



# Academic<sup>th</sup>

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“CLEANER PRODUCTION TOWARDS A SUSTAINABLE TRANSITION”

## **Ambiental Valorization and Energy Generation with System Subproduct of Urban Solid Waste for Pirolysis**

FRIMAIO, G.<sup>a\*</sup>, FRIMAIO, C. A.<sup>b</sup>

*a. Federal Institute of Education, Science and Technology of the Acre*

*b. Universidade Federal do ABC - UFABC*

*\*Corresponding author, gfrimaio@gmail.com*

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### **Abstract**

The biosphere's capacity to absorb the waste generated by society has been long overcharged. Every year it is generated around 1.8 billion tons of urban solid waste (USW) in the world. Brazil produces 7.5 million tons and disposes 58.3% in landfills, and the rest is deposited in controlled landfills and open dumpsites. The appropriate USW management problem has showed to be a challenge, as factors such as quantity, volume, variety and complexity of waste entail risks for human health and the environment. Regulations implanted in Brazil in 2010 encourage the adoption of new alternatives for waste treatment and the development of clean technologies as a way to minimize environmental impacts, as well as technologies that aim to the urban solid waste's energy recovery. In this sense, this study uses the emergy synthesis to evaluate a pioneer USW treatment system in Brazil – the Natureza Limpa Project – installed in the municipality of Unaí in Minas Gerais state, where the slow pyrolysis treatment for urban solid waste is applied. The indicators justify that the system is capable of performing gains in joules of energy (J) and emergy (sej) and presents great potential not only for waste treatment in Brazil, but also as a promising energy source, which is capable to assist on the energy demand by means of the exceeding production of 2.3 tons of charred urban waste, which is capable of producing  $3.25 \times 10^3$  joules of energy per gram of treated waste.

**Keywords:** *Emergy, USW treatment, pyrolysis, Natureza Limpa Project*

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