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Development of regional stakeholders in Bulgaria



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Chapter 1: Abstract (max 300 words)

Since 2012, a number of national and regional bioeconomy strategies have been developed. The European Commission's 2030 Agenda for Sustainable Development introduces 17 goals related to sustainable development and the promotion of sustainable and inclusive economic growth, employment and reduced inequality between countries and regions. New market constraints, unsatisfactory impact of education and research on the value chain, limited effect of the eco-investments and the available financial instruments, as well as the slow pace of stakeholders' convergence at national and European level, pose a serious challenge to the need for an effective integration of these interventions.

Bioeconomy covers systems and sectors that use biological resources (biomass from animals, plants, microorganisms, including organic waste, their functions and principles). To be successful, it must be based on sustainability and circularity. Circular bioeconomy is an integrated model, it aims at extending products' life cycle and the creation of new business models. The growing need for sustainable production and use of food, raw materials and fuels, together with the latest scientific achievements are major economic drivers for bioeconomy's growth. Circular bioeconomy is knowledge - based and has a key role in the overall process of economy's transformation.

The sustainable bioeconomy is the renewable segment of the circular economy. Through this segment can be created incentives for retailers and consumers, aiming at achieving a significant reduction of biodegradable waste, within 50% by 2030, and its utilization as valuable resource. For this to happen, it is necessary to consider regional and local specifics, as well as to analyze all the factors that determine the specific needs and challenges and the ways to deal with them.

The lack of national strategic documents to regulate and support the introduction of circular bioeconomy hinders the process. However, specific measures and trends can be noticed, which in the long-term could lead to a significant increase of the share and the impact of the circular bioeconomy over numerous processes and sectors in the country.

The active collaboration between various stakeholders has a key importance and would contribute to the definition of specific measures for the future programming period, 2021-2027.

II. Chapter 2: Definitions

A. 2.1: *Circular bioeconomy (max 200 words)*

The policies for the development of the bioeconomy and the circular economy in the country are within the scope of two leading state institutions, respectively the Ministry of Agriculture, Food and Forestry and the Ministry of Environment and Water. A definition of a circular bio-economy has not been officially adopted in the country. The approved Strategy for Strengthening the Role of the Agricultural Sector in the Bioeconomy (2020) introduces for the first time a definition of the bioeconomy in the country as follows: "The bioeconomy covers the production of renewable biological resources (biomass) and their conversion into food, fodder, organic products and bioenergy. The agricultural sector (agriculture, forests, fisheries) and the food industry participate in the bioeconomy with all their activities, and the furniture, textile, pharmaceutical, chemical, construction and energy industries - with the activities related to biomass processing and production of biobased products. The first strategic document for the transition to a circular economy is in the process of adoption (Draft Strategy for Transition to a Circular Economy 2021-2027).

In 2015, Bulgaria's bioeconomy generated 3.7 billion euros gross value added (GVA), which is 0.6% of GVA for the EU-28 (621 billion euros) and positions the country in 20th place. The agricultural sector occupies a little over 50% of GVA and those employed in the country's bioeconomy. The production of basic biomass in agriculture in the country in 2017 amounts to 15.1 million tons, which is 2.6 times more than in 2007.

Good examples of the use of biomass waste such as solid biowaste (straw, maize, etc.) and animal waste (manure, food residues, etc.) are:

- Increase the use of biomass, including waste forest and agricultural products for energy production;¹
- The use of manure as feedstock for biogas production, on site in farms, and using the digestate as fertilizer in crop production;²
- Production of second generation biodiesel based on organic waste (used animal and vegetable oils and food waste);
- A number of start-up companies develop innovations in the field of circular bioeconomy and produce biodegradable products through the processing of solid biowaste.

B. 2.2: Contemporary processes (max 800 words)

1) Demographic changes

In the period of 2008-2017, the imbalance of the population's distribution has grown greater, as the overall population of the country has been constantly decreasing.

Table 1. Density of the population in Bulgaria

Indicator	2008	2017
Population density nationally, people/km ²	68,9	63,9
Population density rural areas, people/km ²	39,2	34,4

According to the national definition of rural areas³ and the European typology of municipalities, up to 31.12. 2019 the majority of the population from the rural areas in Bulgaria or 78.0% (2,090,371 people live in intermediate areas and 22.0% (606,516 liters) is concentrated in typically rural areas (total rural areas in the country 232, of which intermediate-169 and typically rural-63).

For the period 2008-2017 the population in the rural municipalities decreased by 319,226 people (11%) compared to a 3% decrease in the urban population⁴. The largest share of the population is in the age group from 15 to 64 years (62.26%) and in the age group 65+ it is 23.61% (in cities is 40.9%). There is a decline in the relative share of all age groups except the population aged 65-69 and 80 and over. The population aged 0 to 39 was 21.1% less, and for the age group 40 to 64 the registered decline was 8.8%. The number of children aged 0 to 14 decreased by 10.9%. The age dependency ratio in the villages is 67.8%, while in the cities it is

¹ National action plan for energy from forest biomass 2018-2027 and Integrated plan for energy and climate of Bulgaria 2021-2030

² Project "Socio-economic analysis of the development rural areas", 2020

³ Rural area is a municipality in which there is no settlement with a population of over 30,000 people.

