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### European Neighbourhood Instrument Cross-Border Cooperation



Project BSB1021 CIRCLECON

**Project title: Knowing Circular Economy in Black Sea Basin**  
**1.2 ACTIVITY TITLE: Regional Specific Study**

## Regional Study in the Region of Varna, Bulgaria:

Programme priority	2. Promote coordination of environmental protection and joint reduction of marine litter in the Black Sea Basin
Programme priority specific objective	2.2 Promote common awareness-raising and joint actions to reduce river and marine litter
Project title:	Knowing Circular Economy in Black Sea Basin
eMS Code:	BSB-1021
Grant contract no	31113/11.03.2021
Project Deliverable:	T.1.2.1 Regional Specific Study
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Date	December 2021

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### Executive Summary

The Regional Study of the Varna Region, Bulgaria analyses and synthesizes the state of the art when it comes to circular economy efforts. It uses two various methodological anchors to describe the situation and derive conclusions: (1) analysis of secondary data, available from different national and international institutions and (2) qualitative research based on interviews with the key stakeholders.

Main conclusions, drawn by different methods, are as follows:

- the most important challenge is the **limited funding** available for SMEs to transform their production models as well as limited funding at the country's disposal for the circular economy. Another major challenge is the **lack of information and data on national and regional level** on circular economy/waste management/recycling. A great challenge in transition to circular economy is also the **behavior of general public and businesses. In order to overcome the existing challenges the interviewed regional stakeholders offered different measures:** additional meetings, information, and demonstrations; activities for involvement of more participants in this process; awareness raising of people about benefits of using the concept of the circular economy; providing incentives to companies developing circular business models; ensuring an effective municipal separate collection of waste and recycling of waste with return of the product from recycling to production; providing policy measures for information campaign; introducing penalties for non-environmental production; introducing grant programs for projects for modernization of production; tax relieves, specific support measures for start-ups following the concept of the circular economy as well as specific measures for construction of centers for separate collection of widespread household waste, hazardous household waste (equipment, batteries and accumulators, fluorescent lamps, car tires, etc.) and non-hazardous waste (paper, cardboard, plastic, glass, bulky and other waste, textiles) and for construction of waste reuses centers.

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### 1. Introduction

The aim of the Regional Study in the Varna Region, Bulgaria is to synthesize the findings concerning circular economy and to enable conclusions on the state of art and measures to be performed in the transition towards circular economy. For this purpose the Regional study is an attempt to describe in detail in quality and quantity terms the current situation of waste management and circular economy issues, especially, waste collection – waste treatment - waste recycling – waste reuse - main environmental challenges in each area — soil, area and water pollution status.

The study in particular presents the policy and institutional framework, their effect and challenges as well as the opportunities to support the regional efforts in achieving smooth transition to circular economy within the policy framework.

In this regard, the main aims of the study are:

1. To illustrate the Varna region economy and the national policy and institutional environment through economic, environmental and other relevant indicators.
2. To present waste management and circular economy related policies, strategies, action plan on national, regional and local level.
3. To identify and analyse the main circular economy monitoring framework indicators for Bulgaria.
4. To identify the main challenges connected to transition towards circular economy in Bulgaria, in general, and in Varna region, specifically.
5. To identify main recommendations and good practices for support of circular economy transition in Bulgaria and in Varna region.

### 2. Methods

The Regional Study has been prepared in two steps. During the first step, VFU expert team produced an overview on main characteristics of Varna region, presenting analyses on national strategies and action plan related to the circular economy issues as well as on official statistics collected on national level in regard to the circular economy monitoring framework.

The study synthesizes the findings of the following activities:

1) Analysis of secondary data, available from different national and international institutions - all available relevant documents and reports are used to offer a general presentation of the Varna region, circular economy institutional environment as well as related national strategies and policies. First, data available from National Statistical Institute of the Republic of Bulgaria and other relevant national institutions (such as ministries and other governmental institutions) are used. It is important to note that much statistical data on the circular economy performance on regional level are not systematically collected or analyzed by national institutions. Then, the study analyzes secondary data derived from the relevant international institutions such as the EUROSTAT, UNEP reports, etc. In other words, this activity is about desk research of the existing and available administration data relating to the targeted CE indicators.

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2) Qualitative research based on interviews with the key stakeholders The interviews were conducted to understand the main circular economy processes and challenges faced by Varna region better. The aim of the interviews is fourfold:

1. To perform mapping, evaluation and benchmarking of the current situation as well as the assessment of potential challenges in the field of circular economy in the region and assessment of instruments and measures to overcome them;
2. To reveal regional discourses concerning circular economy;
3. To map the existing policies (measures and activities) focusing on circular economy; and
4. To find out what kind of data is collected and used by the regional actors to measure circular economy.

The external expert selected representatives of relevant institutions dealing with circular economy issues and each of the categories of organizations to be interviewed.

The interviews titled “Models for development of circular economy in the region of Varna, Bulgaria” were conducted in the period October – December 2021.

24 organizations were contacted and invited for interview, 9 of them responded positively to contribute to development to the Regional Study of the State of Art and to share their opinion about circular economy concept in the Varna Region. The responding rate is 38%. Distribution of organizations per type is as follows: Non-Institutional Regional Authority – 2, Institutional Regional Authority – 3, Business Support Organization – 2, Regional/National/International NGO – 2.

