https://doi.org/10.59277/AERD.2023.2.06

**Dan-Marius VOICILAŞ**

*Institute of Agricultural Economics, Romanian Academy, Bucharest, Romania*
*dmvoici@yahoo.com*

# IS ROMANIA PREPARED FOR THE NATIONAL BIOECONOMY STRATEGY?

## ABSTRACT

The purpose of the paper is to present the level of development of the bioeconomy in Romania showing how well Romania is prepared to have a national bioeconomy strategy. Based on the analysis, results and documents of the BIOEAST Initiative and the BIOEASTsUP Project, the study underlines the main characteristics, needs, opportunities, and challenges of the country, in a regional and EU context. The results show what Romania achieved in the last years, which are the obstacles and the benefits of changes in its national strategies. It is highlighted that, the opportunity to develop a national bioeconomy strategy in accordance with EU regulations should not be lost, so that EU funds for this purpose in 2021–2027 financial period can be accessed.

**Key words:** Bioeconomy, Romania, Strategy, Opportunity, Challenge.

JEL Classification: Q18, Q57, Q58.

## 1. INTRODUCTION

The paper presents the level of development of the bioeconomy in Romania showing how well Romania is prepared to have a national bioeconomy strategy. The study underlines the main characteristics, needs, opportunities, and challenges of the country, in a regional and European Union (EU) context.

In the last decade, economic strategies and policies have made or are going to make the transition towards the bioeconomy concept, because it has a large area of coverage and a huge potential at the EU level. These intentions are supported by statistical data. The main macroeconomic and sectoral indicators show us the importance of the bioeconomy in our times. EU institutions support the transition of the strategies of the member states towards national bioeconomy strategy based on the bioeconomy strategy elaborated at community level. A few examples of the attitude and position papers of these institutions highlight the present efforts to support the construction of the national strategies of the member states, based on the statistical data at sectoral level.

The European Parliament considers that agriculture, a strategic sector, has a huge potential to promote a sustainable bioeconomy in the member states,

especially in the field of rural development (contributing to the diversification of activities and providing decent living, working and economic conditions), but also regarding the agri-food system (which is considered to be the largest segment of the bioeconomy – representing approximately 71% of the added value, followed by the bioproducts and bioenergy segment).

At the same time, the forestry sector occupies an important place both from the point of view of the existing forest resource fund, and especially of their exploitation in a durable, sustainable manner. Given that the exploitation of forest resources represents an intervention in the natural balance of the environment, the integrated approach to managing the use of forest resources will be more effective, aiming not only at the exploitation of forest resources, but also at their more intensive regeneration, guarding and protection. Thus, the complex use of forest resources requires a rational capitalization, justified from an economic point of view, with obtaining benefits from the use of all possible utilities. The interest for the forest fund appears to be of great concern within the activities of the European Commission (EC) and the European Parliament through initiatives and actions aimed at enhancing the types of forest located on the territory of the member states and which recognize the importance of forest ecosystems at a level comparable to that of agroecological systems, each with a decisive role in the generation of sustainable economic resources.

Within the bioeconomy, bioenergy occupies an important place. The European Commission had proposed as an objective to be achieved by the year 2030, that 20% of the total energy produced in Europe should come from renewable sources (wind, sun, waves, etc., as well as bioenergy). Currently, only 6–7% of total energy consumption in Europe comes from renewable sources.

At the end of 2019, the European Council adopted conclusions on the updated bioeconomy strategy, "A sustainable bioeconomy for Europe: strengthening the link between economy, society and environment", which was based on a 2018 Commission communication. (EC, 2018) Among these conclusions, the representatives of the European Council identified the fact that the promotion of employment, economic growth, social inclusion and local development in rural areas, including the bioeconomy, is one of the nine objectives of the Common Agricultural Policy (CAP) for the period 2021–2027 and emphasized that the bioeconomy has the potential to contribute significantly to this goal, given its capacity to create economic value and prosperity, and given that agriculture is among the main suppliers of terrestrial biomass. In addition, the European Council emphasized that a sustainable European bioeconomy should be one of the main components for the implementation of the European Green Deal.

All these examples are solid arguments for the development of the bioeconomy at the EU level, but also at the national level, in each member country.