⁴ Ministry of Agriculture, Food and Forestry

51.5%. The increase in the relative share of the elderly is a prerequisite for increasing the risk of poverty in rural areas.

The share of the population in rural areas, self-determined in the different ethnic groups in the 2011 census is:

Ethnic group	Bulgarian	Turkish	Roma	Others	did not specify
Share, %	75.9	14.7	7.7	0.7	1.0

In the 10-year period between the two censuses, the ratio of the share between the different ethnic groups has been preserved. The population of the Turkish ethnic group, which is above the average relative share for rural areas (15%) inhabits 69 municipalities. The Roma ethnic group, which is above the average relative share for rural areas (10%), inhabits 90 rural municipalities.

The negative demographic trend is a result of the processes such as mechanical and natural movement of the population, as well as the process of urbanization [internal and external migration (-12.5%), natural increase (-10.7 ‰, due to rising mortality), increasing the share of the elderly population, economic disparity in the development of the regions - job search, education, professional development, wage levels and better quality of life]. The negative demographic trend for the country contrasts with the positive population growth in most of the 27 EU member states.

This trend leads to a number of negative effects. In small villages, the decline in population's number makes it inefficient to maintain social and public services. Investments are mainly in the municipal center, leading to internal imbalances in the quality of life in rural areas, which is an additional factor for migration.

Demographic processes pose many challenges for the future development of rural areas, it has a negative effect on the quality of public services, labor resources and limits the labor market.

The rate of employment in rural areas in the country - 57.9% for 2017. is significantly lower than the EU-28 average (67.2%). In 2017 the relative share of employees in rural areas is 25%, and in urban areas - 75%, with a decrease of 9% for rural areas and by 6% for urban areas, compared to 2008.⁵

Throughout the last 10 years, the dynamics of numbers of employees by economic sectors shows that the relative share of employment in them decreases slightly in rural compared to urban areas, but the decrease in actual employment is significant in leading economic sectors such as manufacturing, structural part of the bioeconomy, construction, government and education and has a serious negative impact on the rural labor market.

2) Rural area's development

The strengthening of the strategic and integrated approach for planning the economic and social development of the municipalities from the rural areas is on the agenda in the period 2007-2013 and 2014-2020 of Rural Development Program 2014-2020 (RDP) ⁶. The RDP is a key instruments in achieving balanced territorial development of rural economies and communities, including the creation and maintenance of employment. The evaluation of the Program (2015-

⁵ Employment rate - 15-64 years old

⁶ Annual report on implementation of RDP 2018 (<https://ruralnet.bg>)

2018)⁷ shows that supported farms have significantly increased their ability to recover capital, pay wages and rent on leased land, and cover their own production factor costs. The productivity and exports of enterprises are increasing. Also, there is a significant reduction at the national level of the percentage of people from 41.3% in 2015 to 32.8% in 2018, living below the poverty line in rural areas. According to NSI data, the employment rate as of 2018 is 58.5% or 645.8 thousand people. This is a significant increase compared to 2016, when this ratio was below 50%. The average annual total income per person from the household in 2018 increased by 72% compared to 2008. The main driving factors for economic growth are related to the improvement of the business environment, support to young entrepreneurs and small farms. The observed progress is due to the investments supported by the Program for:

- modernization and technological renewal of 1480 agricultural holdings (40.37% in the fruit and vegetables sector, 36.32% in "livestock", 15% in "essential oils and medicinal crops" and 8.13% in mixed or other projects. The investments made have led to increased productivity, quality of agricultural production and, respectively income in the sector.
- support for the entry into agriculture of 1302 young farmers with appropriate qualifications, which facilitates the knowledge and innovation transfer and which is a prerequisite for improving the integration between rural and urban areas and contributes to the transit to circular bioeconomy in the sector;
- 295 small processing enterprises through investments in processing / marketing of agricultural products, which contributes to the increase of the resource efficiency as well as the export by SME's in rural areas.
- establishment of 50 producer organizations with the participation of 406 small farmers to support the production and supply of high quality agricultural products that meet European standards and market requirements and shorten supply chains. The investment led to an increase in the share of production of small farms, facilitated their access to customers, naturally followed by an increase of their income.
- - support for 65 local action groups (LAGs) for the development and implementation of local development strategies under the CLLD (community-led local development) approach, covering 137 municipalities and 27,53% of the people from rural areas) They are multi-fund funding and supporting a large number of small projects under the various measures of local development strategies that meet local needs and create or maintain employment for the local population (retention, and in some cases return of enterprising people in the local community). 312 infrastructure projects have been implemented to improve the technical, social and public infrastructure and 938 projects for diversification of the economy in rural areas and job creation. As a result, there is an increase in the cost of acquisition of fixed assets in SMEs and agricultural holdings, sustainable development of rural tourism (increase in the number of tourists and the number of overnight stay), increase in employment and income and as a result improve the quality of life in less populated areas.