The selection was based on experience with working on the CE issues and the scope of its services on this topic. Each interview with a stakeholder included seven major themes: 1. The description of the organization and interviewed person. 2. The perspective on the regional developmental pathways in the area of environmental issues and circular economy: past, present and future. 3. Challenges, policies, projects and programmes related to circular economy, and in particular waste management; 4. Data on circular economy/waste management/recycling in the country (existent and possible data sources/data bases, data needs); 5. Perspective on how circular economy matters in the action field of the organization; 6. Organizational engagement (how the organization the interviewed person represents is affected by circular economy challenges) 7. Recommendations.

After collecting all the interviews and creating all the summaries, interview findings summary was prepared.

The results of all these activities are presented in the chapters below.

### 3. General presentation of Bulgaria/Varna region

The Varna Region occupies a territory of 3822 sq.m. which is 3.44% of the territory of the Republic of Bulgaria. Varna region covers 12 municipalities - Avren, Aksakovo, Beloslav, Byala, Devnya, Dolni chiflik, Dylgopol, Provadia, Suvorovo, Varna, Vetrino and Vylchi dol. In the region there are 11 towns and 148 villages.

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The population of the region till 31.12.2018 is 471 252 people -6.73 % of the total population of the country. The average population density in the region is 123.3 people per km<sup>2</sup> and is slightly higher than the average for the country (63.4 people per sq km). Over the last 5 years it has been gradually decreasing. Of all areas, a significant decline is not observed only in Varna.

The Varna Region is one of the most dynamically developing regions in the country. The gross domestic product (GDP) produced for the district of Varna in 2018 is BGN 7,301 million. This ranks Varna district third in the country after Sofia (capital) and Plovdiv districts. Compared to 2017, its volume in nominal terms increased by 10.1%. The GDP produced in the district is 6.7% of the total for the country.

The main economic activities in the region include productions from the areas - chemical industry, cement, sanitary ceramics, glass, food, shipbuilding, road and civil construction, mechanical engineering and metalworking, garment industry and others. The employees in the sector for 2017 are 80,598 people, and there are 63 companies in the region out of the TOP 500 in terms of number of employees.

The services sector is the most dynamically developing sector of the economy. Varna District stands out sharply from the other districts in the region with its share of 67% in the total GVA of the region, against only from 8% to 13% for the other districts. There are many reasons for this, but mainly here the share of tourism, transport and other activities in the service sector is reflected.

The number of employees in the district of Varna is constantly increasing in the period 2011 to 2018, when it reaches 206,300. The employment rate (the ratio between the number of employed persons and the population aged 15 and over) increased from 56.6% in 2011 to 66.3% in 2018.

As of December 31, 2018, the unemployment rate is 4.4%, remaining lower than in the Northeast region and in the country (7.4%).

Foreign direct investment (FDI) in the non-financial sector in the Varna Region as of 31 December 2019 amounts to EUR 1,748.7 million at current prices. In 2019, the highest value of foreign direct investment in industry was - 893.1 million euros. Next in terms of FDI are the services sector (trade, repair of motor vehicles and motorcycles, transport, warehousing and post offices, hotels and restaurants) - EUR 276.5 million, the real estate sector - EUR 244.1 million and the sector Professional activities and research; administrative and support service activities - EUR 157.9 million. In 2019, Varna region ranks fourth in the country (after Sofia (capital), Burgas and Plovdiv) in terms of foreign direct investment. Their share in the total amount for the country is 6.9% and respectively 71.1% for the Northeast region.

The main city in the region – Varna, is one of the largest scientific and educational centers in Bulgaria. There are 6 higher education institutions, 2 colleges and 5 significant research institutes in Varna district.

The development in the area is strongly polarized and the phenomenon of "center-periphery" is manifested. More than three quarters of the enterprises and the fixed tangible assets are located in the municipality of Varna and, accordingly, a very large part of the revenues from activity and profits in the district are realized.

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The most developed in the Varna Region is the **service sector**, followed by **industry**. Key for the region is **trade and tourism**. The structure of the industry is varied. It is determined by the production of mineral raw materials, food and beverage industry, chemical industry and transport machinery. Of particular importance to the economy of the region is the maritime industry which includes shipping, port management, shipbuilding and ship repair, marine resources, maritime science and education, as well as all activities and services covering the maritime business. However, the most dynamic sectors are textile, pharmaceutical products, cosmetic products, the mobile communication and the software industry.

Currently the main National strategies and action plans tackling the circular economy are:

- National Development Programme: Bulgaria 2030;
- Innovation Strategy for Smart Specialization of the Republic of Bulgaria 2021–2027 – under development ;
- National Waste Management Plan 2021-2028;
- National Strategy for Small and Medium Size Enterprises 2021-2027;
- Strategy and Action Plan for Transition to Circular Economy 2021–2027 - under development.

**National Development Programme: Bulgaria 2030** (NDP BG2030) is a strategic framework document based on country analysis and it identifies development trends defining the vision and common strategic objectives of national policies by 2030 covering all sectors of socio-economic policy implementation and their regional dimensions. The main goal of NDP BG2030 is to achieve accelerated economic development, demographic upswing and reduction of inequalities. The socio-economic analysis and the formulation of the economic policies set out in NDP BG2030 have been carried out using the achievements of modern macroeconomic theory and practice in the field of economic growth. NDP BG2020 is the basis for the programming of strategic documents in relation to the implementation of both national policies and EU policies. The program helps to optimize the programming of the development of Bulgaria by 2030, ensuring the connection between the national priorities of the Republic of Bulgaria and the EU objectives. NDP BG2030 provides the framework for setting the priorities for the allocation of public funds (national and European) and the mobilization of private funding. On the basis of the formulated vision and objectives, thirteen priority axes have been identified. The priority strands concern both the formulation and implementation of stand-alone national policies and the implementation of pan-European policies, which encompasses the full range of state actions in the field of socio-economic development.

