Moving Towards Zero Waste to Landfill in Integrated Aluminium Company

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Abstract

Hindalco Industries Limited, an integrated Aluminium and Copper producer, generates approximately 12 Mt of wastes per year. These are basically categorised as Bulk Wastes, Hazardous Wastes and Other Wastes. Some examples are: Bauxite Residue (also known as Red Mud), fly ash, spent pot lining, aluminium dross, vanadium sludge, used oil, plastic waste, municipal solid waste, electronic waste, spent resins, shot blasting dust, fluoride bags etc. We adopt 5 R +1 S (Reduce, Redesign, Recover, Rehabilitate, Recycle, and Store) principle towards management of wastes. Furthermore, Hindalco has targeted to achieve Zero Waste to Landfill (ZWTL) by 2050. Using both in-house and collaborative research with industry partners, educational institutes, expert organizations, we intend to develop alternate applications for sustainable use of these wastes. Currently, Hindalco's wastes are being used in the cement industry, construction work, road development, backfilling of mines etc. In financial year 2022, Hindalco could achieve 86 % utilization of waste as useful raw material for other applications. Further research work is in progress for developing new and innovative products and applications. With this approach, Hindalco is moving towards the set target of ZWTL.

Keywords: ZWTL - zero waste to landfill, Circular economy, Recycling, Bauxite residue, Fly ash.

1. Introduction

Hindalco Industries Limited is a metals flagship company of the Aditya Birla Group. We are the world's largest aluminium rolling and recycling company and a major copper player. We are also recognised as one of Asia's largest producers of primary aluminium. We maintain a presence throughout the manufacturing value chain from bauxite mining, alumina refining, coal mining, aluminium smelting to downstream rolling, extrusions, and foils. Driven by our purpose of building a greener, stronger, smarter world, we provide innovative solutions for a sustainable and prosperous planet. Our core focus as a company is to provide high-grade, environmentally friendly products across our business portfolio which is achieved through robust and significantly optimised manufacturing practices and capabilities. We focus on our ability to bring the best possible value to all our people and stakeholders.

Being cognisant of the impacts of climate change on businesses and the pressing need to transition to a lower-carbon economy and adapt to climate change, we are continuously evolving our understanding of the challenges around climate change and working on how we can integrate it in our strategic decision-making and business processes.

Our finished products include alumina, speciality alumina and hydrate, primary aluminium in the form of ingots, billets and wire rods, value-added products such as rolled products, extrusions and foils. Metallurgical alumina is used for our own captive needs. Chemical alumina and hydrates

are used in a range of industries including water treatment, fillers in cables and plastics, refractories and ceramics, and glass among others.

Hindalco has always strived for establishing highest level of governance in the organization. It plays a pivotal role in driving the climate change agenda across the organization. We have a robust multi-tier governance with Board Oversight on climate-related issues. The Apex Sustainability team, comprising the Executive committee members of Hindalco under the leadership of the Managing Director, guide and review the company's sustainability efforts on a monthly basis. Hindalco has a well-rounded approach to sustainability – encompassing a variety of areas like sustainable mining practices, energy conservation, recycling, environment-friendly utilization / disposal of industrial wastes, water conservation, safety practices, socio-economic development of the communities around the plant and empowerment of employees. Hindalco's approach is to set clear policy and institutional framework, systematically monitor the performance, encourage continuous improvements and innovative practices, and deepen the dialogue with all stakeholders. The Waste task force with proper Terms of Reference (TOR) is formulated since 2019-20 to drive our actions on the ground.

Hindalco is world's most sustainable aluminium company in the Dow Jones Sustainability Indices 2021 and is the only aluminium company in the prestigious DJSI World Index 2021. This is the 2nd consecutive year that Hindalco is at the top of the DJSI Indices having achieved a score of 73 percentage points against an industry average score of 30 [1].

Our initiatives include:

- Choosing the right technology for our greenfield projects to ensure energy efficiency and environmental protection.
- Enhancing material efficiency, process/equipment productivity backed by pollution prevention practices and adoption of cleaner technologies for brownfield projects.
- Waste Management System for systematic collection of scrap and safe storage/disposal and re-use of wastes.
- Water conservation, recycling, zero liquid discharge (ZLD), water positivity, rain water harvesting.
- Controlling emissions through deployment of cleaner technology and state-of-the-art pollution control equipment (PCE).
- Rehabilitation through backfilling and afforestation of mined areas; and rehabilitation of waste disposal sites by greening, e.g. legacy fly ash mound and bauxite residue dump.
- Promoting industrial recycling of waste like spent pot lining, fly ash, spent caustic, etc. through research, collaborations and advocacy.
- Enhancing ecosystems with respect to flora, fauna and habitat development, implementation of biodiversity conservation with scientific approach of Biodiversity management plan (BMP)- implementing the same.

Our environmental commitment (formulated in February 2021) is shown in Figure 1, below [2]:

7. Conclusion

With the abovementioned management approach, it is possible to achieve 100 % utilization of wastes generated from integrated aluminium operation coupled with the following:

- active support from industry partners
- collaborative research projects with expert institutes like IIT, NEERI, JNARDDC, IMMT, CSIR etc. in identifying newer application for the wastes
- technical support and approvals from statutory bodies.
- learning and replication from other countries [5]

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9. References

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