

**PUBLIC-PRIVATE PARTNERSHIP MODEL CONSIDERATIONS ON BIOECONOMY
AND TRANSFER OF BIOTECHNOLOGIES IN THE BULGARIAN COSMETICS AND
PERFUMERY INDUSTRY /THE CASE OF THE BULGARIAN UNIVERSITY
PROJECT “VITA PLUS”/**

Petar Raychev

CPG Consult, Bulgaria, info@cpgbulgaria.com

Atanas Vladikov

University of Plovdiv Paisii Hilendarski, Bulgaria, avladikov@uni-plovdiv.bg

Abstract: This paper is focused on presenting possible modes of introduction and implementation of bioeconomy and biotechnologies in the cosmetics and perfumery industry of Bulgaria. **Financing** of this paper is provided by the project “Vita Plus” (2021-2022) – a transdisciplinary project at University level in Bulgaria. **The object** of the paper is to investigate by the “Vita Plus” project and demonstrate a mode of transferring sustainable biotechnological into Bulgarian industrial reality of cosmetics and perfumery businesses in the country. **The focus** of this paper, thus, is upon one of the long-standing and successful industries of the country, which is 100% private – production of cosmetics and perfumery in Bulgaria. **The aim** is to research this sector and propose successful adoption of biotech models for producing high-end cosmetics and perfumery products, based on Public-Private Partnership models. We aim to suggest how a classical PPP Model may be adjusted to the Bulgarian cosmetics and perfumery industry, as essential part of the new generation of biotech equipment is located at publicly funded Bulgarian scientific environment – Institutes and Universities, while cosmetics and perfumery enterprises are private stakeholders, as a matter of fact, and pertain to the EU business environment. Hence, it is a must to consider the EU Green Deal, which is to be envisioned for the programming period 2021-2027, as both Bulgarian scientific and business environment shall be aligned to greater EU policies of knowledge transfer among public and private stakeholders within EU.

Keywords: EU Green Deal, bioeconomy, biotechnologies, cosmetics & perfumery industry, public-private partnership, PPP model, Small- and Medium-sized Enterprises /SMEs/

1. INTRODUCTION

In the recent years, much popularity was gained by the concept of “bioeconomy”, coupled with the idea of knowledge transfer of biotechnologies from men of science to businessmen. Although there are numerous interpretations of what bioeconomy exactly is, it is worth recalling the fact that bioeconomy as science compels joint research and study on dynamics of plant, animal, and human populations, along with dynamics of economic and social systems.

In practice, bioeconomy comes along with new smart solutions and competitive biotechnologies for high-end market products and services to sustain the local, EU, and global economy. Having in mind, all new global trends and EU policies “to go green” in the forthcoming programming period 2021-2027, it is worth mentioning that bio-based industries may happen to be the new economic drive for both advanced and developing countries. Thus, we reckon that the new generation of biotechnologies may be adopted into a new class of bio-based industries or modify classical industries into industries of high value added, operating in eco-sustainable industrial mode.

Our viewpoint is that biotechnologies and bioeconomy may be introduced and excelled in Bulgaria through adjusted public-private partnership model /PPP Model/, as there is some polarity of capital and scientific endowments in the country. On the one hand, the industry of cosmetics and perfumery in Bulgaria is driven by 100% private stakeholders in the economy – both domestic, and foreign, while essential part of scientific endowment of new and modern generation of biotechnologies is located at publicly funded Institutes and Universities. Speaking straightforward, it must be derived a model for Bulgaria, which may successfully vehicle transactions between publicly funded scientific stakeholders and private businesses. Such a model, we believe – could be a PPP Model, specifically designed to split fairly costs, benefits, and risks in such kind of special class deals. Also, this PPP Model must comfort all parameters of intellectual input, know-how, trademarks, patents, and other stakes in intellectual capital, such as the human capital – as the most important driving force in advanced bio-based industries, per se.