**The issues of circular economy are reflected under Priority 4 – Circular and Low-carbon Economy.** The main goal of the sub-priority is to reduce the **resource intensity** of the country's economy and increase the **efficiency of the materials used**. Action will be taken to increase resource productivity throughout their life-cycle and the rate of circular (secondary) use of materials in the economy, to stimulate product life extension, to reduce waste and control the need to extract new resources. The measures will be aimed at supporting

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enterprises for the introduction of non-waste technologies, reducing the amount 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 as well as design, reuse and recycling strategies ensuring longer product use will be promoted. A special focus will be on **R&D and innovation related to the circular economy** and support for the development and implementation of **green business models**.

Areas of impact are:

1. **Material efficiency:** the measures will aim at sustainable use of raw materials and supplies, reducing the amount of raw materials and supplies used in production, stimulating the use of alternative raw materials and increasing the use of recyclable materials. A particular focus of the interventions will be to improve the knowledge base on the circular economy, the monitoring of waste and material flows, as well as the introduction of new forms of interaction between producers and consumers to support the circular economy. The measures will aim at supporting resource-efficient businesses and overcoming their difficulties in implementing the requirements related to staff classification, waste collection and treatment. Digital technologies will be used to track, control, analyze and optimize supply, production and data collection on the use of the product. A particular focus will be on R&D and innovation related to the circular economy, with interventions that will be oriented towards supporting companies in introducing low carbon and non-waste technologies, reducing production waste and developing industrial symbiosis. Action will be taken to increase the circular (secondary) use of materials in the economy, as well as to promote resource efficiency throughout their life cycle. The efforts of the state will be directed towards assisting enterprises in carrying out waste flow analysis and reviewing production activities to implement industrial symbiosis, introducing environmental standards, implementing eco-innovations to reduce environmental pollution and use resources more efficiently, developing clean technology demonstration projects and providing start-up capital to encourage the development of new businesses, including building new capacities in the field of circular economy.

2. **Waste management:** the sustainable waste management policy will aim at transforming waste into a resource and implementing a waste management hierarchy. The efforts will focus on fostering the efficient use of waste as resource in enterprises, raising awareness on the benefits of the circular economy and promoting the application of clean technologies and the deployment of new green business models. The measures will aim to support the introduction of recycling and recovery technologies and the implementation of the extended manufacturer responsibility regime. Regulatory measures and economic instruments will be implemented to promote the use and market development of recycled raw materials and supplies. The measures will aim at facilitating access, communication, exchange of product and production databases, as well as encouraging manufacturer responsibility for the transition to an informed green choice of goods, developing partnerships for data sharing, good practices and technologies.



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**3. Eco-innovations:** the measures aim to promote the deployment of eco-innovation in enterprises, increasing efficiency at all stages of production and creating competitive advantages, protecting the environment and optimizing resource consumption. Businesses will be supported in developing both new and improved solutions to reduce the negative environmental effects and make more responsible and economical use of resources. Innovative changes to processes and products to comply with the growing environmental and social standards and regulatory requirements will be supported. The general goal is to stimulate patterns of more sustainable production and consumption. A special focus of the interventions will be the development of products and services that facilitate the transition to a low-carbon, resource-efficient and circular economy.

**Innovation Strategy for Smart Specialization (ISIS) of the Republic of Bulgaria 2021–2027 is still under development**, but in the draft it is claimed that it builds on the experience gained from the implementation of ISIS 2014–2020. Still, it will be programmed and implemented in significantly different global, European and national contexts, specifically the decision of European countries to support the EU Green Deal which requires a complete transformation of industrial ecosystems in two directions - **environmental friendliness and digitalization**. This will require not only innovative re-tuning of production processes in enterprises, but also the creation of new public-private infrastructure, allowing both the transition to environmental energy and digital transformation of the industry using the technologies of Industry 4.0. The **thematic priority** that reflects the circular economy principles is reflected in **area 5: Clean technologies, circular and low-carbon economy**.

All 28 administrative districts in the country have identified two priority thematic areas, and **the third priority thematic area for all will be "Clean Technologies, Circular and Low Carbon Economy"**.

The strategy focuses on enhanced support for more effective cooperation between research organizations and business, including through some new forms of partnership, facilitating dialogue and the process of work between them, including and a partnership between business and Centers of Excellence, Centers of Excellence, Digital Innovation Hubs and Research Infrastructures, the development of which is supported and funded through the implementation of the National Roadmap for Scientific Infrastructure (2020-2027).

The “green” dimension of ISIS 2021-2027 is reflected in all three operational objectives, but more specifically in the **Operational objective 2: Improving environmental friendliness (introduction of clean and green technologies) and digitalization** in enterprises and the internationalization of Bulgarian products and services through commercialization and orientation of research to priority thematic areas for smart specialization and technology 4.0 Industry.

There are number of instruments planned under an operational objective 2: i.e. support schemes for commercialization of innovative products and services; schemes, incl. vouchers for stimulating ecological and digital innovations of the production processes up to the technological level TRL 5; schemes supporting the development and implementation of environmental and digital innovations that have reached technological development TRL6-TRL9; schemes for technology transfer in the field of ecology and digitalization of production processes; schemes

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to ensure co-financing of well-evaluated but not funded by Horizon Europe projects that meet the priorities of ISIS and can provide upgrades through national research programs; support for projects with a seal of excellence, evaluated by the EU Framework Programs - Horizon 2020 and Horizon Europe.

