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## FACTORS FOR BIOLOGICAL ENTREPRENEURSHIP DEVELOPMENT IN BULGARIA

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**Abstract:** The development and application of innovative biotechnological methods and processes in agriculture, healthcare, chemistry and energy has recently been considered as one of the solutions to accelerate sustainable growth and development. By focusing mainly on research and innovation, new biomass products and new services needed to develop the bioeconomy can be created, helping to reduce climate change, waste and job creation. According to the OECD, by 2055 the bioeconomy will be the basic principle for the development of the European economy. This means that the focus will be on the production of renewable bioresources in agriculture, forestry and aquaculture, and biomass will become a major source of industrial raw materials.

Entrepreneurship is a key factor in the development of the Bulgarian bioeconomy. According to a report from European Union (the Council of the European Union, 2016), entrepreneurship is defined as a dynamic process whereby individuals are constantly finding economic opportunities and acting to develop, produce, sell goods and services. This process requires qualities such as self-assurance, risk-taking skills and personal responsibility.

Entrepreneurial activity is the result of the interaction between the person's perceived opportunity, the ability (motivation and skills) to seize this opportunity and the conditions of the environment in which he or she is.

The purpose of this study is to identify environmental factors in Bulgaria that encourage and/or impede entrepreneurial activity in the field of bioeconomy. The following tasks have been defined for the goal's: to analyze the entrepreneurial activity in Bulgaria; to identify the factors that stimulate or hinder the start-up of a new business and, on that basis, to reveal directions for improving the entrepreneurial environment. Various research methods were used: induction and deduction, analysis and synthesis, content analysis, statistical data analysis, econometric analysis of time series, general equilibrium modeling, questionnaires, interviews, case studies and more.

As a result of the analysis, statistically leading sectors have been systematized, which attract the interest of start-up entrepreneurs in the field of bioeconomy. The expectations of start-up entrepreneurs to develop their business at national and international level are explored. The entrepreneurial attitudes and entrepreneurial activity among the adult population in different regions of the country are analyzed. Environmental factors are summarized that can turn entrepreneurship intentions in Bulgaria into real behavior.

**Keywords:** bio-economy, biological entrepreneurship, innovation, competitiveness

### 1. INTRODUCTION

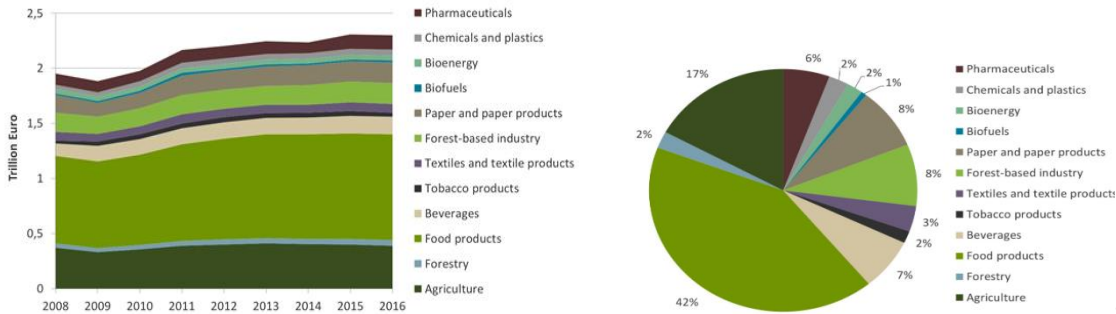
In recent years, the world has been confronted with challenges posed by climate change, deteriorating environment, reduced availability of natural resources, combined with recurrent economic and financial crises. The European economy, which is affected by these processes, is trying to maintain population well-being and economic growth. The EU's long-term vision focuses on the need for a transition to a low-carbon and resource-efficient economy, which should be the basis for sustainable development and economic prosperity. The aim is to combine the development of industries, labor markets and competitiveness in combination with environmental challenges in a new model called bioeconomics. The EU bioeconomy concept focuses on sustaining and creating economic growth and jobs in rural, coastal and industrial areas, reducing fossil fuel dependency, and improving the economic and environmental sustainability of primary production and manufacturing industries.

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### 2. ANALYSIS AND DISCUSSION

The Europe 2020 strategy calls for the bioeconomy to become a key element in achieving smart and green growth in Europe. The EU bioeconomy involves different sectors. According to St. Piotrowski there is a positive trend in the volume of turnover realized by the EU bioeconomy for the period 2008-2016 (see fig.1). With the exception of the crisis year 2009, data show a continuous increase from less than EUR 2 trillion in 2008 to about EUR 2.3 trillion By

2017, the food sector has made an important contribution to this result. The share distribution of turnover by individual sectors in the bioeconomy is presented in Figure 2.