⁷ <https://ruralnet.bg/%D1%82%D0%B5%D0%BA%D1%83%D1%89%D0%B0-%D0%BE%D1%86%D0%B5%D0%BD%D0%BA%D0%B0-%D0%BD%D0%B0-%D0%BF%D1%80%D1%81%D1%80-2014-2020/>

3) Cooperation between rural and urban areas

Within the period 2014-2019 the following trends in the development of relations between rural and urban regions are observed, such as:

- To improve the connectivity in rural areas by reducing disparities in infrastructure development, the investments are being made to improve the road infrastructure of rural areas for 3rd and 4th class road network through funding under the RDP, as well as expanding the network of roads from 1st and 2nd class. through investments from the operational program "Transport and Transport Infrastructure".
- Attracting young farmers (young people living in cities) in the agricultural sector facilitates the development of economic activity in rural areas and helps to increase the educational level of employees in the sector, increases investment in the sector (in new and existing enterprises) promotes the link between science and business.
- Almost two thirds of SMEs are concentrated in five districts (Sofia, Plovdiv, Varna, Burgas and Blagoevgrad). The economic processes in the country have led to the establishment of well-developed economic centers with peripheral municipalities, which are dependent on the development of the center. There are over 20 economic centers in the country (covering 1/3 of the country's territory), where there is a connection with the development of peripheral small municipalities, the weakest of which are in the North-West and North-Central regions. Strong peripheral connectivity "rural-urban areas" is observed in the economic centers of Sofia and Plovdiv, where over 10% of the working age population from rural municipalities in their periphery travel and work in the centers.
- Innovation is a driving force for economic development by supporting cooperation between local farmers and entrepreneurs in rural areas, leading companies in various sectors in the cities, public and academic stakeholders. In recent years, these links have been developed through the established centers of competence, regional innovation centers and clusters in accordance with the priorities of ISIS.
- The implementation of the Leader approach helps to strengthen partnerships at local, regional, national and European level, as well as to strengthen rural-urban links, with a direct impact on the economic and social dimensions of the implementation of Community-led local development strategies. Such as: improving local administrative capacity to revitalize local communities in rural areas, diversifying economic and non-economic activities, creating new jobs, raising the educational level of employees, increasing incomes, etc.

III. Chapter 3: Defining the role of the regional and national management system (max 1500 words)

A. 3.1. Political conditions (strategic level)

Policy/strategy name:	Reducing the demographic differences between the regions in Bulgaria
Relation to demographic change	<p>The demographic situation in the country is characterized by a decrease in the population with an average annual rate of 0.7% (2001-2011)⁸ due to the negative natural rate (68.9% of the decrease is due to high mortality) and continual emigration (31.1%). The demographic decrease is inextricably linked to the state of the labor market as the age dependency ratio is 34.30% (NSI, 2020) and is expected to increase to 52.65 by 2050.⁹</p> <p>The priorities for addressing the demographic challenges in the country are outlined in the Updated National Strategy for Demographic Development of the Population in the Republic of Bulgaria (2012 - 2030).¹⁰</p>
Relation to rural development	Rural areas in the country are characterized by the negative demographic trend, the result of processes such as mechanical and natural movement of the population, as well as the process of urbanization. The needs of rural areas are reflected in priority IV. of the strategic document, namely "Limiting the disparities in the territorial distribution of the population and depopulation in some regions and villages". .
Relation to circular bioeconomy	The development of the bioeconomy is an opportunity to find solutions to societal challenges that are directly related to the demographic crisis, both nationally and in rural areas, such as: Challenges related to ensuring food security; Reducing dependence on non-renewable resources; Climate change mitigation, conservation of biodiversity and natural resources; Stimulating employment, economic growth and competitiveness; Full participation of the agricultural sector in building an innovative economy that combines the pursuit of food security and sustainable development of the sector with the use of renewable biological resources for industrial and energy purposes, ensuring biodiversity and environmental protection.
Implementation	Reports on the implementation of the Updated National Strategy for Demographic Development of the Population in the Republic of Bulgaria (2012-2030). ¹¹
Territorial level	NUTS 1
Interactions between levels	The Council of Ministers and the Ministry of Labor and Social Policy in cooperation with the institutions responsible for all sectoral policies in defining and implementing the priorities and measures of the strategic document.
Relation to S3	The vision of the Innovation Strategy for Intelligent Specialization (ISIS) aims for the country to make a qualitative leap in its innovative performance at EU level to address societal challenges in the field of demography (reducing the brain

⁸ National Statistical Institute(NSI), census of the population and housing stock in the Republic of Bulgaria: 2001 and 2011

⁹ Keeping Convergence hypothesis

¹⁰ Plan for the implementation of the Updated National Strategy for Demographic Development of the Population in the Republic of Bulgaria (2012-2030),