**National Waste Management Plan 2021-2028 (NWMP)** is another strategic document outlining the public efforts in application of the waste management hierarchy in all processes and levels. The Plan outlines 3 main goals:

- 1: **Reducing the harmful effects of waste by preventing its generation and encouraging its reuse** with corresponding National Waste Prevention Program and subprogramme Prevention of food waste.
2. **Increasing the amount of recycled and reused waste** with Program for achieving the objectives for preparation for re-use and for recycling of household waste, Program for achieving the goals for recycling and recovery of construction and demolition waste and Program for achieving the goals for recycling and utilization of MRLs with subprogramme for the management of packaging and packaging waste.
3. **Reducing the quantities and the risk of landfilled household waste and others** with Programme for reduction of the quantities and the risk of landfilled household waste and others

The adopted plan has the following financial dimensions: the total planned funds amount to 1.428 billion BGN. The investment measures mainly include the construction of infrastructure for waste pre-treatment for landfilling and treatment of biodegradable waste. Funds are provided for the expansion of the systems for separate waste collection. For the completion of regional waste management systems 260 million BGN are foreseen, for construction of waste recycling plants through financial instruments - 40 million BGN, for construction of new and expansion of existing systems for separate collection of municipal waste - 145 million BGN, for preparation and implementation of projects for closure and reclamation of municipal landfills for household waste - 100 million BGN, for construction of landfills or additional cells for municipal waste - 174 million BGN.

In general the NWMP aims to create conditions for reducing generated waste; to create conditions for the transition to a circular economy, i.e. management that ensures the effective use of waste as a resource; and to reach 55% recycled amount of the entire municipal waste by 2025.

**National Strategy for Small and Medium-sized Enterprises 2021-2027** also includes measures for introducing the circular economy principles. It was established in pursuance of Art. 5, paragraph 1 of the SME Law and the Small Business Act. It is a medium-term strategic policy paper through which the Government of the Republic of Bulgaria demonstrates its vision of state policy in support of small and medium-sized enterprises (SMEs) in the country. The strategy has been developed in accordance with the government's program NDP BG2030 and the new European industrial policy and SME Strategy for a sustainable and digital Europe. The overall strategic objective of the document is to support the small and medium sized enterprises in their efforts to become more competitive, digitalized, sustainable and export-oriented. **The circular**

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**economy is set out in Priority Area 6 Environment.** During the period the priority of the policy of introduction of circular economy principles is outlined in **Measure 6.4 Improving the capacity of SMEs in connection with the transition to a circular and low-carbon economy.**

To ensure this the Strategy envisages the following activities to be implemented:

- 1) Launch of a series of programs for capacity building of SMEs in the country for: concepts of the circular economy; new circular business models at regional and local level; and opportunities for SMEs in the process of transition to a circular economy; increasing the circularity of certain value chains (with the support of branch organizations, sectoral associations and business intermediaries).
- 2) Support for the efficiency and effectiveness of extended producer responsibility schemes and the inclusion in their scope of sectors that produce large amounts of waste (eg construction).
3. Support for SMEs and start-ups for the introduction of specific circular business models such as reuse, possibility for repair and repair, reverse logistics, remanufacturing, industrial symbiosis, etc. Support for SMEs in the transition from selling products to providing services.
- 4) Support SMEs to increase the share of separately collected and recycled waste on a sectoral basis with a specific focus on sectors that produce significant amounts of waste (eg construction and demolition of buildings, renovation of buildings, etc.). Launch of several pilot projects in different sectors.
- 5) Supporting SMEs to improve the sustainability of the primary raw materials used and increase the share of secondary raw materials in production processes. Supporting SMEs for efficient use of water as a resource in production processes, including the promotion of water reuse and the introduction of closed cycles in enterprises in order to save water.
- 6) Launch of a pilot project for industrial symbiosis as one of the circular business models.

**Strategy and Action Plan for Transition to Circular Economy 2021–2027** is developed in 2020, it is still not approved, however a draft version is available. Due to its nature, the Strategy is a cross-sectoral strategy. It builds on the measures set out in the draft new sectoral strategies and programs, the main ones being in the field of economy, environmental protection and regional development. In the Strategy the main strategic objectives are: **Green and competitive economy, Less waste, more resources and Consumer oriented economy.**

Each strategic objective respectively introduces also specific objectives and measures to be taken in order to achieve them.

Under strategic objective **Green and competitive economy** there are specific objectives related to **new business models, connectivity of the economy and contribution to supply of critical raw materials.** The measures to achieve that are as follows:

