6 wmt of mineral resources as of 30 September 2016. Vedanta operates a metallurgical coke plant with an installed capacity of 522,000 tpa and a pig iron plant operating with a rated capacity of 7,742,000 tpa. Vedanta Limited manufactures pig iron through the blast furnace route. Vedanta Limited has a patent for the technology for the manufacture of energy recovery based metallurgical coke.

Ore from Vedanta Limited's mine at Karnataka was exported mainly through the ports at Goa and Mangalore. However, since the ban on exports imposed by the Government of Karnataka in July 2010, Vedanta Limited sells the iron ore produced at the Karnataka mine only to domestic Indian customers. The suspension on mining operations which was issued by the Supreme Court of India in August, 2011 was lifted by the court on 18 April 2013 and operations partially resumed on 29 December 2013 and fully resumed on 28 February 2015.

The mining suspension orders, due to environmental violations by the miners, issued by the state government of Goa and the Supreme Court of India in September 2012 and October 2012 respectively, were lifted, subject to certain conditions on 21 April 2014. On 10 August 2015, operations at the Codli mine resumed and operations at the remaining mines resumed in second half of fiscal year 2016 after receiving the required consents and approvals.

In addition, Vedanta Limited manufactures pig iron and metallurgical coke in Goa, and also operates two waste heat recovery plants of 30 MW each in Goa. In fiscal year 2016, Vedanta Limited produced approximately 647,645 tonnes of pig iron and 485,794 tonnes of metallurgical coke and as of 30 September 2016, Vedanta Limited has a capacity to produce pig iron of approximately 772,000 mt.

On 22 August 2011, Vedanta Limited acquired a 51.0% ownership interest in WCL, a Liberian iron ore exploration company which was a wholly-owned subsidiary of Elenilto Minerals & Mining LLC, for a cash consideration of \$90.0 million. WCL's iron ore project in Liberia comprises of deposits in Bomi hills, Bea Mountain and Mano River. On 20 December 2012, Vedanta Limited acquired the remaining 49.0% of the outstanding common shares of WCL from Elenilto Minerals & Mining LLC for a cash consideration of \$33.5 million. However, due to the outbreak of Ebola in Liberia, Vedanta Limited's project was temporarily suspended in August, 2014 as the staff had to be evacuated. Since then, iron ore prices have fallen significantly, due to which it was considered not viable to resume operations. Vedanta Limited is in discussions with the government to extend the Mineral Development Agreement to make this project more sustainable.

In consideration of the suspension of exploration in Liberia, low iron ore prices, geo-political factors and no plans for any substantive expenditure has resulted in continued uncertainty in the project, an impairment charge of \$227.5 million has been recognized in fiscal year 2016. Further, an impairment charge of Rs 1,153 million (\$17.7 million) was recorded in fiscal year 2016, towards unused plant and machinery at Bellary, Karnataka.

Goa Energy Limited ("GEL"), which merged into Vedanta Limited on 24 March 2015, owned one of the 30 MW waste heat recovery power plants in Goa which generates power from the waste gases of the metallurgical coke plant and blast furnace.

A number of initiatives were earlier undertaken to expand the mining and logistical capacity at Vedanta Limited's mines at Goa and Karnataka to 40 mmt, but these initiatives have been scaled back and are currently on hold due to regulatory issues and capping of production limits across the state. Vedanta Limited has also made substantial progress on its logistics capacity, with a new railway siding already commissioned in Karnataka and made progress on widening the existing roads and building dedicated road corridors in both Karnataka and Goa. Vedanta Limited has also added capacity in river and port logistics, and now have a fleet of 33 barges and 2 transhippers and 1 floating crane station as on date.

On 6 May 2016, a Memorandum of Understanding ("MOU") was signed between the state government of Jharkhand and Vedanta Limited to set up a 1 mtpa hot metal plant with a facility to produce 0.7 mtpa pig iron and 0.3 mtpa ductile iron pipe plants in Kharswan/Manoharpur. This MOU will support an application to the state government of Jharkhand for the grant of the Dhobil mining lease. The MOU will be valid for one year within which the site selection for plant, identification of source of water, power and raw material, and prepare a detailed project report or DPR will have to be completed, so as to proceed to Stage-II MOU signing.

Revenue from Vedanta's iron ore business in the six months ended 30 September 2016 was \$217.1 million.

### ***Principal products***

*Iron ore.* Vedanta Limited's iron Ore Reserves consist of both lump and fine ore. As of 31 March 2016, the percentage of lump ore in the reserves was approximately 12.0% and 18.0% in Goa and Karnataka, respectively. While the ore in Goa contains an average iron content deposit of 50.0% to 55.0%, the mines in Karnataka are of higher grade deposits, ranging between 56.0% to 60.0% iron. The lump ore is sold from the mines in Karnataka primarily to domestic pig iron or steel producers. The majority of other iron ore produced by Goa mines is sold internationally, primarily to purchasers in China.



*Pig iron.* Vedanta Limited produces basic, foundry and nodular grade pig iron in various grades for steel mills and foundries.

*Metallurgical coke.* Vedanta Limited also produces metallurgical coke, the majority of which is consumed internally.

### Production

The table below sets out Vedanta Limited's total production<sup>(1)</sup> for the periods indicated:

Mine/Mine Type <sup>(1)</sup>	Product	Year Ended 31 March			Six months ended 30 September	
		2014	2015	2016	2015	2016
(Million tonnes)						
Goa (Open-Pit) <sup>(2)</sup> .....	Iron ore	0	0	2.0	0.1	2.6
A. Narrain (Open-Pit).....	Iron ore	1.5	0.6	3.0	0.9	1.7
SRL (Open-Pit) <sup>(2)</sup> .....	Iron ore	0	0	0.2	0	0.4
<b>Total Iron Ore</b> .....	Iron ore	<u>1.5</u>	<u>0.6</u>	<u>5.2</u>	<u>1.0</u>	<u>4.7</u>
Amona Plant.....	Metallurgical coke	0.41	0.49	0.48	0.25	0.24
	Pig iron	0.51	0.61	0.65	0.30	0.37

(1) See "Presentation of Information — Reserves and Production" for an explanation of the basis of preparation of production amounts.

(2) Goa mining operations were suspended due by the State of Goa since 11 September 2012. Post all proper applications and necessary clearances from various government bodies, the suspension has been lifted and operations resumed from August, 2015.

In fiscal year 2016, Vedanta Limited produced 5.2 mt. million tonnes of iron ore fines and lumps. In addition, as of 31 March 2016, Vedanta Limited had total production capacities 729,000 tpa of pig iron and 522,000 tpa of metallurgical coke. As of 30 September 2016, the pig iron capacity was 772,000 tpa after debottlenecking exercises.

The table below sets out Proved and Probable iron Ore Reserves<sup>(1)</sup> as of 31 March 2016 at mines that Vedanta Limited owns or has rights to:

	Proved Reserve				Probable Reserve	Total Proved and Probable Reserves
	Quantity	Fe Grade	Quantity	Fe Grade	Quantity	Fe Grade
	(Million tonnes)	(%)	(Million tonnes)	(%)	(Million tonnes)	(%)
Goa:						
Codli Group.....	18.1	53.3	6.0	55.7	24.1	53.9
Sonshi Group.....	16.3	59.6	21.4	59.2	37.7	59.4
Other .....	7.7	55.3	11.7	56.4	19.4	56.0
A. Narrain .....	19.1	56.1	20.3	56.2	39.4	56.2
SRL.....	42.1	52.16	30.9	55.1	73	53.4
Total Iron Ore Reserves ...	103.3	54.50	90.3	56.5	193.6	55.4

## Description of operations

### Production facilities

*Amona plant.* Vedanta Limited commenced operations at its Amona plant in Goa in 1992 and has been engaged in the manufacture and sale of pig iron since then. Vedanta Limited's metallurgical coke plant at Amona produces a range of coke fractions from over 70 mm for foundries, 20 mm to 60 mm for blast furnaces and six mm to 25 mm for the ferrous alloy industry. Approximately 63.0% of the total production of metallurgical coke is consumed by Vedanta Limited for its pig iron production and the remainder is sold to customers primarily located in India. The cost of the input coal blend is the single most important cost component for the production of coke. Vedanta Limited's production consists mainly of low ash coking coal and it imports 100.0% of low ash coking coal each year. In order to ensure a stable raw material supply, Vedanta Limited has long-term supply contracts for the procurement of such coal. Vedanta Limited generates its own electric power from the waste heat of Vedanta Limited's metallurgical coke plant and the blast furnace gas.

The following table sets out the total rated capacities as of 30 September 2016 at Vedanta Limited's Amona facility:

	Capacity	
	Metallurgical Coke	Pig Iron
	(tpa)	
Amona Plant .....	522,000	772,000

### Mines

*Goa mines.* Vedanta Limited's iron ore operations in Goa consist of four major iron ore mines, namely Codli, Sonshi, Bicholim and Surla. In addition, Vedanta Limited derives ore production from several satellite mines in North Goa. The Goa leases were originally granted as mining concessions by the government during the Portuguese regime from 1955 onwards, and in 1987 these concessions were converted to mining leases. Before suspension of operations in September 2012, Vedanta Limited operated a total of twenty one mining leases in Goa representing an area of approximately 1,695 hectares (includes one third-party lease on contract, representing an area of approximately 62 hectares).

Vedanta Limited carries out exploration in grid patterns of 100 metres by 100 metres at the initial stage of exploration, followed by grid patterns of 50 metres by 50 metres. Core samples are analysed and used to interpret the ore body for the preparation of geological cross sections and the classification of the ore as either crude ore or sub-grade ore. Drill core sampling is undertaken on entire holes and the drill core material is sampled at the sample preparation facilities.

The gross value of fixed assets for the Goa operations, including capital works-in-progress, was Rs. 106,765 million (\$1,601.6 million) as of 31 March 2016.

*Codli mines.* The Codli group of mines is situated in South Goa, approximately 600 km south of Mumbai and 50 km east of Panaji, the capital of Goa. It is an open-pit operation and the mining leases are held by Vedanta Limited. The nearest railway stations, Sanvordem and Margao, are approximately 13 km and 40 km, respectively, from the mine. There is an airport 55 km from the mine at Dabolim. The river loading points at Sanvordem and Capxem are approximately 12 km and 14 km, respectively, from the Codli mines while the port is approximately 40 nautical miles from the river loading point.

The Codli mines cover an area of approximately 340 hectares and are operated under the terms and conditions stipulated in four contiguous leases, three of which are owned by us with the remaining lease being owned by a third-party. Vedanta Limited owns an additional two mining leases to the northwest of the current Codli mine operations where exploration is being undertaken. Exploration at the Codli mines began in 1966 and the mine first commenced production in 1973. Production at the mine reached 3 mmtpa by 1995. This mine has been granted environmental clearance for a production level of 7 mmtpa.

At the Codli mines, the lower grade iron formation is folded and subsequently eroded into basinal areas amenable to open-pit mining. Economically mineable material occurs over an area of about 3.1 km by 1.6 km and is located between 84 metres above sea level and 50 metres below sea level. The formations show a general northwest-southeast trend with shallow to moderate dips towards the northeast with local reversals. The footwall is comprised manganiferous clay and decomposed quartzites and the stratigraphy of the ore body is cross cut by late dolerite dykes and sills which are manifested by pink clayey zones in the mine area.

The Codli mines are multi-pit, multi-lease fully mechanised mining units. The open-pits have a bench height of seven metres, haulage roads of 25 metres width and an overall pit slope of 26 degrees. The Codli mines have 14 basins, of which five pits have been exhausted. The lateritic overburden is removed either by ripping or dozing, and loaded by excavators and/or wheel loaders into heavy earth moving machinery such as rigid dumpers and articulated dumpers. Hauling within the mine is also done by rigid and articulated dumpers. An ore stockpile is maintained at all times to continuously feed the processing plants.

Vedanta Limited has extensive ore processing facilities for upgrading the ore, which include crushing, dry screening, scrubbing, log washing, classifying, hydrocycloning, and magnetic separation with a wet high- intensity magnetic separator. The four Codli processing plants are between 1 and 18 years old and throughput capacity of the four Codli processing plants is 10 mmtpa. The processed ore is transported by road to a riverhead jetty by 10 tonne tipper trucks and then further transported by barges to the Goa ports or transhipper for onward shipment. One plant is provided with a dry circuit to process high grade ore, while the remaining four wet plants process low grade ores. The Codli processing plants undergo regular maintenance and annual repairs are conducted during the monsoon season.

As of 30 September 2016 Vedanta Limited has undertaken an exploration and evaluation program at the Codli mines which involved drilling a total of 78,082 metres in depth in 1,156 holes. The Codli mine deposits are extensively sampled in vertical drill hole grids between 8 metres and 127 metres in length.

Power at the Codli mines is supplied through a government grid supply network with a maximum contracted demand of 5,000 kVA. There are also generator sets with an aggregate of 5,190 kVA available to supply power. The site's full water requirements are met from the rainwater accumulated in exhausted pits.

In fiscal year 2016, 2.9 million wmt of crude ore was produced from the Codli mines since the recommencement of operations at the mines in August 2015 after its temporary suspension of mining activities relating to iron ore imposed by the state government. For the six months ended 30 September 2016, 0.98 million wmt of crude ore was produced from the Codli mines.

The economic cut-off grade at the Codli mines is determined by the requirement to meet various sales contracts. Vedanta Limited operates on a 50.0% iron operational cut-off grade in practice, as compared to the statutory cut-off grade of 45.0% iron. Ore containing 45.0 to 50.0% iron is preserved for future use and ore containing 50.0 to 54.0% iron is beneficiated in order to make it saleable.

The reserves at the Codli mines in the proved reserve category are defined by drill holes spaced at 50 metre intervals, the probable reserves are generally defined by drill holes spaced at a further 50 metre interval from the proved reserves. Possible reserves are generally defined by drill holes spaced at a further 50 metre to 75 metre interval from the probable reserves. As the area is drilled at approximately 50 metre by 50 metre grids, the physical continuity of the ore is well demonstrated.

Vedanta Limited operates the Gauthona Dusrifal mine, the lease of which is held by M/s Timblo Private Limited, as an ore raising contractor since 1989. Since 1983, Vedanta Limited had a common boundary working agreement with M/s Timblo Private Limited and, in 1989, Vedanta Limited acquired control of 40.8 hectares of the leasehold area. This mine is contiguous to the Codli mines. The mining method at the Gauthona Dusrifal mine is the same as that of the Codli mines described above. During fiscal years 2015 and 2016, there was no ore production from the Gauthona Dusrifal mine due to the temporary suspension of mining activities relating to iron ore imposed by the state government.

*Sonshi mine.* The Sonshi mine is situated in the North Goa District, approximately 34 km from Panaji and approximately 40 km north of the Codli mines. It comprises an open-pit mine. The area is well connected by metalled roads and the nearest railway station is at Tivim, approximately 25 km from the Sonshi mine. The river loading point, Amona, is nine km from the site and the port is approximately 35 nautical miles from the river loading point. The airport is approximately 50 km from the Sonshi mine.

The leasehold area of the Sonshi mine is 62 hectares. The leaseholder has submitted timely renewal applications to the state government and no rejections have been notified. The Sonshi mine was operating under deemed consent until the temporary suspension of mining activities relating to iron ore by the state government of Goa. Due to the narrow width of the leasehold area, common boundary working agreements have been entered into with adjoining lessees to facilitate mining operations. The original mining concession was granted in 1953 to Cosme Costa & Sons. Though the lease has not been acquired, but Vedanta Limited has been operating the Sonshi mine as an ore raising contractor since 1958. Production at the mine commenced in 1958. The agreements entered into by us with Cosme Costa & Sons for the raising and sale of iron ore expired in March 2013 and was renewed until November 2017. The Sonshi mine has been granted environmental clearance for a production level of 3.0 mtpa. The area surrounding the Sonshi mine is covered with laterite capping underlain by lumpy ore zone. The ore deposit at the Sonshi mine forms the northern limb of the northwest-southeast trending syncline. The formations dip 50 degrees to 60 degrees northeast. The principal deposit of the Sonshi mine comprises three distinct ore bodies that are folded into a syncline. The youngest ore body has a width of 50 metres, while the other ore bodies dip steeply to the northeast and have widths of approximately 20 metres to 25 metres. The intervening parting between the ore bodies comprised 50 metres of manganiferous clay and a 30 metre wide limonitic zone separating one ore body from the footwall phyllite. The depth extent of these bands has been outlined with deep drilling. Hematite is the major economic mineral in each of the bands.

The open-pit mining operations at the Sonshi mine are fully mechanized. The hard laterite capping is loosened either by drilling, blasting or ripping/dozing. The soft sub-lateritic zone is excavated and transported to respective laterite, clay and ore stacks. The material is then reloaded into smaller 10-tonnetrucks and transported to the plants for processing and beneficiation, which involves crushing, scrubbing, log washing, classifying, double stage cycloning and thickening. The waste is transported to a dump stockpile six to seven km away. Processing operations for the Sonshi mine are similar to those of the Codli mines described above. The processed ore is transported to the Amona jetty, loaded in barges and sent to Mormugao port approximately 35 nautical miles away.

There is no processing plant on-site. The extracted ore is transported by a fleet of contractors with 10-tonnetrucks to the processing plants at Amona (approximately nine km away) and at Cudnem (approximately six km away). The combined throughput capacity of the processing plants is 7.9 mtpa. The plants undergo regular maintenance and annual repairs are carried out during the monsoon season.

No exploration activity was carried out in the mine during fiscal year 2015 due to temporary suspension of mining activities relating to iron ore imposed by the state government. The Sonshi mine has been sampled in vertical and inclined drill holes with a total of 66,766 metres being drilled in 644 holes as of 30 September 2016.

Power at the mine is supplied through a government grid supply network and the maximum contracted demand is up to 1,550 KVA. A 625 KVA diesel generator is also available to supply power in case of the fluctuations at grid power. In fiscal year 2016, 0.2 million wmt of crude ore was produced from the Sonshi mine and for the six months ended 30 September 2016 0.29 million wmt of crude ore was produced from the Sonshi Mine.

The economic cut-off grade at the Sonshi mine is determined by the requirement to meet various sales contracts and the need to maintain stockpiles to meet the contract. Vedanta Limited operates on a 50.0% iron operational cut-off grade in practice, as compared to the statutory cut-off grade of 45.0% iron. Ore containing 45.0 to 50.0% iron is preserved for future use and ore containing 50.0% to 54.0% iron is beneficiated in order to make it saleable.

Vedanta Limited acquired an adjoining mining lease for the Mareta Sodo mine in 2004 from Pandurang Timblo Industries. This mining concession was granted in 1955 and was operated intermittently until the mine was transferred to us in November 2004. This mine has been granted environmental clearance by the MoEF for production of 1 mmtpa. As of 30 September 2016, 17,702 metres have been drilled in 112 boreholes on the leased area. The mining method of the Mareta Sodo mine is the same as that of the Sonshi mine described above. Due to allegations of illegal mining in the State of Goa, the state government of Goa banned mining operations within the state in September 2012, and the MoEF also suspended environmental clearances within the state. In January 2015, the state government of Goa revoked the mining suspension order, and in March 2015 MOEF has likewise revoked the suspension of environmental clearances. Subsequently, the lease deeds were executed and registered as of August 2015 to resume production for all working leases, including the mining lease for the Mareta Sodo mine. In fiscal year 2016, 0.13 million wmt crude ore was produced from this mine. In addition to the Codli mines and right to the third-party mining lease at the Sonshi mine, Vedanta Limited has ten additional mining leases, of which four are non-operative leases. The operative mines are the Sanquelim mines with three contiguous leases with an environmental clearances of 0.2 mtpa, the Orasso Dongor mine (0.2 mtpa) and the Botvadeacho Dongor mine (0.2 mtpa). The non-operative leases are under exploration. *Karnataka*. Vedanta Limited's main operations in Karnataka are at the A. Narrain mine which is located approximately 200 km northwest of Bangalore. The open-pit mine is operated by us and is well connected by rail, with the nearest stations, Sasalu and Amruthapura, and M/s Mineral Enterprises served by Chikkajajur or MMEC railway siding located 16 km, 17 km and 4 km respectively, from the A. Narrain mine. The nearest port at Mangalore is approximately 430 km from the mine and the nearest airport is located at Bangalore, approximately 230 km from the mine.

The leasehold area of the mine is 160.6 hectares, which is classified into two blocks, namely the south block, which is 123.5 hectares, and the north block, which is 37.1 hectares. These two blocks are joined by a narrow stretch of land 40 metres in width and 660 metres in length along the eastern side of the leasehold area. Vedanta Limited has operated the mine since 1994. The MOEF had granted an environment clearance for 6 MTPA in the year 2009. However, due to conditions introduced by the Supreme Court, the production capacity of the mine was reduced to 2.29 MTPA. Furthermore, in May 2016, Vedanta Limited had applied for an enhancement in production capacity of 6 MTPA to Central Empowered Committee appointed by the Supreme Court. Therefore, as per procedure Vedanta Limited has received recommendation from Federation of Indian Mineral Industries for 6 MTPA and from Indian Council for Forestry Research and Education for 5.3 MTPA.

