



## TESTED METTLE

VEDANTA ALUMINIUM'S PLANT AT JHARSUGUDA HAS ADOPTED WORLD-CLASS PRACTICES AND EMBELLISHED ITS PROCESSES WITH THE FINEST METHODOLOGIES. AND HOW

BY JAYASHREE KINI MENDES

1. The billet casting unit at the plant.

2. Billets being rolled out of the casting unit.

3. Vedanta has 1468 pots at its Plant I and II.

**THERE'S A SENSE OF EXHILARATION WHEN** you know that the business you are into can never go out of business. Few would find themselves in such a situation. Vedanta Aluminium is one such company. With the largest integrated aluminium smelter in the world at a single location (Jharsuguda) ex-China, Vedanta Aluminium is perhaps sitting on a gold mine considering the vast future prospects of its products.

The plant at Jharsuguda in Odisha is a fine example of what one can achieve if one only sets their mind to it. Vedanta Aluminium has put in a lot of thought to create an entire ecosystem around the smelter.

One of the advantages of aluminium is that it's a product that is green, light, sustainable, and durable and, going by predictions, is a perfect material for a future world. The high demand for this product will only get higher considering that it's used in all walks of life – soft drink cans to aerospace to space shuttles to buildings to railways, name it and there will be use of aluminium to be found. In short, it is a metal that will never go out of fashion. **Ajay Kapur, CEO, aluminium & power business, Vedanta Limited,** says, "This is the metal of the future. Consider our cities. Metros are being constructed under the ground and they largely use aluminium in their wagons and buildings that go skyward will need aluminium (and

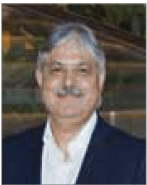
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PLANT VISIT VEDANTA ALUMINIUM & POWER



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"Globally, the production of aluminium is almost 70mtpa. Of that, 50% of the production is from China and India is at 4mtpa."  
— Ajay Kapur



"There are constant quests to seek out new customers – globally as well as in India – and we are backed by a strong technical team."  
— Alok Ranjan

4. A bird's eyeview view of the potlines.

5. The nocasting house occupies a large part of the plant.

6. The control room at the cast house monitors every final product.

7. The final billets produced at the plant.

8. An aerial view of the potlines.



## VEDANTA ALUMINIUM - IN SHORT

- The smelter and power complex at Jharsuguda is situated on ~3000 acres of land
- The plant has a capacity of 1.6 mtpa
- Two power plants have a combined capacity of 3615 MW to support operations at the plant
- Alumina comes from the company's alumina refinery at Lanjigarh
- It takes 14,000 units of power to produce one tonne of aluminium

also steel) to ensure they stand their ground. Globally, the production of aluminium is almost 70mtpa. Of that, 50% of the production is from China and India is at 4mtpa."

## AHEAD OF THE TIMES

The smelter and power complex at Jharsuguda is situated on ~3000 acres of land, which should speak volumes of the capacity and infrastructure. The mammoth 1.6 million tonne per annum (mtpa) smelting facility is supported by two power plants with a combined capacity of 3615 MW. **GG Pal, director, metal, Jharsuguda, Vedanta Limited**, says, "Aluminium production is power intensive which

makes captive power generation facilities a must. Coal to the plant is supplied by Coal India, primarily from the Mahanadi Coalfields. Our main raw material, alumina, comes partly from our alumina refinery in Lanjigarh which has a capacity of ~2mtpa. We also import alumina from global suppliers in Australia and other countries, and bauxite from New Guinea."

Few would be aware that it takes 14,000 units



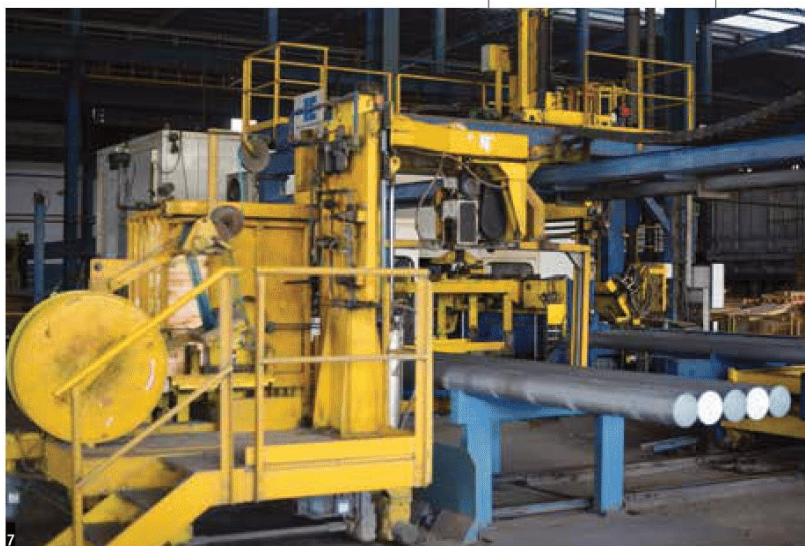
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of power to produce one tonne of aluminium. The company has been prudent to use its resources to internally produce some of the raw materials it needs. For instance, the carbon anodes used inside the smelter are manufactured within the company.

