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CIRCULAR ECONOMY IN INDONESIA'S TIN MINE INDUSTRY

Circular economy (CE) has gained a lot of attention in recent years across several nations. The concept of CE is to an increasing extent considered a solution to a series of challenges such as waste generation and environmental impact of linear production, scarcity of resources, and sustaining economic benefits. In the mining industry, these concepts could relate to using recovered metals in the products for an extended period, to recycling waste streams, such as tailings and water, and to reducing the amount of final waste with advanced sorting. Bangka and Belitung Island in Indonesia produce over 90 percent of the country's tin which is the second world's biggest exporter of metal. Monazite, xenotime, ilmenite, zircon are obtained as the by-products of the tailings. The smelting process produces concentrated tin which no longer contains radioactivity and slag which is classified as a NORM. From previous studies, we have estimated the amount of slags and by-products from tin industry. The production of 10,000 tons tin per year generated 4,922 tons of slags, 2.656 tons of zircon, 10.469 of ilmenite, and 2.656 tons of monazite. The present cost of zircon ranges from US\$ 1,500 – 1,700 per ton, ilmenite US\$ 300-350 per ton, and monazite US\$ 1680-1900 per ton. This shows that the concept of CE can be applied in tin mine industry.

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