The geological formation of this region belongs to the Archean-Proterozoic age. The geology of the A. Narrain mine consists of Archean formations locally termed "Dharwars" which contain rich and large iron ore deposits. The leasehold area forms part of the Chitradurga-Tumkur schist belt and part of a regional isoclinal fold. The strike direction of the ore body dips westerly at an angle of about 60

degrees to 70 degrees. Hematite is the principal ore mineral and limonite, goethite and magnetite constitute the associated minor minerals of the mine. The mineralized horizon extends over a length of about two km. The footwall comprised decomposed quartzite and phyllite, and the stratigraphy is cross cut by late dolerite dykes and sills which are manifested by pink clayey zones in the mine area.

Currently, the north and the south block of the A. Narrain mine have mechanized mining operations. The open-pit mines have a bench height of seven metres, haulage roads of 12 metres to 15 metres in width and an overall pit slope of less than 30 degrees. The A. Narrain mine is equipped with dry process facilities for processing all grades of ore.

The lateritic overburden is removed either by blasting or ripping/dozing, loaded onto and transported by 30-tonnetrucks. The ore mined is processed at the mine's processing facilities, which involves crushing and dry screening processes. The processed ore is then transported by road to the railway yard, for onward transport to customers in Karnataka, Goa and other places. Ore produced in Karnataka ranges from 56.0% to 60.0% iron content and comprises 82.0% fines and 18.0% lumps.

The two processing plants at the A. Narrain mine have a combined capacity of 1,150 tonnes per hour.

Since the mine was taken over by Vedanta Limited, exploration at the A. Narrain mine involved the drilling of a total of 59,025 metres in 605 boreholes as of 30 September 2016. The A. Narrain deposit is extensively sampled in vertical and inclined drill hole grid intervals in side direction of 50 metres and in cross section average of 25 metres with most of the holes covering a depth of 50 metres to 200 metres. Power at the mine is supplied by a 725 KV and 320 KV generator. All power supplied to the mine and plant is through generators.

The gross value of fixed assets, including capital works-in-progress, was Rs. 24,820.5 million (\$372.3 million) as of 31 March 2016.

On 26 August 2011, the Supreme Court of India suspended mining activities in the Chitradurga and Tumkur districts of Karnataka. On 18 April 2013, this suspension was lifted by the Court and in December 2014, the operations were resumed after getting necessary regulatory clearances. Although Vedanta Limited resumed operations in Karnataka based on the stage I forest clearance from the state government of Karnataka and a temporary working permission from the MoEF, the temporary working permission expired on 31 July 2014. Karnataka operations were halted for the period from 1 August 2014 to 27 February 2015. Vedanta Limited resumed operations in Karnataka after all statutory clearances were in place from 28 February 2015. The economic cut-off grade at the A. Narrain mine is determined by the requirement to meet various sales contracts and the need to maintain stockpiles to meet the contract specifications.

The reserves in proved reserve category at the Karnataka mines are estimated based on drilled boreholes spaced at 50 metres along predefined section lines and occasionally off of the section lines, the probable reserves are estimated based on drilled boreholes spaced at 50 metres from the proved reserves and the possible reserves are estimated based on drilled boreholes spaced at 25 metres from the probable reserves. As the area is drilled at approximately 50 metre by 50 metre grids, the physical continuity of the ore is well demonstrated.

*Odisha.* The Thakurani mine is situated at Barbil within the State of Odisha, approximately 400 km from Kolkata airport. The Thakurani mine has been operated by Vedanta Limited as an ore raising contractor since 1999 and the lease expired on 30 November 2010. Production at this mine has ceased.

*SRL, Goa.* SRL and its subsidiary Sesa Mining Corporation Limited extract iron ore from 11 mining leases spread across a total of approximately 980 hectares in Goa. SRL's operations consist of two major iron ore mining areas, one in Bicholim and the other in Surla, both located in North Goa and which together account for approximately 90.0% of SRL's total estimated iron ore reserves as of 31 March 2016. The Bicholim mine consists of five contiguous mining leases covering an area of

479.3 hectares in the north of Goa. The Surla mine consists of three contiguous mining leases covering an area of 253.4 hectares in the recognized iron ore belt of Pale-Velguem-Bicholim-Shirgao in the north of Goa. Mining operations started at the Bicholim mine and the Surla mine in 1958. Processed ore from the Bicholim and Surla mines is transported by SRL to loading jetties at Sarmanas and Surla/Sinori in north of Goa, and then loaded into barges and sent to Mormugao port in Goa, India, where it is then shipped to customers. SRL's mining assets include processing plants, barges, jetties, transhippers and loading capacities at the Mormugao port. In fiscal year 2016, the combined production of the Bicholim and Surla mines was 0.61 million wmt of crude ore since the recommencement of operations at the mines after temporary suspension of mining activities in August 2015, relating to iron ore imposed by the state government.

Vedanta Limited also had a ship building division for the construction and repair of inland mini bulk carriers owned by us as its primary activity as well as supporting Vedanta's core activities including the export of iron ore and the import of coke and coal. This division has now closed.

*WCL.* WCL comprises of three concession areas (Bomi Hills, Bea Mountain and Mano River). The ebola epidemic in Liberia resulted in stoppage of drilling and exploration work for iron ore during fiscal year 2015. The staff was evacuated as a result of the ebola outbreak in 2015.

In consideration of the suspension of exploration in Liberia, low iron ore prices, geo-political factors and no plans for any substantive expenditure resulting in continued uncertainty in the project, an impairment charge of US\$227.5 million was recognized in fiscal year 2016. Vedanta Limited is in discussions with the government to extend the MDA to make this project more sustainable.

### ***Principal raw materials***

*Iron ore operations.* There are no direct raw materials used in Vedanta Limited's iron ore mining and processing operations. Indirect raw materials include power, fuel and lubricants. Vedanta Limited procures these indirect materials from various vendors. The electricity required for its operations is supplied by the government grid and supplemented by Vedanta Limited's owned and hired diesel generator sets. The prices of fuel and necessary lubricants are volatile and the price of power is dependent on tariffs imposed by State Governments.

*Pig iron operations.* The principal raw materials for the manufacture of pig iron are iron ore, metallurgical coke, limestone and dolomite.

Iron ore is largely sourced from mines in Karnataka and Goa. The iron ore is transported from Karnataka by truck and railway rakes and from Goa by truck. Iron ore requirements are met by Vedanta Limited's own mines from Karnataka and purchases from other mines in Karnataka and Goa. Vedanta Limited's metallurgical coke requirements are met by its metallurgical coke division. Limestone and dolomite are purchased from mines in Karnataka and transported to Vedanta Limited by trucks.

*Metallurgical coke.* The principal raw materials for the manufacture of metallurgical coke are hard and semi-hard coking coals. These raw materials are imported from various international suppliers mainly from Australia and Russia.

*Power.* Electricity for Vedanta Limited's metallurgical coke and manufacturing operations is primarily supplied by its wholly owned subsidiary, GEL, which generates power from the waste gases of Vedanta Limited's metallurgical coke plant and its blast furnace.

### ***Distribution, logistics and transport***

Vedanta Limited's mining operations are advantageously located in Goa and are complemented by an efficient transportation network. In order to achieve higher volume and loading capacities and vessels with higher drafts, Vedanta Limited and SRL own and operate transfer vessels, which are used for mid-stream loading at Goa. Vedanta Limited ships products from ports on the west coast of India

and so, the annual monsoon season in Goa impacts its distribution operations from June to September. Vedanta Limited maintains a network of rail cars, barges and transhippers that are primarily used to facilitate the export of its ore to foreign customers. Vedanta Limited's fleet includes 33 barges with capacities between 1,600 to 2,500 tonnes per barge. Vedanta Limited also has one transhipper and a floating crane station with a combined rated capacity of up to 54,000 ton/day.

Sales from Vedanta Limited's Karnataka mines to Indian domestic customers take place on an ex-mine basis, and the transportation is handled by the customer.

### ***Sales and marketing***

*Pig iron.* Currently, the majority of the pig iron produced by Vedanta Limited is sold within India to foundries and steel mills. The sale of pig iron is generally done on a spot basis with prices valid for a month. The prices of pig iron are fixed on a delivered basis, with material generally being sent on a freight-to-pay basis.

*Metallurgical coke.* Currently, all of the metallurgical coke produced by Vedanta Limited is primarily (about 90%) consumed within plant and balance is sold within India to internal and external customers. Approximately 75% to 85% of Vedanta Limited's total metallurgical coke production during fiscal year 2016 was used for the production of pig iron. The balance was sold in the domestic Indian market.

The sale of metallurgical coke to other customers is done on a spot basis with prices valid for a month.

Vedanta Limited has a marketing office at Panaji in Goa with indenting agents to sell the pig iron and metallurgical coke products. The sales and chartering needs are managed from the office at Goa. To cater to Chinese customers, Vedanta has a marketing office in China.

Vedanta Limited's ten largest customers accounted for approximately 49.1%, 40.6% and 28.5% of revenue for iron ore business in fiscal years 2014, 2015 and 2016, respectively. No customer accounted for greater than 10.0% of Vedanta Limited's revenue in fiscal year 2016. One customer each accounted for greater than 10.0% of the revenue in each fiscal year 2014 and 2015.

### ***Market share and competition***

Since 2003, Vedanta Limited has been India's largest exporter of iron ore in the Indian private sector by volume, prior to the temporary suspension of mining activities relating to iron ore in the states of Goa and Karnataka, according to the Federation of Indian Mineral Industries. In fiscal year 2015, no sales were accounted due to the temporary suspension of mining activities relating to iron ore in the state of Goa. In fiscal year 2016 the total sales including sale of confiscated ore purchased through e-auction, was 5.3 million tonnes for Fiscal year 2016 and 3.4 million tonnes for the six months ended 30 September 2016. Vedanta's primary competitors in both the public and private sectors in India include NMDC, MMTC India Limited, Rungta Mines Ltd., MSPL and Essel. In addition, Vedanta Limited competes with a number of international producer-exporters of iron ore worldwide.

### ***Aluminium Business***

#### ***Introduction***

Vedanta's aluminium business is in Chhattisgarh and Odisha. Vedanta operates the business in Chhattisgarh through BALCO, in which Vedanta Limited has a 51.0% ownership interest as of 30 September 2016 and the remaining 49.0% is held by GoI. Operations in Odisha are held through Vedanta Limited.



Since acquiring the interest in BALCO, Vedanta Limited has worked to improve BALCO's operating performance through expansion and by improving operational efficiencies and reducing unit costs of production. BALCO currently sources the alumina required for its smelters from third-party suppliers on the international markets. BALCO intends to further improve its operating performance by continuing to reduce unit operating costs at the Korba facility, including by lowering power consumption and improving the operating efficiency of the captive power plant. BALCO also intends to focus on the production of fabricated products with higher margins.

BALCO, one of the four primary producers of aluminium in India, had a 20.0% primary market share by production volume in India in fiscal year 2016 according to the AAI and as of 30 September 2016. BALCO's partially integrated aluminium operations are comprised of two bauxite mines, 1,140 MW power plants, and refining, smelting and fabrication facilities in central India. BALCO's operations benefit from relatively cost effective access to power, the most significant cost component in aluminium smelting due to the power-intensive nature of the process. This is to a considerable extent due to BALCO being an energy-integrated aluminium producer. BALCO is also setting up a 325,000 tpa aluminium smelter, the first 84 pots of which started commercial production in September 2014 and another 84 pots in August 2016. The remaining 168 pots will start commercial production by the end of fiscal year 2017. The consent to operate the 1,200 MW power plant was received in January 2015, of which 900 MW is commissioned/operationalized at various dates in phased manner during fiscal year 2016. The fourth unit has been commissioned and started commercial production from 1 May 2016.

Pursuant to the re-auctioning of coal mines conducted by the GoI in February 2015, BALCO was successful in securing the Chotia coal block and was the highest bidder for the Gare Palma IV/1 coal block. The total reserves at the Chotia block are 17.5 million tonnes with the annual production capacity of one million tonnes and mining operations commenced at the mine in November 2015.

By way of letter dated 29 July 2015, the GoI rejected the representation of BALCO to accept its bid for the Gare Palma IV/1 coal mine, which would cover 90% of BALCO's coal requirement for captive power generation. As a result, BALCO challenged the rejection before the Delhi High Court. However, as BALCO secured linkage coal of 3.2 million tonne per annum for its captive power plant for a term of 5 years, BALCO has withdrawn its application challenging the rejection.

BALCO's Bodai-Daldali bauxite mines provide a majority of the bauxite required for BALCO's smelters. The bauxite is transferred to the alumina refinery in Lanjigarh, which converts bauxite to alumina and supplies the alumina back to BALCO, for payment of a conversion price by BALCO to us, which is based on the actual cost of production plus a reasonable margin. The remainder of BALCO's alumina requirements is sourced from third parties. The mining lease of the Mainpat bauxite mine has been renewed and it is valid up to 8 July 2042. BALCO has temporarily stopped the mining activity on account of pending approval from the necessary mining authorities.

The Odisha operations include 1.0 million tpa alumina refinery at Lanjigarh with associated 75 MW coal based captive power plant, 0.5 million tpa aluminium smelter with an associated 1,215 MW (nine units with a capacity of 135 MW each) coal based captive power plant and a 1,800 MW (three units with a capacity of 600 MW each) coal based captive power plant at Jharsuguda. The alumina refinery at Lanjigarh was commissioned in March 2010. The green field smelter project of 0.5 million tpa at Jharsuguda was implemented in two phases of 250,000 tpa each. Phase 1 was completed on 30 November 2009 and Phase 2 was completed on 1 March 2010. At Lanjigarh, production ramped up with recommencement of the second stream of the refinery during the first quarter of fiscal year 2017 (up to 2 million tonnes per annum debottlenecked capacity) while approval was received for the expansion to 4 million tonnes per annum.

Vedanta Limited is also setting up another 1.25 mtpa aluminium smelter in Jharsuguda. The commissioning of pots at the first line of the 1.25 mtpa aluminium smelter at Jharsuguda was completed at the end of July 2016. However, this line was impacted by a power outage in early August 2016, following which 168 pots were taken out of production. The impacted pots are currently being rectified and 26 pots have restarted production as on 30 September 2016.

As of 30 September 2016, Vedanta Limited has 1,395,000 tpa of aluminium capacity and 1,400,000 tpa of alumina capacity.

Revenue from Vedanta's aluminium business in the six months ended 30 September 2016 was \$863.3 million from external customers.

### *Principal products*

*Primary aluminium.* Primary aluminium is produced from the smelting of metallurgical grade alumina. Vedanta produces primary aluminium in the form of ingots and wire rods for sale. Ingots are used extensively for aluminium castings and fabrication in the construction and transportation industries. Wire rods are used in various electrical applications especially in the form of electrical conductors and cables. Vedanta Limited also produces aluminium billets.

*Rolled products.* Rolled products, namely coils and sheets, are value-added products that BALCO produces from primary aluminium. Rolled products are used for a variety of purposes in different industries, including aluminium foil manufacturing, printing, transportation, consumer durables, building and architecture, electrical and communications, packaging and general engineering industries.

*By-products.* Vanadium sludge is a by-product of the alumina refining process and is primarily used in the manufacture of vanadium-based ferrous alloys.

### **Production**

The following table sets out Vedanta's total production<sup>(1)</sup> from its Korba, Lanjigarh and Jharsuguda facilities for the periods indicated:

Facility	Product	Year Ended 31 March			Six months ended 30 September	
		2014 <sup>(3)</sup>	2015 <sup>(4)</sup>	2016	2015	2016 <sup>(5)</sup>
				<b>(Tonnes)</b>		
Korba .....	Ingots	34,714	104,650	93,442	44,726	89,738
	Rods	166,239	172,464	217,650	99,169	106,838
	Rolled products	51,082	46,807	20,526	20,093	6,254
	<b>Total</b>	<b>252,035</b>	<b>323,921</b>	<b>331,618</b>	<b>163,988</b>	<b>202,830</b>
Lanjigarh.....	Alumina <sup>(2)</sup>	524,060	976,915	970,893	541,150	566,935
Jharsuguda .....	Ingots	301,008	303,756	333,249	187,505	193,583
	Rods	120,013	133,603	139,184	59,817	56,174
	Hot metal sold	—	—	8,892	4,528	23,977
	Billets	121,231	115,979	110,400	48,108	64,438
	<b>Total</b>	<b>542,252</b>	<b>553,338</b>	<b>591,725</b>	<b>299,958</b>	<b>338,172</b>
<b>Total</b> .....	Alumina <sup>(2)</sup>	524,060	976,915	970,893	541,150	566,935
	Ingots	335,722	408,406	426,691	232,231	283,321
	Rods	286,252	306,067	356,834	158,986	163,012
	Rolled products	51,082	46,807	20,526	20,093	6,254
	Hot metal sold	—	—	8,892	4,528	23,977
	Billets	<u>121,231</u>	<u>115,979</u>	<u>110,400</u>	<u>48,108</u>	<u>64,438</u>

(1) See "Presentation of Information — Reserves and Production" for an explanation of the basis of preparation of production amounts.

- (2) Alumina is used for the production of aluminium and rolled products. Approximately two tonnes of alumina is required for the production of one tonne of aluminium. Additional alumina needed for the production of aluminium is purchased from third parties and is not reflected in alumina production numbers.

The following table sets out the total bauxite ore production<sup>(1)</sup> for each of Vedanta's mines for the periods indicated:

Mine (Type of Mine)	Product	Year Ended 31 March			Six months ended 30 September	
		2014	2015	2016	2015	2016
(Tonnes, except percentages)						
Mainpat (Open-pit).....	Bauxite ore mined	—	—	455	455	—
	Ore grade	—	—	47.70%	47.7%	—
Bodai-Daldali (Open-pit) ....	Bauxite ore mined	472,155	860,710	1,033,300	515,100	516,000
	Ore grade	46.90%	46.80%	46.90%	46.8%	46.9%
<b>Total</b> .....	Bauxite ore mined	472,155	860,170	1,033,755	515,555	516,000

- (1) See "Presentation of Information — Reserves and Production" for an explanation of the basis of preparation of production amounts.

#### Ore Reserve base

The table below sets out BALCO's Proven and Probable bauxite Ore Reserves as of 31 March 2016:

Mines	Proven Reserves			Probable Reserves			Total Proven and Probable Reserves			SSL Interest	Reserve Life
	Quantity	Alumina	Silica	Quantity	Alumina	Silica	Quantity	Alumina	Silica	%	(years)
	(in million tons)	(%)	(%)	(in million tons)	(%)	(%)	(in million tons)	(%)	(%)		
Mainpat .....	4.22	44.48	4.43	—	—	—	4.22	44.48	4.43	—	5-6
Bodai-Daldali .....	1.93	45.68	3.64	—	—	—	1.93	45.68	3.64	—	1-2
<b>Total</b> .....	<u>6.15</u>	<u>44.86</u>	<u>4.18</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>6.15</u>	<u>44.86</u>	<u>4.18</u>	<u>51</u>	<u>—</u>

The table below sets out Vedanta Limited's Proven and Probable bauxite Ore Reserves as of 31 March 2016:

	Proved Reserve		Probable Reserve		Total Proved and Probable Reserves	
	Quantity	Oxide	Quantity	Oxide	Quantity	Oxide
	(Million tonnes)	(%)	(Million tonnes)	(%)	(Million tonnes)	(%)
Vedanta Limited <sup>(2)</sup> ..						
Shevaroy	0	0	0	0	0	0
Kolli Hills	0	0	0	0	0	0
<b>Total</b> .....	<u>6.15</u>	<u>44.86</u>	<u>0</u>	<u>0</u>	<u>6.15</u>	<u>44.86</u>

- (1) See "Presentation of Information — Basis of Presentation of Reserves and Resources" for an explanation of the basis of preparation of reserve amounts.

- (2) Operations at these mines have been suspended. Reserves as of 31 March 2016 are estimated to be 0.04 million tonnes in the case of Shevaroy and 0.11 million tonnes in the case of Kolli Hills.

## **Description of operations**

### *Smelters and Refineries*

The following table sets out the total capacities as of 30 September 2016 at BALCO's Korba and Vedanta Limited's Lanjigarh and Jharsuguda facilities:

	Capacity		
	Alumina <sup>(1)</sup>	Aluminium	Power
	(tpa)		(MW)
Korba.....	—	245,000	2,010
Korba (under construction) .....		162,500 <sup>(2)</sup>	
Lanjigarh .....	1,400,000	—	75
Jharsuguda .....	—	500,000	3,015
Jharsuguda (Under construction) .....	—	487,000 <sup>(3)</sup>	—
Total .....	<u>1,400,000</u>	<u>1,395,000</u>	<u>5,100</u>

- (1) Alumina is used for the production of aluminium and rolled products. Approximately two tonnes of alumina is required for the production of one tonne of aluminium.
- (2) 168 pots out of 336 pots of 325,000 smelter at Korba was commissioned fully during six months ended 30 September 2016. However, a technical issue in September 2016 took 167 pots out of production. Rectification work is in progress and these pots are expected to be re-started by the forth quarter of fiscal year 2017.
- (3) For the 1,250,000 tpa smelter, Line 1 of 312,500 tpa was commissioned in July 2016, however, this line was impacted by a power outage in early August, following which 168 pots were taken out of production. The impacted pots were being rectified, and 26 pots were restarted as on 30 September 2016. In Line 2 of 312,500 tpa, 168 pots were commissioned during six months ended September 2016 and the remaining 168 pots will commence commercial production in balance fiscal year 2017.