We believe such investigation and design of a PPP Model may be successfully adopted into the cosmetics and perfumery industry, as one of the export-oriented industries of the country, and among the top performing industries in the country, as well.

2. NATURE OF THE RESEARCH AT THE UNIVERSITY OF PLOVDIV “VITA PLUS” PROJECT

There are many definitions, papers, strategies, and numerous documents, which shed light on what bioeconomy is supposed to be, and how it should be introduced. For instance, Germany has accrued tremendous intellectual and organizational input for almost a decade and may reshape industrialization landscape through a series of new biotechnologies and launch bioeconomy in practice, as a set of policies involving research into modernizing traditional industries and create new bio-based industries (Noske, 2017). Also, other EU countries did publish numerous papers, and documents to promote biotechnologies as a main component of the new bioeconomy paradigm (Clever Consult BVBA, 2015). In addition, EU published in 2018 an updated strategy on bioeconomy (European Commission, 2018) and a Communication on setting a new agenda and introducing sustainable bioeconomy (COM/2018/673).

We decided to investigate through the provided financing in the “Vita Plus” project not only the popular papers and documentation available for introducing biotechnologies in EU as a formal policy into shaping the forthcoming era of bioeconomy, but also to study in the forthcoming months the level of readiness of private stakeholders in Bulgaria to launch new biobased businesses. Our research shall be based on surveying private and public stakeholders in Bulgaria, which may offer readiness of productive partnership in transferring knowledge, know-how, patents, intellectual capital from the public research stakeholders to private businesses against fair monetary returns. We believe that new opportunities for business innovations and competitiveness may emerge in the fields of agriculture, marine and coastal sector, and forestry. Due to the wide nature of applicability of biotechnologies, we are to limit our research in the cosmetics and perfumery industry, as one of the well-performing and export-oriented industries of Bulgaria.

3. IMPORTANCE OF THE SCIENTIFIC PROJECT

In the “Vita Plus” project we shall try to investigate the institutional, organizational, and market redesign of Bulgarian economic environment, to demonstrate what the economic establishment of the country was, how it transformed, and what the new EU reality is. Nowadays, there are a numerous brand-new concept for Bulgarian scientific, institutional, and business environment – such as public-private partnership contracts, transfer of knowledge for profit, licensing agreements, know-hows, “green deal”, EU policies, EU Communications, and so on. This – in contrast to the developed EU countries, was not a reality for the previous generations of Bulgaria, and we now, as a country – entering the next EU programming period /2021-2027/ must know our past, to define our future. To the best of our knowledge, we are unaware for the period of political transformation (commenced in the early 90s for our country) until accession of Bulgaria to EU to present day – to exist a systematic University funded research on how political and economic changes affected Bulgarian cosmetics and industry sector. This is the main reason to plan a thorough scientific investigation in the next two years through the project “Vita Plus” how these changes transformed the cosmetics and industry sector (which was totally public before 1989), and then it turned into 100% private through the implemented mass and cash privatization. Although there are numerous challenges to track back and analyze in-depth all parameters of the turn-around economic policy, our main hypothesis is that Bulgarian industrial entrepreneurs, operating in the cosmetics and perfumery sector in present day, must find an intelligent approach to communicate their business needs and partner more intensively with qualified representatives of publicly funded Universities and Institutes; this is so, as publicly funded Universities and Institutes are technologically modernized with EU-financed biotech and equipment for advanced and costly researches. The state of reality is that such kind of biotech equipment – due its costly value and high prices of extensive and team research experiments – is rarely spread or non-existent in Bulgarian cosmetics companies, which are Small- and Medium-sized Enterprises /SMEs/ in their large part.

We want to focus on this new EU policy to introduce in EU member states the paradigm of bioeconomy, as EU-based companies, public stakeholders, and citizens are aware already that this is an ecofriendly policy, which helps we live a healthy life with sustainable jobs and businesses. In particular, the economic turnover of EU bioeconomy is estimated at present at € 2,3 trillion, and 8,2% of EU workforce is employed there (ENRD Review № 28, 2019, p. 2). This gives us another reason to research this problem of how to find a scientifically reasonable way to implement new generations of biotech business solutions with the assistance of EU programs and funds in our economy.

