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Waste and Biomass Valorization  
Volume 10, Issue 6, 1 June 2019, Pages 1529-1537

## Use of Municipal Solid Waste (MSW)-Derived Hydrogen in Ecuador: Potential Applications for Urban Transportation (Article)

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### Abstract

This paper performs an assessment of the potential energy-purposed H<sub>2</sub> production in Ecuador from municipal solid waste (MSW). Thermochemical and electrochemical paths are considered for MSW conversion. Ecuadorian provincial MSW distribution (2016 data) provides the base information for assessing and constructing maps of the theoretical H<sub>2</sub> production yield and its density per unit area. Additionally, the use of H<sub>2</sub> in fuel cell-propelled urban public transportation is proposed as an end-use consumer. Results show that it is possible to fulfil urban public transportation energy demand in 91% of the country with MSW-derived H<sub>2</sub>; in fact, the three provinces that together generate 57% of the available MSW (Guayas, Pichincha, and Azuay) could satisfy their public transportation diesel fuel demand with MSW-derived hydrogen. In the case of these three provinces, H<sub>2</sub> generation could replace by 2.57 times (on average) the local urban transportation diesel fuel demand. Finally, a possible scenario for a non-conventional H<sub>2</sub> production path is shown, which could also represent a suitable MSW final disposal alternative with benefits to urban mobility. © 2017, Springer Science+Business Media B.V., part of Springer Nature.

### SciVal Topic Prominence

Topic: Municipal solid waste | Waste management | Landfill gas

Prominence percentile: 99.647

### Author keywords

- H<sub>2</sub> production
- Municipal solid waste
- Sustainable transportation
- Thermochemical conversion

### Indexed keywords

- Engineering controlled terms:
- Diesel fuels
  - Fuel cells
  - Hydrogen production
  - Mass transportation
  - Potential energy
  - Urban transportation

- Engineering uncontrolled terms:
- Final disposals
  - H<sub>2</sub> production
  - Municipal solid waste (MSW)
  - Public transportation
  - Sustainable transportation
  - Thermochemical Conversion
  - Urban mobility
  - Urban public transportations

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ISSN: 18772641  
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Original language: English

DOI: 10.1007/s12649-017-0161-1  
Document Type: Article  
Publisher: Springer Netherlands

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