## 2. STATE OF KNOWLEDGE

Bioeconomy is a concept developed in the last decades, after Christian Patermann started to get involved in its promotion and development. The is no unique accepted definition worldwide accepted for bioeconomy. Different institutions or authors have given different definitions, but generally they refer to the same field.

For instance, the European Commission states "bioeconomy comprises those parts of the economy that use renewable biological resources from land and sea – such as crops, forest, fish, animals, and micro-organisms – to produce food, materials and energy." (EC, 2012)

The BIOEAST Initiative says that "The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy independently of the processing technologies. It thus includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, bio-technological and energy industries." (https://bioeast.eu)

According to the European commission web page (https://ec.europa.eu/knowledge4policy/bioeconomy/country/romania_en) there is no definition for bioeconomy in Romania. Of course, there are many Romanian authors that gave definitions for bioeconomy, and among all these definitions I want to present my own definition: "A complex system composed of Earth resources and their anthropic and natural transformation processes, which belong to biology and contribute to the economic, social and cultural development of people in a sustainable way, based on knowledge, forethought and empathy". (Voicilas, D.M., 2021)

In recent years, there are studies at EU level that analyses the bioeconomy and its potential. Also, the Romanian authors contributed to the development of the field by different projects and publications. An example is the BioeastsUp Project, in which the Institute of Agrarian Economics of the Romanian Academy was a partner, and it was of real help in carrying out this study.

## 3. MATERIAL AND METHOD

To answer the question "Is Romania prepared for the national bioeconomy strategy?" we used different sources and methods. Based on the analysis, results and documents of the BIOEAST Initiative and the BIOEASTsUP Project, there were elaborated this article. BioeastsUp is Horizon 2020 project "Advancing Sustainable Circular Bioeconomy in Central and Eastern European Countries" (BIOEASTsUP), funded by EC for the period 2019–2023 (https://bioeast.eu/bioeastsup/). Also, information from BIOEAST Initiative (https://bioeast.eu) were useful for the research taken.

To achieve the objectives, we had in view a literature review and a text analysis of the documents elaborated by different institutions and authors.

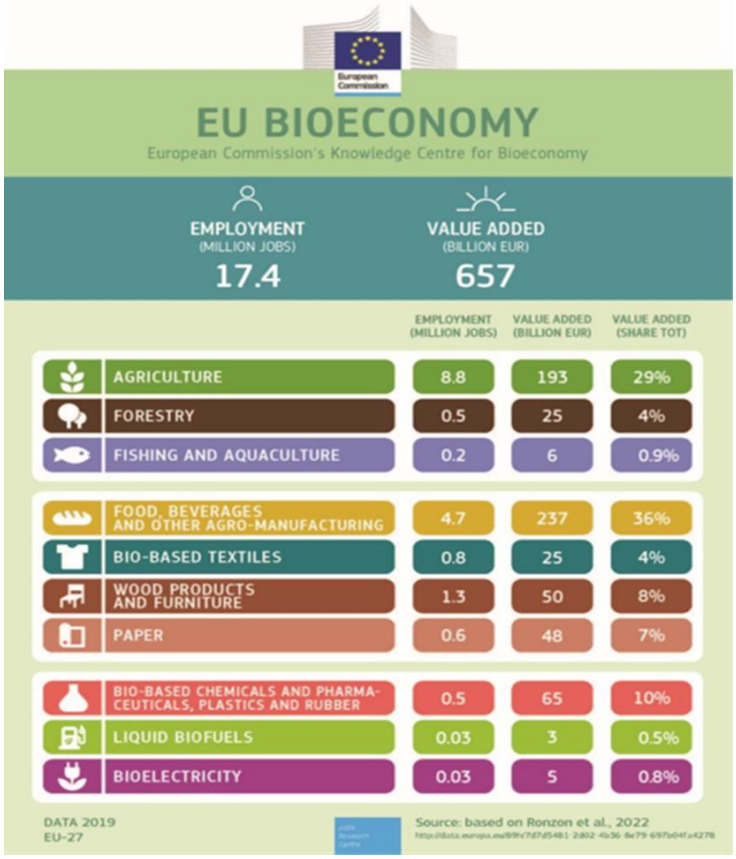
Important part of the research was the discussions with the national experts in the field, also the focus groups organized and the SWOT analysis.