*Korba aluminium complex.* BALCO's aluminium complex is located at Korba in the State of Chhattisgarh in central India. The aluminium smelter at Korba, which uses pre-baked Guiyang Aluminium Magnesium Design Research Institute technology or GAMI technology and has a capacity of 245,000 tpa, was fully commissioned in November 2006 at a cost of \$543.2 million. The Korba alumina refinery was commissioned in 1973, used the conventional high pressure Bayer process and has a capacity of 200,000 tpa of alumina. The operations of the refinery have stopped since September 2009.

BALCO is in the process of setting up a 325,000 tpa smelter at the Korba facility, first 84 pots of which commenced commercial production in September 2014. The remaining 257 pots will commence commercial production by the end of fiscal year 2017. BALCO's 100,000 tpa smelter and 200,000 tpa smelter are no longer in operation since June 2009 and November 2009 respectively.

The fabrication facility at Korba has two parts, a cast house and a sheet rolling shop. The cast house uses Properzi CCR copper rod technology and has a foundry which has twin-roll continuous casters with a SNIF degasser and hydraulically driven semi-continuous ingot casting machine to produce ingots and wire rods. The sheet rolling shop has three parts: a hot rolling mill with a capacity of 75,000 tpa, an older cold rolling mill with a capacity of 30,000 tpa and a cold rolling mill

commissioned in 2004 with a capacity of 36,000 tpa. Molten metal is cast into slabs and then either hot-rolled and sold as hot-rolled sheets or converted into cold-rolled sheets in the cold rolling mills. Alternatively, molten metal is directly used in strip casting and then fed to the cold rolling mills to be converted into cold-rolled sheets or coils.

Smelting requires a substantial continuous supply of power and interruptions can cause molten metal to solidify and damage or destroy the pots. Power for the Korba facility is for the most part provided by the coal-based 540 MW captive power plant commissioned in March 2006. The surplus generation from the power plant is supplied to the State Electricity Board and other customers. Following the shutdown of the 100,000 tpa aluminium smelter, power from its associated 270 MW power plant was sold in the merchant power market and presently 270 power plant is under suspension due to lower realization in merchant sale. BALCO has constructed a CPP 600 MW coal-based thermal power facility at Korba in the state of Chhattisgarh. The power generated from CPP 600 MW units is being utilized in the 325,000 tpa smelter.

#### *Coal mining operations*

Thermal coal is a key raw material required for the operation of BALCO's captive power plants. In September 2014, the Supreme Court of India canceled all the coal blocks that had been awarded by the Ministry of Coal between 1992 and 2012 to all companies in India. Consequently, in February 2015, the GoI conducted an auction to award mining rights to successful bidders for all such coal blocks. Pursuant to the re-auctioning of coal mines conducted by the GoI in February 2015, BALCO was successful in securing the Chotia coal bloc, in the state of Chhattisgarh and was the highest bidder for the Gare Palma IV/1 coal block. The total reserves at the Chotia block are 17.5 million tonnes with the annual production capacity of one million tonnes and mining operations commenced at the mine in November 2015.

The following tables contain details of Vedanta's coal mining operations.

1. The Chotia coal mine is divided into two sub-blocks, Chotia I and Chotia II. Both of these blocks are assigned to the existing captive power facilities at the BALCO operations. The estimates provided below are based on the DMT report.

<b>Blocks</b>	<b>Gross CV range (Min — Max)</b>	<b>Sulphur (%)</b>
	<b>Kcal/kg</b>	
Chotia-I .....	3,565 - 6,476	0.30-0.60 (Total)*
Chotia II .....	3,967 - 6,152	0.30 (Total)*

\* Sulphur data is not available for all seams. Total is based only on available seam data.

2. This coal, which is thermal grade coal, would be blended with low GCV coal before being fed to the Boiler.
3. The extractable coal indicated is considering all losses. This number reflects the final tonnage of the mine. There is no plan of putting wash plant either at the mine site or at the plant as the coal is of high GCV.

*Lanjigarh alumina refinery.* The Lanjigarh alumina refinery is located in the Lanjigarh district in the state of Odisha, which is located approximately 450 km from BALCO's Korba facility in the state of Chhattisgarh. In March 2007, Vedanta Limited began the progressive commissioning of a 1,000,000 tpa Greenfield alumina refinery, with expansion to 1.4 mmtpa of installed capacity progressively commissioned during six months ended 30 September 2016. Lanjigarh alumina refinery

also has associated 75 MW captive power plant, expandable to 90 MW. The captive power plant is fully operational and can meet the power requirements of the refinery. Vedanta Limited is currently in discussions with government authorities for sourcing adequate supply of bauxite. Production at the alumina refinery does not affect production at the smelters.

Vedanta Limited planned to expand the alumina refining capacity at Lanjigarh to 5 MTPA by increasing the current alumina refinery's capacity to 2,000,000 tpa by de-bottlenecking and then further expand the refinery by constructing a second alumina refinery, with a refining capacity of 3 mmtpa along with an associated 210 MW captive power plant. Vedanta Limited has received approvals for expanding the Lanjigarh refinery to 4 mtpa and received environmental clearance from MoEF for the same on 20 November 2015. Environment clearance for expanding operations up to 6 mtpa will be received after the balance area of 666.03 HA of land has been acquired. However the environmental clearance for the expansion of the alumina refinery at Lanjigarh was challenged by an individual before the NGT. For more information on these proceedings, see "Risk Factors — Litigation — Petitions have been filed in the Supreme Court of India and the High Court of Odisha to seek the cessation of construction of Vedanta Limited refinery in Lanjigarh, and related mining operations in Niyamgiri Hills, which are currently suspended".

The second stream operations have commenced at the Alumina refinery from April 2016 and the debottlenecked capacity has reached 1.7-2.0 million tonnes per annum (although this is contingent on the bauxite quality). When Vedanta Limited has further visibility on bauxite sources, a further ramp-up to 4 million tonnes will be considered.

*Jharsuguda aluminium smelter.* The Jharsuguda aluminium smelter is located in Jharsuguda in the state of Odisha, India. Operations in the Jharsuguda facility were implemented in two phases. The first phase has a production capacity of 250,000 tpa and was completed in November 2009. The second phase was commissioned in June 2010. A total of 9 units of the associated 1,215 MW coal-based thermal captive power plant of 135 MW each have been commissioned. The captive power plant units meet the power requirements of the Jharsuguda smelter and all other power requirements of this facility.

Vedanta Limited is also setting up an 1,250,000 tpa aluminium smelter. For the 1,250,000 tpa aluminium smelter, Line 1 of 312,500 tpa was commissioned in July 2016, however, this line was impacted by a power outage in early August, following which 168 pots were taken out of production. The impacted pots are in the process of being rectified and 26 pots have restarted operations as on 30 September 2016. In Line 2 of 312,500 tpa, 202 pots were operationalized as of 30 September 2016 and the remaining 134 pots will commence commercial production in balance fiscal year 2017. Power to this smelter will be provided by Vedanta Limited's 2,400 MW power plant in Jharsuguda. Three units of 600 MW each are identified as captive power plant for its aluminum business, with effect from 1 April 2016 and one unit is considered as independent power plants for commercial power generation. Operations of the first three units are captured in Commercial Power Sector for period up to 31 March 2016 and aluminum sector thereafter.

#### *Balco Korba*

On 7 October 2006, BALCO entered into a memorandum of understanding with the state government of Chhattisgarh and the Chhattisgarh State Electricity Board, under which, among other things, feasibility studies were undertaken to build a thermal coal-based 1200 MW power facility, along with an integrated coal mine in the state of Chhattisgarh at an estimated cost of Rs. 46,500 million (\$697.6 million). The project was disrupted in September 2009 due to the collapse of a chimney under construction during heavy rains and lightning at Korba. There were 40 fatalities in the accident and SEPCO Electric Power Construction Corporation, the contractor and the sub-contractor Gamon Dunkerley and Company Limited, are the subject of an investigation by the Chhattisgarh government. The matter is to be heard on 29 April 2017.

On 8 August 2007, BALCO entered into a memorandum of understanding with the state government of Chhattisgarh for a potential investment to build an aluminium smelter with a capacity of 650,000 tpa at Chhattisgarh at an estimated cost of Rs. 81,000 million (\$1,215.1 million). BALCO has received environmental clearances for both phases of the project. Trial production started in February 2014 from the 325,000 tpa aluminium smelter and 84 pots started commercial production from September 2014.

BALCO received a coal block allocation in fiscal year 2007 of which 211 million tonnes for use in its captive power plants which was subsequently deallocated in fiscal year 2015 pursuant to the orders of the Supreme Court of India. Consequently, in fiscal year 2015, the Company made an assessment for the recoverability of the amount incurred thus far, and made a provision for Rs. 294.1 million (\$4.4 million) in its income statement.

### ***Mines***

*Chhattisgarh.* BALCO has two captive bauxite mines, namely, the Mainpat bauxite mine and the Bodai-Daldali bauxite mine, in the state of Chhattisgarh in central India. Mainpat is an open-pit bauxite mine located in the Surguja district of the state of Chhattisgarh. The Mainpat mine has been in production since 1993 and has a leased hold area of 6.39 km<sup>2</sup>. The bauxite extraction limit for the mine granted by MoEF is 750,000 tpa. The mining lease of Mainpat mine is valid until 8 July 2042. Environmental clearance for the Mainpat mine has been renewed by the MoEF and is valid up to 16 September 2038. The Forest Clearance for the entire revenue forest land co-terminus with the Mining Lease period obtained and the Mining operation resumed in October 2016.

The Bodai-Daldali deposits are located approximately 260 km from Korba in the Kawardha district of the state of Chhattisgarh. Bodai-Daldali was commissioned in 2004 and the mining lease that is valid until 26 March 2017. The bauxite extraction limit for Bodai-Daldali Mines granted by MoEF is 1,250,000 tpa.

The Chhattisgarh bauxite deposits are situated over a plateau with steep scarps on both sides, at an elevation of approximately 1,000 meters above sea level, for Mainpat, and approximately 940 meters above the surrounding land, for Bodai-Daldali. Bauxite is generally one meter to three meters thick and lies within a laterite sequence overlying thick tertiary basalts of the Deccan Traps. The cover of laterite and thin top soil is up to five meters thick but is generally less than two meters. Bauxite outcrops around much of the plateau rims.

A typical profile of the Chhattisgarh deposits comprises topsoil and soft overburden above the laterite. The upper laterite consists of hard, loose or indurated bauxite pebbles and boulders with a clear contact with the underlying hard bauxites. The bauxite occurs in discontinuous lenses up to four meters in thickness with laterite infilling joints and fractures with the bauxite. The contact with the softer lower laterite is usually gradational and irregular.

The bauxite is hard with a natural moisture content of 5.0% to 10.0%, with an in-situ density of 2.3 tonnes per metre<sup>3</sup> to 2.4 tonnes per meter<sup>3</sup>. It comprises primarily gibbsite with boehmite and minor diaspore. The reactive silica content is low and iron is present in the form of hematite and aluminous goethite. The average grade of the bauxite is approximately 44.9% aluminium oxide and silica levels of 4.2% as of 31 March 2016.

All mining and transportation at both mines are undertaken by contractors. One thin top soil layer is removed by an excavator and is either transported to an adjacent storage point or an area that is being backfilled. The laterite layer is drilled and blasted. The overburden is then removed by backhoe excavators and 15 tonne dumpers. Broken ore is hand-sorted, leaving waste material behind. Ore productivity is around 2 to 3 tonnes per person per day in the dry season which decreases to 1.25 to 1.75 tonnes per person per day in the wet season.

The current exploration drilling program is based on a 50-meter square pattern and is reduced to a 25-meter centers for detailed mine planning. Sampling is normally in 0.4 meter lengths and core is currently split and retained for future reference. Bauxite samples are tested for silica and aluminium oxide at laboratories situated on site and at the Korba plant. Selected sample are re-assayed as part of a quality control program.

Since the commencement of operations, the Mainpat mine has produced approximately 7.4 million tonnes of bauxite. During fiscal year 2016 there was production totaling approximately 455 tonnes at 47.7% aluminium oxide. Currently, bauxite production has been temporarily suspended from 17 September 2015 due to pending forest clearance of mining lease area and a restriction on the removal of mined ore from the mining site.

As of 31 March 2016, BALCO estimates reserves at Mainpat to be 4.2 million tonnes and the remaining mine life of the Mainpat mine to be approximately five to six years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan.

Total production at the Bodai-Daldali mine since the commencement of production has been 5.9 million tonnes of bauxite, with production in fiscal year 2016 totaling to approximately 1,033,300 tonnes with 46.9% aluminium oxide. Power is supplied by on-site diesel generators and ground water provides the water requirements for the mine.

As of 31 March 2016, BALCO estimates the reserves at Bodai-Daldali to be 1.93 million tonnes and the remaining mine life to be approximately 2 years based on (i) reserves; and (ii) planned production which is determined on the basis of a life-of-mine plan. The cut-off grade used to define the reserves at BALCO's mines was 42.0%.

In fiscal year 2016, all mining and transportation of the bauxite was done by contractors and the total cost for this was Rs. 2,334 (\$35.2) per tonne of bauxite.

Based on current costs and historical prices, BALCO's operations are forecasted to remain profitable and therefore the deposits at the Mainpat and Bodai-Daldali mines fulfill the requirements for being classified as reserves. The reserves as of 31 March 2016 at BALCO's mines at Mainpat and Bodai-Daldali have been determined by verifying that the integrated operation is economic at an aluminium price of \$1,751 per ton, which is the average metal price for fiscal years ended 31 March 2016, 2015 and 2014.

The mining recovery factors applied to determine the reserves for both mines are 65.0%. The grade dilution factor is reconciliation between the actual mined/dispatched grades obtained and in-situ grade values. The grade correction/dilution factors applied for Mainpat and Bodai-Daldali mines are Al<sub>2</sub>O<sub>3</sub> — 96%, SiO<sub>2</sub> — 114% and Al<sub>2</sub>O<sub>3</sub> — 95%, SiO<sub>2</sub> — 104% respectively. The parameters for Mainpat are derived from the reconciliation of actual production against the geological model, while the parameters for Bodai-Daldali are based on estimates.

In fiscal year 2016, there was no stripping ratio at the Mainpat mine as there was no ore extraction during the year, while the stripping ratio at the Bodai-Daldali mine was 1.0:3.89. The stripping ratio for the remaining reserves at Mainpat is 3.84 tonnes of waste per tonne of ore, while at the Bodai-Daldali mine, it is 3.85 tonnes of waste per tonne of ore.

*Shevaroy.* The Shevaroy bauxite mine is located eight km northeast of Yercaud town in the state of Tamil Nadu in India, which is approximately 85 km east of the Mettur Dam complex, where Vedanta Limited's aluminium operations were located when they were operational. Work at the Shevaroy mine has been suspended since Vedanta Limited's aluminium operations ceased in November 2008. Vedanta Limited estimates the balance reserves of the portion of the Shevaroy mine which Vedanta Limited is permitted to mine was 0.04 million tonnes as of 31 March 2016. If mining recommences at this mine, its life is estimated by Vedanta Limited to be approximately three months.



*Kolli Hills.* The Kolli Hills bauxite mine is located in the state of Tamil Nadu in India, approximately 150 km southeast of the Mettur Dam complex, where Vedanta Limited's aluminium operations were located when they were operational. Work at the Kolli Hills mine has been suspended since Vedanta Limited's aluminium operations ceased in November 2008. It is estimated the balance reserves of the portion of the Kolli Hills mine which Vedanta Limited is permitted to mine was 0.11 million tonnes as of 31 March 2016. If mining recommences at this mine, its life is estimated by Vedanta Limited to be approximately seven months.

### ***Principal raw materials***

The principal inputs for Vedanta's aluminium operations are bauxite, alumina, power, water, carbon, caustic soda and certain other raw materials. In the past, Vedanta has been able to secure an adequate supply of the principal inputs for its aluminium business.

*Bauxite.* Bauxite is the primary raw material used in the production of alumina. Currently, Vedanta Limited does not have any dedicated mining source and are in the process of identifying bauxite mining sources across India. Currently, bauxite is being sourced mainly through imports (34.1%), from the domestic market in the west coast (6.3%), BALCO mines (33.6%) and the remaining from Madhya Pradesh, Chhattisgarh, Jharkhand and Andhra Pradesh. BALCO supplies bauxite to the Lanjigarh refinery, on per job basis and receives alumina produced from the supplied bauxite.

*Alumina.* Alumina is the primary raw material used in the production of aluminium. Vedanta's aluminum business currently sources alumina largely from third-party suppliers in international markets. The alumina sourced externally is metallurgical grade calcined alumina with a minimum alumina content of 98.6% on a dry basis. In fiscal years 2014, 2015 and 2016, BALCO purchased 355,950 tons, 317,701 tons and 299,375 tons of alumina at an average price of, \$397, \$374, and \$323 per ton, respectively, on a cost, insurance and freight or CIF basis at the port of Vizag, Kakinada and Gangavaram, India. Similarly, in fiscal years 2014, 2015 and 2016, Vedanta Limited purchased 0.72 million tons, 0.37 million tons and 0.47 million tons of alumina at an average price of \$352 per mt, \$357 per mt and \$353 per mt, respectively, on a cost, insurance and freight basis at the port situated in the state of Andhra Pradesh.

*Power.* Smelting primary aluminium requires a substantial, continuous supply of electricity. As a result, power is a key input at BALCO's Korba facility, where it is provided by two coal-based captive power plant of 540 MW and CPP 600 MW. The captive power plant has historically been dependent upon coal allocations from Coal India. In November 2007, BALCO received a coal block allocation of 211.0 million tonnes for use in its captive power plants. The said coal block was deallocated during fiscal year 2015. However, the company received another coal the Chotia coal block through the e-auction. As of 31 March 2016, Company also secured linkage coal of 3.2 million tonne per annum for its captive power plants for a term of 5 years.

Power for BALCO's mines is provided by on-site diesel generators. BALCO has constructed a 1200 MW coal-based thermal power facility three out of four units of which were commissioned during fiscal year 2016 and the fourth unit has commenced operations during May 2016. Of the 1200 MW facility, power generated from two 300 MW units is being utilized in the 325,000 tpa smelter being set up and the power from the balance 600 MW units will be sold to third parties as of 30 September 2016.

Vedanta Limited's nine coal-based captive power plant of 135 MW each at Jharsuguda facility have been sourcing coal through coal linkage from Mahanadi coal field, imports, e-auction and from washeries. The linkage coal quantity from Mahanadi coal field is transported through bottom discharge wagons. The power plant at Jharsuguda sources coal from sources such as the GoI's coal mining companies, long-term coal supply agreements with various state governments under PPAs and from imports. In fiscal year 2016, the total coal purchased from these other sources was 7.21 million tonnes.

The total volume of coal consumed annually by coal-fueled power plants is largely dependent on the amount of generation and is approximately 7.14 million tonnes as of 30 September 2016.

*Water.* Water is also an important input for Vedanta Limited's and BALCO's captive power plants. BALCO sources its water requirements at Korba from a nearby canal, with the water transported by pipelines. BALCO is currently in a dispute with the National Thermal Power Corporation or NTPC in relation to the right of way for its water pipeline that supplies water to its 270 MW captive power plant, which has been built through NTPC premises. On the issue of easementary rights, the Arbitrator issued its award on 11 January 2016 in favour of BALCO. NTPC challenged the said award before the Delhi High Court and the next hearing will take place on 8 March 2017. BALCO has also filed counter applications before the Delhi High Court which are pending consideration. During fiscal year 2016, BALCO received another water allocation of 7 million m<sup>3</sup> (MCM) p.a. for 1200 MW facility.

Vedanta Limited's Jharsuguda facility sources its water requirements at Jharsuguda from Hirakud Dam situated over a distance of 33 km, with the water transported by pipelines. Water from the dam is stored at water reservoir inside the plant, from where the water is purified in a demineralized plant to make it fit for use in the power plant.

*Carbon.* Carbon is an important raw material to the aluminium smelting process. Carbon is used in the process of electrolysis, in the form of cathodes and anodes, with the latter being the biggest component of Vedanta Limited's carbon costs. Anodes are made up of carbonaceous material of high purity. For pre-baked anodes, green carbon paste made of calcined petroleum coke and coal tar pitch is compacted or pressed into the required form. These anodes are baked before their use in electrolytic cells or pots. Both BALCO and Vedanta Limited has in-house facilities to manufacture carbon anodes to meet their entire carbon anode requirements at Korba and Jharsuguda facility, respectively. Calcined petroleum coke, coal tar pitch and fuel oil, which are the key ingredients for the manufacture of carbon anodes, are sourced primarily from the Indian market. There is an adequate supply of these raw materials in India, though their prices are generally determined by movements in global prices. At times, based on commercial comparison, orders for imports are also placed.

*Caustic soda.* Caustic soda is a key raw material used to dissolve the bauxite in the alumina refining process. The caustic soda requirement varies significantly depending on the silica content of the bauxite and the technology employed.

*Other raw materials.* Vedanta Limited and BALCO uses other raw materials such as fluorides and other chemicals. For these raw materials, there are several sources of supplies in the domestic/international markets and Vedanta does not currently foresee any difficulty in securing supplies when needed.