<http://www.strategy.bg/PublicConsultations/View.aspx?lang=bg-BG&Id=4414>

¹¹ <https://www.mlsp.government.bg/uploads/19/pril/report-2019-demo.pdf>

	drain, attracting successful Bulgarians, stimulating youth entrepreneurship), sustainable development, intellectual capital and the health of the nation.
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Policy/strategy name:	Sustainable agriculture
Relation to the demographic change	<p>A number of national strategic, program and planning documents aim at preventing the demographic crisis in the country, incl. mainly in rural areas, which are most affected by internal and external migration, negative natural growth, economic disparities in their development, , defining specific objectives and measures for rural development by supporting the development of sustainable agriculture, such as:</p> <ul style="list-style-type: none"> • National Development Program: BULGARIA 2030. • Plan for recovery and sustainability of the Republic of Bulgaria • Strategy for digitalization of agriculture and rural areas of the Republic of Bulgaria • National strategy for development of the forestry sector • Rural Development Program (RDP) for the periods 2014-2020 and Strategic Plan for Development of Agriculture and Rural Areas 2021-2027. • National Action Plan for energy from Forest Biomass Energy 2018-2027 • Integrated National Climate and Energy Plan of the Republic of Bulgaria 2021-2030. • National Waste Management Plan, 2021-2028, etc.
Relation to rural development	The implementation of the policy aims at establishing a more appropriate structure of the agriculture, which will improve its economic, social and environmental sustainability and rural development.
Relation to circular bioeconomy	<p>Priorities of sustainable agriculture from bioeconomy's view point are:</p> <ul style="list-style-type: none"> - sustainable use of renewable resources for industrial purposes to ensure environmental protection; - progress of applied R&D for the development of innovative technologies, products and services for the agricultural sector for more productive, ecological and less resourceful food production; - introduction of innovations for more efficient use of resources to ensure food security - the transfer of knowledge and the provision of information concerning research and innovation in the field of agriculture; - education and training in the field of labor bioeconomics in the individual branches of the agricultural sector.
Implementation	Reports on the implementation of the policy by the following institutions: Ministry of Agriculture, Food and Forestry, Ministry of Energy, Ministry of Environment and Water , Ministry of Economy, Ministry of Science and Education, State Fund Agriculture .
Territorial level	NUTS 1
Interactions between levels	The Council of Ministers and MAFF in cooperation with the institutions responsible for sectoral policies in the fields of environment, energy and economy.

Relation to S3	ISIS 2014-2020, thematic area "Industry for Healthy Living and Biotechnology" supports the development of R&D for sustainable agriculture, including biotechnology for medicinal purposes, healthy eating, natural cosmetics.
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Policy/strategy name:	Circular and low carbon economy
Relation to the demographic change	<p>Demographic change, should not be seen only as a challenge, should also be seen as new opportunity for local development. Taking into account the changing demands of urban societies, especially in terms of food, leisure and recreation, there is a significant potential for agriculture, forests and fisheries to produce quality, safe and diverse products, in an environmentally friendly way and applying the principle of the circular economy, incl. bioeconomics.</p> <p>The transition from a linear to a circular and low-carbon economy, incl. and the circular bioeconomy has the main goal of reducing the resource intensity of the country's economy.</p>
Relation to rural development	<p>The policy for transition to a circular economy and low-carbon economy is among the main priorities of the Bulgarian strategic documents. and it is aimed at diversifying economic activities in rural areas and increasing the productivity of resources such as biomass waste, which are beginning to be seen as a "resource" for the economy. This will help to develop industrial symbiosis in their utilization for the production of biodegradable products and will increase the incomes of the farmers.</p>
Relation to circular bioeconomy	<p>A strategic framework for the policy of the agricultural and forestry sectors, in support of the development of the circular bioeconomy is presented in:</p> <p>Project of identified needs for the New CAP 2021-2027. in Bulgaria, objective 8, measures:</p> <ul style="list-style-type: none"> - Expanding the application of the Leader / CLLD approach; - Diversification of the economic activity with new production based on bio and circular economy, to be directed to sectors outside tourism, hotel and restaurant business; - Construction and renovation of public, social, technical and educational infrastructure in rural areas. <p>The strategy to strengthen the role of the agricultural sector in the bioeconomy, envisages the implementation of measures contributing to rural development. As well as to the promotion of resource efficiency, support the transition to a circular economy and a climate-resilient economy in agriculture, forestry and the food sectors, with focus on innovation such as:</p> <ul style="list-style-type: none"> - supporting enterprises for the introduction of waste-free technologies; - reduction of the quantities of waste generated in the production process; - the development of industrial symbiosis. - implementation of business models that allow interaction between products and services throughout the supply chain, design, reuse and recycling strategies, ensuring longer use of products. - Special focus will be placed on R&D and innovation related to the circular economy and support for the development and implementation of green business models. <p>Innovation strategy for intelligent specialization of the Republic of Bulgaria provides:</p> <ul style="list-style-type: none"> - creating conditions for the development of the regional dimensions of the research and innovation ecosystem;