## 4. RESULTS AND DISCUSSIONS

### 4.1. ARGUMENTS FOR BIOECONOMY DEVELOPMENT

First of all, the question arises, "How important is the bioeconomy at the EU level?" To answer, it is necessary to refer to the available statistical data. Data for EU show us the real size of the bioeconomy.

The main macroeconomic and branch indicators that we analysed (Figure 1) present the situation of the bioeconomy at the level of 2019, when the BioeastsUp Project started. For example, the number of jobs and the added value. In EU, there are more than 17 million jobs in bioeconomy. If we refer to the added value, the size is even more impressive, with 657 billion Eur.




*Source:* EC, 2022 (Based on Ronzon *et al*., 2022, JRC).

Figure 1. Indicators of the bioeconomy in the EU.

To see which branch of the bioeconomy is more important, we analyse the 10 branches according to the two indicators.

For "Employment", "Agriculture" has the largest share with 50.6%, and "Food, beverages and other agro-manufacturing" follows with 27%, together cumulating 77.6%. Of course, "Agriculture" is the core of the bioeconomy, it has the largest share because some EU members have a very large population employed in agriculture. Here, we refer especially to Romania and Poland.

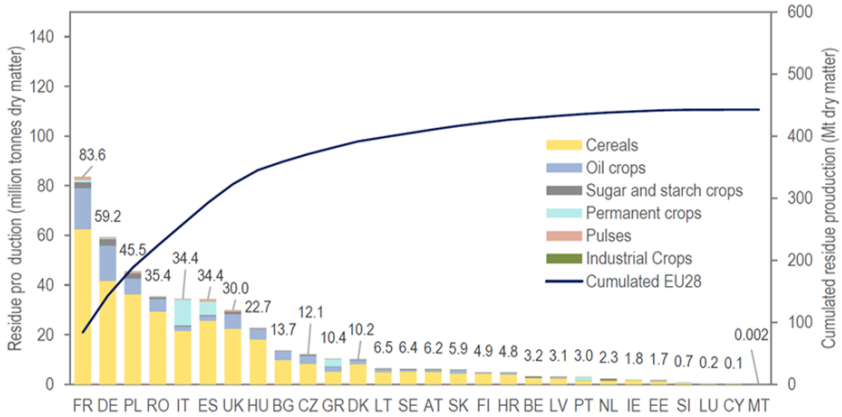
For "Value added", the largest share is "Food, beverages and other agro-manufacturing", with 36% from total bioeconomy. If we add agriculture (29%), we notice that 65% of the bioeconomy belongs to the two branches.

These two indicators highlight that "Agriculture" and "Food, beverages and other agro-manufacturing" are the main two branches for bioeconomy. At the same time, there are other branches with increasing role for bioeconomy in the last years. Here, we underline "Wood products and furniture" in the case of "Employment", and "Bio-based chemicals and pharmaceuticals, plastics and rubber" and "Wood products and furniture" in the case of "Value added".

Another question we are thinking about is "How important is the bioeconomy for Romania?" Data from BioeastsUp Project help us in the evaluation of the size of the bioeconomy in Romania.

Besides the number of the jobs in "Agriculture" and "Food, beverages and other agro-manufacturing", there are other evidences which support the importance of the bioeconomy for Romania.

For instance, biomass resources. Romania has high quantitative and qualitative potential for biomass resources from agricultural and forestry production (see Figure 2). Residue production from the main crop groups per member state, expressed in Mt of dry matter per year is presented and Romania ranks 4th in EU. The average values is over the reference period 2006–2015 (BioeastsUp Project, Based on Camila *et al*., 2018).

