Mitigation Evaluation Potential of Environmental Impacts Associated with Leds Recycling

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Abstract

The growing demand for e-waste management studies has not found significant answers in the countries of South America, despite the increase in consumption of electrical and electronic equipment, in particular, for lighting services. This sector is responsible for the consumption of approximately 20% of the global electric energy and it is estimated that more than 15% of it already uses LED. It is evaluated that until 2030 the sector tends to be a great generator of electronic waste. It was studied the recycling routes of LED lighting products available to compare them with each other and with other destination processes, in order to identify potential opportunities to mitigate impacts associated with each one, in order to subsidize managers in their decisions. The LCA protocol was used to map the environmental impacts. We tried to use modeling with local databases, when available. The results point to significant differences in depression in the use of some materials (such as rare earths, germanium, gold and silver) and environmental impacts associated with the disposal of potentially toxic materials (such as arsenic, zinc, copper, nickel, lead, iron and silver). The results vary according to the route of separation and depending on the application niche of the product, since it involves different designs and use of different materials. It was concluded that the choice of route for recycling, compared to other destination processes, can mitigate environmental impacts, but can also generate design requirements for manufacturers of lighting products. These can make your products more environmentally sustainable.

Keywords: *LED recycling, impact mitigation potential, recycling route, recycling in lighting.*