

## Framework to Drive Resource Efficiency and Circular Economy in Indian Aluminium Sector

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### Abstract

Aluminium is an extensively used metal that plays a vital role in India's industrial and economic development. The life cycles of aluminium products involve high energy inputs, intensive material consumption and environmental emissions. India has set ambitious targets for steering the sector into resource efficiency and a circular economy framework. A circular economy and resource efficiency's impact in the aluminium sector is based on the broad principles of tackling waste and pollution, ensuring products and materials are kept in use and maintaining natural systems. It extends beyond recyclability, focusing on keeping products as resources at the end of their lifecycle and giving a similar output as its linear counterpart with minimal ecological and environmental impact. Focus on four priority areas would substantially drive the sector into the circular economy and resource efficiency with reduced emissions. First is recycling aluminium scrap, which requires just 5 to 8 % of the energy needed to produce primary aluminium. Increased collection and recovery of post-consumer scrap can reduce the need for carbon-intensive primary aluminium. Second, zero-waste management in line with zero discharge to encourage the utilization of various wastes and improve sustainability in the Aluminium sector. The third is the decarbonization of electricity consumption which accounts for most of the industry's carbon footprint. The aluminium industry's power demand can be addressed by shifting to renewable energy sources and carbon capture, utilization and storage (CCUS) technologies. Finally, the decarbonization of direct emissions from the aluminium processing (accounting for 25 to 30 % of sectoral emissions).

India's annual aluminium production could reach five million tonnes by 2026-27, increasing around 25 % from current levels. Indian demand for primary aluminium is expected to remain strong due to electrification, urbanization, industrial corridors, smart city, mobility and infrastructure projects. Given this, the sector has to be committed to contributing to the achievement of resource efficiency, circular economy and reduced carbon emissions.

**Keywords:** Aluminium, Resource efficiency, Circular economy, Recycling, Zero-waste.