### ***Distribution, logistics and transport***

Bauxite mined from the Mainpat and Bodai-Daldali mines is transported by road and rail Alumina Refinery at Lanjigarh of Vedanta Limited for conversion into Alumina and Alumina from Vedanta Lanjigarh is transported through Rail to BALCO's Korba facility. Alumina purchased from third-party suppliers is obtained from a combination of domestic sources and imports, and is transported to the Korba facility by rail and the Jharsuguda facility by road from domestic third-party suppliers or ports. BALCO's and Vedanta Limited's aluminium products are transported from the Korba facility and the Jharsuguda facility, respectively to domestic customers through a combination of road and rail, and shipped for export.

### ***Sales and marketing***

BALCO's aluminium businesses' ten largest customers accounted for 42.0%, 47.0% and 58.4% of its revenue from the aluminium business in fiscal years 2014, 2015 and 2016 respectively. While two of BALCO's customers accounted for greater than 23.19% of BALCO's revenue in fiscal year 2016, no customer accounted for greater than 10.0% of BALCO's revenue in fiscal years 2014 and 2015.

Vedanta Limited's 10 largest customers of the Odisha aluminium business accounted for approximately 39.5%, 46.3% and 53.4% of its Odisha aluminium business in fiscal years 2014, 2015 and 2016 respectively. One of the Odisha aluminium business customers accounted for 10.2% of its revenue in fiscal year 2016. None of the customers accounted for greater than 10.0% of Odisha aluminium business in fiscal years 2014 and 2015.

BALCO's and Vedanta Limited's aluminium sales and marketing head office is located in Mumbai, and it has field sales and marketing offices in most major metropolitan centers in India. Currently, Vedanta's aluminium business sells its products primarily in the Indian market, with limited focus on exports. However, with the further commissioning of the new 325,000 tpa aluminium smelter at Korba and Line 1 and Line 2 of new 1,250,000 tpa aluminium smelter at Jharsuguda, a significant part of the additional production will be sold in the export market. Vedanta's aluminium business's key customers include conductor manufacturers, state road transport corporations, railways, defense contractors and electrical equipment and machinery manufacturers.

Domestic sales are normally conducted on the basis of a fixed price that BALCO and Vedanta Limited determine from time to time based on the LME spot prices plus regional premiums, as well as domestic supply and demand conditions. The price for the aluminium which BALCO and Vedanta Limited sell in India is normally higher than the price it charges in the export markets due to the Indian tariff structure, smaller order sizes that domestic customers place and the packaging, storing and truck loading expenses incurred when supplying domestic customers.

Vedanta's export sales of aluminium are currently through short-term contracts as well as on a spot basis at a price based on the LME price plus a premium.

### ***Projects and developments***

#### ***Lanjigarh***

Vedanta plans to invest Rs. 106,000 million (\$1,590.2 million) to expand the alumina refining capacity at Lanjigarh to 5 mmtpa by (i) increasing the current alumina refinery's capacity to 2,000,000 tpa by de-bottlenecking; (ii) constructing a second alumina refinery with a capacity of 3 mmtpa; and (iii) constructing an associated 210 MW captive power plant. The expansion of the alumina refinery at Lanjigarh was on hold since 20 October 2010 due to the order passed by the MoEF's restricting Vedanta from any further expansion of this refinery. However the required environmental approvals were received on 20 November 2015 for up to 4 mtpa, and an additional environmental clearance for up to 6 mtpa will be received after the completion of land acquisition of the balance area of 666.03 HA. Further, a Consent to establish the 6 mtpa capacity and a consent to operate for 2 mtpa capacity has also been obtained. However, construction activities continue to be on hold and the management is evaluating the timing for resuming construction activities in Lanjigarh. As approvals for expansion of the Lanjigarh refinery to 4 mtpa has been received, second stream operations have commenced at the Alumina refinery from April 2016 and the debottlenecked capacity has reached 1.7-2.0 million tonnes per annum (although this is contingent on the bauxite quality). When further visibility on bauxite sources is possible, a further ramp-up to 4 million tonnes will be considered. As of 31 March 2016, Rs. 55,387 million (\$830.9 million) was spent on the Lanjigarh expansion project.

An investment of Rs.\$2,910 million is being made to set up a second 1,250,000 tpa aluminium smelter. As of 31 March 2016, \$2,569 was spent on this project.

#### ***Jharsuguda***

Vedanta Limited is also setting up another 1,250,000 tpa aluminium smelter in Jharsuguda, The commissioning of pots at the first line of the 1.25 mtpa aluminium smelter at Jharsuguda was completed at the end of July 2016. However, this line was impacted by a power outage in early August 2016, following which 168 pots were taken out of production. The impacted pots are currently being rectified and 26 pots have restarted production as on 30 September 2016.

As of 30 September 2016, Vedanta limited has 500,000 tpa of aluminium capacity and 2,000,000 tpa of alumina capacity. In addition, the first line of 1,250,000 tpa aluminum smelter at Jharsuguda is currently being ramped up.

### ***Market share and competition***

According to the AAI, BALCO and Vedanta Limited are two of the four primary producers of aluminium in India and together had a 40.0% market share by sales volume in India in fiscal year 2016 while its main competitors are Hindalco and National Aluminium Company Limited with a 42.0% and 18.0% market share by sales volume in India in fiscal year 2016, respectively.

Aluminium ingots, wire rods and rolled products are commodity products and BALCO and Vedanta Limited compete primarily on the basis of price and service, with price being the most important consideration when supplies are abundant. Aluminium competes with other materials, particularly plastic, steel, iron, glass, and paper, among others, for various applications. In the past, customers have demonstrated a willingness to substitute other materials for aluminium.

### ***Commercial Power Generation Business***

#### ***Introduction***

Vedanta has been building and managing captive power plants in India since 1997, and currently operates multiple power plants across locations in India. Vedanta's commercial power generation business in India leverages its experience in building and managing captive power plants that support its primary businesses. As of 30 September 2016, the total power generating capacity of Vedanta Limited's thermal power plants, wind power plants and gas based plants was 9,000 MW.

Vedanta owns and operates several commercial power plants, namely Vedanta Limited's 600 MW coal-based thermal power plant in Jharsuguda, MEL's 106.5 MW coal-based thermal power plant in Mettur Dam, HZL's wind power plants in Gujarat, Karnataka, Maharashtra, Tamil Nadu and Rajasthan aggregating 274.2 MW, BALCO's 600 MW coal-based thermal power plant and TSPL's 1,980 MW coal-based thermal power plant at Talwandi Sabo.

Vedanta Limited operates a coal-based thermal power plant of 2,400 MW, four units of 600 MW each at Jharsuguda. The three units of 600 MW each of coal-based thermal power plants in Jharsuguda have been converted from commercial power plants to captive power plants from 1 April 2016 and is now part of the aluminium business and one unit is an independent power plant for commercial power generation. Operations of the first three units are captured in Commercial Power Sector for the period up to 31 March 2016 and in the aluminum sector thereafter.

BALCO operates coal-based thermal power plant of 1,200 MW, four units of 300 MW each at Korba. The first two units are identified as independent power plants and are referred to as IPP 600 MW. The first 300 MW unit of the IPP 600 MW was capitalized on 1 August 2015 after the successful completion of trial runs. The second unit has been commissioned and commenced commercial production on 1 May 2016.

Sales of units of power increased from 9,859 million units in fiscal year 2015 to 12,121 million units of power in fiscal year 2016. The increase in sales drove revenue from Vedanta's commercial power generation business from \$420.9 million in fiscal year 2012 to \$691.7 million in fiscal year 2016. As of 30 September 2016, the total power generating capacity of Vedanta's non-captive thermal power plants and wind power plants was approximately 3,830.7MW. Revenue from Vedanta's commercial power generation business in the six months ended 30 September 2016 was \$375.4 million from external customers.

The following table sets out information relating to Vedanta's power plants:

<b>Fiscal Year</b>	<b>Capacity</b>	<b>Location</b>	<b>Fuel Used</b>	<b>CPP/IPP</b>
<b>Commissioned</b>	<b>(MW)</b>			
1988 <sup>(1)</sup> .....	270.0	Korba	Thermal Coal	IPP
1997 .....	24.0	Tuticorin	Liquid fuel	CPP
1999 .....	75.0	Mettur Dam	Thermal Coal	IPP
2003 .....	7.4	Debari	Liquid fuel	CPP
2003 .....	6.0	Zawar	Liquid fuel	CPP
2003 .....	14.8	Chanderiya <sup>(2)</sup>	Liquid fuel	CPP
2003 .....	4.8	Cambay	Gas based	CPP
1999 and 2003 .....	10.0	Ravva	Gas based	CPP
2005 .....	7.5	Tuticorin	Liquid fuel	CPP
2005 .....	15.0	Pantnagar	Liquid fuel	CPP
2005 .....	154.0	Chanderiya	Thermal coal	CPP
2006 .....	540.0	Korba	Thermal coal	CPP
2007 .....	75.0	Lanjigarh	Thermal coal	CPP
2007 .....	107.2	Gujarat and Karnataka	Wind <sup>(3)</sup>	IPP
2007 .....	30.0	Amona	Gas based	CPP
2008 .....	80.0	Chanderiya	Thermal coal	CPP
2009 .....	80.0	Zawar	Thermal coal	CPP
2009 .....	16.0	Gujarat and Karnataka	Wind <sup>(3)</sup>	IPP
2009 .....	675.0	Jharsuguda	Thermal coal	CPP
2009 .....	25.0	Mettur Dam	Thermal coal	IPP
2010 .....	540.0	Jharsuguda	Thermal coal	CPP
2010 .....	3.3	Rajasthan Raageshwari Gas terminal	Gas based	CPP
2010 .....	14.4	Gujrat Viramgam Terminal	Gas based	CPP
2010 .....	32.5	Pipeline Above Ground Installations	Gas based	CPP
2011 .....	1,200.0	Jharsuguda	Thermal coal	CPP
2011 .....	48.0	Rajasthan and Karnataka	Wind	IPP
2011 .....	174.3	Dariba	Thermal coal	CPP
2012 .....	103.0	Karnataka, Maharashtra, Rajasthan and Tamil Nadu	Wind <sup>(3)</sup>	IPP
2012 .....	600.0	Jharsuguda	Thermal coal	IPP
2012 .....	30.0	Amona	Gas based	CPP
2013 .....	600.0	Jharsuguda	Thermal coal	CPP
2013 .....	80.0	Tuticorin	Thermal coal	CPP
2013 .....	6.5	Mettur Dam	Thermal coal	IPP
2014 .....	80.0	Tuticorin	Thermal coal	CPP
2010 and 2014 .....	60.0	Rajasthan Mangala Processing terminal	Thermal coal	CPP
2015 .....	31.3	Gujrat Bhogat terminal	Thermal coal	CPP
2015 .....	660.0	Mansa- Talwandi Sabo Road, Mansa, Punjab	Thermal coal	IPP
2016 .....	660.0	Mansa-Talwandi Sabo Road, Mansa, Punjab	Thermal coal	IPP
2016 .....	1,200	Korba	Thermal coal	CPP
2016 .....	600.0	Mansa-Talwandi Sabo Road, Mansa, Punjab	Thermal coal	IPP
Total .....	9,000			

(1) Commissioned by BALCO prior to the acquisition of BALCO in 2001 which is not being used for captive purposes at present due to the closure of operations at the 100,000 tpa aluminium smelter.

(2) Transferred from Debari to Chanderiya in March 2009.

(3) The wind power plants are not for captive use.

The following table sets out the total power sales in MU for the fiscal years ended 31 March 2014, 2015 and 2016 and for the six months ended 30 September 2015 and 2016.

Facility	For the Fiscal Year Ended March 31			six months ended 30 September	
	2014	2015	2016	2015	2016
Jharsuguda 2400 MW coal based thermal power plant .....	7,625	7,206	7,319	3,820	1,497
TSPL .....	—	1,213	2,792	1077	2951
BALCO 270 MW .....	390	89	169	128	0
BALCO 600 MW .....	—	10	1,025	158	1156
HZL - Wind Power Plant .....	448	444	415	286	320
MALCO — 106.5 MW coal based thermal power plant .....	911	897	402	320	115
<b>Total</b> .....	<b>9,374</b>	<b>9,859</b>	<b>12,122</b>	<b>5,789</b>	<b>6,039</b>

#### *Commercial power plants*

*Vedanta Limited.* Vedanta Limited has a 2,400 MW coal based thermal power plant facility (comprising of four units of 600 MW each) in Jharsuguda in the state of Odisha. The three units of 600 MW each of coal-based thermal power plants in Jharsuguda have been converted from commercial power plants to captive power plants from 1 April 2016 and is now part of the aluminium business and one unit is an independent power plant for commercial power generation. Operations of the first three units are captured in Commercial Power Sector for the period up to 31 March 2016 and in the aluminum sector thereafter.

The plant has been built with an estimated investment of approximately Rs. \$769 million. The first unit of commercial operation commenced in November 2010. The second unit was operational on 20 March 2011, the third unit was operational on 19 August 2011. The fourth unit was operational on 26 April 2012.

This facility requires approximately 15 million tpa of coal. Vedanta Limited has applied to the Ministry of Coal for allotments of coal blocks and long term coal linkages, which are long term supply contracts for delivery of coal meeting specific contract specifications for captive use. In January 2008, the Ministry of Coal jointly allocated the coal blocks in the Rampia and Dip Side Rampia in the state of Odisha to six companies, including Vedanta Limited. The six companies entered into an agreement to jointly promote a new company, Rampia Coal Mine and Energy Private Limited, or RCMEPL which was incorporated in February 2008.

On 16 April 2008, RCMEPL submitted an application to the state government of Odisha for the grant of a prospecting license, or a license for exploration, which was pending approval from the regulatory authorities. However, Ministry of Coal issued a letter on January 15, 2014 de-allocating the coal block from RCMEPL. RCMEPL has approached the High Court of Odisha against the action of the Ministry of Coal. On 24 September 2014, the Supreme Court ordered for the cancellation of coal blocks allotted by the government over past few decades. In fiscal year 2016, the total coal purchased from these other sources was 5.6 million tons.

The total volume of coal consumed annually by Odisha's coal-fueled power plants is largely dependent on the amount of generation and ranges between 5.5 million to 6.4 million tons.

Additionally, Vedanta Limited has been allotted a coal linkage of 2.6 mmtpa for the Jharsuguda project to meet the coal requirements of one of the units of 600 MW of the 2,400 MW power facility, for which Mahanadi Coalfields Limited has signed fuel supply agreement for supplying 80% of the letter of assurance quantity. For the remaining 3 X 600 MW units, Vedanta Limited is buying coal primarily through the auction route. The facility is also designed to include a water reservoir, railway marshalling yard, coal stockpile, ash pond and other required facilities. The power generated from the 2,400 MW power plant is sold to customers such as, state electricity boards, state-owned utility companies, power trading companies and private entities.

In September 2006, Vedanta Limited entered into a power purchase agreement with Grid Corporation of Orissa Limited ("GRIDCO"), under which GRIDCO was granted the right to purchase up to 25.0% of the installed capacity of the power plant after adjustments for auxiliary consumption by us, for approximately up to 561 MW from this project. Further, GRIDCO shall at all times have the right on behalf of the state government of Odisha to receive from the Jharsuguda power project, 7.0% of the power generated (after adjustments for auxiliary consumption by us), up to approximately 157 MW of power at variable cost, as determined by the Odisha Electricity Regulatory Commission ("OERC"). GRIDCO will have the right to purchase power from us once every five years, for a period of 25 years from the date of commercial operation of the last unit. This right is an option to purchase rather than a binding commitment of GRIDCO.

In the event GRIDCO decides not to avail part or whole of the above mentioned right during any five year period, it shall give six months' notice of the same to us prior to the commencement of such period. Power from the power plant to be purchased by GRIDCO will be evacuated by GRIDCO from the bus bar (which is the discharge point of the power plant) of the project. For the evacuation of the remaining power, Vedanta Limited has constructed a 400 KV Loop-In-Loop-Out I and a 400 KV Loop-In-Loop-Out II transmission line to connect to the transmission line being developed by Power Grid Corporation India Limited ("PGCIL") near Jharsuguda. Vedanta Limited entered into an agreement with PGCIL in July 2010 to build the dedicated transmission system required for evacuating power from the power plant to the pooling units of PGCIL. The tariff for the sale of power by Vedanta Limited to GRIDCO will be determined by the OERC as follows:

For the sale of power up to 25.0% of the installed capacity:

- a fixed capacity charge which shall be determined by the OERC as per the terms and conditions of tariff issued from time to time and will be related to target availability. Recovery of fixed capacity charges below the level of target availability shall be done on a pro rata basis and calculated proportionately to the capacity requisitioned to GRIDCO; and
- a variable energy charge, which shall comprise fuel cost and shall be calculated on the basis of the ex-bus energy scheduled to be sent out from the generating station. The energy charges shall be calculated as per the methodology prescribed by the OERC from time to time.

For the sale of power for 7% or 5% depending on the allocation of coal blocks within the state of Odisha a variable energy charge is applicable, which shall comprise fuel cost and shall be calculated on the basis of the ex-bus energy scheduled to be sent out from the generating station. The energy charges shall be calculated as per the methodology prescribed by the appropriate commission, from time to time. The working methodology of tariff determination is under dispute and pending before the courts in India.

Vedanta Limited petitioned to OERC to convert the 600 MW X 4 IPP into a captive generating plant (“CGP”) to cater to the power needs of the 1.25 MTPA Smelter at Jharsuguda. After extensive deliberation and inconsideration of the facts, the OERC issued an order of conversion of Unit I, III and IV into CGP with effect from 1 April 2015, while retaining the IPP status of Unit II to fulfill the obligation under a PPA with GRIDCO.

*BALCO.* BALCO’s power business includes a 270 MW power plant at BALCO’s Korba facility, which was previously for captive use before the shutdown of the 100,000 tpa aluminum smelter at Korba on 5 June 2009. BALCO also operates IPP 600 MW coal-based thermal power facility in the state of Chhattisgarh which had received approval to operate on 14 January 2015 from the regulatory authorities. One unit of 300 MW was commissioned and commenced production during fiscal year 2016 and the second unit was commissioned and commenced commercial production on May 1, 2016.

*MEL.* Mettur power plant is a 106.5 MW coal based thermal power plant operated by MALCO Energy Limited or MEL in the state of Tamil Nadu. The plant has been set up in stages, with the first 75 MW set up in the year 1999 to cater to the requirements of the aluminum smelter operated by MEL. The aluminum operations were closed since November 2008. An additional 25 MW unit was added in the year 2009. Further, a 6.50 MW steam turbine generator was added in the year 2013 taking capacity to 106.5 MW.

MEL entered in to an energy purchase agreement with Tamil Nadu Electricity Board in January 2009 for supply of power until April 2009 and entered with Power Trading Corporation Limited for supply of power to Tamil Nadu Electricity Board from April 2009 until May 2011, which was subsequently re-entered with Tamil Nadu Electricity Board from June 2011 until May 2016. MEL has entered into an agreement with NTPC Vidyut Vyapar Nigam Limited for supply of power (66.3 MW) to Telangana State Southern Power Distribution Company Limited (TSSPDCL) from June 2016 to May 2017. The tariff for power supply is as provided in the energy purchase agreement.

MEL sources entire coal through imports, primarily from Indonesia, Russia and South Africa. In fiscal year 2016, the total coal purchased from these sources was 0.32 million tons. The total volume of coal consumed annually by the coal-fueled power plants is largely dependent on the amount of generation and ranges between 0.5 million to 0.55 million tons. MEL’s 10 largest customers accounted for approximately 96.2%, 91.6% and 78.5% of revenue for MEL’s power business in fiscal years 2014, 2015 and 2016, respectively. One of MEL’s customers accounted for 82.7%, 91.9%, and 88.4% of MEL’s revenue in fiscal years 2014, 2015 and 2016.

*HZL.* As of 30 September 2016, wind power plants with a combined power generation capacity of 274 MW have been commissioned in the States of Gujarat, Karnataka, Tamil Nadu, Maharashtra and Rajasthan in India at a total cost of Rs. 14,520 million (\$217.8 million). The electricity from these wind power plants is sold to State Electricity Boards. During their meeting on 21 January 2016, the HZL’s Board of Directors approved the sale of the Company’s wind power assets subject to the final approval of the price by the board. HZL is in the process of identifying a buyer.

### *Projects*

#### *Talwandi Sabo — Being set up through TSPL*

In July 2008, the 1,980 MW Talwandi Sabo project was awarded to Vedanta Limited through an international Case 2 tariff based competitive bidding process. The project was set up through Vedanta Limited’s wholly owned subsidiary, TSPL. All necessary approvals for the project have been obtained and commissioning of this project was carried out in four stages. Total cost of the project is Rs. 116,840 million (\$1,752.8 million). The boiler light up and synchronization of the first unit was achieved in the third quarter of fiscal year 2014 and coal logistics were established in the fourth quarter of fiscal year 2014. The first 660 MW unit of the Talwandi Sabo power plant was capitalized



in fiscal year 2015 and the second 660 MW unit was capitalized in December, 2015 after the successful completion of trial runs. The third unit was commissioned in the second quarter of fiscal year 2017. As of 30 September 2016, Rs. 108,018 million (\$1,620.4 million) was spent on the Talwandi Sabo thermal power project. This project is financed through internal sources and external borrowings.