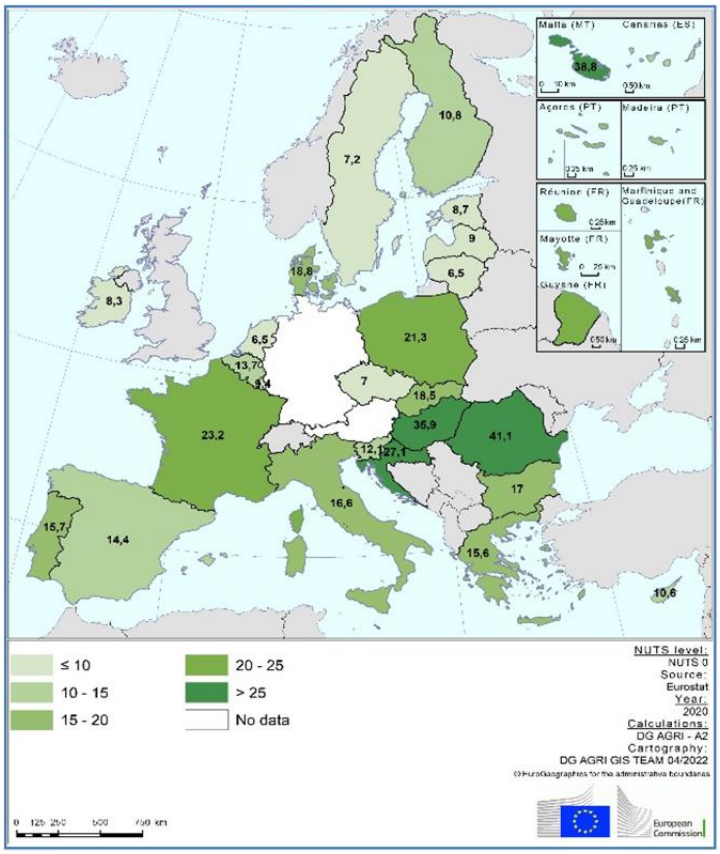



*Source*: BioeastsUp Project.

Figure 2. Biomass resources.

The structure of the existing bioeconomy: According to the JRC studies, the bioeconomy of Romania generated (2017) about 38.88 billion € turnover (13% of overall turnover of non-financial corporations – including agriculture – in the country, compared with 9% EU average) and 12.48 billion € value added. In 2017 the bioeconomy employed 2.4 million persons (28% of total people employed compared to the EU average – 9%). Romania had the highest share of people employed in bioeconomy sectors among BIOEAST countries (11 countries: Poland, Czech Rep., Slovakia, Hungary, Lithuania, Latvia, Estonia, Slovenia, Croatia, Bulgaria, Romania). According to BioeastsUp Project, during the 2010–2017 period, Romania was above average among BIOEAST countries in terms of real growth of whole bioeconomy.

Another example is organic agriculture. Romania has a large potential for developing organic farming (Hamelin *et al*., 2019). The studies done by EC give us evidence about the size and the potential of organic agriculture. Romania is on the first place in EU for areas under conversion to organic (EC, 2023) (Figure 3).




*Source*: EC, 2023.

Figure 2. Areas under conversion.

The research done under BioeastsUp Project gives us arguments why organic agriculture has potential in Romania. There are a few characteristics that make Romania unique (Balogh *et al*., 2022):

- Unique geographic regions;
- Agroecology is associated with preservation of local traditional peasant agricultural customs;
- Long tenured organizations;
- Involvement of civic actors and individual farms in EU supported agroecology-specific research;
- Availability of EU funds.

## 4.2. NEEDS, CHALLENGES AND OPPORTUNITIES FOR ROMANIA

Following the meetings that took place between the team from the Institute of Agricultural Economics of the Romanian Academy (IEA-AR), members in the consortium of the BioeastUp Project, and the national experts, some conclusions were drawn regarding the domestic needs, but also the challenges and opportunities that Romania has through the implementation of the national bioeconomy strategy. Next, we will present some of these, which we considered more important.

**Needs**

Romanian experts rely more on public support and funds than on private one to mobilize the potential of the bioeconomy. Bioeconomy is perceived as a political desideratum.

According to the answers of experts and stakeholders, investments are needed in increasing productivity in almost all primary and manufacturing sectors.

Romania still needs to face some consumers' practices in order to be more engaged in ecosystem valorisation and in order to add more value to sustainable products.

The survey conducted confirms that, there is still a need for organic waste adaptability skills.

There is no specific institution that is strictly dedicated to bioeconomy.

**Challenges**

There is a gap between high and low technology industries and RDI in these industries.

Logistics are challenging (this is the result of the structure of the farms, the short time needed to deliver the residual biomass and the storage time). Another matter that is challenging is the efficient use of all biomasses.

In addition to the above, we can add the challenges identified by the experts of the Bioeast Initiative, which in our opinion are perfectly valid in the case of Romania.

Research and Innovation deadlock: the macro-region still suffers the drawbacks of poor R&I infrastructure. The uptake and deployment at full scale of research results into practice and the inputs of practitioners into research need to be improved.