We are fully aware that such a tremendous change in society, business and peoples’ lifestyles shall be led in full transparency, clear relations with all interested parties, system interactions and working partnership forms among institutional, scientific, and business stakeholders, positive communication of findings and fair distribution of costs, benefits, and risks in such an endeavor. We stand on the position that through the “Vita Plus” project we can gather, analyze, and systematize real data from Bulgarian stakeholders on the historical background, business perceptions,

attitudes, and awareness how biotechnologies may be transferred into real bio-based businesses and high-end products of cosmetics and perfumery with an appropriate PPP Model for this industry.

4. METHODOLOGY - RESEARCH DESIGN AND DATA COLLECTION

Our methodological approach shall be based into tracking back the path of industrialization and shape of the cosmetics and industry sector, along with economic transformations of the sector, in order to scientifically detect how production of end-products and services is organized and managed, so that we could suggest modes, examples, and models of introducing biotechnologies to present market players. Also, we shall compose a PPP Model – adjusted to the cosmetics and perfumery market segment, where we shall demonstrate how new biotechnologies may be market-oriented and economically productive for Bulgarian entrepreneurs in the cosmetics and perfumery.

To demonstrate the complexity of the problem, we must remind that after the end of the World War II, Bulgaria operated as centrally planned economy. Since 1945 to 1989 the country organized its industrial production schedules in 5-year annual plans, which were largely dependent on international division of labor, capital, and industrialized profiling, based on international agreements signed under the Council for Mutual Economic Assistance /CMEA/ (1949-1991), led by the political and economic leadership of non-existent already USSR.

Thus, it is essential to state that Bulgarian industrialization was dependent on foreign economic relations to introduce into the economy industry samples, technologies, factories, way of working, scientific literature, mode of research and education, and other indicators that were totally aligned with the interests of USSR and CMEA. In contrast, Western European countries were operating into the system of European Economic Community /EEC/ (1957-1993) and European Free Trade Association /EFTA/ - established in 1960. Thus, there was a serious split in economic paradigms opposing the economic systems of USSR and CMEA-members to the economic systems of EEC-members, EFTA-members, and the policies of the Coordinating Committee for Multilateral Export Controls /COCOM/ (1949-1994). It is worth recalling that COCOM-members exercised strict control on transferring knowledge, know-hows, patents, and licenses to USSR and CMEA-members and paths of industrialization and marketization extensively diverged.

Bulgaria – being a CMEA-member, on the one hand, and under COCOM-regulations, on the other – was forced to establish new units and structures of science under the guidance and supervision of Soviets' and CMEA-professionals, who consulted at large Bulgarian publicly funded and totally controlled economic operators. Thus, introduction of different biotechnologies came at a comparatively late stage, as industrialization of the country was initially oriented towards heavy machinery production, production of metals, non-organic chemistry production, etc. It was in the mid-80s, when some transfer of biotechnologies was initiated, and establishment of biotechnological productions was started in the country. For example, in terms of genetic biotechnologies – it was established the Institute of Genetic Engineering in the city of Kostinbrod in 1985, as a part of the Bulgarian Agricultural Academy. From special investment funds were created 17 laboratories for embryo transplantation, and specialized labs for tissue cultures in some institutes researching the nature and behavior of plants. Furthermore, it was in the mid-80s when the Institute of Cryobiology and Lyophilization was established (Ivanov D., 2008, p. 325). Also, in this period, there were established 50 high-tech risk publicly funded SMEs and semi-industrial labs at state Universities and Institutes. Among these high-tech organizations are production lines of new pharma products, bio stimulators, “white/clean rooms” for tech particles production, polymers, and others (ibid, p. 346). For example, in the mid-80s the funds for Science are reported to be about 700 million then-BGN (Ivanov D., 2006, p. 197). Based on official currency rates data for the 80s (US Treasury Report, 1980), we can estimate that the then conversion to the US dollar approximates this amount for Science to \$ 830 million USD. Hence, getting into 80s to find a sound economic ground for our look-back approach, it is reasonable to match registered Bulgaria data with international sources of information. Speaking in numbers, we can demonstrate that Bulgarian Gross Domestic Product /GDP/ per capita in 1980 was estimated at \$ 3'437 USD and an inflation rate for the period 1963-1988 was estimated at 1,3% per annum (Bornstein, 1994, p.344). At that time, the population of Bulgaria is estimated a little bit less than 9 million citizens (Statista Graph, 1980), which stands to mean that the GDP of Bulgaria in 1980 approximated \$ 30 billion USD. In summation, we can reasonably say that Bulgaria allotted approximately 3% of its GDP for development of Bulgarian Science.