	<ul style="list-style-type: none"> - supporting open innovations and promoting experimentation and entrepreneurship in the regions of the country; - encouraging innovation processes in accordance with regional imbalances, in order to achieve sustainable and balanced development; - supporting the partnership between SMEs and higher education institutions to build a technological advantage for companies for growth in the regions.
Implementation	Policy implementation reports from: Ministry of Economy, Ministry of Agriculture, Food Forestry Ministry of Environment and Water and Ministry of Education and Science (.
Territory level	NUTS 1
Interactions between levels	Council of Ministers and the Ministry of Economy in cooperation with the institutions responsible for sectoral policies in the fields of environment, energy, science and education, agriculture, laundry and forestry.
Relation to S3	<p>Innovation strategy for intelligent specialization of the Republic of Bulgaria 2021-2027, thematic areas:</p> <ul style="list-style-type: none"> - "Healthy living and biotechnology industries"; - "Clean technologies, circular and low carbon economy" <p>The aim of the thematic areas is the development of a green / bio-based economy (according to the scope of the definition of "Innovation for sustainable growth: Bioeconomy for Europe"). Bio-based products are "products that are wholly or partly derived from materials of biological origin, excluding materials embedded in geological formations and / or fossilized"</p>

B. 3.2. Legal conditions (operational level)

The legal and regulatory framework that stimulates the development of the bioeconomy covers the following key documents at national level regarding bioeconomy and the transition to a circular bioeconomy, such as:

Food Act, guarantees the application of unified procedures and the implementation of coordinated control for compliance with the requirements of European law and Bulgarian legislation in the field of food production and food safety.

Law for management of the agro-food chain establishes the general principles and requirements of food law in order to ensure verification of compliance with fodder and food law and animal health and animal welfare rules, incl. the labeling of food and fodder, plant protection products, food and feed additives, vitamins, mineral salts, trace elements and other additives.

Waste Management Act regulates the measures and control for protection of the environment and human health by preventing or reducing the generation of waste, as well as the harmful impact of the generation and management of waste, and by reducing the overall impact of the use resources and by increasing the efficiency of this use, which will facilitate the transition to a circular economy and ensure long-term competitiveness.

Forestry Act regulates the measures and control for protection, management and use of forest territories in the Republic of Bulgaria, in order to ensure multifunctional and sustainable management of forest ecosystems

Fisheries and Aquaculture Act regulates the ownership, organization, management, use and protection of fish resources in the waters of the Republic of Bulgaria, trade in fish and other aquatic organisms

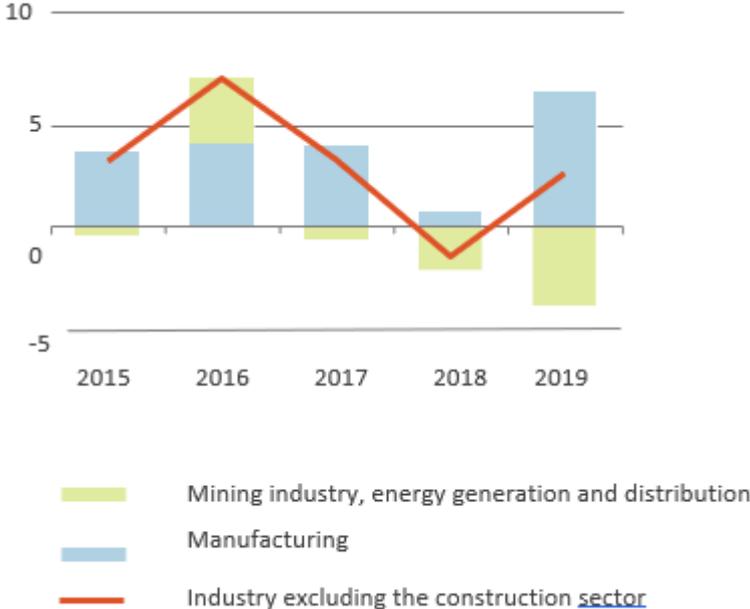
Environmental Protection Act regulates the protection and use of environmental components; prevention and reduction of pollution, etc.

In the last 10 years, the laws have been amended many times for different purposes. The reasons that caused their change are on the one hand related to the introduction of European provisions in our national legislation or the inclusion of texts for technical corrections and updates due to references to other regulations, and on the other hand to refine the substance of the text. These changes lead to difficulties in their implementation, both by business operators and by official control bodies. Currently, there is a lack of a specific regulatory framework which should accelerate the promotion of the circular bioeconomy.

C. 3.3. Socio-economic conditions

In Bulgaria, a wide range of industries contribute to the development of the bioeconomy - the added value in the industry sector without construction in 2019. increased by 2.6%. The growth is due to the manufacturing sectors, where has been spotted increase in compensation, but also a decline in employment.

Fig.: Contributions to actual growth of GVA in the industry sector without construction



The circular economy still occupies an insignificant share in the national economy, but its relative contribution, measured by the share of GVA (gross value added) and investment in GDP is higher than in the EU-28 (Eurostat). Value chain defragmentation is observed. An indicator of the technological lag is the low level of secondary used and recycled materials from the total processed ones. This is the reason why the export of recyclable raw materials exceeds the import almost twice, while for the EU-28 the trend is opposite.

