

Aluminium Industry at the Crossroads: Growth, Sustainability, and Innovation

Satish Pai

Managing Director,

Hindalco Industries Ltd, Mumbai, India

Corresponding author: Vilas.Tathavadkar@adityabirla.com

<https://doi.org/10.71659/icsoba2026-xxYYY>

Abstract

The aluminium industry stands at a pivotal point in its evolution, propelled by rising demand from electric vehicles, renewable energy infrastructure, sustainable construction, and advanced manufacturing sectors. At the same time, sustainability has become a strategic imperative, as primary aluminium production is highly energy-intensive and contributes nearly 2 % of global greenhouse gas emissions. In response, leading aluminium producers are accelerating investments in renewable energy-powered smelters, next-generation inert anode technology, carbon capture, utilization and storage (CCUS), and circular economy initiatives. These efforts are aimed at significantly reducing the industry's environmental footprint while enhancing long-term competitiveness and supporting the transition to a low-carbon economy. India, with its abundant bauxite and coal reserves and expanding domestic market, has become the 2nd largest producer of primary aluminium. Infrastructure development, electric mobility, and renewable energy expansion are accelerating aluminium consumption across key sectors. However, Indian industry is facing critical sustainability challenges from coal-dependent electricity, increasing global environmental regulations such as Carbon Border Adjustment Mechanism (CBAM), energy security concerns, etc. This has created need for innovations to enhance recycling and resource efficiency by the adoption of Industry 4.0 technologies to improve productivity and sustainability.

Hindalco's strength lies in its integrated operations, relentless focus on innovation, and deep commitment to sustainability. As one of India's leading aluminium producers, the company plays an important role in the nation's growth by supplying a wide range of aluminium products that support sectors such as infrastructure, transportation, packaging, and renewable energy.

Sustainability is not just a business priority for Hindalco; it is embedded in the way the Company operates and grows. This commitment has been recognized globally, with Hindalco being ranked among the world's most sustainable aluminium companies in the S&P Global Corporate Sustainability Assessment (CSA) for the sixth consecutive year.

Looking ahead, the demand for lightweight, recyclable, and sustainable materials is expected to increase significantly. To capture this opportunity, Hindalco and Novelis are investing around US\$10 billion in organic growth projects across their aluminium and copper businesses. These investments will help meet growing demand from transformative sectors such as electric mobility, renewable energy, packaging, and infrastructure, while creating long-term value through sustainable growth. This paper reviews the evolving global and Indian aluminium landscape by examining market trends, sustainability challenges, technological innovations, and policy developments shaping the sector.

Keywords: Sustainability, Renewable energy, Low-carbon economy, Recycling, Industry 4.0.