The primary fuel for TSPL is domestic coal which Vedanta sources from Mahanadi Coalfields Limited or MCL. The annual coal requirement of the power plant is around 8.19 MTPA (for a GCV of coal at 3,700 kcal/kg and PLF of 80%). TSPL entered into a Fuel Supply Agreement (FSA) with MCL on 4 September 2013 with Annual Contracted Quantity (ACQ) of 7.72 million tons per annum (MTPA) for a 20 year period. As per the FSA, the coal supplied would be E/F grade i.e. between G8-G13 based on the recent grading system of Coal India Limited. Based on the G8- G13 grades, the GCV of the coal would be in the range of 3400 - 5200 Kcal/kg.

According to the terms of FSA, the MCL shall endeavor to supply coal from its own sources and also has the option to supply the balance quantity of coal through import (subject to mutual agreement with TSPL). The supply of domestic coal would be at least 75% of ACQ from fiscal year 2017 onwards as any supply below these levels by MCL would have an incidence of penalty on MCL. MCL may also provide domestic coal more than these levels. The balance coal requirement will be met by the Company through alternate sources i.e. use of imported coal/ e-auction coal.

As per the presidential directive issued on 17 July 2013 and consequently the Cabinet Committee of Economic Affairs (CCEA) approval and advice of CERC, considering impact on cost of generation in the concluded PPAs due to shortage in domestic coal availability, pass through of imported coal cost has been allowed in the tariff.

In May 2008, Vedanta Limited entered into an on-shore and offshore engineering, procurement and construction contract with SEPCO Electric Power Construction Corporation (“SEPCO”), for the Talwandi Sabo thermal power project for Rs. 66,560 million (\$1,024 million). Under the contract, SEPCO is to provide testing, system design, engineering services for the plant and equipment among other things. In November 2012, TSPL had entered into a revised offshore EPC contract where contract value was revised upto \$1,081 million. After the commissioning of three units, the contract was revised upwards by \$74 million in November 2012. In April 2016 the parties entered into a revised EPC contract, for USD1,041.8 million and Rs. 21,371 million for offshore and onshore EPC services respectively.

#### Surplus Power from Captive Power Plants

Vedanta also sells excess power generated from its captive power plants to third parties pursuant to commercial arrangements. For example, Vedanta Limited entered into a letter of intent dated 16 November 2011 with GRIDCO for the sale of excess power from its captive power plant at Jharsuguda. Similar agreements have been entered into with third parties for the excess power at Vedanta’s captive power plant in Tuticorin

#### ***Other Activities***

Vedanta’s other activities include:

##### *Port business*

Vedanta has a 100.0% interest in Vizag General Cargo Berth Private Limited or VGCB as of 30 September 2016, a joint venture between Vedanta Limited and Leighton which won the bid to mechanize the coal handling facilities and upgrade the general cargo berth for handling coal at the outer harbour of Vishakhapatnam port, on the east coast of India.

The initial capacity of the upgraded berth will be 10.2 MTPA, with flexibility to be upgraded to 12.5 MTPA. VGCB has entered into an agreement on 8 October 2010 with the port authority,

Vishakhapatnam Port Trust, to mechanize the coal handling facilities and upgrade the general cargo berth on a build-operate-transfer basis for 30 years commencing on the date of award of concession. Vishakhapatnam Port Trust will receive a royalty of 38.1% of the revenue earned from the cargo handling activities as set out in the concession agreement.

In January 2013, operations commenced, and construction was completed on 8 April 2013. The estimated project cost was Rs. 6,640.0 million (\$132.8 million) of which Rs. 6,304 million (\$ 95.2 million) was spent as on 31 March 2016.

Sterlite Ports Limited, a 100% subsidiary of Vedanta Limited has received the 'letter of award' for redevelopment of berths 8, 9, barge berths and mechanical ore handling plant at the Port of Mormugao on a Develop, Build, Finance, Operate and Transfer ("DBFOT") basis for 19 mmtpa capacity multi-cargo port terminal in Mormugao Port, Goa. The redevelopment of the berth will result in the handling of all types of cargo including iron ore, coal, lime stone, bauxite and general cargo with an expected capacity of 19.2 million tons per annum. The company is in the process of forming a special purpose vehicle which will enter into an agreement with the Mormugao Port Trust, to operate the berth on a build-operate-transfer basis for 30 years commencing from the date the concession was awarded.

### **Seasonality**

Vedanta's iron ore mining operations are affected by changes in weather conditions, particularly heavy rains. Goa, where the majority of Vedanta's iron ore mining operations are located, experiences monsoon seasons, which usually occurs from early June to early October. During the monsoon season, restricted barge movements result in significantly lower exports through the Mormugao port in Goa, where Vedanta's iron ore is shipped to customers. Vedanta attempts to mitigate the effects of the monsoon season by concentrating on mine development and extracting larger quantities of overburden waste during the monsoon season in order to permit speedier extraction of iron ore during the dry season. In addition, during the monsoon season, Vedanta typically conducts annual maintenance at its processing plants and its other mining machinery.

Vedanta's oil and gas, zinc, copper, aluminium and commercial power business segments are not subject to seasonality.

### **Intellectual Property**

Vedanta, through Vedanta Limited, owns one patent in India and another in Europe that relates to a system for producing metallurgical coke. Vedanta Limited also has a patent in the United States relating to the reduction of sulphur-based gases during the production of iron ore. Vedanta, through Vedanta Limited, owns an additional patent in India that relates to a system for enhancing the quality of cathodes. Vedanta through Vedanta Limited owns a new pig iron product. Vedanta also has a number of patents in the process of being granted in India related to mining, refining and smelting processes. Vedanta owns a number of trademarks that are used to identify its businesses and products. Vedanta has also acquired certain intellectual property rights under licences from third parties for use in its businesses. Cairn India has entered into various agreements with Cairn Energy and its subsidiaries (the "Cairn Energy Group") in connections with trademarks and corporate logos, which are registered in EU, UK, India and Benelux. Vedanta's patents, licences and trademarks constitute valuable assets. Vedanta has a patent for the manufacture of energy recovery based metallurgical coke. However, Vedanta does not depend on any single patent, licence or trademark in a material manner in the conduct of its sales and operations viewed as a whole.

### **Awards**

In 2016, Vedanta was recognized a one of the top companies to work for in Asia, by ACES. Cairn India was also ranked as the world's fastest growing energy company by Platts in 2013.

## **Litigation**

Save as disclosed below, there are no outstanding governmental, legal or arbitration proceedings, including any such proceedings which are pending or threatened of which Vedanta is aware, which Vedanta believes could reasonably be expected to have a material adverse effect on its results of operation or financial condition.

***Vedanta Limited has commenced proceedings against the GoI, which has disputed Vedanta Limited's exercise of the call option to purchase its remaining 29.5% ownership interest in HZL.***

Under the terms of the shareholders' agreement between the GoI and Sterlite Opportunites and Ventures Limited ("SOVL") (which has been merged into Vedanta Limited with effect from 1 April 2012), Vedanta Limited was granted two call options to acquire all the shares in HZL held by the GoI at the time of exercise. Vedanta Limited exercised the first call option on 29 August 2003. Arbitration is on-going in relation to a dispute between the GoI and Vedanta Limited, with respect to Vedanta Limited's exercise of its second call option to acquire the remaining shares in HZL held by the GoI, pursuant to the shareholders' agreement between the parties. The GoI has refused to act upon the second call option, stating that Vedanta Limited's second call option violates the provisions of the Indian Companies Act, 1956, by restricting the right of the GoI to transfer its shares. The next date of hearing by the arbitral tribunal is on 25 February 2017.

***Vedanta Limited has commenced proceedings against the GoI which has disputed Vedanta Limited's exercise of the call option to purchase its remaining 49.0% ownership interest in BALCO.***

Arbitration proceedings have been concluded in relation to a dispute between the GoI and Vedanta Limited, with respect to Vedanta Limited's exercise of its second call option to acquire the remaining shares in BALCO held by the GoI, pursuant to the shareholders' agreement between the parties. In January 2011, the arbitration tribunal rejected Vedanta Limited's claims on the grounds that the clauses relating to the call option, the right of first refusal, the "tag-along" rights and the restriction on the transfer of shares violate the provisions of the Indian Companies Act, 1956. In April 2011, Vedanta Limited filed an application under section 34 of the Arbitration and Conciliation Act, 1996 in the High Court of Delhi to set aside the award dated 25 January 2011 to the extent that it holds these clauses ineffective and inoperative. The GoI also filed an application before the High Court of Delhi to partially set aside the arbitral award dated 25 January 2011 in respect of certain matters involving valuation. The High Court of Delhi passed an order dated 10 August 2011 directing Vedanta's application and the application by the GoI to be heard together as they arise from a common arbitral award. The matter is currently pending before the High Court of Delhi and the next date of hearing is on 10 July 2017.

***Appeal proceedings in the High Court of Bombay brought by SEBI to overrule a decision by the Securities Appellate Tribunal of India that Vedanta Limited has not violated regulations prohibiting fraudulent and unfair trading practices.***

In April 2001, SEBI ordered prosecution proceedings to be brought against Sterlite (now Vedanta Limited), alleging that it violated regulations prohibiting fraudulent and unfair trading practices, and also passed an order prohibiting Sterlite from accessing the capital markets for a period of two years. SEBI's order was overruled by the Securities Appellate Tribunal of India in 22 October 2001 on the basis of a lack of sufficient material evidence to establish that Sterlite had, directly or indirectly, engaged in market manipulation and that SEBI had exercised its jurisdiction incorrectly in prohibiting Sterlite from accessing the capital markets. In November 2001, SEBI appealed to the High Court of Bombay. No further action or procedures have taken place since 2001.

SEBI's order was based on its finding that Sterlite had manipulated the price of its shares in connection with its proposed acquisition of shares in Indian Aluminium Company Limited ("INDAL") and its proposed open offer to the shareholders of INDAL in 1998. SEBI also alleged that MEL provided funds to an entity Vedanta allegedly controlled to enable its associate to purchase Sterlite's shares, as part of a connected price manipulation exercise.

In addition to the civil proceedings, SEBI also initiated criminal proceedings in 2001 before the Court of the Metropolitan Magistrate, Mumbai, against Sterlite, Vedanta's Executive Chairman, Mr. Anil Agarwal, Sterlite's Director of Finance, Mr. Tarun Jain, and the chief financial officer of MEL at the time of the alleged price manipulation. When SEBI's order was overturned in October 2001, Sterlite filed a petition before the High Court of Bombay to defend those criminal proceedings on the grounds that the Securities Appellate Tribunal of India had overruled SEBI's order on price manipulation. An order has been passed by the High Court of Bombay in Sterlite's favour, granting an interim stay of the criminal proceedings.

***Criminal proceedings against former directors of SIL.***

Ms. Krishna Bajaj filed a complaint against the former directors of Sesa Industries Limited ("SIL") (which has since been amalgamated with Sesa Goa) before the Magistrate at Mumbai in 2000, in relation to shares issued on a preferential basis by Sesa Industries Limited in 1993 to Sesa Goa's shareholders, alleging that the shares of Sesa Industries Limited were not listed within 12 to 18 months of the offer as stated in the offering document. The four directors appeared before the court on 16 June 2009 and pleaded not guilty to the charges. The four directors filed a criminal application in the High Court of Bombay challenging the Magistrate's order of framing charges, before the High Court of Bombay. The High Court of Bombay admitted the criminal application and stayed the proceedings pending before Magistrate at Mumbai.

***Criminal proceedings against certain directors and employees of BALCO***

Criminal proceedings were initiated by Mr. Ajay Padia before the Court of the Judicial Magistrate First Class, Pune against Mr. Anil Agarwal, Mr. Navin Agarwal, Mr. Tarun Jain and certain of our other former directors and employees in 2002 alleging that an assurance that was given by the above mentioned directors regarding payment of all amounts owed to him for the damaged material supplied by BALCO was not honored. An application under was filed in the High Court of Bombay for quashing the proceedings in the Judicial Magistrate First Class and to dispose the matter directing that alternative remedies were available before the Sessions Court, Pune, which was the appropriate Court. The High Court of Bombay stayed the criminal proceedings and the application was listed for disposal. The next date of hearing has not been fixed.

***BALCO is involved in litigation in relation to the illegal felling of trees situated on forest land.***

Petitions have been filed in public interest before the Supreme Court of India by various individuals and Sarthak, a non-governmental organization alleging that illegal possession and use of forest land, which has been proposed to be leased by Chattishgarh Government, for non-forest activities by BALCO. The Supreme Court of India referred the matter to the Central Empowered Committee, which recommended an ex post-facto diversion of forest land with payment of net present value on land for which forest compensation was not paid prior to the year 1980. Subsequently, it was alleged that BALCO had cut trees in violation of the Supreme Court order and one of the petitioners filed a contempt petition and the matter was again referred to the Central Empowered Committee. The Central Empowered Committee submitted its report on June 30, 2012 to the Court recommending that a detailed survey should be conducted through Forest Survey of India (MoEF) using high quality remote sensing technique to find out whether any tree felling and/or non-forest use has taken place after February 29, 2008 in the revenue forest land and/or deemed forest in possession of BALCO. In order to expedite the proceedings, BALCO filed an application in the Supreme Court seeking direction to pay the net present value on forest land as per the recommendation of the Central Empowered Committee providing an ex-post facto diversion of the 1,751 acres forest land held by BALCO.

***Writ petitions filed against Vedanta alleging violation of certain air, water and hazardous waste management regulations at Vedanta's Tuticorin plant.***

On 24 March 2013, the TNPCB issued a show cause notice to Vedanta alleging violation of environmental laws and conditions imposed by the TNPCB and releasing pollutants from the Tuticorin plant. Further, TNPCB issued an order dated 29 March 2013 ordering the closure of the Tuticorin plant. Vedanta filed an appeal before the NGT, Chennai against the order of closure by the TNPCB on 1 April 2013. The matter was transferred to the NGT Principal Bench at New Delhi and in a hearing in May 2013, Vedanta was directed to provide certain information to the Tribunal.

The Tribunal passed an interim order in May 31, 2013 allowing the smelter to recommence operations subject to certain conditions, and consequently Vedanta recommenced operations on June 16, 2013. The expert committee constituted by the Tribunal submitted a report on the operation of the plant on July 10, 2013 stating that the plant's emissions were within the prescribed standards. Based on this report, the Tribunal on July 15, 2013 ordered that the interim order dated 31 May 2013 shall continue to operate. On August 8, 2013, the Tribunal confirmed its 31 May 2013 order with directions to comply with the recommendations made by the committee to further improve the working of the plant within a time bound schedule.

Vedanta implemented all the recommendations during fiscal year 2013. However, the TNPCB filed Civil Appeals in 2013 against the Tribunal's interim order dated May 31, 2013 and final order and judgment dated August 8, 2013. V Gopalaswamy, General Secretary of a Political Party, MDMK, also filed Civil Appeals in 2013. These Civil Appeals are pending before the Supreme Court of India. In the meanwhile, TNPCB has renewed Consent to Operate for the existing Copper smelter, which is valid till March 31, 2017. The appeals are pending before the Green bench of the Supreme Court of India.

***The Enforcement Directorate has levied penalty of approximately Rs. 347 million on Vedanta Limited.***

The Enforcement Directorate ("ED") by an order in August 2004 alleged that Twin Star had remitted approximately \$46 million through Sterlite (now Vedanta Limited) and MALCO in the past without prior permission from the Reserve Bank of India ("RBI"). By this order, the ED levied penalties on Vedanta Limited and certain directors of Vedanta Limited of approximately Rs. 347.0 million.

Vedanta Limited filed an appeal against the order of ED before Appellate Tribunal of Foreign Exchange seeking waiver of pre-deposit, which was allowed by the Appellate Tribunal of Foreign Exchange. The ED challenged this order before Delhi High Court. The Delhi High Court remanded the matter back to the Appellate Tribunal of Foreign Exchange for deciding the issue of waiver of pre-deposit afresh.

***Proceedings against Vedanta relating to Niyamgiri mining project and expansion plans of refinery in Lanjigarh***

In 2004, a writ petition was filed by a private individual against Vedanta, the Government of Odisha, India, the Odisha Mining Corporation Limited ("OMC"), and others before the High Court of Odisha, alleging that the grant of a mining lease by the OMC to Vedanta to mine bauxite in the Niyamgiri Hills at Lanjigarh, in the State of Odisha, would violate the provisions of the Forest (Conservation) Act, 1980 of India. The petition alleged that the felling of trees, construction of the alumina refinery by Vedanta and the development of the mine was in violation of the Forest (Conservation) Act, 1980 and would have an adverse impact on the environment. The petition sought,

among other things, to restrain the grant of the mining lease to mine bauxite, to declare the joint venture agreement entered into between Vedanta and the OMC void, a court direction for the immediate cessation of construction of the Lanjigarh alumina refinery and an unspecified amount of compensation from Vedanta for damage caused to the environment. This petition was also filed before the Supreme Court of India by certain non-governmental organizations and individuals. The Supreme Court granted Vedanta the clearance to mine in and around the Niyamgiri Mines on terms and conditions as specified in the Court order. Consequent to the order of the Supreme Court, the proceedings before the High Court of Odisha became redundant as the issues were already determined.

Thereafter, the MoEF on August 24, 2010 declined to grant the forest clearance for the Niyamgiri Mines to the OMC, and rendered the environmental clearance non-operational. On March 8, 2011, the OMC challenged the order of the MoEF by a special leave petition in the Supreme Court of India. On April 1, 2011, the Court admitted the OMC's plea against the MoEF. The Supreme Court in its order dated April 18, 2013 ordered the Government of Odisha to place any unresolved issues and claims of the local communities under the Forest Rights Act and applicable rules before the Gram Sabha, the council representing the local community. The Gram Sabha was ordered to consider these claims and communicate its decision to the MoEF through the Government of Odisha within three months of the order. The Government of Odisha completed the process of conducting Gram Sabha meetings and submitted its report on the proceedings to the MoEF.

Further the MoEF, based on the report submitted by the Government of Odisha rejected the grant of stage II forest clearance for the Niyamgiri project of OMC on January 8, 2014, which is one of the sources of supply of bauxite to the alumina refinery at Lanjigarh in terms of the joint venture agreement with the government of Odisha (through the OMC). Under the terms of the joint venture agreement, 150 million tonnes of bauxite is required to be made available to Vedanta. Prior to the joint venture agreement coming into force, the same terms were incorporated in a Memorandum of Understanding between Vedanta and OMC. Assets under construction as at March 31, 2016 was after an impairment charge of Rs. 668 million (\$11.0 million) which relates to impairment of mining assets of Jharsuguda Aluminium at Lanjigarh as the MoEF has rejected the Stage II forest clearance for the Niyamgiri mining project. The OMC has issued a show cause notice dated February 20, 2015 on Vedanta to show reason for why the joint venture agreement for the supply of 150 million tonnes of bauxite will not be cancelled in view of the failure to achieve certain milestones set out in the joint venture agreement. Vedanta replied to the notice substantiating all facts on the project followed by an in-person meeting. Vedanta noted that the joint venture agreement was contingent on OMC obtaining necessary mining licenses. It stated that it did not have any objection to the Joint Venture agreement being terminated as mining leases could not be secured, but with the caveat that Vedanta should not be held responsible for not fulfilling its obligations under the agreement, and requested an assurance that the MoU for the supply of 150 million tons of bauxite should remain in force. On April 15, 2015, the OMC informed MoEF that it intends to undertake bauxite mining independently at Niyamgiri mines and make available bauxite to the open market in view of approval from the Department of Steel and Mines, Government of Odisha for the cancellation of the joint venture agreement dated February 18, 2009. Subsequently, the OMC terminated the joint venture agreement. Vedanta has sought a request for modification of the joint venture agreement or an amendment to the joint venture agreement with a standalone long-term linkage agreement for the supply of 150 MT of bauxite. The matter is pending with the OMC.

On October 20, 2010, the MoEF ordered Vedanta to maintain the status quo on the expansion of the refinery at Lanjigarh. Against this order, Vedanta filed a writ petition in the High Court of Odisha and the High Court dismissed the petition. Vedanta made an application to the MoEF to reconsider the grant of the environmental clearance for the expansion of the alumina refinery. By its letter dated February 2, 2012, the MoEF issued fresh terms of reference to Vedanta for preparation of the environment impact assessment report. Vedanta submitted this report to the Odisha Pollution Control Board and simultaneously submitted various representations to the MoEF as well as the Project Monitoring Group established under the Cabinet Committee on Investments. The Expert Appraisal

Committee of the MoEF reconsidered the project and revalidated the terms of reference for 22 months effective January 2014. Thereafter the suspension imposed on the expansion of Vedanta's alumina refinery was lifted. The public hearing was held on July 30, 2014 and the expansion of the Lanjigarh refinery was considered by the Expert Appraisal Committee in its meeting dated January 9, 2015 for the grant of environmental clearance. In line with the Expert Appraisal Committee's recommendation, the MoEF on November 20, 2015 granted environmental clearance for the alumina refinery expansion from 1 to 6 MTPA in a phased manner and subject to certain conditions being met. For the 6 MTPA expansion, the company is required to obtain an amendment of environmental clearance after the completion of land acquisition of the balance area of 666.03 HA. Subsequent to the grant of environmental clearance for expansion, the Odisha State Pollution Control Board has revalidated the consent to establish the alumina refinery expansion on January 2, 2016, and has granted the consent to operate for the 2 MTPA on December 31, 2015.