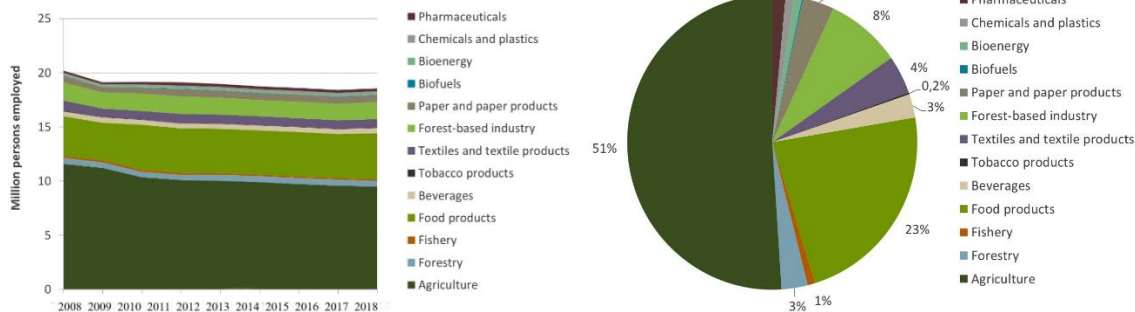
Source:

Dr. St. Piotrowski, European Bioeconomy in Figures 2008 -2016

**Fig. 1** Bioeconomy turnover in the EU-28, 2016

**Fig. 2** Turnover turnover by individual sectors in the EU-28, 2016

The data in Figure 2 show that approximately half of this turnover is from the food and beverage sector. One quarter of total turnover is produced by primary sectors (agriculture and forestry), and the remaining share is generated by the so-called biological based industries (such as chemicals and plastics, pharmaceuticals, paper and paper products, forestry, textile, biofuels and bioenergy). Data on employment in the EU bioeconomy28 in the period 2008-2018 are presented in Fig. 3



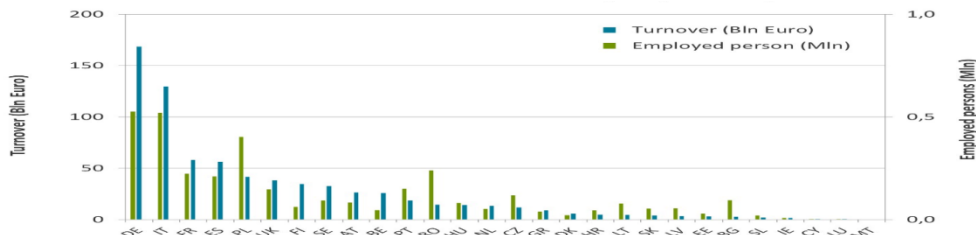
**Fig.3** Overall employment in the EU bioeconomy, EU-28, 2018

**Fig.4** Total number of employees by sectors in the EU-28, 2018

(2008-2018)

The data of fig. 3 show that despite growth in overall turnover, overall employment in the EU bioeconomy is declining. This decline in employment is mainly due to the decline in the agricultural sector. Employment in other sectors is stable, unchanged or slightly increasing. The total number of employees in the EU bioeconomy amounted to 18.6 million in 2018 (see Fig. 4).

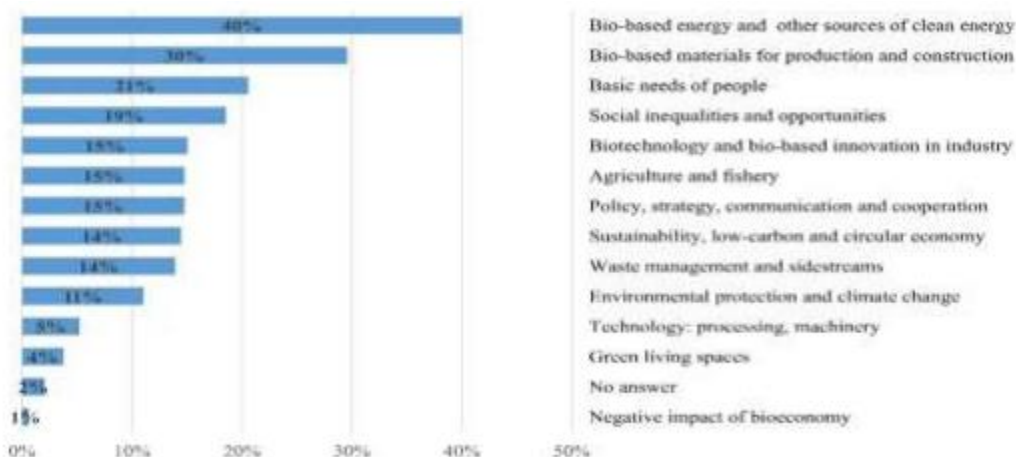
The figures for total turnover and employment in the bio-based economy (excluding agriculture, forestry, fisheries, food, beverages and tobacco) for each EU-28 Member State in 2018 are summarized in fig. 5. There are significant differences between groups of Member States. The data show that Bulgaria is among the countries that are stronger in the sectors with less added value in the bioeconomy but with higher employment of human resources. In comparison, Western and Northern European countries generate much higher turnover than employment created. The countries with the highest turnover / employment ratio in 2018 are Finland, Belgium and Sweden.



