

A Bioeconomy maturity assessment for the agrifood value chain - A step towards a bio-circular food system

¹Bruno Magalhães, ²Rui Dias, ¹Marco Estrela, ¹Juan Henriques and ³Alexandre Carvalho

¹*Low Carbon & Resource Efficiency, R&Di, Instituto de Soldadura e Qualidade, Av. Prof. Dr. Cavaco Silva, 258, Taguspark, 2740-120 Oeiras, Portugal*

²*Low Carbon & Resource Efficiency, R&Di, Instituto de Soldadura e Qualidade, Rua do Mirante, 258, 4415-491 Grijó, Portugal*

³*Intelligent & Digital Systems, R&Di, Instituto de Soldadura e Qualidade, Rua do Mirante, 258, 4415-491 Grijó, Portugal*

Abstract

The world population growth and the rising incomes of individuals is increasing the demand for food and agricultural products and creating extreme pressure on natural resources. In this sense, it is necessary to mitigate problems related to intensive crop and livestock farming or overfishing and to act on the whole food systems to move towards a circular bioeconomy. There is a considerable room for improvement in our food production and consumption patterns, reducing food waste that ends up in landfills and increasing food production in a sustainable way. The transition to a sustainable and circular bioeconomy is crucial for better food production, better nutrition and livelihoods and a better environment with sustainable food waste management. This work proposes a bioeconomy maturity assessment, with the main objective of supporting the agrifood actors to understand their position and to point the direction towards a circular bioeconomy in a clear and intuitive way. The maturity assessment for the Bioeconomy was structured in two main developments, a set of variables and a methodology to extract quantitative and visual outcomes. To identify the variables, seven pillars for bioeconomy were defined with the main contributions focused on the indicators defined by FAO in the "Indicators to monitor and evaluate the sustainability of bioeconomy" and guidelines expressed by the European Commission in the "Updated Bioeconomy Strategy 2018". From the defined seven pillars, namely: Bioeconomy; Circular economy; Environmental; Social; Economic; Governance; and Digitalization, 17 sub-themes were identified from which variables were materialized in the form of a group of 17 questions. The methodology for the assessment started with the attribution of 5 predetermined answers to each question with the allocation of a value from 0 and 1 (0, 0.25, 0.5, 0.75, 1). According to the given answers, an equitable weighting procedure was applied among the seven pillars to find the aggregated global numeric value between 0 and 1, resulting in the bioeconomy maturity index. The assessment's final output compiles numeric and

visual results in the form of a radar and a bar chart, for an easier understanding of the results and to support the monitoring and improvement of the process towards a bio-circular food system. The presented methodology is currently being digitalized and it is expected to be tested and validated within industrial project partners. Preliminary results show the high applicability of the developed methodology for the establishment of a baseline scenario for the companies bioeconomy maturity.

Keywords: Circular bioeconomy, agrifood-systems, maturity assessment

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