Technical and Economic Feasibility of Recycling *Aluminum* Scrap to *Aluminum* Re-Draw Rod

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Maintaining the bear low voltage line is a major difficulty that Ceylon Electricity Board faces today since it is very sensitive to the natural and other impacts such as wayleaves, animal collisions and electricity thefts. At present, Aerial Bundled Conductors are used for replacing existing low voltage bear lines under maintenance/rehabilitation 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, reducing the distribution network failures/faults and losses, minimizing clearing of vegetation which protects environment especially in urban areas, protecting the distribution network from theft and illegal tapping. When the low voltage power lines of bear 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. This project involved the study and investigation of the technical and economic feasibility of recycling Aluminum scrap into Aluminum Re-Draw rod to manufacture low voltage Aerial Bundle Conductors from the recycled Aluminum scrap. Testing and detailed analysis were done on chemical composition, electrical properties, mechanical properties and dimensional tolerance to the find technical feasibility of the scrap Aluminum recycling process. Accordingly, with respect to all testing and analysis, fabricating Aluminum Re-Draw Rod from scrap Aluminum is technically feasible. Further, a pricing formula was generated and the total price was calculated for the Aluminum Re-Draw rod fabricated from recycled Aluminum scrap by studying, witnessing, measuring and analyzing every sub-process of the Aluminum recycling process namely Aluminum cleaning, Aluminum bailing, scrap ingot making and Re-Draw Rod making. 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 results, 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.

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