**Fig. 5 .** Turnover and employment in the EU bio-based economy per Member State, 2018

A survey conducted by international experts on the impact of the development of the bioeconomy over the next 20 years on society shows the following results (Fig.6) - the largest share of the respondents (40%) believe that the bioeconomy will in the future influence the development of bio- energy. According to 30% of respondents, the bioeconomy will boost the production of bio-based products and materials. For 21% of experts, the bioeconomy will contribute to providing humanity with food and water until zero famine is reached in the world.

Overcoming social inequalities through bioeconomics was cited by 19% of respondents as a possible achievement of bioeconomy. Three other opportunities for influencing the bioeconomy on society gather an equal share of opinions (15%) - biotechnology and biological innovation in industry; agriculture and fisheries; policy, strategy, communication and cooperation. For 14% of experts, the bioeconomy in the future should promote sustainability, low carbon production and the circular economy, along with two related areas: waste management and side flows (14%); and environmental protection and climate change (11%).



Source: Irwa Issa, Sebastian Delbru, Ulrich Hamm, Bioeconomy from experts' perspectives, University of Kassel, Witzenhausen, Germany, BIOCUM AG, Berlin, Germany

**Fig 6.** Main promising success stories of the bioeconomy over the next 20 years

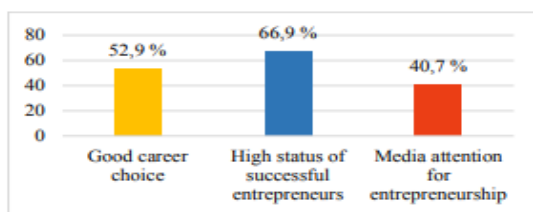
Innovation is considered the key to success in improving environmental degradation and resource consumption. They are an incentive to build entrepreneurship and sustainable growth in the bioeconomic model. Eco-innovation is any innovation that reduces the use of natural resources and reduces the release of harmful substances throughout the life cycle. Eco-innovation can be found in all forms of new or significantly improved products, goods, services, processes, marketing methods, organizational structures, institutional arrangements and lifestyles and social behavior that lead to environmental improvements over relevant alternatives. They imply the development and implementation of new approaches to the value chains of products and processes that reduce the intensity of material use and, at the same time, increase the intensity of service and well-being. The factors that stimulate or prevent companies from developing, creating and implementing eco-innovations are summarized in Table. 1.

**Table. 1.** Incentives and limiting factors for the creation and implementation of eco-innovations

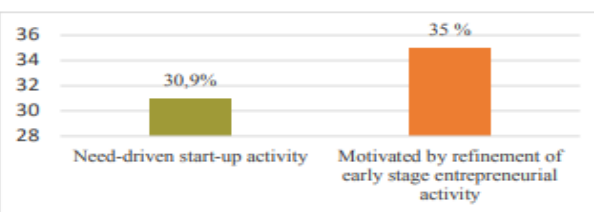
Incentives	limiting factors
<p><i>Economically:</i></p> <ul style="list-style-type: none"> <li>• growth in the market for eco-innovative products and services;</li> <li>• access to subsidies and financial incentives;</li> <li>• having good business partners.</li> </ul>	<p><i>Economic and financial:</i></p> <ul style="list-style-type: none"> <li>• lack of financial resources for the enterprise;</li> <li>• uncertain market demand;</li> <li>• uncertain return on investment;</li> <li>• difficult access to public subsidies.</li> </ul>
<p><i>Politically:</i></p> <ul style="list-style-type: none"> <li>• existing or expected environmental regulations and standards;</li> <li>• voluntary codes or agreements on good environmental practices;</li> <li>• creating clusters and supporting clusters.</li> </ul>	<p><i>Corporate:</i></p> <ul style="list-style-type: none"> <li>• lack of qualified staff;</li> <li>• lack of expertise;</li> <li>• limited opportunities to improve production efficiency.</li> </ul>