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- Financing of SMEs from the processing industry for the introduction of ecodesign, especially in key value chains - electronics, ICT, textiles and plastics, as well as for the introduction of models that allow the use of services instead of products.
- Establishment of a mechanism for subsequent financing of project proposals for ecodesign through a financial instrument.
- Conducting information training campaigns for business.
- Preparation of specialized training programs for "green" management and "green" business in vocational schools or as an additional qualification in vocational training centers.
- Analysis of the possibilities for increasing the requirements for mandatory content of recycled materials in certain product groups and ways to strengthen control in construction.
- Amendments to the sectoral legislation in order to implement the recommendations of the Analysis of the previous activity.
- Platform for the results of implemented technologies for resource efficiency, environmental products, industrial symbiosis.
- Platform for materials for industrial symbiosis.
- Adoption of a decision for priority allocation of the areas in the industrial zones and parks to groups of enterprises, which participate in industrial symbiosis.
- Structuring a financial instrument for industrial symbiosis for large processing enterprises in the sectors identified in the previous analysis.
- Construction of installations for recycling and utilization of biomass of agricultural origin.
- Preparation of a national list of critical raw materials.
- Amendments to national legislation to give priority to the exploration, extraction, processing and recycling of raw materials included in the national list of critical raw materials.
- Ensuring appropriate institutional organization and capacity of the institutions ensuring the availability of geological information and the management of the exploration activities, the mining and processing industry in the country.
- Study of the potential for extraction of raw materials of critical importance in the exploitation of existing deposits and in future exploration activities.
- Review of available information and conduct additional research on the content of critical raw materials in accumulated waste in closed sites.
- Development of expert knowledge and skills in the field of mining, mining and processing technologies.

Under strategic objective **Less waste, more resources** there are specific objectives related to **less waste, more recycled waste, better quality raw materials and no landfilled waste**. The measures to achieve that are as follows:

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- Introduction of measures at municipal level to prevent waste generation and transition to a circular economy.
- National legislation in the field of disposable plastics.
- Measures to increase the quantities and improve the quality of separately collected waste from plastic packaging.
- Funding and support for research organizations and businesses in the development of technologies and products.
- Payment for services in proportion to the amount and / or volume of waste.
- Increasing the quantities and improving the quality of separately collected waste from plastic packaging.
- Mandatory separate collection of plastic waste generated in industry, commercial and administrative sites.
- Providing information to consumers aimed at preventing and sustainable consumption of plastics.
- Analysis of the existing system for separate collection of packaging waste and assessment of the potential for achieving the new higher recycling targets.
- Increase in the allocated funds for informing the consumers.
- Assessment of the required capacity for municipal waste treatment.
- Mandatory separate collection of bio-waste.
- Construction of new treatment plants.
- Funding for projects related to the development and implementation of new technologies for separation, treatment and treatment of waste providing a higher degree of separation of secondary raw materials.
- Information exchange platforms.
- Financing for the completion of the regional waste management systems.
- Additional indicators for monitoring the costs of municipal waste.
- Clear rules and criteria for spending the funds from deductions for landfilling.

Under strategic objective **Consumer oriented economy** there are specific objectives related to **better informed consumers, sustainable models of consumption and social green economy**. The measures to achieve that are as follows:

- Actions for presenting ecoproducts in the commercial sites in an appropriate way.
- Study of the mechanism and applicability of voluntary agreements as a tool to encourage retail chains to provide environmentally friendly products.
- Financing of SMEs from the manufacturing industry for ecodesign, promotion of environmental products and new consumption patterns, primarily in the key value chains - electronics, ICT, textiles and plastics.

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- Raising consumer awareness of the second-hand product market, renting/leasing and repairing through communication campaigns, as well as activities focused on educating young people, such as including relevant topics in school and university curricula.
- Creation of electronic platforms for providing information on alternative activities to the purchase of a new product.
- Establishment of reuse centers in cities.
- Information campaign for acquainting the users with the activity of the separate collection sites.
- Increasing public engagement in preventing the generation of food waste and participating in separate biowaste collection systems.
- Introduction of the concept of "green" public procurement in the additional provisions to the Public Procurement Act.
- Information campaigns aimed at a wider range of experts in the contracting organizations.
- Supporting companies involved in repair activities to be present in reuse centers in cities.
- Financing qualification courses for people from vulnerable groups involved in the repair work.

On local level all municipalities within the Varna Region have developed and implemented Waste Management Programmes for the period of 2014-2020 and will develop and implement a new one for 2021-2028 as well as a Circular Economy Plan once the Strategy and Action Plan for Transition to Circular Economy 2021-2027 is adopted.

The institutional set up for circular economy policies In Bulgaria is as follows:

**Ministry of Environment and Water** - waste management policy; OP „Environment”; eco-labelling, water management policy, biodiversity;

**Ministry of Economy** - competitiveness and investment policy; OP “Innovation and Competitiveness”; public procurement policy; innovation; SMEs standardization and technical harmonization, Innovation Strategy for Smart Specialization;

**Ministry of Energy** - mineral resources and mining waste management; energy efficiency and renewable energy policy;

**Municipalities** - management of the waste generated on their territory, local taxes, others.

As seen in the above analysis, Bulgaria officially has been committed to transform its economy in accordance with the circular economy idea, yet despite the undertaken legislative activity and other initiatives taken in this scope the country and the Varna region are only at the initial phase of implementation. Circular economy strategies have to be drawn up in Bulgaria at the regional and local level and the bottom-up initiatives should be taken by local self-government structures (i.e.cities). Special focus as well must be given to their further

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legislative activity, new social initiatives and new technological solutions in the field of, e.g. eco-innovation in order to accelerate their transformation towards circular economy.

### 4. Circular Economy in quantitative perspective

Currently Bulgaria is struggling regarding introduction of circular economy principles. As other EU member states Bulgaria is measuring its progress towards a more circular economy using a **Circular economy monitoring framework**, which was adopted in 2018. It consists of a set of indicators, taking into account the main elements of circular economy which are intended to measure the progress of actions aimed at a transformation towards circular economy at all stages of the life cycle of raw materials, goods and services and also at the innovation and competitiveness aspects.