We believe that Bulgarian soil and climate are very appropriate for implementing biotechnological solutions into the cosmetics and perfumery industry, as historical data for our economy demonstrate that our country produced and exported a lot of fresh fruits and vegetables, wines, canned food, and other products, retrieved from the Bulgarian land and processed in Bulgarian factories with Bulgarian workers. For example, in the period 1983-1989 our country exported on average 30 thousand to 35 thousand tons of toothpaste, 400 thousand tons of canned food, 400 to 450 thousand tons of fruits and vegetables, 300 thousand tons of wine (Ivanov D., 2008, p. 367). To us, this means that Bulgarian land can be utilized again to return to its crop potential, including herbs and plants for producing

biocosmetics and bio-perfumery. In fact, the reindustrialization of Bulgarian economy may be based on biotechnologies and bioeconomy, we reckon – fit not only for the big business, but also for the SME, that is for caring for preserving nature Bulgarian families.

Having in mind these facts and figures from the past, we want to research in the “Vita Plus” project what was lost in the economic transformation, what may be upgraded and modernized in the forthcoming period of 2021-2027, and what can be set anew as foundations of bioeconomy in the country. Thus, we want to compose in our methodological approach specific sets of data, which shall help us to reasonably assume what was the level of Bulgarian Science, and the approximate biotech endowment and compare the influence and positive impact of Bulgaria being full member of the EU.

Methodologically speaking, we are to retrieve information from historical Bulgarian datasets, and conduct sectoral survey and in-depth interviews with private stakeholders in the cosmetics and perfumery industry to check their organizational and production potentials to enter bioeconomy with purchasing biotechnological equipment and partner with researchers into the field of cosmetics.

Once having completed our data, we shall proceed to construct our main research hypothesis that Bulgarian entry into bioeconomy may be transacted through bio-based industries, such as the cosmetics and perfumery, which – in our opinion, has a great potential to evolve into the first bio-based industry and create the first real new jobs in Bulgarian bioeconomy. Later, we are to suggest a PPP Model, fit for establishing sustainable economic relations between public and private stakeholders into the sector of cosmetics and perfumery, upgrading their businesses to biocosmetics and bio-perfumery, grounded on appropriate biogeographical regions of the country. We strongly believe that such sector-specific research may help Bulgarian SMEs to revitalize their businesses by introducing new bioeconomy business model, based on fair public-private partnerships. We expect our PPP model to extend the tradition sector of cosmetics and perfumery beyond traditional supply chain of biomass and its processing by adding higher values through implementation new biotech solutions for business’ sake.

Furthermore, we strongly believe that bioeconomy may be appropriate for the Bulgarian economy, as bioeconomy can accelerate in EU adoption of sustainable and climate-friendly practices in rural areas, as it is demonstrated in some publications (Bourguignon, 2017; ENRD Review № 28, 2019).