On February 18, 2016 an individual challenged the environmental clearance grant for the alumina refinery expansion at Lanjigarh before the National Green Tribunal Kolkata wherein MoEF, Odisha State Pollution Control Board and Vedanta Limited have been made parties.

***Demands against HZL by the Department of Mines and Geology and Ministry of Mines.***

The Department of Mining and Geology, Rajsamvad of the State of Rajasthan issued several show cause notices in August, September and October 2006, aggregating Rs. 3,339 million (\$50.1 million) to HZL, claiming unlawful occupation and unauthorized mining of associated minerals other than zinc and lead at HZL's Rampura Agucha, Rajpura Dariba and Zawar mines in Rajasthan, during the period from July 1968 to March 2006. In response, HZL filed a writ petition against these show cause notices. In October 2006, the High Court issued an order granting a stay and restrained the Department of Mines and Geology from undertaking any coercive measures to recover the penalty. In January 2007, the High Court issued another order granting the Department of Mines and Geology additional time to file their reply and also ordered the Department of Mines and Geology not to issue any orders canceling the lease. The next date of hearing has not yet been fixed.

***Demands against HZL by the State of Rajasthan***

The State of Rajasthan issued a notification in February 2008 notifying the Rajasthan Environment and Health Cess Rules, 2008, imposing environment and health cess on major minerals including lead and zinc. HZL and other mine operators resisted this notification and the imposition thereunder before the High Court of Rajasthan on the ground that the imposition of such cess and all matters relating to the environment fall under the competence of the Central government as opposed to the state government. In October 2011, the High Court of Rajasthan disposed the writ petitions and upheld the validity of the Rajasthan Environment and Health Cess Rules, 2008. HZL challenged this order by a special leave petition in December 2011 before the Supreme Court of India. The Supreme Court of India issued a notice for stay. Further direction was issued by the Supreme Court on March 23, 2012 not to take any coercive action against HZL for recovery of cess. The matter is still pending and is not yet listed for hearing.

***Vedanta is involved in proceedings related to mining operations in the State of Goa.***

Pursuant to findings in the Justice M.B. Shah Commission Report dated March 15, 2012 on the allegations of illegal mining in the State of Goa, the state government had banned iron ore mining operations in Goa on September 10, 2012 and the Ministry of Environment and Forest ("MOEF") had suspended environmental clearances of all mining leases within the State of Goa. A writ petition was filed before the Supreme Court of India to initiate action based on the Justice M.B. Shah Commission Report and an interim order was passed by the Supreme Court of India on October 5, 2012 suspending mining operations within Goa.

The Supreme Court of India passed an interim order on November 11, 2013 directing that the inventory of the excavated mineral ores be verified by the Directorate of Mines and Geology (“DMG”) and the Monitoring Committee was constituted to sell the materials through an e-auction. The Monitoring Committee is e-auctioning the ore and the proceeds from the auction will go to the state government.

On April 21, 2014, the Supreme Court passed judgment in the matter lifting the ban with certain stipulations including directions on mining by the lessees after November 22, 2007 as being illegal, dumping outside the leased area as being impermissible; interim buffer zone fixed at one kilometer from the boundaries of National Parks and Sanctuaries, ad-hoc cap on annual excavation at 20 million tonnes other than from dumps until the final report of Expert Committee is submitted, appropriation of the sale value of e-auctioned inventorized ores by the state government as per stipulated conditions, payment of 10% of the sale proceeds to the Goan Iron Ore Permanent Fund. The Supreme Court has held that all mining leases in the State of Goa, including those of the Company, had expired in 2007 and consequently, no mining operations can be carried out until renewal/execution of mining lease deeds by the state government. The petition filed by Vedanta in May 2014 for the review of the aforesaid judgment in the Supreme Court of India on certain limited issues was subsequently withdrawn by Vedanta in September 2014.

On August 13, 2014, the High Court of Bombay, Goa Bench passed a common order directing the State of Goa to renew the mining leases for which stamp duty was collected in accordance with the Goa Mineral Policy (2013) and to decide the other applications for which no stamp duty was collected within three months thereof.

In January 2015, the government of Goa revoked the order suspending mining operations in the State of Goa and MOEF revoked suspension of environmental clearances in March 2015. Subsequently, the lease deeds for all working leases were executed and registered as of August 2015. Vedanta obtained consent to operate under the Air Act and Water Act from the Goa State Pollution Control Board (“GSPCB”) and mining plan approval from the Indian Bureau of Mines for these leases, and the Company resumed operations of its mines on 10 August 2015.

On 10 September, 2014, the Goa Foundation challenged the High Court order directing the renewal of mining by way of a Special Leave Petition (SLP) before the Supreme Court of India, challenging the judgment of the High Court dated 13 August 2014 directing renewal of mining leases. No stay has yet been granted by the Supreme Court. Another set of SLPs on an identical issue were filed by Rama Velip. Two writ petitions have also been filed before Supreme Court by Goa Foundation and Sudip Tamankar in September 2015 for setting aside the second renewal of iron ore mining leases in Goa made under section 8 (3) of MMDR Act and challenging the revocation of suspension on mining in State of Goa.

The Expert Committee has filed its reports on dump handling and ceiling on annual extraction before the Supreme Court recommending enhancement of annual extraction ceiling immediately to 30 million MT and subsequently to 37 million MT after infrastructure development. Vedanta filed an application before the Supreme Court of India, requesting clarification on whether any contributions to the Goa Permanent Iron Ore Fund should be made as per the Supreme Court’s orders, as the Central government has introduced a provision to set up social fund known as District Mineral Foundation in states for similar objectives.



***Proceedings against Vedanta challenging environmental consents received for expansion project of pig iron, metallurgical coke, sinter plants and power plant in Goa***

Cairn India is working in partnership with its joint operation partner, ONGC, in the Rajasthan Block. The Rajasthan production sharing contract (the “Rajasthan Block PSC”) was signed on 15 May 1995 between the GoI and a consortium consisting of ONGC and Shell India Production Development BV.

Cairn India acquired its interest in the Rajasthan Block PSC in three stages, eventually acquiring a 100 per cent. beneficial interest in the assets and liabilities as of May 2002 and acquiring legal title to this interest on 20 June 2003. Under the Rajasthan Block PSC, the GoI has an option to acquire a participating interest of 30 per cent. in any development area containing a commercial discovery. The GoI exercised its right in all three development areas, specifically DA 1 in 2005, DA 2 in 2007 and DA 3 in 2009, acting through its nominee, ONGC, and acquired a 30 per cent. participating interest.

Under the Rajasthan Block PSC, until such time as India attains self-sufficiency in its crude oil supply, Cairn India is required to sell to the GoI, or its nominee, all of Cairn India’s entitlement to crude oil and condensate extracted from the Rajasthan Block to assist in satisfying domestic Indian crude oil demand. The GoI has the option but not an obligation to purchase the entire or part of the crude oil produced from the Rajasthan Block. However, the GoI has granted permission to Cairn India to sell the remaining quantities of crude oil, over and above those allocated to government nominees, to other domestic private refineries. As of 31 September 2016, Cairn India sells the crude oil to both private refineries and, the public sector undertakings refineries. As of 31 March 2016, commercial sales arrangements were in place for over 200,000 bopd with public sector undertakings and private refineries. Any additional sales to the public sector undertakings refineries, special economic zone refineries and overseas are subject to approval from the GoI.

The Rajasthan Block PSC established a management committee for the Rajasthan Block, which consists of four members, two of whom are nominated by and represent the GoI and the licensee, ONGC, together, and two of whom are nominated by and represent Cairn India. The management committee must unanimously approve annual work programmes, budgets, proposals for the declaration of a discovery as commercial, field development plans, and the delineation of or additions to a development area, whereas all other matters only require a majority vote.

The Rajasthan Block PSC is currently due to expire in May 2020, but it may be extended by mutual agreement among the parties for up to an additional ten years in the case of commercial production of natural gas or, in other cases, up to five years. There is also a provision to further extend the production sharing contract by agreement of the parties if production of crude oil or natural gas is expected to continue after the relevant period.

The Rajasthan Block benefitted from a tax holiday of seven years from the fiscal 2009 (being the year of commencement of commercial production in the Rajasthan Block) to 31 March 2016. However, during this seven year period, minimum alternate tax rules applied resulting in a taxation of book profits calculated in accordance with the generally accepted accounting principles used in India. Any minimum alternate tax paid can be carried forward for a total period of ten years from the year of credit and used to reduce corporate tax due in future years in excess of minimum alternate tax payable in those years.

Separately, an application was filed by the village panchayat head of Navelim, Goa before the National Green Tribunal against the GSPCB, MoEF, State of Goa, others and Vedanta alleging that (i) GSPCB had issued its approval in a piecemeal manner to Vedanta, even though the environmental clearance order issued by the MoEF and the approval are for all four plants thereby violating the MoEF order, (ii) the no-objection certificate issued in relation to this project in 2007 was forged and fabricated, and (iii) the CN5 bridge at Maina-Navelim junction falls outside the notified industrial area. The application sought cancellation of the approval and the order of the MoEF. On March 1, 2013, the National Green Tribunal gave directions to issue notices to all the parties. Vedanta

responded on April 11, 2013, denying all contentions and submissions made by the village head and requested that the application be dismissed. Pleadings in the matter have been completed. Subsequently on February 10, 2014 the matter was transferred from the Principal Bench of the National Green Tribunal at New Delhi to the Western Bench of the National Green Tribunal at Pune. On July 31, 2014, the National Green Tribunal held that owing to an identical issue pending before the Supreme Court of India, the proceeding before the National Green Tribunal is adjourned pending determination by the Supreme Court of India.

***Vedanta has challenged the imposition of forest development tax by Government of Karnataka.***

In October 2008, Vedanta filed a writ petition in the High Court of Karnataka against the Government of Karnataka and others, challenging the imposition of a forest development tax at a rate of 8.0% (a subsequent demand was made for the payment of tax at the rate of 12.0%) on the value of iron ore sold by Vedanta from the mining leases in the forest area, pursuant to the notification by the Government of Karnataka and the memorandum/common order issued by the Deputy Conservator of Forests. In August 2009, the High Court of Karnataka permitted the Government of Karnataka to levy the forest development tax and ordered that the demand be restricted to 50.0% of the forest development tax as an interim arrangement pending disposal of the writ petition.

Vedanta filed an application before the High Court of Karnataka, seeking modification of the order in August 2009. However, the application was not taken up for hearing. Subsequently, Vedanta filed a special leave petition before the Supreme Court of India against the High Court's order. In November 2009, the Supreme Court of India ordered the High Court of Karnataka to dispose the application for modification of the order given in August 2009 and ordered Vedanta to furnish a bank guarantee towards payment of the forest development tax. In April 2010, High Court of Karnataka ordered to pay 25.0% of the demand in cash and furnish a bank guarantee for the remaining 25.0%.

On January 3, 2016, the High Court of Karnataka passed its final order quashing the forest development tax notification, holding that the rate of forest development tax levied to be 8% and directing a refund of the amount collected from mining leases other than state government owned companies. The state government of Karnataka appealed against the order before the Supreme Court of India, and another mining lessee also filed a counter appeal in the matter. The matter is pending before the Supreme Court and next hearing date is scheduled on August 3, 2016. In the interim, the Supreme Court has stayed the refund of the forest development tax amount as ordered by the High Court.

In the meantime, the Govt. of Karnataka enacted the FDT Amendment Act which empowers the State to collect FDT at 12%, with retrospective effect from 2008, on the sale price of iron ore sold by Vedanta. Vedanta filed a writ petition in the High Court of Karnataka challenging constitutional validity of the FDT Amendment Act. The High Court granted temporary relief by directing the State government to not take any coercive action against Vedanta based on the newly enacted law.

***Vedanta is involved in a tax dispute with the Indian Tax Department.***

The Group through its subsidiaries Richter Holdings Limited and Westglobe Limited in 2007 acquired the entire stake in Finsider International Company Limited (FICL) based in the United Kingdom which was holding 51 percent shares of Sesa Goa Ltd, an Indian Company. In October 2013, the Indian Tax Authorities (Tax Authorities) have served an order on Richter and Westglobe for alleged failure to deduct withholding tax on capital gain on the indirect acquisition of shares in April 2007.

The Tax Authorities determined the liability for such non-deduction of tax as Rs. 8,751.8 million (US\$131.3 million) in the case of Richter and Rs.5,834.5 million (US\$87.5 million) in the case of Westglobe, comprising tax and interest. Being aggrieved, Richter and Westglobe filed appeals before the first appellate authority. Writ petitions were filed in the High Court of Karnataka challenging the constitutional validity of retrospective amendments made by the Finance Act 2012 and in particular the imposition of obligations to deduct tax on payments made against an already concluded

transaction. The Karnataka High Court passed interim orders and directed that the adjudication of liability (TDS quantum and interest) shall no more remain in force since tax department passed the orders on merits travelling beyond the limited issue of jurisdiction. The high court will hear on jurisdiction issue. The next hearing is scheduled for January 25, 2017.

***The Cairn India Group is involved in a special leave petition relating to income tax***

Cairn India Energy West BV (“Cairn Energy”) filed a writ petition with the High Court of Gujarat in December 2008 challenging the restriction of section 80-IB (9) of the Indian Income Tax Act, 1961 (“Section 80-IB (9)”) to the production of oil. Section 80-IB(9) allows the deduction of 100% of profits from the commercial production or refining of mineral oil. The term “mineral oil’ is not defined but has always been understood to refer to both oil and gas, either separately or collectively. The 2008 Indian Finance Bill appeared to remove this deduction by stating (without amending section 80-IB (9)) that “for the purpose of section 80-IB(9), the term “mineral oil’ does not include petroleum and natural gas, unlike in other sections of the Act”. Subsequent announcements by the Indian Finance Minister and the MoPNG have confirmed that a tax holiday would be available on production of crude oil but have continued to exclude gas. The High Court of Gujarat, by its order dated July 29, 2009 did not admit the writ petition on the ground that the matter needs to be first decided by the lower tax authorities. A special leave petition has been filed before the Supreme Court of India against the decision of the High Court of Gujarat. In the event that this challenge is unsuccessful, the potential liability for tax and related interest on the tax holiday claimed on gas production for all periods to March 31, 2016 is approximately Rs.3,201 million

Seperately, the Commissioner of Income Tax (Appeals) by an order dated June 17, 2010 has understood natural gas as falling within the ambit of the term “mineral oil” in relation to an assessment of Cairn Energy for the assessment year 2005-2006.

***Cairn India has filed certain writ petitions relating to sales tax***

Cairn has filed two writ petitions before the Rajasthan High Court seeking to set aside the letters and show cause notice issued by the Rajasthan Sales Tax Department and others demanding 4% VAT on sales of crude oil on the basis of an intra-state sale (as opposed to an inter-state sale). A 2% Central States Tax is currently being paid. A stay against the show cause notices has been issued. The potential liability for tax and related interest for all periods until 31 Dec 2016 is approximately Rs.41,581 million (US\$623.7 million) (Tax Rs.29,591 million (US\$443.9 million) & Interest Rs.11,990 million (US\$179.8 million)). The matter was last heard on May 17, 2016 and the judgement dated July 13, 2016 allowed the petition and held that sale of crude oil should be regarded as interstate sale subject to central states tax and that Rajasthan VAT should not be applicable. The Rajasthan Sales Tax Department has filed a petition before the Division Bench of the Rajasthan High Court against the order dated 13 July 2016 of the Rajasthan High Court. The Rajasthan Sales Tax Department has filed a writ petition before the division bench of the Rajasthan High Court against the order dated 13 July 2016 of the Rajasthan High Court.

***Claim against BALCO for energy development cess***

In December 2006, the High Court of Chhattisgarh on a writ filed by BALCO and others, declared the provisions relating to imposition of energy development cess of Rs. 4,379 million (\$65.7 million) on the captive power plants to be unconstitutional and ordered refund of the cess already collected by the state government. The State of Chhattisgarh filed a special leave petition in the Supreme Court against the order of the High Court. The Supreme Court has issued notice and stayed the refund of the cess already collected, pending the disposal of the special leave petition and restrained the tax department from taking any corrective step for the collection of the cess. The matter is expected to be listed in due course.

***The Amalgamation and Re-organization Scheme has been challenged by the Indian tax authorities and others***

Subsequent to the effectiveness of the Amalgamation and Re-organization Scheme, special leave petitions challenging the orders of the High Court of Bombay at Goa were filed before the Supreme Court of India by the Commissioner of Income Tax, Goa and the Ministry of Corporate Affairs in July 2013 and in April 2014, respectively. Further, a creditor and a shareholder have challenged the Amalgamation and Re-organization Scheme in the High Court of Madras in September 2013. Further, the Ministry of Mines, GoI have challenged the Amalgamation and Reorganisation Scheme before the High Court of Madras and the High Court of Bomaby, Goa Bench, respectively. These petitions are pending for hearing and admission.

***Arbitration proceedings on issues related to the cost recovery of the Ravva block***

Cairn along with other joint operation partners (the “Contractor Parties”) are involved in a dispute against GoI relating to the recovery of contractual costs in terms of calculation of payments that the Contractor Parties were required to make in connection with the Ravva field.

The Ravva production sharing contract obliges the Contractor Parties to pay a proportionate share of ONGC’s exploration, development, production and contract costs in consideration for ONGC’s payment of costs related to construction and other activities it conducted in Ravva prior to the effective date of the Ravva production sharing contract (the “ONGC Carry”). The question as to how the ONGC Carry was to be recovered and calculated, along with other issues, was submitted to an international arbitration tribunal in August 2002 which rendered a decision on the ONGC Carry in favor of the Contractor Parties whereas four other issues were decided in favor of GoI in October 2004 (the “Partial Award”).

The GoI then proceeded to challenge the ONGC Carry decision before the Malaysian courts, as Kuala Lumpur was the seat of the arbitration. On October 11, 2011, the Federal Court of Malaysia adjudicated the matter and upheld the Partial Award. Per the decision of the arbitral tribunal with regards to Partial Award, the Contractor Parties and the GoI were required to arrive at a quantification of the sums relating to each of the issues under the Partial Award. Also, the arbitral tribunal retained the jurisdiction for determination of any remaining issues in the matter.

Pursuant to the decision of the Federal Court, the Contractor Parties approached the Ministry of Petroleum and Natural Gas (“MoPNG”) to implement the Partial Award while reconciling the statement of accounts as outlined in the Partial Award. GoI failed to implement the Partial Award by way of reconciling accounts as provided in the Partial Award.

However, on 10 July 2014, MoPNG issued a show cause notice alleging that since the Partial Award had not been enforced the profit petroleum share of the GoI had been short-paid. MoPNG threatened to recover that amount from the sale proceeds payable by the oil marketing companies to the Contractor Parties. The Contractor Parties replied to the show cause notice taking various legal contentions. On 9 March 2015, a personal hearing took place between MoPNG and the Contractor Parties whereby the Contractor Parties expressed their concerns against such alleged unilateral recoveries and filed further written submissions on March 12, 2015.

Because the Partial Award did not quantify the sums, the Contractor Parties approached the same arbitral tribunal to pass a final award in the subject matter since the arbitral tribunal had retained the jurisdiction to do so. The arbitral tribunal was reconstituted. The reconstituted tribunal commenced hearings at the Hague on February 23, 2015, and the claimants approached the tribunal for interim relief to maintain the status quo against the MoPNG’s show cause notice and alleged unilateral recoveries directly through Ravva crude oil and gas buyers and the tribunal granted the interim-relief on June 26, 2015. The final hearing took place on June 26, 2016, and the parties were ordered to make their submissions, if any with respect to the cost of arbitration proceedings. The final award was passed by the tribunal on 26 October 2016, upholding that no further amounts are due from the

claimants. With respect to arbitration costs, the award specifies that each party should bear costs equally. GoI has the right to challenge the final award and may also challenge its enforcement. While Cairn does not believe so, however if GOI is finally successful in its challenge, Cairn could be liable for approximately Rs. 4,259.55 million (US\$63.98 million) and interest.

#### ***Proceedings related to the Imposition of Entry Tax***

BALCO challenged the constitutional validity of a local statute levying entry tax on the entry of goods brought into the State of Chhattisgarh, India from outside and other notifications, as being in violation of certain provisions of the Indian Constitution. BALCO paid the entry tax of Rs. 2,318 million (\$34.8 million) under protest to the state government of Chhattisgarh until 31 October 2016. By its order dated 10 September 2009, the Chattisgarh High Court upheld the constitutional validity of the impugned statute.

Vedanta also filed a writ petition before the High Court of Odisha, challenging the constitutionality of the Odisha Entry Tax Act. On February 18, 2008, the Odisha High Court held that (i) the Odisha entry tax is not compensatory, (ii) there should not be any entry tax on goods coming into Odisha which are not manufactured in Odisha, and (iii) that the Odisha Entry Tax Act is valid. This challenge was with regard to levy of entry tax on indigenous goods. The High Court order was challenged before the Supreme Court of India wherein the court ordered Vedanta to pay the entry tax amount towards earlier dues amounting to Rs. 35 million (\$0.5 million) and amounts accruing from October 2009 on a monthly basis i.e. Rs. 0.8 million per month, until the matter is finally disposed. These amounts have been fully paid under protest.

