

## **Sustainability Furtherance of Ceylon Electricity Board Through Recycling of Aluminum Scrap to Aluminum Re-Draw Rod**

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Ceylon Electricity Board uses Aerial Bundled Conductors for replacing existing low voltage bare lines under maintenance work and for newly constructed schemes or new extensions. Aerial Bundle Conductors provide multiple benefits to the electricity distribution network by increasing the network effectiveness and reliability. When the low voltage power lines of bare Aluminum conductors are converted to Aerial Bundle Conductors, the Aluminum conductors are removed as scrap material and nearly 1000 MTon Aluminum scraps are being sold per year at a predetermined price without using it for value addition purposes. Aluminum is one of the most sustainable and efficient material. This metal does not degrade its technical properties due to the process of melting down to its molten form. Therefore, Aluminum can be recycled infinitely. This project involved the study and investigation of the technical and economic feasibility of recycling Aluminum scrap to Aluminum Re-Draw rod rather than manufacturing Re-Draw rods from virgin Aluminum which incurs high cost and contributes to the depletion of Aluminum, a precious metal. 85% scrap Aluminum and only 15% virgin Aluminum were mixed for this process. Testing and detailed analysis were done on chemical composition, electrical properties, mechanical properties and dimensional tolerance to find the technical feasibility of the scrap Aluminum recycling process. It was proven from the tests and analytical results that fabricating Aluminum Re-Draw rods from scrap Aluminum is technically feasible. As per the intermediate testing done for the molten scrap Aluminum, it was explored that the virgin percentage can further be reduced or avoided by adopting proper cleaning and dross removing techniques. From this recycling process of Ceylon Electricity Board, the country can save about US \$ 2.3 million (Rs 412 million) foreign exchange per year by converting 1000 MT of scrap Aluminum to Re-Draw Rods every year. According to the cost calculations, the economic benefit of the process of recycling will be more than 50%. Hence this process of recycling scrap Aluminum to Aluminum Re-Draw rod is technically and economically feasible.

*Keywords:* Aerial Bundle Conductors; Aluminium; Depletion; Feasibility; Recycling

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