Stalemate in the bio-based value chains: Neither the traditional nor the innovative value-chains are fully exploited, the opportunities for creating value added processes locally are low or missing. The local rural development model should be based on small-scale investments and on small-scale biomass processing.

Governance impasse: A more systemic and integrated approach in decision-making is necessary to agree on a set of common principles for sustainable production and consumption (the political involvement of the political parties).

Societal indifference: The rural communities of the Central and Eastern European Countries (CEE) need to be strengthened economically and socially to fully exploit the potential of a knowledge-based, sustainable circular economy.

Financial barriers: Low access to finance and low level of synergies in public-private funds and investments – CEE countries are characterized by low level of private support to research and innovation and by low level of synergies between public and private funds and investments.

**Opportunities**

The opportunities to implement the bioeconomy strategy are multiple and beneficial to the states that adopt this concept, both in terms of future economic activities and in terms of daily life, ours, and our descendants. By this strategy is possible to attract funds for business investments, also funds for research projects because the EU has dedicated programs for such initiatives.

Last but not least, the strategies improve the environment and our lifestyle, which give hope for a healthier life in the future.

## 4.3. ACHIEVEMENTS IN THE LAST YEARS

During the development of the BioeastsUp Project, various activities took place to create the necessary connections between the authorities, the business environment, the academic environment and different non-patrimonial entities, in order to accelerate the process of developing a bioeconomy strategy and improve cooperation between them. In this subchapter we will present the evolution and the main results.

**Year 2019**

What Romania had in 2019 is presented below.

The national institutions involved in the bioeconomy were:

– Lead ministry: Ministry of Agriculture and Rural Development (MADR), Ministry of Economy, Ministry of Water and Forests.

- Other ministries involved in bioeconomy: Ministry of Health, Ministry of Energy, Ministry of Research and Development.
- Other institutions involved in bioeconomy: clusters, associations ("Bioeconomy" Commission of the Consultative Body for Research-Development and Innovation, which belongs to the Ministry of Research and Innovation).

At that time, there were no national bioeconomy strategy but, there were other national bioeconomy-related strategies, like: Romanian RDI Strategy for 2014–2020 (2014), Strategy for the development of the agri-food sector on average- and long-term 2020–2030 (2015), Romanian Strategy for Competitiveness 2014–2020 (2014), Smart specialization domains financed by structural funds within Competitiveness Operational Programme 2014–2020, Draft Integrated National Energy and Climate Change Plan for 2021–2030 (2018).

Also, at macroregional level (countries from central and south-east of EU and from Baltic), created the BIOEAST Initiative. The Initiative have had a National Contact Point (NCP), which was in the MADR. One of the NCP's main roles at national level was to interact and coordinate the national views with other bioeconomy related ministries.

There were created five Thematic Working Groups (TWG) to support the work of the BIOEAST Initiative, mainly the Governing Board in specific strategic areas: Agroecology, Bioenergy, Food systems, Forestry, Freshwater.

**Year 2022**

MADR has become the central public administrative authority responsible with the application of the governance program and strategy, with responsibilities into elaboration and implementation of sectorial national strategy in the following domains: agriculture and food industry, rural development, land reclamation, and contexed domains, such as: specialty scientifical research, preservation and sustainable management of the soils and both vegetal and animal genetic resources as well as bioeconomy.

When we analysed the official documents of this ministry, we saw that, one of the objectives refers to sustaining agricultural research, information, and farm advisory services in agriculture. As regards the bioeconomy area, the MADR's long- and medium-term Strategy for RDI has as main goals: evaluation of long- and medium-term feasibility of national bio-economic potential to produce non-food bioresources under impact of global climate changes; eco-innovative approaches to develop new agricultural technologies.

Since that year, MADR grants sectorial research projects into joining RD units, universities, and professional organizations.

Stakeholders' Platform was developed in BIOEASTsUP Project and provides an opportunity for cooperation and networking among the relevant stakeholders and institutions in the field of Bioeconomy. It also contributes to the joint

promotion of Central and Eastern European stakeholders to the European market. The registration was started and under development.

**Year 2023**

Besides the five TWG that have already existed, other two were established: Bio-based materials and Education.