In a related matter in respect of challenging the levy of entry tax on imported goods, on April 9, 2013 the Supreme Court of India ordered the deposit of 50% of the entry tax amount accrued until September 30, 2012, which amounted to Rs.1,196 million (\$17.9 million). The amounts were paid as per the court order. However, as the entry tax demand was also partially on the SEZ operation, the same was challenged separately before the High Court of Odisha, Cuttack wherein Vedanta paid 50 % of the demand under protest as per the court order. The matter is pending adjudication. Meanwhile, the Government of Odisha notified its SEZ Policy 2015 in December 2015, exempting entry tax levy on SEZ operations and Vedanta is seeking exemptions relying on the same.

Furthermore, there was a demand of entry tax on March 26, 2012 for Rs. 727 million and interest of Rs. 492 million for the period from August 2007 to January 2012 on power business of the then SEL. Vedanta has paid the amount in accordance with the interim order of Supreme Court of India which was given pursuant to the holding of the Odisha High Court.

Vedanta is in compliance with the interim orders passed by the Supreme Court of India on both indigenous and imported goods. The challenges were heard by a nine judge bench of the Supreme Court and the court in its order rejected the compensatory nature of tax as a ground of challenge. The order maintains status quo with respect to all other issues which have been left open for adjudication by regular benches hearing the matters.

#### ***Ravva Joint Venture Arbitration proceedings: Base Development Cost***

The Ravva joint venture had received a notice from Ministry of Petroleum & Natural Gas, Government of India (GOI) for the period from 2000-2005 for USD 129 million for an alleged underpayment of profit petroleum to the Indian Government, out of which, Cairn India's share is USD 29 million plus potential interest at applicable rate (LIBOR plus 2% as per PSC).

This claim relates to the Indian Government's allegation that the Ravva JV had recovered costs in excess of the Base Development Costs ("BDC") cap imposed in the PSC and that the Ravva JV had also allowed these excess costs in the calculation of the Post Tax Rate of Return (PTRR). The Ravva joint operation partners (excluding ONGC) initiated arbitration proceedings and the arbitral tribunal announced its award on 18 January 2011, broadly allowing companies including Cairn India to recover

base development cost spent amounting to \$278 million and disallowed an over-run of \$22.3 million spent in respect of base development cost and directed 50.0% legal cost on the GoI. The High Court of Kuala Lumpur, on 30 August 2012, dismissed the GoI's application for setting aside the award with costs.. The GoI further filed an appeal before the Court of Appeal, Kuala Lumpur, which was dismissed on June 27, 2014. The GoI thereafter filed an application for a leave to appeal against the Court of Appeal's order before the Federal Court, which was dismissed by the Federal Court of Malaysia on 17 May 2016. Meanwhile, GoI issued a show-cause notice in this matter which Cairn India Limited replied to and subsequently also filed an application for enforcement of the award before the Delhi High Court as an additional measure of caution. The next hearing in the matter is scheduled for 15 February 2017. Additionally, on 14 August 2015, the GoI filed a suit and obtained an ex-parte 'stay-order' from the Delhi High Court against the determination of 'quantum of costs' by the arbitral tribunal. Cairn India filed an appeal before the Court against the 'stay order' and the 'stay-order' obtained by the GoI in this matter was set aside on 3 May 2016. The next hearing before the Court in the GoI's civil suit is scheduled for 21 April 2017. GoI has also filed an SLP before the Supreme Court against the Division Bench Order of the High Court, dated 3 May, 2016, setting aside the 'stay-order' obtained by the GoI, which is due for hearing on 31 January 2017

### ***Proceedings, notices and enquires initiated by the Central Excise***

The Central Excise department of the GoI had issued in June 2010 an ex-parte notice for reversal of Cenvat credit of Rs. 3,150 million (\$47.3 million) along with interest of Rs. 88 million (\$1.3 million) for the non-compliance of Rules 4(5a) and 4(6) of the Cenvat Credit Rules, in respect of non-return of job work challans for the period March 1, 2009 to September 30, 2009 within a stipulated time. In addition, it also alleged that Vedanta violated the advance license conditions from 2005 to 2009. In 2010, Vedanta filed four writ petitions WP No. 8123, 8135, 9744 and 9755 in the High Court of Madras against the Central Excise department along with an associated contempt petition. All the above petitions were heard on 29 July 2010 and pursuant to the order dated 8 June 2010, the High Court of Madras in relation to WP No. 8123, remanded the matter to be heard and determined afresh by a new set of officers of the Central Excise department. The High Court of Madras further granted a stay in relation to WP No. 8135 in so far as relates to job work challan matter and until a fresh enquiry was made. Further, pursuant to the order dated 29 April 2011 the High Court of Madras dismissed WP No. 9744, 9755 and the contempt petition.

The Central Excise department deputed the Assistant Commissioner of Central Excise to conduct an enquiry for the alleged non-compliance of Rules 4(5a) and 4(6) of the Cenvat Credit Rules in respect of non-return of job work challans. The Assistant Commissioner of Central Excise served a show cause notice on September 9, 2011. Vedanta filed a response before the Assistant Commissioner of Central Excise. After conducting a personal hearing, the Assistant Commissioner passed a favorable order on 1 January 2012 and dropped the entire demand for duty and interest. The department went into appeal before the Commissioner (Appeals) against this order, but the appeal was restricted only to the demand of interest. The Commissioner (Appeals) allowed the appeal on 25 February 2013 on the condition that interest would become applicable only in those cases where goods have not been sent back or cleared from the premises within 180 days from the date of dispatch from the Tuticorin unit. The verification whether any interest is payable or not has been completed and department raised the interest liability of Rs. 2.4 million which Vedanta has challenged before Tribunal on April 7, 2015 and the case has yet to be listed for hearing.

Vedanta filed two writ appeals no. 704 and 705 of 2011 in the High Court of Madras, Division Bench challenging the orders passed with respect to the writ petitions no. 8135 and 9744 of 2010. The writ petitions were admitted on August 1, 2011 and the Court ordered other party to maintain the status quo. In the meanwhile, the Commissioner of Customs Tuticorin issued a show cause notice in January, 2015 based on alleged violation of advance license conditions from 2005 to 2009 expressly mentioning that this show cause notice shall be kept pending and not be adjudicated unless and until directions are obtained from the High Court enabling such adjudication. The show cause notice also sought explanation as to why (i) a sum of Rs. 3,996.08 million along with interest for alleged violation of condition of export obligation should not be demanded as duties of customs; and (ii) the

quantity of 77,241.0 metric tonnes of copper should not be held liable for confiscation for violation of export obligation. Vedanta filed writ petition no. 626 of 2015 against this show cause notice, which was tied up with writ appeals no. 704 and 705 of 2011 and heard together. Thereafter, regular hearings took place in the High Court, and on 12 March 2015 the High Court gave an interim order, allowing one of the prayers in writ in form of injunction to the Directorate General of Foreign Trade actions in pursuit of the show cause notice received from customs department. During the course of the hearings, writ appeal no. 704 was withdrawn as it has become infructuous as it relates to the job work challan matter which has already been concluded.

Writ appeal no. 705 of 2011 and writ petition no. 626 of 2015 were heard on 11 March 2016, and were both dismissed in terms of the final judgment of the High Court dated 1 August 2016. The court held that it did not find any impediment to custom authorities issuing show cause notice on basis of material gathered / input received from excise authorities. The court also held that company shall respond to the show cause notice dated 13 January 2015 within two weeks from receipt of the order and directed the Commissioner of Customs to conduct proceedings as expeditiously as possible. Vedanta has filed a Special Leave Petition against the High Court's order before the Supreme Court. The final hearing before the Supreme Court on the Special Leave Petition, as well as the accompanying stay application is awaited.

### ***Ravva Joint Venture Arbitration proceedings involving Cairn India***

The Ravva joint venture had received a notice from Ministry of Petroleum & Natural Gas, Government of India (GOI) for the period from 2000-2005 for USD129 million for an alleged underpayment of profit petroleum to the Indian Government, out of which, Cairn India's share is USD29 million plus potential interest at applicable rate (LIBOR plus 2% as per PSC).

This claim relates to the Indian Government's allegation that the Ravva JV had recovered costs in excess of the Base Development Costs ("BDC") cap imposed in the PSC and that the Ravva JV had also allowed these excess costs in the calculation of the Post Tax Rate of Return (PTRR). The Ravva joint operation partners (excluding ONGC) initiated arbitration proceedings and the arbitral tribunal announced its award on 18 January 2011, broadly allowing companies including Cairn India to recover base development cost spent amounting to \$ 278 million and disallowed an over-run of \$22.3 million spent in respect of base development cost and directed 50.0% legal cost on the GoI. The High Court of Kuala Lumpur, on 30 August 2012, dismissed the GoI's application for setting aside the award with costs. The GoI further filed an appeal before the Court of Appeal, Kuala Lumpur, which was dismissed on June 27, 2014. The GoI thereafter filed an application for a leave to appeal against the Court of Appeal's order before the Federal Court, which was dismissed by the Federal Court of Malaysia on 17 May 2016. Meanwhile, GoI issued a show-cause notice in this matter which Cairn India Limited replied to and subsequently also filed an application for enforcement of the award before the Delhi High Court as an additional measure of caution. The next hearing in the matter is scheduled for 15 February 2017. Additionally, on 14 August 2015, the GoI filed a suit and obtained an ex-parte 'stay-order' from the Delhi High Court against the determination of 'quantum of costs' by the arbitral tribunal. Cairn India filed an appeal before the Court against the 'stay order' and the 'stay-order' obtained by the GoI in this matter was set aside on 3 May 2016. The next hearing before the Court in the GoI's civil suit is scheduled for 21 April 2017. GoI has also filed an SLP before the Supreme Court against the Division Bench Order of the High Court, dated 3 May, 2016, setting aside the 'stay-order' obtained by the GoI, which is due for hearing on 31 January 2017.

Following various rounds of exchange of information, ONGC accorded its consent on July 8, 2016, agreeing to the extension of the PSC by 10 years, on the existing terms. On September 9, 2016, Court gave time to GoI to give their decision by October 14, 2016, and listed the matter for hearing on November 7, 2016. On November 7, 2016, the Court granted additional time to the GoI to submit its decision by January 6, 2017 and listed this matter for hearing on January 9, 2017. This matter did not come up for hearing on January 9, 2017 and is now listed for hearing on January 31, 2017. In the meantime, GoI has sought additional time until February 28, 2017 for taking a decision in this matter.

***Writ petition filed in the Delhi High Court by Cairn India Limited relating to extension of tenure of the Production Sharing Contract for the Rajasthan block***

Cairn India Limited filed a writ petition before the High Court of Delhi against the MoPNG, the DGH and ONGC regarding the extension of the tenure for the Production Sharing Contract (“PSC”) for the RJ-ON-90/1 Block (“RJ Block”).

The RJ Block PSC is valid until May 14, 2020. Consistent with the terms of the PSC, given that the RJ Block is also producing natural gas, Cairn India Limited has been requesting an extension of the tenure of the RJ Block PSC for a period of up to 10 years, i.e., until May 14, 2030. ONGC, Cairn India Limited’s joint venture partner in the RJ Block, is technically aligned on the recoverable resources potential of the RJ Block beyond the PSC period, until the proposed extension period up to 2030. Cairn India Limited has been making regular requests to the MoPNG for extension of the tenure of the RJ Block PSC since the past few years. However, apart from seeking further technical and financial details, the MoPNG has not yet made a final decision in the matter.

With regards to the MoPNG’s delay, a writ petition was filed by Cairn India Limited on December 11, 2015, seeking relief from the High Court of Delhi. During the Court hearing held on December 14, 2015, the MoPNG and DGH contended that no decision had been taken in the matter as the requisite data had not been provided by Cairn India Limited and ONGC. ONGC further contended that it had sought certain commercial particulars from Cairn India Limited which had not been furnished by Cairn India Limited. Through its order dated December 14, 2015, the High Court of Delhi ordered all parties to exchange the requisite information and documents to enable the GoI to make a decision in the matter. The High Court of Delhi imposed timelines on the parties for the exchange of information, namely the GoI, DGH and ONGC to seek data and information within four weeks, Cairn India Limited to provide the requisite information within two weeks thereafter, ONGC to review and revert with commercial alignment on the projects within six weeks thereon and the GoI to take a decision within three months from the date of consensus between Cairn India Limited and ONGC. Following the December 14, 2015 court order, information has been exchanged between Cairn India Limited and ONGC for obtaining ONGC’s commercial alignment.

Notwithstanding the above, MoPNG’s and ONGC’s stance so far has been that due to insufficient data provided by Cairn India Limited, ONGC has not been able to conclude its commercial assessment. In view of this, the High Court of Delhi through its order dated April 5, 2016, ordered ONGC to give a final opportunity to Cairn India Limited to furnish the requisite documents within 2 weeks from the date of the aforesaid order and thereafter to make a final decision on commercial alignment within an additional 2 weeks, in order to enable the GoI to take its decision in the matter as per the timeline stated in the High Court of Delhi’s order dated 14 December 2015. On 7 November 2016, the Court granted time to the GoI to submit its decision by 6 January 2017. The next date of hearing is scheduled on 9 January 2017, which has now been rescheduled for 31 January 2017. GoI has sought additional time until 28 February 2017 from the court.

***Writ petition filed in the Delhi High Court by Cairn India Limited relating to export of crude oil from RJ Block.***

Cairn India Limited has filed a writ petition before the High Court of Delhi against the Directorate General of Foreign Trade (“DGFT”), the MoPNG, and Indian Oil Corporation Limited (“IOCL”) for the export of crude oil from the RJ Block.

Due to its nature and composition, RJ Block crude has the potential to be valued higher by refineries in other markets, beyond the prices being received from the GoI nominated buyers, namely IOCL and private refiners Reliance Industries Limited and Essar Oil Limited. Since 2009, Cairn has been receiving bids from international buyers and refiners offering prices that are an additional US\$3-4 per bbl more than the domestic sale prices for RJ Block crude.



In accordance with the provisions of the RJ Block PSC and the applicable GoI policies for crude oil export, Cairn India Limited repeatedly requested IOCL and MoPNG to allow it to export RJ Block crude oil, to which there has been no firm response. Cairn India Limited also made written requests to the DGFT to intervene in the matter, which again proved unsuccessful.

In view of the aforesaid, Cairn filed a writ petition in the High Court of Delhi on December 11, 2015 to obtain relief in the form of orders to the DGFT, MoPNG and IOCL for approvals and authorizations to permit and facilitate the export of RJ Block crude oil, to the extent GoI nominated buyers are unable to cover the entire production. Through its order dated December 14, 2015, the High Court ordered the MoPNG, DGFT and IOCL to obtain necessary instructions on whether the GoI was willing to pick up the entire crude oil production from the RJ Block, or in the alternative was ready to grant permission to Cairn to directly export the crude oil not covered by the GoI nominees.

The GoI's stance thus far has been to deny Cairn India Limited's request for export, although it has yet to present its complete arguments to the High Court of Delhi justifying such denial. Relying on the lack of consent from the GoI, DGFT also rejected Cairn's request for export permission on February 16, 2016. During the course of arguments, the High Court of Delhi disagreed with GoI's observations on the construct of Article 18 and observed that there was no embargo on export neither in the PSC nor in the policy. On October 18, 2016, the writ petition was dismissed with liberty to refer the matter to dispute resolution as per PSC. Cairn has filed an appeal before the division bench of the High Court.

***Shenzhen Shandong Nuclear Power Construction Co. Limited has commenced arbitration proceedings against Vedanta***

On March 19, 2012, Shenzhen Shandong Nuclear Power Construction Co. Limited ("SSNP") filed a petition before the Bombay High Court under section 9 of the Arbitration and Conciliation Act, 1996, that Vedanta had suppressed the fact that it had failed to obtain environmental clearances in relation to a 210 MW co-generation power plant for a refinery expansion project at Lanjigarh and further alleged the non-payment of dues for construction and other services in relation to the same. This was subsequent to SSNP's notice for termination of the contract dated February 25, 2011 and legal notice dated February 23, 2012 for recovery of its alleged dues. SSNP also made a request for interim relief. Under the petition, SSNP sought for a restraining order on encashment of the advance bank guarantee, injunction from disposing or creating third party right over plant and machinery at the project site and security for the amount due under the contract. During the pendency of the petition, SSNP invoked arbitration by way of a notice dated April 18, 2012. SSNP sought an award for the sums of Rs. 4472.11 million, USD 2380million and Euro 121 million. On April 25, 2012, the High Court of Bombay dismissed SSNP's petition. SSNP appealed against this order before a division bench of the High Court of Bombay, which, by its order of December 12, 2012 ordered Vedanta to deposit a bank guarantee for an amount of Rs. 1,870 million (\$28.2 million) until completion of the arbitration proceedings.

On April 5, 2013, Vedanta also filed a counterclaim for delays in operations caused arguing that SSNP was responsible. Subsequently SSNP filed an application for an interim award of Rs. 2,020 million (\$30 million) before the arbitral tribunal, which was not allowed. The proceedings are ongoing and the final hearing is scheduled for March 2017.

***Proceedings against TSPL relating to its delay in commissioning various units of the power plant***

TSPL entered into a long term power purchase agreement with the Punjab State Power Corporation Limited ("PSPCL") for supply of power. TSPL has a contractual obligation to commence commercial operation of various units of the power plant according to the scheduled timelines agreed in terms of the agreement. However, there were delays in implementing the project as compared to the scheduled timelines under the agreement. TSPL received letter from PSPCL, seeking payment of liquidated damages of Rs.3,176.42 million (\$47.9 million) for each delay in commissioning of Units I, II and III totaling Rs.9,529.25 million (\$143.8 million).

Subsequently, PSPCL invoked the bank guarantee of Rs. 1,500 million (\$22.6 million) towards payment of the liquidated damages on account of delay in completion of the commissioning of Unit I. TSPL filed a petition with the Punjab State Electricity Regulatory Commission (“PSERC”) for quashing of the claim of liquidated damages and grant of extension of time to complete the commissioning of various units of the power plant. It claimed that the highlighted delays arose due to PSPCL’s delay in the fulfilment of certain obligations under the power purchase agreement, such as those in relation to procuring interconnection and transmission facilities and arranging supply of adequate quantity of fuel for the project, as well as other force majeure reasons. On 22 October 2014, PSERC ordered the matter to be settled through arbitration and the Punjab & Haryana high court allowed the stay on encashment of bank guarantee. PSPCL submitted an appeal in Appellate Tribunal for Electricity (APTEL) against the PSERC order and on May 13, 2015, APTEL disposed the appeal by directing that the matter will be adjudicated by an arbitral tribunal. The proceedings are ongoing and are listed for arguments on 24 January 2017 and 25 January 2017.

### ***Proceedings against TSPL relating to mega power project benefits***

Sterlite Energy Limited (now Vedanta Limited) (“SEL”) submitted its bid for setting up a 1980 MW thermal power plant in the state of Punjab under a tariff based international competitive bidding process under a Case-II competitive bidding mechanism on June 2008, which was ultimately awarded to SEL. A power purchase agreement (PPA) was entered between TSPL and PSEB on September 2008, which is now known as PSPCL. According to the power purchase agreement, any increase or decrease in the capital cost of the project on the occurrence of any “Change in Law” (as defined therein) after the cut-off date of June 16, 2008, had to be passed on to PSPCL.

Because TSPL intended to sell all of the generated electricity to the state of Punjab, it did not meet one of the requirements for the mega power project at the time of bidding, namely that the project had to sell electricity to more than one state. However, the said requirement was amended in October 2009, making TSPL eligible for the mega power project status. Accordingly, TSPL was given the mega power project status in 2010 and thereafter has been receiving the customs and excise exemption.

In July 2013, PSPCL filed a petition before the PSERC, alleging that a TSPL had become entitled to the mega power project status after the cut-off date, the mega power project benefits received by TSPL had to be passed on to PSPCL pursuant to the power purchase agreement’s “Change in Law” clause. TSPL in its reply stated that as of the cut-off date, similar benefits were available to it under India’s the foreign trade policy as a non-mega power project and accordingly, that its economic position had not altered pursuant to the grant of mega power project status to warrant the passing on of such benefits to PSPCL. TSPL has also produced a number of approval letters issued by various Director General of Foreign Trade offices across India, which extended such benefits to non-mega power projects including government power projects or other public sector undertakings.

PSERC passed an order dated December 2, 2014, holding against TSPL. TSPL thereafter filed an appeal on January 2015 along with a stay application before the APTEL, challenging the order of PSERC. The stay application was rejected by APTEL without considering the submissions of TSPL. TSPL then filed a stay application before the Supreme Court, appealing against APTEL’s order on the stay application. The Supreme Court granted a stay on April 24, 2015 and subsequently on July 28, 2015, the Supreme Court ordered the stay to continue until given any further orders. The next hearing is scheduled for 19 January 2017.

