



## A Case Study of Orlando (USA) and Curitiba (Brazil) about Sustainable Urban Mobility with biomethane

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### **Abstract:**

Increasing urbanization and climate change scenarios are one of the major challenges faced by the international community. Current patterns of urban mobility contribute greatly to the accumulation of greenhouse gases (GHG) in the atmosphere. This is mainly due to our dependence on urban transportation systems and modes that rely heavily on burning of fossil fuels. This concern has forced the administrative and energy sectors to search for alternative fuels that can meet growing urban energy demands, while minimizing greenhouse gas emissions. Unfortunately, alternative fuels technology remains expensive and outputs are often unable to satisfy a region's need. This article aims to analyze a more sustainable approach toward urban mobility through the use of alternative fuels, focusing specifically on the use of biomethane as a renewable fuel source used to power public transit. It is available in abundance worldwide, and exerts a very small carbon footprint, thus mitigating water, air and soil pollution. The use biomethane to fuel public transit in Curitiba (Brazil) and Orlando (United States) and its benefits are presented in this article, as well as the comparison of this fuel to other sources and its trade-offs, through an empirical research. With the support of the Urban Agency of Curitiba (URBS) and MetroPlan Orlando, this study identified the biomethane potential for both cities, using landfill waste, and the impacts of CO<sub>2</sub> emission reduction to the atmosphere, proposing a more sustainable source of energy for public transportation. It is concluded that, if compared to diesel, biomethane has a similar yield, emits 85% less CO<sub>2</sub> to the atmosphere and avoid other pollutant emissions in its production chain.

### **Biography:**

Dr. Lofhagen has completed her PhD from Pontifical Catholic University of Paraná (Brazil), in partnership with the University of Arizona (USA) and Postdoctoral Studies from Pontifical Catholic University of Paraná, in partnership with the University of Central Florida (USA). She is professor and has published more than 20 papers in reputed journals and has been serving as an editorial board member in international journals and events.



### **Recent Publications:**

1. United Nations. Department of Economic and Social Affairs, Population Division (UNDESA). World Population Prospects: The 2015 Revision, Key Findings and Advance Tables; Working Paper No. ESA/P/WP.241; United Nations: New York, NY, USA, 2015.
2. Pasqual, J.C.; Bollmann, H.A.; Scott, C.A. Assessment of Collective Production of Biomethane from Livestock Wastes for Urban Transportation Mobility in Brazil and the United States, *Journal Energies*, v. 11, p. 01-19, April 2018. DOI: 10.3390/en11040997. ISSN: 1996-1073.
3. Senguttuvel, Ferrer, P.; Cambra-López, M.; Cerisuelo, A.; Peñaranda, D.; Moset, V. The use of agricultural substrates to improve methane yield in anaerobic co-digestion with pig slurry: Effect of substrate type and inclusion level. *Waste Management*. 2014, 34, 196-203.
4. European Union. Well-to-Wheels Report Version 4.a. 2014. Available online: [http://iet.jrc.ec.europa.eu/about-jec/sites/iet.jrc.ec.europa.eu/about-jec/files/documents/wtw\\_report\\_v4a\\_march\\_2014\\_final.pdf](http://iet.jrc.ec.europa.eu/about-jec/sites/iet.jrc.ec.europa.eu/about-jec/files/documents/wtw_report_v4a_march_2014_final.pdf) (accessed on 2nd April 2019).
5. Biomethane from Livestock Wastes for Urban Transportation Mobility in Brazil and the United States, *Journal Energies*, v. 11, p. 01-19, April 2018. DOI: 10.3390/en11040997. ISSN: 1996-1073.

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