Table: Socio-economic indicators for circular bioeconomy.¹²

¹² Strategy for Strengthening the Role of the Agricultural Sector in the Bioeconomy (2020)

Indicators	Measurement	Bulgaria	EU-28
Share of GVA in GDP	%	1.21	0.98
Share of total employees	%	1.76	1.73
Share of investments in GDP	%	0.18	0.12
Share of recyclable raw materials	%	4,3	11,7
Share of recycled waste in the total waste (2014)	%	17	55
Trade in recyclable raw materials (import)	Thousand tons	220	58 132
Trade in recyclable raw materials (export)	Thousand tons	407	36 718

Source: <https://ec.europa.eu/eurostat/>

The transition to a circular economy is associated with a change in the existing linear economic model and requires the participation of all affected players - consumers, businesses and the state. With the adoption and implementation of the Strategy for Transition to a Circular Economy 2021-2027, the indicators, developed by Eurostat along the value chain, for measuring its progress will be introduced.

According to NSI data, the COVID-19 pandemic in 2020 caused serious socio-economic consequences in the country. ¹³ GDP for 2020 decreased by 4.2% compared to 2019, and the foreign trade balance was negative. The most affected are the economic sectors "Culture, sports and entertainment" (-15.6%) and "Trade" (11.9%). The impact of the pandemic on the "Agriculture, Forestry and Fisheries", "Mining" and "Manufacturing sectors" is relatively smaller -5.3%. The lowest GDP per capita is in the North-West and North-Central regions, although in the period 2016-2019. there is an increase of 22.9%. The unemployment rate for 2020 (5.13%) is comparable to that for 2018. (5.22%), but is 0.88% higher than in 2019. (4.13%). In the social environment there is pressure on the health care system, as well as in demography - due to higher mortality, the return of Bulgarians from abroad and the growth of registrations at the current address in small towns. Changes can also be expected in the fields of education and culture, due to the completely different work environment in 2020.

D. 3.4. Technological conditions

Research and innovation, access to infrastructure and the exchange and transfer of innovations in agriculture, food and fisheries is concentrated in leading scientific organizations (Agricultural Academy and its structural units; Institute of Forestry - BAS; Institute of Microbiology - BAS; Institute of Organic Chemistry with a center of phytochemistry-BAS); specialized higher schools (Agricultural University, Plovdiv, Thracian University, Stara Zagora, University of Forestry, Sofia, University of Food Technology, Plovdiv and Sofia University "St. Kliment Ohridski") and the new scientific infrastructure (centers of competence and centers of excellence, technology centers, supported by OP NOIR 2014-2020).¹⁴

Despite the increase in R&D investment from the national budget and EU funds, the share of R&D investment in the agricultural sector is still relatively small (5.19%) compared to those in

¹³ National Statistical Institute, January 2021. Activity and condition of non-financial enterprises in the epidemic situation in January 2021., <https://www.nsi.bg/bg/>

¹⁴ <https://opnoir.bg/>

technical sciences (54.00%) and medical and health sciences (18.25%)¹⁵. There is also a continuing outflow of young professionals to EU countries for career development. The research activity, carried out in close cooperation mostly with leading companies from the food industry and agricultur, also with the participation of the branch organizations, is aimed at developing the bioeconomy in the country by improving productivity in the agricultural sector (management of resources and processes in a sustainable way) and creating innovative technologies for: processing bioresources into new food products; increasing soil fertility, ecological approaches in waste management and their use for energy production from renewable sources; new materials and technologies such as wear-resistant coatings based on new composites and nano materials, etc.

It is necessary to provide an eased access to knowledge and information. As well as to give the the opportunity to SME's and small agricultural holdings for direct participation in development process of technologies and innovations. In recent years, in pursuance of the priorities of ISIS, centers of competence and centers of excellence (located mainly in major economic and educational centers), as well as regional innovation centers and clusters to promote the bioeconomy in the country have been established and developed.

3.5. Environmental conditions

The analysis of the sustainable development of the forestry, agricultural and research sectors, in view of their condition and role in the development of the bioeconomy in the country, shows that:¹⁶

The agricultural sector is developing at a good rate of growth of biomass production; increasing production of energy crops and bioenergy from renewable sources in agricultural holdings - biogas and biodiesel. The average yields of basic cereals are increasing; and there is a reduction in the negative impact of agriculture on the environment. However, there is an imbalance in the production structure of the agricultural sector, an overproduction of energy crops and disturbed balance of fodder production. There is a low use of agricultural waste for secondary use and low use of energy crops for energy production due to their high share of exports.

Sufficient raw materials and significant quantities of unused forest wood biomass for energy production are available in the forestry sector. Public recognition of the importance of biomass in the production of renewable energy has been achieved and experience has been gained in the industrial production of energy and pellets. On the other hand, there is an individual use of a large part of the available resource for heating through low-efficiency combustion plants and low technological level in extraction and transport of the raw material.

