

Supportive Regulations and Standards to Encourage a Level Playing Field for the Bio-based Economy

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ABSTRACT

A favourable regulatory and standardization framework is a prerequisite for establishing a cutting-edge bio-based economy in Europe. This article presents an overview of existing regulatory and standardization barriers that are hampering the market uptake of bio-based products. Among others, they include: i) the lack of a level playing field vis-à-vis biofuels and fossil-based products; ii) the lack of generally accepted end-of-life routes for bio-based products; and iii) the existence of standards designed for fossil-based materials that do not match market practises. Based on the results of a 2-round Delphi survey, proposals are formed to overcome the identified barriers. These solutions are thereafter verified by stakeholders through additional interviews and a workshop. Finally, recommendations were drafted to update the current regulatory and standardization framework. More specifically, the adoption of relevant principles for the cascading use of biomass, the use of alternative innovative feedstock (e.g. waste) and the update of existing standards (e.g. compostability) are proposed.

KEYWORDS

Bio-Based Economy, Cascading Principles, Compostability, Delphi Survey, Level Playing Field, Regulatory Framework, Standards, Waste as Feedstock

INTRODUCTION

Improved and innovative ways of producing and consuming food, products and materials are needed for decoupling economic growth from resource depletion and environmental impact (European Commission, 2018). As stated in the Strategic Innovation and Research Agenda (BBI JU, 2017), a sustainable bio-based economy in Europe could provide environmental, social and economic benefits, and therefore contribute towards achieving a carbon-neutral future consistent with the Paris Agreement.

A supportive regulatory and standardization framework is a prerequisite for establishing such a sustainable and efficient bio-based economy in Europe. Regulation should enable rather than impede innovation for unlocking the potential of the bio-based economy, and should ensure a level playing field for competition between bio-based and fossil-based industries.

This paper identifies existing regulatory and standardization gaps and bottlenecks affecting bio-based industries; it is based on in-depth interviews with selected value chain representatives, followed by a 2-round Delphi survey. This survey focused on the identification of barriers hampering the market uptake of bio-based products, as well as potential innovations (drivers of change) that are expected to play an important role in scaling up the industry. The results of the 2-round Delphi survey provided the basis for the formulation of specific recommendations for updating existing standards

DOI: 10.4018/IJSR.2019010104

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and regulations, and for the development of new regulations to fill important gaps, in particular in the identified fields of innovation.

The paper studies the importance of different elements of a supportive regulatory framework for the bio-based economy that are needed for establishing a level playing field for bio-based products. Regulatory and standardization related suggestions for enhancing principles of cascading use of biomass, and for enhancing the use of waste as a feedstock, are elaborated. In addition, solutions for existing gaps in standards are identified and proposed.

The paper is organized as follows: first, the proposed methodology is explained, followed by a description of identified existing barriers. Thereafter, the results on the required elements for a supportive regulatory framework are illustrated, and finally, the conclusions and recommendations of this study are presented.

LITERATURE REVIEW, RESEARCH OBJECTIVES AND METHODOLOGY

Systematic foresight investigations with a focus on technologies, regulations and standards allow better decision-making towards the enabling of a bio-based economy (Ladu and Quitzow, 2017). It is indeed a challenge to establish a flexible regulatory framework that can adapt to the pace of change of innovations and new technologies. Foresight investigations can be defined as a structured dialogue among stakeholders on possible future developments (Giaoutzi and Sapio, 2013). It represents a relevant policy instrument and decision-making tool based on the following features: anticipation, participation, networking, vision and action (Vecchiato and Roveda, 2014). Blind (2008) proposed three methodologies for conducting regulatory foresight:

- i) A first approach that uses science and technology indicators for identifying possible fields that may cause challenges for the regulatory framework.
- ii) A second approach based on surveys that enable regulatory bodies to identify future needs for regulations.
- iii) A Delphi methodology involving multiple survey rounds.

For this paper, we adopted a combined methodology for conducting regulatory foresight, including preliminary expert interviews (see Ladu and Clavell, 2018) and a 2-round Delphi exercise (see Ladu and Clavell, 2019). The Delphi method is based on structured surveys and makes use of information obtained from the experience and knowledge of the participants (JRC, 2015). It aims to synthesize the collective expertise of the respondents (Linstone and Turoff, 2002), and includes two or more rounds to validate and refine the results of initial communications with the participants. The formalization of the methodology, the amount of data, the number of experts involved, and the fact that diverging opinions are partially hidden behind the main converging one, make it a popular and credible approach for policy makers (JRC, 2015).

By means of preliminary interviews, experts' opinions were collected with the objective of identifying existing market barriers that are currently hampering the market uptake of bio-based products, and anticipating upcoming innovations that would have a positive impact in the further development of the sector. Special attention was paid to existing regulatory, standardization and investment barriers, which could delay these new developments, and which should be addressed and possibly removed in order to support further deployment of the bio-based economy. Overall, 20 key sector experts were interviewed, including 10 experts from industry and 10 experts from academia.

Based on these results, a 2-round Delphi study was designed and conducted to identify required updates of the regulatory and standardization framework for supporting a full deployment of innovation potentials and for unlocking investments in the bio-based economy.

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