

**DEGRADATION OF SYNTHETIC ORGANIC DYES IN SOLUTION BY FERRATE – HYPOCHLORITE OR CALCIUM HYPOCHLORITE**

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**ABSTRACT**

The potential to produce electricity using landfill biogas in Bolivia was studied in this article. Three important locations (Santa Cruz, La Paz and Cochabamba) and their solid waste disposal characteristics were considered. LandGem first-order degradation model was used to quantify the biogas production from the landfill. Recommended values of  $k$  and  $L_0$  available in the open literature were used since in Bolivia there are few landfills and no specific data are available (humidity, nutrients, pH, temperature, etc.). An average of 55.2% of the total solid waste in Bolivia is organic waste that can be used in landfills. The results showed that Santa Cruz can produce more landfill biogas than La Paz and Cochabamba. Using the methane obtained from the landfill biogas in reciprocating combustion engines, it was found that Santa Cruz can produce more electricity (265 GWh) than La Paz (175 GWh) and Cochabamba (110.4 GWh). The current electricity price in Bolivia (35 USD/MWh) was used to evaluate the prefeasibility of the project, representing an average income of 281,061.0 USD/y for Santa Cruz and 161,000.0 USD/y for La Paz and Cochabamba, respectively. However, the economic analysis showed that IRR of 6.2% can be achieved for Santa Cruz and 7.9% for La Paz and Cochabamba, respectively, also higher payback periods were obtained (more than 9 years). La Paz and Cochabamba had the higher IRR and less payback period since only one reciprocating engine was chosen to cover the largest period of methane production while Santa Cruz used two. The economic indicators can be improved if international electricity prices are applied. The results presented in this article could provide valuable information to the solid waste management industry, policy makers and investors.

**Keywords:** Landfill Biogas, Solid Waste Management, Alternative Power Generation, Bolivia.

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