### ***Cairn received a show cause notice from the Indian tax authorities for not withholding tax on payments made while acquiring a subsidiary***

In March 2015, Cairn India Limited received a notice from the Indian Tax Authorities (“Tax Authorities”) alleging failure by Cairn India Limited to withhold tax on the consideration paid to Cairn UK Holdings Limited (“CUHL”) on a transaction which took place in the year 2007-08. The said transaction relates to the acquisition of the shares of Cairn India Holdings Limited (“CIHL”), a 100%

subsidiary of Cairn India Limited as of 30 September 2016, from CUHL during the financial year 2006-2007 as a part of group reorganization by the then ultimate parent company Cairn Energy Plc. Based upon the retrospective amendment(s) made in the year 2012 by inserting explanation 5 of section 9(1)(i) of the Income Tax Act, 1961, the Tax Authorities vide its order dated March 11, 2015, raised a demand of approximately Rs.204,947 million (\$3,074.5 million) comprising tax of approximately Rs.102,474 million (\$1,537.3 million) and interest of an equivalent amount) for not withholding tax on the consideration paid to CUHL, for shares of CIHL. The Tax Authorities stated in the said order that a short term capital gain of Rs. 245,035 million (\$3,676 million) accrued to CUHL on transfer of the shares of CIHL to Cairn India Limited in financial year 2006-2007, on which tax should have been withheld by Cairn India Limited. Cairn India Limited understands that a tax demand has also been raised by the Tax Authorities on CUHL with respect to taxability of alleged capital gain earned by CUHL.

In this regard, Vedanta Resources Plc. filed a Notice of Claim against the GoI under the UK-India bilateral investment treaty in order to protect its legal position and shareholder interests. Management was advised that Vedanta Resources Plc. has a good case to defend as per provisions of UK-India bilateral investment treaty, the benefit of which would ultimately accrue to Cairn India Limited. Further, Cairn India Limited has sought independent advice on this issue and has been advised that there could be no liability on Cairn India Limited for the failure to withhold the taxes in the year 2006-07 based on provisions of law prevailing at the time of transaction as the aforesaid retrospective amendment has cast an impossible obligation on Cairn India Limited to deduct tax by having to predict and anticipate that the retrospective amendment will be made by the legislature on a future date. Cairn India Limited has approached the Hon'ble Delhi High Court against the said order and also filed an appeal before the Commissioner of Income Tax (Appeals) to defend its position. The next hearing date before Delhi High Court is scheduled on 23 January 2017.

#### ***Class actions against KCM on behalf of Zambian nationals***

Two separate proceedings were issued in England and Wales by two English law firms, Hausfeld and Leigh Day, on behalf of Zambian nationals who allege that they have suffered loss and damages as a result of KCM's operation of the Konkola copper mine.

On 31 July 2015, Leigh Day issued proceedings on behalf of 1813 individual claimants from the Shimulala, Kakosa, Hellen and Hippo Pool communities in the Chingola district in Zambia. The allegations made against the Company and KCM pertain to alleged incidents occurring over an 11 year time period and include claims of personal injury, significant pollution, environmental damage and claims for aggravated and exemplary damages and for injunctive relief. These allegations are currently being investigated by KCM. There has been no hearing or proceeding in any court on the merits of any of these claims to date, none has been scheduled, and the amount of the claims has not been specified.

The Company and KCM have challenged the jurisdiction of the High Court of Justice of England and Wales, *inter alia*, on the basis that (a) there are already existing proceedings in Zambia which have been brought by multiple claimants against KCM in respect of the operation of the Konkola copper mine, (b) some of the claimants have already brought claims in Zambia, (c) the Konkola copper mine is situated, operated and regulated by Zambian regulators pursuant to Zambian law, (d) it is where KCM, the operator of the mine, is domiciled, (e) it is where the minority shareholder of KCM (controlled by the Government of the Republic of Zambia) is domiciled, (f) it is where the claimants are situated; (g) it is where the damage is alleged to have occurred, (h) it is the where the relevant witnesses are based, the relevant evidence is based, and (i) it is Zambian law which applies to these claims and Zambia has a fully functional legal system which can also accommodate group actions (or class actions) claims.

On 28 May 2016, the English High Court of Justice, Queen’s Bench Division, Technology and Construction Court released a judgment disallowing the applications from the Company and KCM, respectively, ruling that the English courts have jurisdiction to hear and adjudicate the claims. The Company and KCM were granted permission to appeal the order before the Court of Appeal which has been allowed. The hearing for the appeal has been fixed for the first week of July 2017.

Hausfeld issued a claim form on 16 July 2015 in the Queen’s Bench Division on behalf of 347 claimants in relation to alleged pollution from the Konkola copper mine which was alleged to have led to, amongst other things, personal injury. Whilst no particulars of claim were produced, the claims by Hausfeld appeared to cover materially the same facts and matters as those which form the substance of the claim being brought against the Company and KCM by Leigh Day (referred to above). It subsequently became clear that Leigh Day and Hausfeld were claiming to act for some of the same claimants and, following a case management conference in the English High Court on 24 November 2015, it appears to have been established between Leigh Day and Hausfeld that those “overlapping” claimants wished to instruct Leigh Day rather than Hausfeld, increasing the number of claimants represented by Leigh Day to 1826. The Hausfeld claim form was therefore allowed to lapse without service. That claim on behalf of 347 claimants is therefore at an end.

On 25 January 2016, Hausfeld informed the High Court that they are assessing the viability of potential new claims relating to alleged environmental pollution against KCM and Vedanta, involving 1,099 individuals in the Copperbelt region in Zambia. Hausfeld told the Court that the alleged pollution appeared to emanate from a different source than that which is the subject of the Leigh Day claim, though Hausfeld have indicated that they are awaiting the outcome of Vedanta and KCM’s jurisdiction challenges in the Leigh Day claim (referred to below) before deciding whether to pursue those claims. Hausfeld have not yet commenced pre-action correspondence, or taken any other steps, in respect of those potential new claims.

The claim amount is not currently quantifiable.

### ***Proceedings against KCM by Zambia Consolidated Copper Mines Investment Holdings***

KCM and its shareholder, majority State-owned Zambia Consolidated Copper Mines Investment Holdings (ZCCM-IH) have been engaged in discussions with regard to the price participation settlement agreement entered into in December 2012 (“Price Participation Agreement”). In June 2016, ZCCM-IH filed a claim before the English High Court of Justice, Queen’s Bench Division, Commercial Court in relation to alleged outstanding amounts pursuant to the terms of the settlement agreement. The Court handed down a judgment on 16 December 2016, allowing ZCCM-IH’s application and ruling that \$103,327,244 including contractual interest is payable to ZCCM. ZCCM’s application for additional sums under the settlement agreement will be subject to a hearing post March 2017. KCM and ZCCM-IH have engaged in settlement discussions about the payment and have filed a consent order before the court on 13 January 2016.

### **Sustainability**

In fiscal year 2012, Vedanta introduced a series of policies and technical and management standards (the “Sustainability Framework”) aligned to international sustainability standards, such as the International Finance Corporation Performance Standards, the International Council on Mining and Metals Sustainable Development Framework and the United Nations Global Compact Principles. In fiscal year 2013, Vedanta took further steps to implement the Sustainability Framework by requiring its operating subsidiaries to have clear action plans in place with supporting documentation to guide them to further implement the Sustainability Framework, based on self-assessment. In addition to the self-assessment requirement, Vedanta has also adopted an evaluation and internal assurance process and programmes to train and develop its employees and contractors in the Sustainability Framework.

In fiscal year 2015, Vedanta introduced safety performance standards, formal safety risk assessment, industrial hygiene baseline assessment and safety leadership coaching. In fiscal year 2016, Vedanta incorporated safety performance standards into executive remuneration. These standards now form integral part of internal assurance process, known as Vedanta Sustainability Assurance Program (VSAP) and the businesses performance is tracked against these standards on regular basis.

Vedanta's Board, particularly the Sustainability Committee, is responsible for ensuring the implementation of the Sustainability Framework and to otherwise assist the Board in meeting its responsibilities in relation to sustainability related matters arising out of the activities and operations of Vedanta. See "Management — The Board — Sustainability Committee". The committee which is headed by independent director meets on a quarterly basis and takes stock of Vedanta's sustainability performance and provides guidance on related strategic and policy decisions.

As of 31 December 2016, 100% of existing & running operations are certified to ISO 14001 and OHSAS 18001 standards. Further 44 plants are certified to ISO 9001, 17 plants are certified to ISO 50001 and 10 plants are certified to SA 8000. Vedanta procures required approvals from suppliers and the local community, before it sources its raw materials for its operations.

In its effort to promote health and safety, Vedanta has adopted the Experience Based Risk Quantification & Bow Tie and Making Better Risk Decision approach to enhance its risk assessment, incident investigations and decision making capabilities. Additionally, Vedanta has adopted Consequence Management technique to instill discipline amongst people and avoid repeat incidents. Despite three employee fatalities in fiscal year 2017, Vedanta's target is to eliminate fatalities.

During fiscal 2017 Vedanta engaged an independent agency to conduct a stability assessment of some of its large structures including the tailing dams and fly ash ponds. Vedanta has a tailing dam related business risk as a part of its group risk register and its businesses regularly provide updates.

Vedanta's operations are aligned with regulatory requirements, as applicable, such as the IFC performance standards. With recent developments in relation to climate change and environment protection, Vedanta is in the process of updating its policies and is taking steps to implement measures for environment protection, such as conservation of forests and biodiversity enhancement. Vedanta also engages with third party consultants to effectively mitigate, manage and resolve environment pollution, if any, in locations where it operates.

As of 30 September 2016, Vedanta employed, directly or through contractors, more than 70,000 people. During fiscal year 2016, Vedanta held more than 4,100 stakeholder engagement meetings and approximately 250 partnerships with non-governmental organisations, academic institutions, governments and government bodies were in place.

Vedanta also develops local infrastructure, including roads, sanitation, education and medical facilities, in the communities where it operates, investing \$37 million during fiscal year 2016 to provide support for schools, hospitals, health centres and farmers which benefited approximately 2.25 million people.

Additionally, Vedanta paid \$3.2 billion to the various governments during fiscal year 2016 through direct and indirect taxes, royalty and oil tax.

## **Indian Regulatory Matters**

### ***Mining Laws***

The MMDR Act, the Mineral Concession Rules, 1960 of India, as amended, and the Mineral Conservation and Development Rules, 1988 of India, as amended governs the mining rights and operations of mines in India. The MCD Rules outline the procedures for obtaining a prospecting

license or the mining lease, the terms and conditions of such licenses and the model form in which they are to be issued. The GoI announced the National Mineral Policy in 1993 which was replaced by the National Mineral Policy of 2008 (“NMP 2008”). NMP 2008 provides for a change in the role of the GoI and the state governments to incentivize private sector investment in exploration and mining and for ensuring level playing field and transparency in the grant of concessions and promotion of scientific mining within a sustainable development framework so as to protect the interest of local population in mining areas. The Mines and Minerals (Development and Regulation) Amendment Act, 2015 was promulgated on March 27, 2015 and has brought about significant changes in the legal regime for the mining sector including defining bauxite, iron ore, limestone and manganese ore as notified minerals, creation of a new category of mining license i.e. the prospecting license-cum-mining lease, grant of mining lease for a period of 50 years for all minerals other than coal, lignite and atomic minerals, establishment of District Mineral Foundation for the benefit of persons in districts affected by mining related operations, auction of notified and other minerals by competitive bidding, including e-auction etc. The MMDR Act was further amended by the Mines and Minerals (Development and Regulation) Amendment Act, 2016 which permits the transfer of captive mine leases (granted before January 12, 2015) without having to go through an auction processed and also allows the dumping of waste outside of the mining area by including dumping sites within the definition of lease area. The amendment received presidential assent on May 6, 2016.

Working conditions of mine laborers are regulated by the Mines Act, 1952, as amended (“Mines Act”) and it sets forth standards of work, including number of hours of work, leave requirements, medical examination, weekly days of rest, night shift requirements and other requirements to ensure the health and safety of mine workers. The Mines (Amendment) Bill, 2011 proposes several amendments to the Mines Act, including significant enhancement to the monetary penalties and terms of imprisonment for violations.

### ***Oil and Gas Laws***

The MoPNG is the principal regulator of oil and natural gas exploration and production in India. The MoPNG established the Directorate General of Hydrocarbons in 1993 to promote the sound management of Indian petroleum and natural gas resources with due regard to the environmental, safety, technological and economic aspects of petroleum activities. The Directorate General of Hydrocarbons is responsible for, *inter alia*, ensuring correct reservoir management practices, reviewing and monitoring exploratory programs, the development plans of oil companies, and monitoring the production and the optimal utilization of gas fields.

The MoPNG oversees the Oil Industry Safety Directorate, which develops standards for safety, fire-fighting, training programs and information dissemination, and conducts periodic safety audits of all petroleum-handling facilities. It also oversees the Oil Industry Development Board, which provides financial and other assistance for the conductive development of the oil industry. The safety standards prescribed by the Oil Industry Safety Directorate, and the safety regulations prescribed by the Directorate General of Mines Safety in respect of onshore petroleum mining installations, must be complied with.

Oil and natural gas exploration activities are governed by The Oilfields (Regulation and Development) Act, 1948, as amended (“ORDA Act”). This legislation provides for the regulations of oilfields and for the development of mineral oil resources, including natural gas and petroleum. The ORDA Act empowers the GoI to frame rules on the granting of mining leases and petroleum exploration or prospecting licenses, the conservation and development of mineral oils, the production of oil, and the regulation of oilfields.

The Petroleum Exploration License and Petroleum Mining Lease under the Petroleum and Natural Gas Rules, 1959, as amended (“PNG Rules”) provide the framework for the granting of petroleum exploration licenses and petroleum mining leases. The PNG Rules prohibits the prospecting or exploitation of any oil or gas unless a license or lease has been granted under the PNG Rules. A

petroleum mining lease entitles the lessee to an exclusive right to extract oil and gas from the relevant contract area. Petroleum exploration licenses and petroleum mining leases are granted by the MoPNG for offshore areas and by the relevant state governments, with the prior approval of the GoI, for onshore areas.

The Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976, as amended regulates the exploration and exploitation of resources of the continental shelf and exclusive economic zone.

The Essential Commodities Act, 1955, as amended makes provisions controlling the production, supply and distribution of certain essential commodities, which include petroleum and petroleum products.

The Petroleum Act, 1934, as amended (“Petroleum Act”) provides that no person shall produce, refine, blend, store or transport petroleum except in accordance with the rules framed by the GoI under the Petroleum Act. The Petroleum Rules, 2002, as amended now regulate these activities.

The Petroleum and Natural Gas Regulatory Board Act, 2006, as amended provides for the establishment of the Petroleum and Natural Gas Regulatory Board. The board regulates the refining, processing, storage, transportation, distribution, marketing and sale of petroleum products and natural gas (excluding production of crude oil and natural gas).

The Petroleum and Minerals Pipelines (Acquisition of Right of User in Land) Act, 1962, as amended provides the framework governing the acquisition of right of user in land for laying pipelines for the transportation of petroleum and minerals and other matters connected therewith. This law is limited to the acquisition procedure, restrictions on use of land and compensation payable to the persons interested in the land.

The MoPNG through its notification no. O-32011/4/2013-ONG-I dated March 30, 2016 introduced a new exploration and licensing policy named Hydrocarbon Exploration and Licensing Policy (“HELP”). This is a fundamental change in the Indian oil and gas sector, which introduces a new contractual and fiscal model for the award of hydrocarbon acreages. Four main facets of HELP are: single license, open acreages, revenue sharing model and marketing and pricing freedom.

The MoPNG through its notification no. O-22013/27/2012-ONG-D-V(Vol-II) dated March 21, 2016 introduced the policy for marketing including pricing freedom for the gas to be produced from discoveries in deepwater, ultra-deepwater and high pressure temperature areas. This policy is applicable to all discoveries in deep water/ultra-deep water/high temperature-high pressure areas which are yet to commence commercial production as of January 1, 2016 and to all future discoveries in such areas. As per the policy the producers will be allowed marketing freedom including pricing freedom subject to a ceiling price on the basis of landed price of alternative fuels.

### ***Power Sector***

Under the Electricity Act, 2003, as amended (“Electricity Act”), transmission and distribution of, and trading in, electricity require licences from the appropriate Central or State Electricity Regulatory Commissions (respectively, “CERCs” and “SERCs”, and collectively, “ERCs”), unless exempted in accordance with the Electricity Act. CERC has jurisdiction over generating companies owned or controlled by the GoI or which have a composite scheme for generation and sale in more than one State. SERCs have jurisdiction over generating stations within State boundaries, except those under CERC’s jurisdiction. The respective ERC determines the tariff for supply of electricity from a generating company to a licensee, transmission, wheeling, and retail sale of electricity. The Electricity Act was amended in 2007 to exempt captive power generation plants from licencing requirements.

The Electricity Act allows generating companies open access to transmission lines. The provision of open access is subject to the availability of adequate transmission capacity as determined by the Central or State Transmission Utility. Under the Electricity Act, ERCs determine tariff for supply of electricity by a generating company (as well as for transmission, wheeling and retail sale of electricity).

The Electricity (Amendment) Bill 2014 seeks to segregate the distribution network business and the electricity supply business, and introduce multiple supply licensees in the market. The Bill introduces a supply licensee who will supply electricity to consumers. The distribution licensee will maintain the distribution network and enable the supply of electricity for the supply licensee.

### ***Environmental Laws***

Vedanta's business is subject to environmental laws and regulations. The applicability of these laws and regulations varies from operation to operation and depends on jurisdiction in which Vedanta operates. Vedanta's operations require environmental and other permits covering, amongst other things, water use and discharges, stream diversions, solid waste disposal and air and other emissions. Major environmental laws applicable to Vedanta's operations, as amended from, include the Environment (Protection) Act, 1986, Forest (Conservation) Act, 1980 of India as amended, and the Forest Conservation Rules, 2003, Hazardous Wastes (Management and Handling) Rules, 1989 of India, Water Act, Water (Prevention and Control of Pollution) Cess Act, 1977, Air Act, The Coal Mines (Nationalization) Act, 1973, or Coal Nationalization Act, Coking Coal Mines (Nationalization) Act, 1972, Coal Mines (Taking Over of Management) Act, 1973, Coking Coal Mines (Emergency Provision) Act, 1971, Coal Bearing Areas (Acquisition and Development) Act, 1957, Coal Mines (Conservation and Development) Act, 1974 and the New Coal Distribution Policy, 2007.

The Environmental Protection Act, 1986, the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 provide for the prevention, control and abatement of pollution. Pollution control boards have been set up in states in India to exercise the powers under these statutes to prevent and control pollution. Companies must obtain the clearance of state pollution control boards before emitting or discharging effluents into the environment.

In case the project value exceeds Rs. 1 billion for a new project or Rs. 500 million for the expansion of existing oil and gas exploration and production project, the project also requires the approval of the Ministry of Environment and Forest.

The Hazardous Waste (Management and Handling) Rules, 1989 was superseded by the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 which came into force on September 24, 2008. The 2008 Rules was also superseded by the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 ("HWMTM Rules 2016"). The HWMTM Rules 2016, as amended, encourages disposal of waste farther away from the source of generation. It promotes transboundary movement of hazardous wastes.

### ***Employment and Labor Laws***

Vedanta is subject to various labor, health and safety laws which govern the terms of employment of Vedanta's laborers at the mining and manufacturing facilities, their working conditions, the benefits available to them and the general relationship between the management and such laborers. These include the Industrial Disputes Act, 1947, Factories Act, 1948, Contract Labor (Regulation and Abolition) Act, 1970, Employee State Insurance Act, 1948, Payment of Wages Act, 1936, Minimum Wages Act, 1948, Workmen's Compensation Act, 1923, Payment of Gratuity Act, 1972, Payment of Bonus Act, 1965, and Employees' Provident Funds and Miscellaneous Provisions Act, 1952.



### ***Other Laws***

In addition to the above, Vedanta is required to comply with the provisions of the Companies Act, 2013, as amended, Companies Act, 1956, to the extent applicable, and rules framed thereunder and other applicable statutes imposed by the central or the state government and authorities for the day-to-day business and operations. Vedanta is also subject to various central and state tax laws.

Moreover, there are various rules and regulations which are framed and amended from time to time by the SEBI in order to regulate the functioning of the securities market, which we are required to comply with. Vedanta is also required to comply with the Foreign Exchange Management Act, 1999 and the rules and regulations made thereunder, which primarily governs foreign investment in India.

### ***Regulation of Foreign Investment***

Foreign investment in India is governed primarily by the provisions of the Foreign Exchange Management Act, 1999, as amended (FEMA) which relates to regulation primarily by the Reserve Bank of India (RBI) and the rules, regulations and notifications thereunder, and the policy prescribed by the Department of Industrial Policy and Promotion, Government of India, which is regulated by the Foreign Investment Promotion Board. The FEMA regulates transactions involving foreign exchange and provides that certain transactions cannot be carried out without the general or specific permission of the RBI.

Dividends are freely repatriable without any restrictions (net after Tax deduction at source or Dividend Distribution Tax, if any, as the case may be). The repatriation is governed by the provisions of the Foreign Exchange Management (Current Account Transactions) Rules, 2000, as amended from time to time.

Further, RBI has placed certain restrictions and conditions for the use of debt funds in India which are raised in the overseas market by overseas holding/group companies of Indian companies where such Indian companies account for sole/major operations of the group. Indian companies are also not allowed to issue any direct or indirect guarantee or offer any security in any form for borrowings by their overseas holding/group companies.