Sustainability plays a large role in its manufacturing process. The waste from the carbon anode is recycled and the officials at the plant ensure that it functions on zero-discharge, zero-waste. Surprisingly, such have been the in-depth research executed by Vedanta Aluminium that for a metal that requires large amounts of water, the company's specific water consumption is only ~0.4 cu.m. per tonne of aluminium production. Considering that the company is one of the largest miners of natural resources, it is careful to ensure that there is little or no environmental damage.

A digital 'war room' looks keenly at the overall health of the potlines so that it can pre-determine failure or breakdowns, if any. **Avijit Deb, chief digital officer, aluminium & power business, Vedanta Limited**, says, "Each and every aspect of the manufacturing process and machinery is monitored from here. We have left no stone unturned to ascertain that there is no cessation of continuous activity within the plant. The digital room has a seamless process of mapping each process with the relevant machinery so as to avoid loss of production."

The R&D lab overseen by **Helio Campbell Truci, head, R&D, aluminium & power business, Vedanta Limited**, and his team constantly monitor the end products picked up as samples from every lot. He says, "There is a science behind picking up samples and, so far, we have had positive feedback from our customers. The machinery here is state-of-the-art





"We have left no stone unturned to ascertain that there is no cessation of continuous activity within the plant."  
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"We also import alumina from global suppliers in Australia and other countries, and bauxite from New Guinea."  
— GG Pal



"There is a science behind picking up samples and, so far, we have had positive feedback from our customers."  
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9. The slabs are stored in the yard before being shipped out.

10. The yard uses machinery to ship the cast products to the warehouse.



and we have equipment here that allows us to analyse final goods and also the contents of the manufacturing process such as maintaining the chemistry of the pots so that there are no changes in the final goods at any given batch production."

#### EXCELLING IN WHAT THEY DO

At regular intervals, Vedanta Aluminium has been prudent to invest into the smelting line. Today, the Jharsuguda plant operates 608 pots at its Plant-I and 860 pots in Plant-II. It is in the process of ramping up operations to increase production in the near future to 2 mtpa.

Another set of operations that mark the process is where the liquid aluminium is taken to the casting yard to produce ingots, wire rods, billets, alloy ingots and cast bars. Besides this, it has the capacity to produce slab as well as T-ingot. "We have begun producing alloy hubs for passenger cars and are working with reputed vehicle manufacturers," says Kapur.

The company's cast houses are an eye-opener for any outsider. The hot metal (molten aluminium) produced in its smelters is sent to the three cast houses equipped with 30 world-class furnaces and casting technologies from USA and Europe to be developed into a range of products, based on market demand.

Today, the company caters to a wide range of international as well as domestic market segments like building & construction, automobiles, transportation, electrification, etc. One can imagine how far back India lags in its consumption of aluminium, which stands at 4mtpa as compared to China that consumes about 35mtpa.

Vedanta Aluminium deploys several technologies at the plant. However, for smelting it has adopted GAMI, which is the latest and more efficient, energy-saving and comes with emission-reducing control technology system for aluminium reduction cells.



Nothing is left to chance. The final products undergo rigorous checks and measures digitally to ensure customers get top-of-the-line products developed with global standards of quality, safety and sustainability.

Recently, GE and Vedanta Aluminium & Power business, signed an agreement to implement GE's Digital Smelter solutions at its smelter to increase its operational efficiency and productivity. This will be the first such deployment of digital twin technology at any aluminum smelter in India and is part of Vedanta's long-term digital transformation initiatives.

We next meet **Alok Ranjan, chief marketing officer, aluminium & power business, Vedanta Limited**, whose task is to determine that final goods finds its way into the market. There are constant quests to seek out new customers – globally as well as in India – and backed by a strong technical team, he is also responsible to offer feedback to the company to look at new products, which may be the need of the hour. New geographies aid in expansion of the company's products and since Vedanta Aluminium has already established its quality and meet global parameters, it's all in day's work for the company. **MT**