

Circular Economy in Brazil

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https://doi.org/10.1007/978-981-16-0913-8_15.

ABSTRACT

Despite the importance of its natural environment and of its agribusiness sector, Brazil is a largely urbanised country, but unfortunately with significant inequalities. In several cities, mainly in the North (N) and Northeast (NE) administrative regions, there are the shantytowns (favelas), lacking basic sanitation, differently from Southeast (SE), the most industrialised region in the country. In this context, Circular Economy can contribute significantly to improve basic sanitation in the country, with the sustainable use of the residues for different purposes. In fact, Circular Economy in Brazil is still in its early stages, and is more developed in the bioenergy and bioeconomy sectors (Circular Bioeconomy). This is mainly due to the long-term country's experience in bioenergy, with the Proalcool Program, which has started in 1975, and nowadays is the second largest biofuels program worldwide, only behind the USA. Other bioenergy and biofuels programs in Brazil include biodiesel and biogas programs with a significant development on the energy conversion from biomass residues, including sugarcane bagasse, wood residues, rice husks, and others. Such residues are used for not only thermal and electricity generation but also for pellets and second-generation ethanol production. Additionally, the energy conversion of other residues from urban and rural areas focus on electricity generation and biomethane production. There are also other uses of biomass residues, such as fertigation (fertilisation and irrigation with vinasse) of sugarcane crops and animal feed; however, other uses with higher added value are still in its early stages. Nowadays, in Brazil, there is an important environmental and social legislation, being applied with the corresponding enforcement, which addresses recycling, reverse logistic, and energy conversion of urban residues. Considering the importance of Circular Economy for a sustainable use of waste, this chapter presents an overview of the Circular Economy in Brazil, focusing also in Circular Bioeconomy. It includes recent detailed data about the existing legislation and enforcement, with specific information about the more important case studies related to the use of waste for energy conversion. Special emphasis was performed for different sectors, such as vehicles, electronics, health services, construction and demolition, and plastic. In addition, the chapter presents the recent policies on municipal solid waste and sanitation, as well as the recent RenovaBio Program for bioenergy, just started in the biofuels sector. The existing challenges are presented and perspectives for the different sectors involved are discussed. A special last section discusses the impacts of the COVID pandemic on such sectors in 2020.

Keywords

Bioeconomy; Bioenergy; Brazil; Circular Economy ; Waste