The team from IEA-AR, based on its research, elaborated a Concept paper for National Bioeconomy Strategy. There were discussions with different experts in the field and stakeholders, and it was chosen, as an example for the Concept paper, the Organic agriculture.

Also, it was elaborated the Bioeconomy Strategic R&I Agenda. The Agenda is a result of the meetings with the stakeholders. After its creation, it was validated by the actors involved in its construction.

During the year there were meetings or cooperations with members from other E projects in this field, like: Be-Rural, BioVoice, AgroBioHeat.

## 5. CONCLUSIONS

Through the results of this research, we offer a general picture of the bioeconomy in Romania, which are the premises and the stage of development. The analyses carried out within the BioeastsUp Project also show the existing gaps between the Bioeast countries, also these countries and other countries from EU, and help to organize future trajectories for the development and implementation of the national bioeconomy strategy. The efforts done in the last year, by the entities involved in this field, were presented. The results of the activities organized were also presented.

A general accepted idea by the stakeholders was that the bioeconomy should be perceived as a cluster that agglomerates many sectors of an economy, introducing new connections between them that, as a result, bring new value-added products and services. Bioeconomy represents an alternative mode of growth comprising economic, environmental, societal, and political objectives.

Romania needs a specialized institution for bioeconomy not only a department or a thematic working group in MADR. There are many reasons that support this statement, and one is the importance of the bioeconomy for the future and its size in the national economy.

The data analysed show that Romania has potential for bioeconomy development. The country is one from the EU with big resources for bioeconomy.

Because the stakeholders need more public engagement and state support, the Government should develop special programs for the development of the bioeconomy.

Special national programs for the education of the population in the protection of the environment and avoiding waste are necessary.

Also, investments for collecting and valorisation of the organic residues resulted in agriculture, forestry and not only. The logistic for an efficient use of residues must be rethinking.

After the present research the conclusion is that Romania is not ready to elaborate and implement the national bioeconomy strategy.

## 6. ACKNOWLEDGEMENTS

Parts of the results of this study are based on the analyses carried out within the Horizon 2020 project "Advancing Sustainable Circular Bioeconomy in Central and Eastern European countries" (BIOEASTsUP), funded by the European Commission for the period 2019–2022, under grant agreement no. 862699 and results from BIOEAST Initiative.

## REFERENCES

1. Balogh L., Réthy K., Strenchock L., Szilágyi A. (2022). *Agroecology and sustainable yields thematic study. Socio-ecological indicators of agroecology-systems in the BioEast countries*. BIOEASTsUP project, TWG study
2. Hamelin, L., Borzęcka, M., Kozak, M., Pudełko, R. (2019). *A spatial approach to bioeconomy: Quantifying the residual biomass potential in the EU-27*, Renewable and Sustainable Energy Reviews, Volume 100, 2019, Pages 127–142, ISSN 1364–0321, https://doi.org/10.1016/j.rser.2018.10.017
3. Voicilas, D.M. (2021). *Perspectives for bioeconomy strategy in Romania*, AERD Journal, Year XVIII, No.2, IEA, Ed. Academiei Române, ISSN 1841–0375, Bucureşti, România
4. ***, European Commission, (2022). *EU Bioeconomy strategy progress report-European Bioeconomy Policy: Stocktaking and future developments*, Print ISBN 978-92-76-50197-8, PDF ISBN 978-92-76-50201-2, Brussels/Luxemburg (Based on Ronzon *et al*., 2022, JRC)
5. ***, European Commission, (2012). *Innovating for Sustainable Growth-A Bioeconomy for Europe*, Directorate-General for Research and Innovation, ISBN 978-92-79-25376-8, doi 10.2777/6462, Luxembourg: Publications Office of the European Union
6. ***, European Commission, (2018). *A new bioeconomy-Strategy for a sustainable Europe*, https://ec.europa.eu/commission/news/new-bioeconomy-strategy-sustainable-europe-2018-oct-11-0_en, Brussels, Belgium
7. ***, European Commission (2023). *Organic farming in the EU-A decade of organic growth*, Agricultural Market Brief no.20, Brussels, Belgium
8. https://bioeast.eu [accessed 28.09.2023]
9. https://ec.europa.eu/knowledge4policy/bioeconomy/country/romania_en
10. https://bioeast.eu/bioeastsup/ [accessed 28.09.2023]