

# **Alternatives of municipal solid wastes to energy for sustainable development. The case of Barranquilla (Colombia)**

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## **Abstract**

Municipal solid remains an issue that needs to be addressed globally towards a more circular economy and lower environmental impacts. In Colombia, over 96% of municipal solid wastes are landfilled, with little recycling or revalorisation of wastes and several environmental implications. With the technological development of different waste-to-energy routes, the energy revalorisation of solid wastes is increasingly becoming an attractive business opportunity. The waste-to-energy potential of the Atlantic Department (Colombia) was estimated based on the characteristics and daily availability of municipal solid wastes for different technologic routes. The implementation of the technological routes discussed could replace from 1 to 49 % of the demand for energy carriers like natural gas, electricity, or gasoline. This energy potential could replace from 2 to 106% of the energy demanded by the power generation, transport, residential, industrial, and commercial sectors. Furthermore, these technology routes could reduce greenhouse gas emissions by 46 to 92% of the greenhouse gas emissions resulting from landfilling. These results stress the need to upgrade energy policies in the country and to introduce new incentives to overcome economic and other barriers precluding the widespread use of waste-to-energy technologies.

**KEYWORDS:** Municipal solid wastes, waste-to-energy, renewable energy