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Boosting the adoption of Bio-Based Technologies

# National results from the analysis on "High-level study of regional dynamics" – Czech Republic

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# Article information

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| **Title** | National results from the analysis on “High-level study of regional dynamics”– Czech Republic |
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| **Brief summary** | This article provides an extensive exploration of the bioeconomy status and agricultural practices in the Czech Republic with a focus on the Czech Highlands and South Moravia, from the trends in the different sectors and the economic indicators, to the research and funding opportunities and the challenges or opportunities of the bioeconomy sector in the regions. |
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# National results from the analysis on "High-level study of regional dynamics"– Czech Republic

The bioeconomy sector and relevant activities are heavily influenced by the conditional characteristics of each country, where the existence and effectiveness of any initiatives are dictated by the political, social, industrial, and technological situation of the country in question. In the Czech Republic, the complex regional dynamics pose both as a catalyst and a hindrance to the bio- based advancement process.

The Czech Republic is a landlocked country in Central Europe, bordered by Austria, Germany, Poland, and Slovakia, with its agricultural and forestry sectors being shaped by the climate and topography of the region. The central and sparsely populated Czech Highlands are characterized by rolling hills and a cool, moist climate suitable for dairy farming, fodder crops, and forestry while, in contrast, South Moravia enjoys a warmer and drier climate, fostering viticulture and high-value crops such as sunflowers and vegetables. [4,6]

The Czech Republic's agricultural land spans 3.5 million hectares, predominantly arable. In 2023, agricultural production experienced mixed trends: cereal harvests declined slightly, while oilseeds, vegetables, and hops saw increases. The Highlands contributed 7.5% to the nation's agricultural output, and South Moravia contributed 11.6%.

The integral to the economy livestock sector focuses on cattle and pigs, however poultry is the prevalent species of livestock in the country. Following poultry, both the Czech Highlands' and South Moravia's most abundant livestock species are pigs, followed by cattle. Organic farming occupies 13.7% of the agricultural land. Forestry, heavily concentrated in coniferous species like spruce, is a vital sector in the Czech Republic with state forests accounting for 54% of the total forest area, where significant wood harvesting and reforestation efforts aimed at mitigating climate impacts. [4]

The Czech Republic is advancing biomass valorisation across agricultural, livestock, forestry and agro-industrial sectors:

1. Agricultural Biomass: The primary use is as feed or biofuel, with limited utilization in combustion and industrial applications.[6]
2. Livestock biomass: The yearly meat production is relatively steady in most species of livestock and recently the utilisation of livestock by-products like manure has been gaining popularity in farming practices. [4]
3. Forestry Biomass: Stem wood and forestry residues are underutilized due to processing limitations., while efforts are being made to focus on enhancing efficiency and diversifying applications, such as pellet production and bioplastics.[6]
4. Agro-industrial Biomass: By-products generated by food processing that are increasingly integrated into bio-based industries' processes.[6]

The country faces logistical challenges in biomass transport and storage, underscoring the need for improved infrastructure and cohesive policy frameworks. Clear borders of responsibilities between the actors and a cohesive approach in management and expectations are key for the survival, advancement, promotion, and evolution of biomass valorisation in the Czech Republic [6].

The Czech Republic is noting significant advancements in bioeconomy-related innovations, such as in:

1. Biotechnology: The developments include the fields of nanotechnology, human healthcare, and bioplastics. [3]
2. Bio-based Textiles: A number of opportunities exist in technical textiles, utilising agricultural and forestry by-products, as well as biological textile waste. [3]
3. Furniture and Packaging: The focus is on the creative uses of wood and other biomaterials, in alignment with the EU sustainability goals.[3]

A robust network of research institutes and SMEs fosters innovation in biomass valorisation. The Fodder Research Institute leads national and international projects, emphasizing sustainable agricultural practices and biofuel development. Collaborative initiatives, such as the Association of Research Organisations, integrate private and public sectors to advance bioeconomy objectives. [1, 3]

South Moravia's economy, dominated by agriculture and viticulture, contributes €33.6 billion to the national GDP, while the Czech Highlands' smaller but significant contribution is €9.8 billion. Employment in bioeconomy sectors is declining but remains a key focus for regional development. [2]

While the Czech Republic lacks a dedicated bioeconomy regulatory framework, its policies align with EU directives. While funding opportunities through national and European programs, such as Horizon Europe and LIFE, support research and operational projects however, the implementation of Bio-Based Technologies remains limited, highlighting the need for strategic investments. [2, 7]

A review of the EIP-AGRI project database from the EU CAP network in Europe reveals that only eight Operational Groups were funded between 2015 and 2023 in the Czech Republic. However, only one of these was relevant to BBTs and was implemented in the South Moravia region. The total budget for this project was €192,007 [5]. In general, Bio Based Technology research projects are mostly focused on the utilisation of crop residues and perennial plants, with research on designer crops for optimal biomass content coming at a close second ibn frequency. Thus, the research results are mostly utilised by farmers, followed by foresters, processors, and retailers. [8]

Barriers such as limited biomass processing capabilities, logistical inefficiencies, and fragmented policy management are undeniable in the Czech Republic's bioeconomy sector. However, opportunities exist in diversifying biomass applications, improving technology readiness, and fostering innovation through research and funding. Taking into account all the presented information regarding the geographical, regulatory and technical point of view, and looking at the amount of biomass as well as knowledge available in the region, we can conclude that the Czech Republic has a Red Light in terms of BBTs implementation. For a more detailed description of the regional dynamics in the Czech Highlands and South Moravia please consult the BBioNets Knowledge Platform page dedicated to the Czech Republic here.

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# Document information

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| **Project overview** | **BBioNets** will constitute a thematic network that will rely on, promote, and further advance the work carried out by EIP AGRI Operational Groups (OGs) with respect to **management and/or processing of agricultural and forest biomass with Bio-Based Technologies (BBTs).** The project will set up 6 regional Forest and Agriculture Networks - FANs (IE, ES, IT, GR, PL, CZ) that will identify local needs, prioritise specific BBTs and share BBT knowledge ready for practice to farmers and foresters, boosting the (re)definition of value chains, stimulating cross-fertilisation beyond borders, and bringing Europe to the forefront of farming, forestry, and bioeconomy with economically viable and sustainable practices. |
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