For both sectors they have a low level of qualification of the available workforce and lack of staff.

According to the project of identified needs for the new Common Agricultural Policy (CAP) in the country for the period 2021-2027, there are 9 specific and 1 general objectives defined in the 8 priority areas:

¹⁵ NSI, 2019, R&D expenditures by fields of science and sectors

¹⁶ Strategy for strengthening the role of the agricultural sector in the bioeconomy, February 2020.

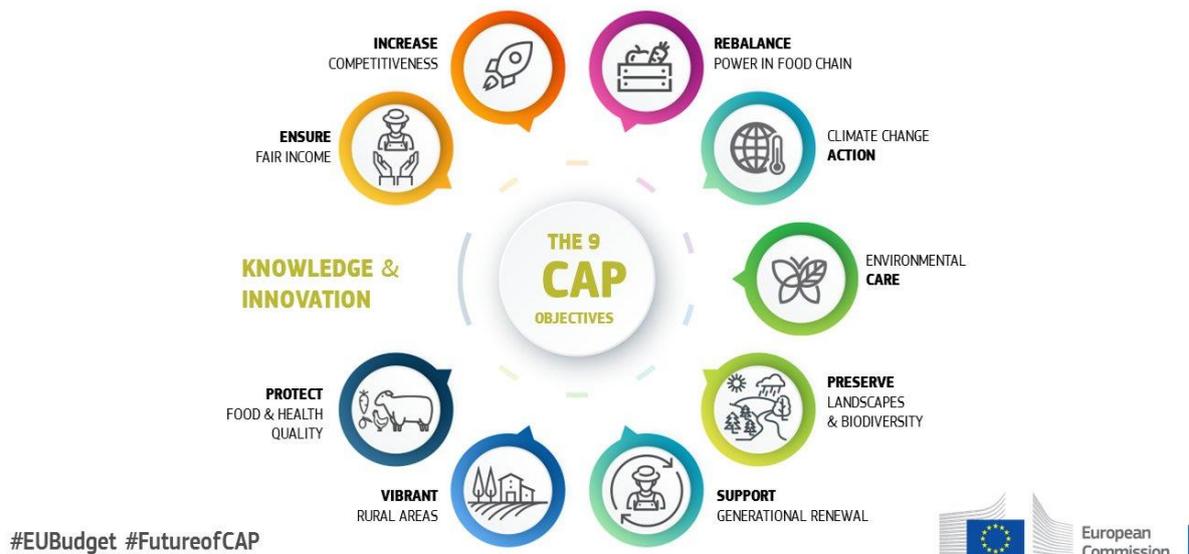


Fig.3 Objectives of the Common Agriculture Policy (CAP) for the period 2021-2027.

Measures aimed at the bioeconomy are defined in Objective 8: Promoting employment, growth, social inclusion and local development in rural areas, including the bioeconomy and sustainable forestry. The development of the bioeconomy is an opportunity to find solutions to societal challenges related to ensuring:

- **reduction of dependence on non-renewable resources** - the Bulgarian economy is still heavily dependent on energy derived from fossil resources. Exhaustion and strong dependence on their imports into the country determines the priority role of the transition to alternative sources of materials and energy, incl. bioresources and biowaste;
- **food security** - although with a small contribution, Bulgaria contributes to ensuring food security on a global scale by increasing the production of cereals;
- **limiting climate change, protecting biodiversity and natural resources** - the planned measures aim to put as little pressure as possible on air, soils, water basins, climate and ecosystems;
- **expanding information on the bioeconomy** and strengthening the dialogue between society and bioeconomy stakeholders - in this way the benefits for the economy and the individual can be more clearly outlined and support for the implementation of new scientific discoveries in practical applications can be outlined;
- **supporting employment, economic growth and competitiveness** - sustainable, new and innovative products, business models and production processes in the agricultural sector can encourage new economic activities and provide employment in the production chain of biobased products;
- **vocational training and acquisition of practical knowledge** - knowledge-based bioeconomics uses modern technologies to create innovations and jobs by developing and combining many different natural and technical sciences, which presupposes the need for qualified personnel. The demographic crisis and high competition in the EU labor market have determined the shortage of well-trained experts in the country. On the other hand, new interdisciplinary training programs based on rapid technological development should be developed.

IV. Chapter 4: Stakeholder analysis (max 1200 words)

Public authorities, research institutions, educational and consultancy organizations, industry, NGOs and civil society, and end-users are the key stakeholders involved in the transition to a circular bioeconomy.