Also, methodologically speaking, development of the Bulgarian bioeconomy may be based on development of Bulgarian cosmetics industry, as it has serious presence on the domestic market with an overall production of about BGN 300 million per year (€ 150 million); a significant share of (Stat Book, 2020) this production is placed to foreign markets. The European cosmetics market was valued at €78.6 billion (ibid.), making EU the largest market for cosmetic products in the world. Trade is a critical component of the industry, with trade in cosmetic products and ingredients (within the EU) exceeding 128 million US dollars. (IME, 2020). These values stand to mean as a clear sign for the importance of that industry and across its value chain. For example, recent statistics demonstrates that production in 2018 of cosmetic products in Bulgaria increased by 50%, as compared to 2017 (Stat Book, 2020).

The increasing production values indicated by the National Statistical Institute lead to significant socio-economic benefits, where the cosmetics industry creates over 50 thousand jobs (ibid.). Of these, 15’000 are employed directly in the manufacture of cosmetic products. Moreover, there are about 150’000 (ibid.) employed indirectly in the cosmetics value chain.

The industry value chain can be segmented into five main stages. The first stage in the value chain comprises the companies that provide the raw materials required to make cosmetics products. These include companies manufacturing the ingredients used in the production of cosmetics, but also companies developing and manufacturing packaging components and R&D activities (e.g. market research, product formulation and industrial design). The next step of the value chain (manufacturing) is made up of manufacturers. Socio-economic benefits are created through production, but also through supporting activities (e.g. marketing and advertising, IT, accounting and legal services and business administration). The finished cosmetic product may then pass-through distribution and/or wholesale. The final stage of the value chain involves the retail sale and purchase of cosmetics. End-consumers may buy cosmetic products through a range of channels, including grocery stores supermarkets, department stores, pharmacies, online stores, and beauty salons. Beauty salons (e.g. nail salons, hair salons, spas, etc.) also purchase, use and sell cosmetics products. Most companies in the Bulgarian cosmetics industry are SMEs, which main data shows the volumes of its sales and market orientation. In addition, recent statistics demonstrates that exports of Bulgarian perfumery and cosmetics in 2019 increased by 3,1% on an annual basis, and by 16,88% compared to 2014 (IME, 2020). Hence, the sector is getting impetus for development, as the market of the sector is expanding in the direction of the entry of more and more natural or organic products. Also, Bulgarian companies in the perfumery and cosmetics sector spend less than 5% of their annual turnover on R&Ds in 2017 (Stat Book, 2020) and this remains one of the core problems in the sector, as no or insignificant transfer of technologies may be

executed. Ranging from hair care, skin care, oral and body care to perfumery and decorative cosmetics, cosmetic products are an important part of people's everyday life in the country.

5. CONCLUSION

In general, global trends demonstrate that cosmetics industry is a science-driven, fast-paced, and highly innovative sector, which makes large investments in R&D. Here is why, application of a public-private partnership model may assist Bulgarian SMEs to get technologically advanced by producing higher value-added products, if sustainable and fair University-business connections are established. Also, Bulgarian enterprises have a great lack of technological preparation for commencing in-depth processing of large volumes of local raw material – rose and lavender oils, for instance – to complete a full bioeconomy cycle with adding higher economic values in the cosmetics industry and enter bioeconomy. Low price levels of the domestic market, along with the small domestic market consumption potential, as well as local consumer conservatism will continue to guide Bulgarian perfumery and cosmetics manufacturers in their business strategies to export a greater part of their products. These characteristics of the Bulgarian perfumery and cosmetics market lead to a great number of manufacturers to start rebranding their products for the local market, redirecting their new products to reflect in domestic consumers' images of traditional brands from the past. Hence, recent trends in the Bulgarian cosmetics industry shape industry stakeholders instead of going into more R&D-intensive high-tech products and innovating new bio-based cosmetics and perfumery products – to spiral-down to old-fashioned economic, technological, and marketing patterns. Thus, public-private partnership comes to be a business necessity for the SMEs to enter the segment of highly competitive bio-based industry as cosmetics and perfumery are already shaped into. The Bulgarian cosmetics industry shall open and demonstrate greater contractual commitment for collaboration with relevant R&D stakeholders, such as Universities and Tech Centers for adding greater economic values and construct a sustainable value chain in the sector through adopting adequate PPP models in the industry and overleap the inherited economic paradigms of the past.

