



# 10<sup>th</sup> INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

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## Global Efficiency of the Brazilian Soybean Transportation for Exportation: Road Versus Railroad Systems

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### Abstract

The efficient flow of Brazilian agricultural and industrial production to the exporting ports is considered as fundamental to guarantee quality and competitiveness to Brazilian products. Currently, the road system comprises 61% of the Brazilian transport matrix, followed by rail 21% and waterway 18%. Strategic plans by the government point to subsidizing the growth of the railway modality to reach 35% of the transport matrix, but generally these decisions are based exclusively on economic indicators. In this sense, this work aims to evaluate the energy (written with "m") global efficiency of the road and rail modes in Brazil. Due to its importance in the Brazilian gross domestic product, the soybean commodity is considered as a case study (year 2014/2015), and the boundaries of the evaluated system includes its production at Mato Grosso State to the Port of Santos city. Results indicate an energy demand for the road system of 6.25E5 sej/ton.km, while the rail system demands 73.9E5 sej/ton.km. These values represent an energy global efficiency of approximately 12 times higher for the road system, being, therefore, the modal that should be promoted from an energy perspective. Anyhow, it is recognized the need in considering other aspects as economic, social, logistics, etc., to subsidize a better informed decision.

**Keywords:** *Energy accounting; Santos port; Soybean; Road transport; Railroad transport.*