BIO CIRCULAR CITIES

Exploring the circular bioeconomy potential in cities

Regulatory gap and opportunity analysis for a circular bioeconomy

Summary

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Published in February 2023

This project has received funding from the Bio-based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 101023516. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the Bio-based Industries Consortium.

Approach

One of the objectives of the Biocircularcities (BCC) project is to provide policy recommendations for implementing a circular bioeconomy in the three pilot territories: Pazardzhik Province (BG), the Metropolitan City of Naples (IT) and the Metropolitan Area of Barcelona (ES). This work spans three phases:

- The first phase aims to provide an overview of the current regulatory framework and best practices in the field of circular bioeconomy and biowaste management at European, national, regional and local level in the three pilot areas;
- The second phase analyses in depth selected documents of the regulatory framework and identifies drivers and barriers for the implementation of a circular bioeconomy;
- The last part formulates policy recommendations that could help to overcome the identified gaps or regulatory deficiencies that hinder the collection of biowaste as a feedstock and the valorisation of biowaste at local level.

The report "Regulatory gap and opportunity analysis for a circular bioeconomy", available on the Biocircularcities website, aims to identify the legal/administrative, technical, economic, environmental, and social drivers and barriers that favour or hinder the transition to a more biocircular system for biowaste management. More sustainable management of biowaste requires legal measures at EU level and the individual target countries to improve the quantity and quality of source-separated biowaste so that it can be used as feedstock for bio-based products, as well as the successful market introduction of bio-based alternatives compared to fossil-based solutions.

For the analysis of legal opportunities and gaps in the policy framework, 23 documents on circular bioeconomy at EU level and 49 at national, regional, and local level for the Pazardzhik Province, the Metropolitan City of Naples and the Metropolitan Area of Barcelona were examined. Key passages of legislation were selected and analysed in depth to identify relevant drivers and barriers that promote or hinder the implementation of new biocircular value chains.

Moreover, with the support of local stakeholders and international reviewers, potential opportunities and existing shortcomings that enable or limit biocircular products/processes at each specific stage of the selected local biobased value chains were identified. The involvement of numerous stakeholders in Living Laboratories and Peer Review Sessions allowed for understanding their approaches and interests and clarifying what they see as opportunities and shortcomings in the current regulatory framework for circular bioeconomy and potential recommendations for the adoption of biobased solutions. The collective knowledge built in the participatory processes ensures that the decisions taken by the project partners are in line with local priorities and existing international practices.

The results of the report are aligned with the literature review on circular bioeconomy carried out by the Biocircularcities partners and will support the formulation of policy recommendations to overcome the barriers for the implementation of circular bioeconomy in the selected pilot areas.

Support to biorefineries at European level

At the European level, support is mainly given to biorefineries that – according to the "cascading use of biomass principle" – process secondary raw materials into a range of marketable bio-based products, including biochemicals, bioplastics, (novel) food and feed, and bioenergy. This approach also applies to the selected streams of the BCC project, i.e., forestry residues, organic waste from the agro-industrial sector and municipal biowaste for the pilot regions Pazardzhik Province, the Metropolitan City of Naples and the Metropolitan Area of Barcelona respectively.

Key drivers

In the discussion of the results, the identified legal drivers and barriers to circular bioeconomy implementation were structured according to the stages of biowaste management, i.e., biowaste prevention, separate collection and biowaste valorisation into bio-based products relevant to the three project pilots.

Among the most important **drivers** grouped per category were:

- **Legal/Administrative:** Strong EU policies with binding targets for Member States on municipal solid waste (incl. biowaste) include limiting landfilling, preparing for re-use and recycling targets, and introducing mandatory separate collection systems for biowaste. Equally important are legal incentives for new bio-based products.
- **Technical:** Door-to-door collection and smart bin collection systems to improve the quality and quantity of municipal biowaste in order to use biowaste as feedstock for bio-based products; best available techniques (BAT) implementation; construction of decentralised valorisation plants (e.g., micro-scale anaerobic digestion or community composting); and conversion of MBT plants treating residual waste into composting or anaerobic digestion plants for source separated biowaste.
- **Economic:** Taxes and bans on landfilling and incineration; reduction of waste charges/fees and pay-as-you-throw (PAYT) schemes to encourage separate collection of biowaste; specific and differentiated waste fees covering all waste management costs; taxes on fossil fuels to allow fair competition with bio-based products; EU funding for using BAT; and sustainable public procurement of biobased products.
- **Environmental:** (Food) waste prevention measures; biowaste valorisation schemes instead of landfilling and incineration; decoupling products from fossil resources; using biowaste instead of primary biomass.

- **Social:** Communication campaigns to raise social awareness on the positive effects of the CBE in relation to food waste prevention, biowaste separate collection and bio-based products.
- **Stakeholder Involvement:** Involve stakeholders with different knowledge and interests to facilitate exchange and cooperation and find sustainable CBE solutions tailored to the local context.

Key barriers

Among the most important **barriers** grouped per category were:

- **Legal/Administrative:** Lack of binding targets and consequences for non-compliance with targets and measures; lack of a clear definition between "end of waste" and "by-products"; lengthy and cumbersome authorisation procedures.
- **Economic:** Too high investments for the implementation of innovative infrastructures and lack of planning security for long-term investments; large disparity between the current high costs for collecting and valorising biowaste compared to the revenues from the sale of bio-based products (unstable market demand).
- **Technical:** Lengthy and cumbersome permits for new biorefineries and organic waste treatment plants; lack of biowaste collection and treatment infrastructure; limited implementation of BAT and feedstock availability.
- **Environment/Health:** Lack of comprehensive environmental and health risk analyses to assess the performance of innovative biowaste collection systems and recovery technologies for the use of biowaste as feedstock for the production of new bio-based products.
- **Social:** Lack of knowledge and/or will for (food) waste prevention and separate collection; reluctance of using products made from biowaste.
- **Stakeholder Involvement:** Lack of best-practice exchange.

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