



Submissions

Flor Hernandez

Logout

[Overview](#) > [Your Submissions](#) > [Contribution Details](#)


## Contribution Details

### Contribution Details

Conference Track / Type of Submission: Oral, workshop, round table, panel or poster

### Environmental Evaluation of different wastewater treatment systems: Activated Sludge, Trickling filter, UASB and Stabilization ponds in Latin American and the Caribbean

# 410

Hernandez, Flor; Güereca, Leonor Patricia; Noyola, Adalberto

Organization(s): Universidad Nacional Autónoma de México, Mexico

Submitted by: Flor Hernandez (Universidad Nacional Autónoma de México, MX), ID: 1060

Presenting Author: Hernandez, Flor [fhernandezp@iingen.unam.mx](mailto:fhernandezp@iingen.unam.mx)

Topics: LCA "highlight"

© Copyright form signed by Flor Hernandez on 24th May 2013, 05:41:24am

### Abstract

Environmental evaluation of water treatment systems was developed for four technologies of wastewater treatment: activated sludge, upflow anaerobic sludge blanket reactors (UASB), stabilization ponds and trickling filter. This paper presents the first Life Cycle Assessment (LCA) of 9 wastewater treatment scenarios for the current situation in the Latin America and the Caribbean (LAC). This paper analyzes the environmental effect of each unit process considering three flows: small, medium and large, the former within a range from 0.1 to 25 L s<sup>-1</sup>, the medium from 25 to 250 L s<sup>-1</sup> and the latter from 250 to 2500 L s<sup>-1</sup>.

The input flow is based on data representative of the LAC, which were obtained by collecting data from six countries in the region: Brazil, Chile, Colombia, Guatemala, Mexico and the Dominican Republic (established according to the reported in Noyola et al. 2012). Similarly input and output of each unit process are based on real site data of 158 wastewater treatment plants within the region.

The Life cycle inventory (LCI) obtained considers more than 40 chemical compounds emitted to air, water and soil, also raw material and energy used.

As a result, in Global Warming Potential category, scenarios S2, S5 and S8 (stabilization ponds) have greater impacts (67%) due to CH<sub>4</sub> emissions from anaerobic lagoons (100%), likewise S1, S4 and S7 (activated sludge) have impacts about 35% in the aeration tank and 33% in the sand filter due to the emission of fossil CO<sub>2</sub> (91%) produced in electricity generation that feeds these processes.

The analysis of each substance involved in the impacts of each scenario permits to conclude that scenarios with electricity use have major impacts in the categories of acidification, abiotic resource reduction, human toxicity and stratospheric ozone depletion. Scenarios with anaerobic processes have major impacts in the category of Climate Change and formation of photochemical oxidants.

### Submitted File(s) for Final Version

1st file Contribution410\_a.pdf

2nd file Contribution410\_b.docx

### Session Details

#### LCA highlights

Time: Monday, 26/Aug/2013: 3:30pm - 5:00pm

Location: Brev B

Session Chair: Claudia Peña, Chilean Network of LCA / University of Concepción, Chile

[Overview](#) > [Your Submissions](#) > [Contribution Details](#)

Print View

Contact and Legal Notice · Contact Address: [lcm2013@chalmers.se](mailto:lcm2013@chalmers.se)  
 Conference: LCM 2013

Conference Software - ConfTool Pro 2.6.57  
 © 2001 - 2013 by H. Weinreich, Hamburg, Germany