These indicators are grouped into four areas of circular economy policy strictly relating to: production and consumption, waste management, secondary raw materials, competitiveness and innovation and priority areas included in the EU action plan for the Circular Economy.

To date they are the only framework for monitoring circular economy throughout the world developed at the pan-national level. Therefore, they focus on the macro-level and Eurostat database was the source of the data. The time horizon for most of the data covered 2010–2018.

**Table 1. Monitoring Framework Bulgaria: Circular Economy Indicators**

Indicator	Value
<b>I. Production and consumption</b>	
<b>1. Waste generation</b>	
Generation of municipal waste per capita (Kg per capita)	407 (2018)
Generation of waste excluding major mineral wastes (Kg per capita)	3 097 (2018)
Generation of waste major mineral wastes (kg per capita)	18 470 (2018)
Food waste (tonne/year)	478 667
<b>II. Waste management</b>	
<b>1. Recycling rates</b>	
Recycling rate of municipal waste (percentage)	31.5 (2018)

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Recycling rate of all waste excluding major mineral waste (percentage)	23 (2018)
<b>2. Recycling / recovery for specific waste streams</b>	
Recycling rate of overall packaging waste (percentage)	60.4 (2018)
Recycling rate of plastic packaging waste (percentage)	59.2 (2018)
Recycling rate of wooden packaging (percentage)	21.3 (2018)
Recycling rate of electrical and electronic waste (e-waste) (percentage)	66.7 (2018)
Recycling of biowaste per capita (kg)	7 (2018)
Recovery rate of construction and demolition waste (percentage)	24 (2018)
<b>III. Secondary raw materials</b>	
<b>1. Circular material use rate (percentage)</b>	1.3 (2019)
<b>2. Trade in recyclable raw materials</b>	
Imports from non-EU countries	123 225 (2020)
Exports to non-EU countries	505 485 (2020)
Intra EU trade	178 322 (2020)
<b>IV. Competitiveness and innovation</b>	
<b>1. Private investments, jobs and gross value added related to circular economy sectors</b>	
Gross investment in tangible goods (percentage of gross domestic product (GDP) at current prices)	0.21 (2018)
<b>Number of persons employed (percentage of total employment)</b>	1.73 (2018)
Value added at factor cost (percentage of gross domestic product (GDP) at current prices)	1.12 (2018)
<b>2. Number of patents related to recycling and secondary raw materials</b>	0



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Source: Eurostat

In terms of the indicator **I. Production and consumption** which focuses on the share of waste which is recycled and include two main indicators monitoring overall progress: **recycling of waste and the recycling in specific waste streams**, it should be noted that **Bulgaria reduced their municipal waste** per capita generation by more than 20% during 2000-2018.

The **generation of municipal waste per capita** indicator measures the waste collected by or on behalf of municipal authorities and disposed of through the waste management system. It consists to a large extent of waste generated by households, though similar wastes from sources such as commerce, offices and public institutions may be included. Compared to the average EU citizen that generated on average 502 kg of municipal waste, decreased from 513 kg in 2000, **Bulgaria is performing well with 407 kg of municipal waste**, but however, this is due partly to differences in consumption patterns and economic wealth and partly to how municipal waste is currently collected and managed.

Even though municipal waste only represents about 10% of the total waste generated or about 30% of the generated amount of waste excluding major mineral waste, following up on its evolution can give a good indication of changing consumption patterns and waste prevention performance and where citizens' actions and involvement is most relevant.

**Generation of waste excluding major mineral wastes per GDP unit** indicator is defined as all waste generated in a country (in mass unit), excluding major mineral wastes, per GDP unit (in euro, chain linked volumes (2010)). In 2018 in the EU 66 kg of waste (excluding major mineral waste) was generated per thousand EUR of GDP. Waste generation per GDP has decreased by more than 10% in the EU between 2004 and 2018, thus improving eco- efficiency of economic activity. **Bulgaria has among the highest values of more than 400 kg/thousand EUR of GDP among EU 27 members.** This is due to the fact that certain industries produce a high level of waste.

**Generation of waste, excluding major mineral waste**, per Domestic Material Consumption unit indicator tracks the efficiency of EU material consumption by comparing the tones of waste generated to domestic material consumption (DMC).<sup>1</sup> In 2018 on average the EU produced 0.129 kg of waste (excluding major mineral waste) per kg of DMC that means that 13% of domestic materials consumption ended up as waste. 2018 data show that the indicator for **Bulgaria is among the medium range from 15.2%** as small ratio means better performance.

**Food waste** is waste which is generated in the production, distribution and consumption of food. Food waste is a significant concern in Europe (estimated to be around 20% of all food produced), and it is associated with pressure on finite natural resources, the environment and climate change. A priority sector of the EU action plan for the circular economy addresses food waste and the sustainability of the food system.

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<sup>1</sup> DMC sums up the total use of resources driven by domestic demand distinguishing it from consumption driven by the export market. Therefore, this indicator gives an indication of "material efficiency".

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Currently food waste monitoring is hampered by lack of data, baseline for individual Member States, monitoring obligations, agreed definition, methods and sources, and by limited information on developments at global level. According to these calculations, food waste in the EU amounted to 69 million tones in 2016 and 2018. **Such data is not available for Bulgaria.**

Bulgaria as a member of the EU aims at establishing a circular economy where materials and resources are maintained in the economy for as long as possible and where the disposal of waste is the last option of waste management. The indicators' set of waste management provided by Eurostat is a way to monitor progress towards more recycling and less disposal.