<p><i>Factors Related to Companies:</i></p> <ul style="list-style-type: none"> <li>• <i>availability of information and knowledge about technologies in the specific field;</i></li> <li>• <i>good organizational and management skills;</i></li> </ul>	<p><i>Other:</i></p> <ul style="list-style-type: none"> <li>• <i>limited environmental awareness among consumers, leading to low demand for eco-products.</i></li> <li>• <i>lack of regulatory incentives.</i></li> <li>• <i>dominance of established companies in the market;</i></li> <li>• <i>poor interaction between science and business</i></li> </ul>
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The growth of turnover in the bioeconomy, its potential for development in different sectors and the eco-innovations that are being created are a significant prerequisite for increasing the interest of entrepreneurs in starting a new business in the bioeconomy, and in a market economy, private companies are besides consumers and the main actors. According to the Global Entrepreneurial Monitoring for Bulgaria (GEM) report, 7.1% of Bulgarians have entrepreneurial intentions. Of all the surveyed adults from Bulgaria - 52.9% they answer that the entrepreneurship is a good career choice; 66.9% believe that successful entrepreneurs enjoy high public status, and 40.7% believe that entrepreneurship is regularly the subject of media attention (Fig. 7). According to the same survey (Fig. 8), 30.9% of Bulgarians are motivated by the need to start a business, and 35% are motivated by the opportunity to start a business.

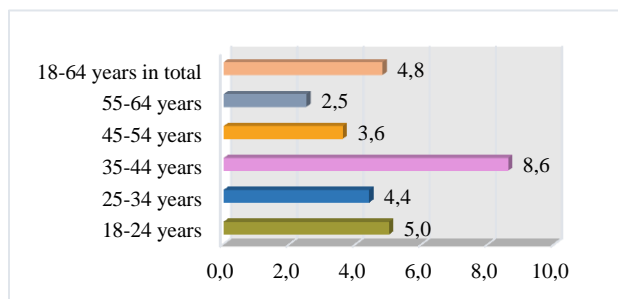


Source: 2018 Global GEM National Expert Survey  
**Fig.7** Public attitudes towards entrepreneurship, 2018

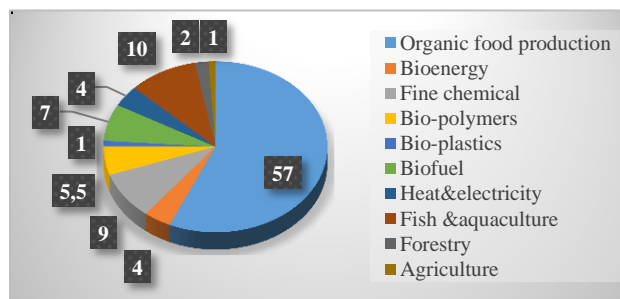


Source: 2018 Global GEM National Expert Survey  
**Fig.8** Entrepreneurship among the adult population in Bulgaria, 2018

The data on the factors for bio-entrepreneurship development in Bulgaria were collected through an online survey conducted in April 2019. 256 companies representing key sectors of the Bulgarian bio-economy participated in the survey. The questionnaire includes general business information, respondent characteristics, questions about entrepreneurial attitude and conditions of the Entrepreneurial Framework. Single-band (frequency and distribution) and binary (chi-square) data analysis methods were used to analyze the collected data. Data is analyzed using the SPSS statistical package. The distribution of the bio-entrepreneurial adult population in Bulgaria by age structure is presented in fig. 9. The main conclusion that can be drawn is that the respondents between the ages of 35 and 44 are the ones who are most willing to start a business in the bio-sector. The smallest group of respondents is 55-64 year olds. The entrepreneurial intentions of the study participants are summarized by sectors in Fig. 10. It is evident that the greatest desire is to start a business in organic food production - 57% of the respondents answered in this way. 10% said they wanted to start a business in the field of bioenergy, 9% - in the fine chemical sector, 7% in biofuel sector, 5.5% in the bio-polymers sector. Only 1% said they wanted to start a business in the agricultural sector and bioplastics.



