J Fundam Renewable Energy Appl 2018, Volume 8
DOI: 10.4172/2090-4541-C4-060

11th World Bioenergy Congress and Expo

July 02-04, 2018 | Berlin, Germany

Using of the ecological analysis to justify the environmental feasibility of biohydrogen Production from cassava wastewater biogas

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The use Bioenergy, in recent years, has become a good alternative to reduce the emission of polluting gases. Several Brazilian and foreign companies are doing studies related to waste management as an essential tool in the search for energy efficiency, taking into consideration, also, the ecological aspect. Brazil is one of the largest cassava producers in the world, the cassava sub-products are the food base of millions of Brazilians. The repertoire of results about the ecological impact from the production, by steam reforming, of biohydrogen from cassava wastewater biogas is very limited because, in general, this commodity is more common in underdeveloped countries. This hydrogen, produced from cassava wastewater, appears as an alternative fuel to fossil fuels since this is a low cost carbon source. This paper evaluates the environmental impact of biohydrogen production, bt steam reforming, from cassava wastewater biogas. The ecological efficiency methodology developed by Cardu and Baica was used as a benchmark in this study. The methodology mainly assesses the emissions of equivalent carbon dioxide (CO_2, SOx, CH4 and particulate matter). As a result some environmental parameters, such as equivalent carbon dioxide emissions, pollutant indicator and ecological efficiency are evaluated due to the fact that they are important to energy production. The average values of the environmental parameters among different biogas compositions (different concentrations of methane) was calculated, the average pollution indicator was 10.11 $kgCO_2e/kgH_2$ with an average ecological efficiency of 93.37%. As a conclusion, bioenergy production using biohydrogen from cassava wastewater treatment plant is a good option from the environmental feasibility point of view. This fact can be justified by the determination of environmental parameters and comparison of the environmental parameters of hydrogen production via steam reforming from different types of fuels (as shown in table 1).

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