The trend of the **recycling rate of municipal waste** at the EU 27 level, for the three consecutive years – 2017, 2018 and 2019 are 47.7 % having a slightly upward trend. However **Bulgaria has among the medium values of the indicator - 31.5%** but it is slightly decreasing for the last three years.

Another important process in waste management is measured by the **treatment rate** and the data shows that the treatment of national waste in EU 27 is on average 55 percent. **Bulgaria has the lowest rate of treatment - 23 %** among the EU countries.

**Recycling/recovery for specific waste streams** also plays a major role and the Packaging Waste Directive (PWD) sets the following targets: a minimum of 60 % recovery rate and the recovery and recycling rates of all packaging waste. In 2018 of the EU Member States these rates are respectively 81% and 66.3%. **Bulgaria's rates are as follows: recovery - 60.5% and recycling - 60.4%.** The percentages meet the requirements of the PWD. A positive trend is that the increase of the recycling and recovery rates is steady over the ten-year period.

In terms of indicator **Secondary raw materials** Bulgaria has among the **lowest values** of the indicator - 2.3% and it is decreasing for the last three years. This low value of the indicator shows a need for new virgin material and a high level of waste making Bulgarian economy low resource efficient. The trend of the circular material use rate at the EU 27 level, for the three consecutive years – 2017, 2018 and 2019 are 11.9% having a slightly upward trend.

The **transformation of waste** into resources and reintroducing it into European economy is an important aspect at the EU level as well as the imports/exports of certain categories of waste and by-products from non-EU countries, that can improve the supply with raw material, reduce the waste and preserve the natural capital. The data shows that the imports of the recyclable materials from the non-EU countries are almost non-existent or very low in many states, including Bulgaria. It can be noted that **in Bulgaria it is in a descendent trend** in the last four years.

The indicator **Exports to non-EU countries** is about the quantities of certain categories of waste and by-products but exported by EU Member States to non-EU countries. As it is clear from the data the comparison between the **imports and exports of secondary raw materials** in the last three years the **level of the exports is bigger than the imports** for most of the states, including Bulgaria.

The **Intra EU trade** indicator is about the quantities of certain categories of waste and by-products imported between Member States of the European Union. The data from the last 10 years reveals the statistics on intra-EU imports available on Eurostat – 2010 - 2020. We can see that **Bulgaria is among the countries less implicated in intra-EU imports with waste and by-products**, registering a slightly decreased trend.

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In terms of indicator **Competitiveness and innovation** the efforts are concentrated on private investment, jobs and gross value added related to circular economy sectors.

The **share of private investment** in the circular economy sectors differs a lot among the Member States, ranging from 0.09% in Greece to 0.25% in Latvia. After Latvia, **the highest share of investments in circular economy sectors compared to GDP is found in Bulgaria (0.21%).**

**Employment in the circular economy** has increased in most Member States, both in absolute and relative terms, during the period 2008-2018, despite the financial and economic crises. **Bulgaria has an average share - 1.73 %**, compared to that of the EU 27 -1.71%.

**The gross added value (as a share of GDP) in the circular economy sectors** differs a lot among the Member States. According to the latest available figures Croatia has the highest share of gross added value in circular economy sectors, being almost 1.56% and it is followed by Iceland with 1.25% . **Bulgaria is ranging among the first five countries in the EU with 1.12%.**

As it is seen in the above presented data Bulgaria is facing challenges with recovery rate of construction and demolition waste, recycling rate of e-waste and generation of waste excluding major mineral wastes per GDP unit and patents related to recycling and secondary raw materials, trade in recyclable raw materials, circular material use rate and recycling of bio-waste.

The data also shows that the transformation towards circular economy in Bulgaria is happening at the slowest pace. There are different reasons for that. One is related to the fact that Bulgaria has been a part of the Eastern Bloc and only since the 1990s its economy has been operating according to the principles of free market and competitive economy and thus the problems with problems of excessive waste generation, exhaustion of resources, environmental pollution, increasing consumerism or unbalanced consumption came much later. Therefore the activities aimed at implementing circular economy may be slightly slower in time, though they do occur.

The other is that Bulgaria's lesser involvement in circular economy implementation may also be because of the lack of a sufficiently developed infrastructure to process waste or to society's lower circular economy-related awareness.

Another essential matter is the issue of financing activities which serve the implementation and functioning of Bulgarian economy according to circular economy principles. Certainly, the countries' switching to circular economy is beneficial for the natural environment and in consequence for the people, but it does require greater circular economy awareness from the regulator, governing authorities, consumers and society in general in terms of implementation of advanced technologies and this, in turn, requires time and financial outlays.

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### 5. Regional challenges connected to circular economy

In order to identify the regional challenges interviews titled “Models for development of circular economy in the region of Varna, Bulgaria” were conducted in the period October – December 2021.

24 organizations were contacted and invited for interview, 9 of them responded positively to contribute to development to the Regional Study of the State of Art and to share their opinion about circular economy concept in the Varna Region.

