Impact of the regionalized agricultural profile of soybean in the decarbonization credits emissions of biodiesel in the RenovaBio policy

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Abstract

In 2017, the Brazilian government enacted Law 13,576, known as the National Biofuels Policy (RenovaBio), as part of the National Energy Policy and as a contribution to fulfilling the commitments established by Brazil under the Paris Agreement in 2015. The policy aims to reduce greenhouse gas (GHG) emissions in the transportation sector. Biofuel producers that distinguish themselves for their low carbon footprint obtain decarbonization credits (CBIO), which are traded on the stock market. One CBIO is equal to 1 ton of CO_{2eq} avoided, and the average value in 2023 was US$23 (R$113) per 1 CBIO. To participate in RenovaBio, biofuel producers must certify their production based on RenovaCalc, which was developed based on Life Cycle Assessment (LCA), considering the GHG emissions during the biofuel production life cycle. The carbon intensity for the agricultural phase is calculated based on input consumption. RenovaCalc accepts two types of agricultural data: primary data (must be verifiable) and penalized typical data, which are pre-filled based on an average of soybean production in Brazil. This study updated the typical agricultural soybean profile in RenovaCalc to create profiles for each Brazilian state. It compared the carbon footprint of soybean production at the state level to the national level, evaluating the impact on CBIO production for the selected states, considering the typical agricultural profile. The data used for the simulations were obtained from the ANP website. Using the regionalized data, an average increase in CBIO amount of 7.8% was observed for the states evaluated, when compared to the national typical profile. The highest increase in the CBIO amount was observed for the State of Minas Gerais (10.6%), and the lowest for the States of Mato Grosso, Pará, and Rondônia (6.3%), using the regionalized data.

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