Stakeholder group	Public authorities at local and national level
Subgroup of stakeholders	<p>National level: State institutions as: Ministry of Agriculture, Food and Forestry, including: 7 executive agencies on: food safety; forests; hail control; fisheries and aquaculture; the vine and the wine; selection and reproduction in animal husbandry; variety testing, approbation and seed control; National parks; National Agricultural Advisory Service; Center for risk assessment in the food chain; and the institutions responsible for sectoral policies in the fields of economy, environment, energy, science and education, agriculture, laundry and forestry, health and regional development.</p> <p>Regional level: subdivisions of state institutions at the regional level</p> <p>Local level: 232 municipalities in rural areas – municipalities’ councils and administrations.</p>
Position in the network	<p>The state institutions are responsible for the development and implementation of policies at the national level, and their subdivisions for support and control over the implementation at the regional and local level.</p> <p>They initiate the establishment and ensure the work of working groups with the participation of representatives from other stakeholders to develop strategic, planning and program documents to facilitate the transition to a circular bioeconomy.</p> <p>Development of the regulatory and legal framework for circular bioeconomy with the participation and the support of the representatives of all other stakeholders such as academies, industry and NGOs.</p> <p>Development and implementation of financial instruments for transition to a circular bioeconomy.</p> <p>Providing a control of the implementation of the regulatory framework and financial instruments through their subdivisions on regional level.</p>
Meaning for GoDanuBio	<p>The public sector is essential for creating sustainability of the project results by carrying out the following activities:</p> <ul style="list-style-type: none"> - ensuring access to targeted information on good practices, products and innovations in the field of the circular bioeconomy; - promoting public dialogue between all stakeholders to facilitate the transition to a circular bioeconomy; - supporting the development of the ecosystem for systematic multilevel governance with actors from the regional level of politics, industry, academia and civil society organizations. - financial support for the development of research in the sector; - ensuring the necessary changes in the strategic and regulatory

	framework and financial instruments for support.
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Stakeholder group	NGOs and informal civil society organizations
Subgroup of stakeholders	65 Local action groups (Leader and CLLD approach in 2014-2020 period covering 135 municipalities in rural areas) and other representatives of regional and local business support ecosystem.
Position in the network	NGOs are an important part of the stakeholder group with direct access to participation in the processes of developing strategic, planning and programming documents at national (through participation in working groups at state institutions) and at regional and local level (working groups at regional governors and municipal councils), as well as directly involved in the management of local initiative groups. On the other hand, they provide access to information and advice to end users such as farmers and processing companies at the local level, as well as manage financial resources in support of local socio-economic development.
Meaning for GoDanuBio	NGOs are an important partner that will provide a platform for dissemination of knowledge at regional and local level in the field of circular bioeconomy and project results, such as: <ul style="list-style-type: none"> - organizing trainings for knowledge transfer based on the project' outputs; - conducting events for exchange and demonstration of good practices; - support and direct participation in the process of creation, management and development of clusters in the bioeconomy sector.

Stakeholder group	<i>Academies that represent research and educational institutions in the agricultural and forestry sector, biotechnology and others. related scientific fields</i>
Subgroup of stakeholders	Academies and institutes in the agricultural sector as: Agricultural Academy and its structural units Institute of Forests – BAS; Institute of Microbiology – BAS; Institute of Organic Chemistry with Center for Phytochemistry – BAS and others educational and research infrastructures of the Republic of Bulgaria.
Position in the network	The academic sector is one of the key factor for accelerating the transition to a circular bioeconomy in the country by the development of innovative technologies, products and processes through the intelligent combination of bio- and engineering sciences. The academic sector works mainly with leading companies and branch organizations from the agricultural and processing sectors, which limits the quick access of small companies and farms to the latest technologies, knowledge and new products. It is necessary to encourage the exchange of information, knowledge and the transfer of know-how to

	the agricultural and processing sector, incl. the smallest farms.
Meaning for GoDanuBio	<p>The academic sector, as an educational and scientific infrastructure (which is in the process of renewal in recent years), is the owner of knowledge, patents and technologies - an essential factor for the long-term socio-economic development of rural areas. In order to achieve sustainability of the project results, their participation in the network must ensure:</p> <ul style="list-style-type: none"> - increase of the knowledge and skills for the circular bioeconomy - development of new programs and training modules for professional development of the workforce in the field of circular bioeconomics; - promotion of scientific results in the bioeconomy sector; - easy and fast transfer of applied scientific results in the agricultural and industry sectors; - participation in the process of project development together with stakeholders for facilitating the transition to a circular bioeconomy.

Stakeholder group	Industry
Subgroup of stakeholders	Private producers (Large and SMEs in the in the processing industry and other industrial sectors processing biomass, large and small farms)
Position in the network	<p>The competitiveness of companies from industry and the agricultural sector is directly dependent on the development of science and technology in the bioeconomy with a view to moving to a circular bioeconomy, as well as the availability of well-trained personnel for production.</p> <p>Large companies, as well as more innovative ones, actively participate in the research activities of the academic sector by concluding contracts for specific research and / or transfer of new technologies and products. There is a slowdown in the transfer of new knowledge and technology to smaller producers due to limited financial resources.</p>
Meaning for GoDanuBio	<p>Creating sustainability of project results through:</p> <ul style="list-style-type: none"> - identification and involvement of smaller companies from industry and the agricultural sector in the process of development and implementation of new technologies, products and services in the value chain; - raising the knowledge and qualification of experts and workers in the field of circular bioeconomics; - support and / or direct participation in the process of creation, management and development of clusters in the bioeconomy sector.