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## WEEE and recycling processes for the recovery of critical raw materials: A perspective on Germany

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Modern production of electronic devices results in increasing demand of resources and subsequent production of waste electrical and electronic equipment (WEEE). Efforts around the world are needed in order to deliver effective methodologies to manage an approximate WEEE production of 30 to 50 Million Tons per year and urgently increase global recycling rates of only 17%. The situation in Germany despite the country's leading role in recycling volumes as estimated to be a WEEE production per year exceeding 1,769 Kilotons. In average, WEEE amounts between 9kg/head to 21-27 Kg/head were produced in this country by 2012. Considering these amounts, this research provides a background on WEEE and related recycling processes. Emphasis is given on the recovery of Critical Raw Materials (CRM) as they are considered by the European Union to be of compelling economic importance and of high risk of supply deficit. The description of the most common and advanced recovery mechanisms have been explored to contribute to the understanding of the sciences behind WEEE recycling. A review of existent literature and actual developments is presented to construct a theoretical overview about Germany's direction in regards this matters. The main motivation for developing this project is to convey better practices among those interested in this field. By recreating a recycling model in which technological, legislative and sustainability concerns are interleaved, it is desired to stimulate reflections over the operational complexity of these practices, especially those linked to the recovery of CRM. The results of this paper can support university students and the public in general in further R&D of recycling methodologies and to raise questions in regards of this issue.

### Biography

Nicolas Sarmiento Sierra has completed two Bachelor degrees from the Universidad de San Buenaventura in Bogota, Colombia (Aeronautical Engineering) and Polytechnic West in Perth, Australia (Aviation Maintenance). Currently, he is a student of MSc in Mechanical Engineering in Kleve, Germany at Rhein Waal University of Applied Science. He is directing his efforts to further study the areas mentioned above and aims to be a participant of the transition to what is known today as a Circular Economy.

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