ACKNOWLEDGEMENTS

This paper is a part of a project “Vita Plus”, № 1/2021-2022, financed by the University Science Fund, University of Plovdiv Paisii Hilendarski, Bulgaria.

REFERENCES

- Bornstein M. (1994). *Comparative Economic Systems. Models and Cases*, 7th Edition, IRWIN, ISBN 0-256-09593-0
- Bourguignon D. (2017). *Bioeconomy - Challenges and Opportunities*, European Parliamentary Research Service /EPRS/, Members' Research Service, January, 2017, Briefing, European Parliament, [https://www.europarl.europa.eu/RegData/etudes/BRIE/2017/595890/EPRS_BRI\(2017\)595890_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2017/595890/EPRS_BRI(2017)595890_EN.pdf)
- IME (2020). *International Research and Identification of Potential Markets for Export Growth of Bulgarian Small and Medium-sized Enterprises in Selected Sectors*, In Bulgarian language, *Mezhdunarodno izsledvane I identificirane na potencialni pazari za eksporten rastezh za Balgarskite MSP v izbrani sektori*, Report, Institute for Market Economy (IME), Sofia, 30 April 2020, pp. 71-72.
- Ivanov D. (2008). *Socialist Bulgaria*, Library “Social Ideas” № 13, Collected Works, in Bulgarian Language, Arete-Fol Foundation, Sofia University Press, ISBN 978-954-07-2678-6
- Ivanov D. (2006). *Real Socialism*, Library “Social Ideas” № 11, Collected Works, in Bulgarian Language, Arete-Fol Foundation, Sofia University Press, ISBN 978-954-07-2488-1
- Noske A. (2017). *Bioeconomy 2030. The German National Research Strategy*, 6th German-Brazilian Dialogue, November, 2017, Federal Ministry of Education and Research, https://fapesp.br/eventos/2017/6dialogue/08-11-17/15h30_Andrea_Noske.pdf
- CLEVER CONSULT BVBA. (2015). *Bio Base New Analysis Report on the Bottlenecks SMEs Encounter in the Bio-Economy*, Study to support international partnerships and collaboration in the field of biobased economy, Belgium
- COM/2018/673 final COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0673>
- ENRD Review № 28 (2019). *Mainstreaming the Bioeconomy*, EU Rural Review № 28, European Network of Rural Development /ENRD/, European Union, https://enrd.ec.europa.eu/sites/enrd/files/enrd_publications/publi-enrd-rr-28-2019-en.pdf
- EUROPEAN COMMISSION (2018). *A Sustainable Bioeconomy for Europe: Strengthening the Connection between Economy, Society, and the Environment – Updated Bioeconomy Strategy*, Brussels

- STATISTA GRAPH (1980). *Population of Bulgaria from 1800 to 2020 (in 1,000s)*, Statista, Society, Historical Data, <https://www.statista.com/statistics/1008286/population-bulgaria/>
- STAT BOOK (2020) *Republic of Bulgaria Annual Statistical Book, In Bulgarian language, Republika Balgaria Statisticheski Godishnik*, National Statistics Institute, Sofia, p.
- US TREASURY REPORT (1980). *Treasury Reporting Rates of Exchange as of March 31, 1980*, Section US Dollar Currency Rate against Bulgarian Lev: 1 USD to 0,8445 BGN, p. 5, Department of the Treasury, Fiscal Service, Bureau of Government Financial Operations, https://www.govinfo.gov/content/pkg/GOVPUB-T63_100-3a1c412279b9d41760aeb975bfc3fe27/pdf/GOVPUB-T63_100-3a1c412279b9d41760aeb975bfc3fe27.pdf

Official Website of the University of Plovdiv Transdisciplinary Project “Vita Plus”: www.vitaplus.uni-plovdiv.bg