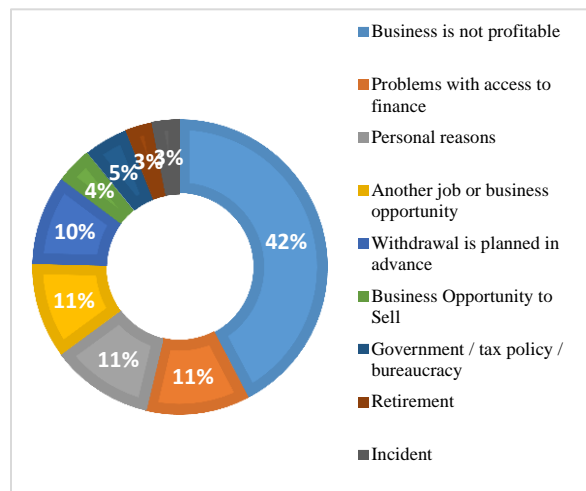
Source: Own calculations  
**Fig. 9** Entrepreneurial activity by age groups in Bulgaria, 2019



Source: Own calculation  
**Fig.10.** Entrepreneurial Intentions in Bulgaria, 2019.

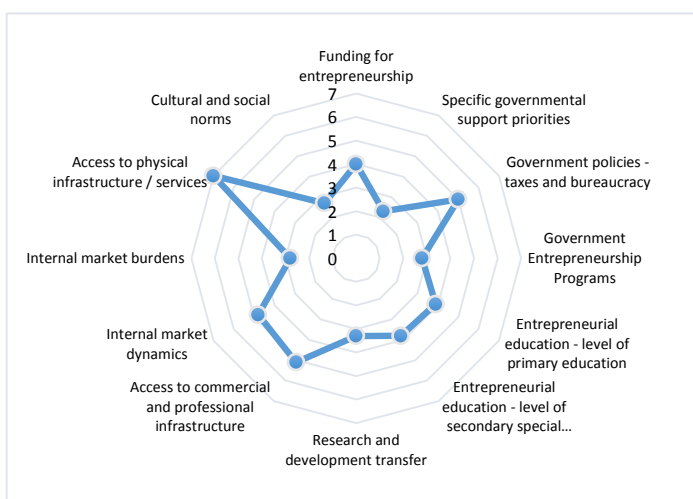
The results of the analysis also show that the main reason for leaving the business is that there is no opportunity for profit - 42% of the respondents answered in this way (see Fig.11). The most common point among them is that the business is not profitable. Secondly (by 11% each) respondents ranked the following three reasons: lack of access to

funding, personal reasons and another job or business opportunity. Third with 10% of the respondents ranked the reason like withdrawal planned in advance. In fourth place, 5% of respondents ranked heavy bureaucracy. The conditions of the entrepreneurial framework in Bulgaria presented in fig.12. The biggest factor in the development of bio-entrepreneurship is the factor of physical access to infrastructure, followed by the factor of internal market dynamics and the factor of access to commercial networks. Of less importance are the factors - access to finance, entrepreneurship training - secondary and higher education, followed by the factors like research and development transfer, cultural and social norms, internal market burdens and Government Entrepreneurship programs.



Source: Own calculations

**Fig.11** Reasons for leaving the business and terminating the activity Framework in Bulgaria, 2018



Source: Own calculations

**Fig. 12** Conditions of the Entrepreneurial Framework in Bulgaria, 2018

#### 4. CONCLUSION

There is a need for a change in the system, the way we produce, consume and dispose of goods. By developing its bio-economy - the renewable segment of the circular economy – EU countries can find new ways of providing food, goods and energy without depleting the limited biological resources of the planet. Moreover, not only environmental protection and climate change make them reconsider their economic paradigm and modernize their production patterns: there is also a significant potential for new green jobs, especially in rural and coastal areas . The EU has to pave the way for the transformation of waste, residues and unnecessary items into high value products, environmentally friendly chemicals, feed and textiles. Research and innovation play a key role in accelerating the building of a green European economy and achieving the goals of the United Nations for sustainable development. This strengthening of the bio-economy can make a significant contribution to achieving a wide range of EU objectives, including mitigation of climate change, circular economy and resource efficiency, environmental protection, job creation, growth and revenue. Achieving a sustainable circular bio-economy requires concerted work by the public and private sectors. Major sectors of the bio-economy are agriculture and forestry, fish and aquaculture, bio-energy and biofuels, food industry, bio-based products and processes.

#### ACKNOWLEDGEMENT

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