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Life Cycle Assessment of cleaner electricity generation systems: an analysis of scientific production

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Abstract

The search for electricity cleaner production has become a research and development item in several countries. There are demands for investments, developments of new technologies and knowledge generation about the environmental performances of different sources of electricity generation. Thus, this work aims to perform a systematized theoretical analysis of scientific research on Life Cycle Assessment (LCA) of electric power generation systems. The systematized theoretical analysis was constructed using Methodi Ordinatio method. The criteria for theoretical analysis were: keywords ("LCA + Electric* Mix*", "LCA + Electric* Energy + Life Cycle Assessment + Energy Production"), author, year, country, university, periodic, JCR, number of citations and Methodi Ordinatio. After the application of the method 26 articles were selected for discussion. that the results show that there is a higher incidence of articles published in European countries. Among the main evaluation methods used are the ReCipe, CML, Impact 2002+, CED. Another highlight is that the studies show that wind energy has one of the lowest environmental impact indexes in its generation compared to other sources according to the articles addressed. In some countries, cleaner sources are promising due to their capacity to generate electricity through locations with high wind rates and high sunlight capture. In this way, the results can be used in public policies, development actions and incentives of different energy matrices and contribute to the scientific literature on LCA and electric power generation.

Keywords: *LCA, Electricity, Environmental performance, Energy matrix*