**Table 2. Interviewed organizations in Varna Region**

Type of the organization	Title of the organization/ interviewed person	Short description
Non-Institutional Regional Authority	National Agricultural Advisory Service, Territorial department – Varna/ Juri Zarev, Senior Expert - coordinator	The National Agricultural Advisory Services performs ancillary activities in the area of agriculture by providing advisory services, current information and technical assistance to farmers for the implementation of efficient and competitive agriculture in the Republic of Bulgaria in accordance with approved by the EU standards
Non-Institutional Regional Authority	Regional Unit – Varna, Directorate General “European Funds for Competitiveness”, Managing Authority of OPIC, Ministry of Economy – Bulgaria/ Vladimir Bobev, Director of the unit	“European Funds for Competitiveness” DG is established for amendment and supplement of the Structural Regulation of the Ministry of Economy, Energy and Tourism. The Directorate General is a Managing Authority under Operational Programme “Innovation and Competitiveness” and Operational Programme “Small and medium-sized enterprises initiative” for the programming period 2014-2020.
Institutional Regional Authority	Municipality of Varna, Ecology and Environmental Protection Directorate/ Todor Kolev - Director	The Ecology and Environment Protection Directorate delivers on the commitments of the Mayor of Varna Municipality in the field of national environmental legislation, participates in the coordination of activities in the implementation of projects and programmes at local level, aimed at environmental protection, resource efficiency increase, including the initiatives envisaged in the European Union’s Circular Economy Package. It also supports the work of the Mayor through the activities of the three specialized structural units – departments.
Institutional Regional Authority	Regional Administration of Varna/ Silviya Zleksandrova – Deputy Governor	The district administration of Varna is managed and represented by the district governor, who is appointed by the Council of Ministers. The district governor interacts with the bodies of local self-government on the territory of the district of Varna, with the bodies of the executive power and with other institutions not included in the system of the executive power.

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		On the territory of Varna district there are 12 municipalities: Avren, Valchi dol, Aksakovo, Devnya, Beloslav, Dolni Chiflik, Byala, Dalgopol, Varna, Provadia, Suvorovo, Vetrino
Institutional Regional Authority	Municipality of Devnya/ Svilen Shitov- Mayor	Municipality of Devnya public administration and a body of local self-government. Some of the main goals of the Municipality of Devnya are: effective use of all opportunities to improve the investment climate and increase the investment attractiveness of the Municipality of Devnya; expanding the scope and improving the information management system of the processes in order to increase the possibilities for data collection and analysis; attracting additional resources through national and international programs and funds and uniting the efforts of all stakeholders; effective use of all regulatory powers to protect and improve the environment; take effective action to prevent environmental pollution. ensuring compliance with the applicable regulatory requirements regarding the environment in the Municipality of Devnya.
Business Support Organization	Association of Recyclers and Traders of Second Hand Clothes/ Sirma Jeleva, Secretary	The Association of Recyclers and Traders of Second Hand Clothes is instituted in order to sustain the industry social and economic importance for the development of circular economy and to control compliance with the European and national directives concerning textile processing and trade in textiles. As a voluntary branch organization, the association represents its members – legal entities complying with the legislation in force in the country and guaranteeing the quality and safety of the products they offer
Business Support Organization	Black Sea - Danube Association of Research and Development/ Valeri Penchev, Executive Director/ Chairman of the Management Board	Black Sea - Danube Association of Research and Development is an independent non-profit research organisation - a grouping of universities, consultancy, other organisations, and individuals engaged in research, training, engineering and advisory activities in coastal protection against flooding and erosion, construction of harbour and coastal structures, and environmental protection on the western Black sea coast and lower Danube.
Regional/National/International NGO	Black Sea NGO Network/ Ema Gileva, Legal representative/ member of Management Board	The Black Sea NGO Network, established in 1998 and registered in 1999, is a regional association of NGOs from all Black Sea countries. The BSNN members, currently over 60, are brought together by the common concern for the decreasing environmental quality of the Black Sea and the need for the adoption of democratic values and practices in

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		the Black Sea countries that follow the ideals of sustainability
Regional/National/International NGO	Foundation "Recycle Art Academy/ Natalia Nikolova – Chairman of the Management Board	The Academy works in the field of applied and fine arts, using waste materials giving them new life. In parallel, they learn how to reduce the consumption of single-use plastic, how to live with the idea of "Zero waste" and compost. They create works of art and show people how to deal with waste.

According to the most of **non-institutional and institutional regional/local authorities** from the Varna region that were interviewed, the **critical challenges** in regards to the regional developmental pathways in the area of environment, there are **enough national support programs, but however they need to be applied in a proper way.**

Contrary to this, **environmental NGOs and business support organizations, and one local authority** (Municipality of Devnya) consider that **policy framework in this field provides certain opportunities, but it is insufficient and is quite limited for application on local level.** According to them the support for the introduction of the principles of the circular economy is **not included** among the most **important national priorities.**

For example, Bulgaria has not yet adopted a Strategy and Action Plan for the transition to a circular economy. The measures included in the draft of the Plan are insufficient for a quick and effective transition. Many other strategies and national plans are not tied to the circular economy at all.

On the other side, **support for the introduction of the principles of the circular economy should be a long-term national priority.** The National Development Program "Bulgaria 2030" prioritizes the circular and low-carbon economy. The transition strategy is an important step towards the development of the circular economy.

All participants in the survey confirmed that the **involvement of young people** in this process is a positive sign. Therefore, there is still a need to raise their awareness about the topic.

NGOs and business support organizations suggest **introducing specific measures for support** for companies developing circular business models such as tax breaks, reduced insurance for green jobs, easier access to grants, financial instruments, etc. Apart from that, measures are needed for raising awareness of the general public.

Another identified problem is **lack of statistical data on circular economy/waste management/recycling.** It is suggested such data to be collected for different priorities depending the needs of the interviewed organizations. For example, National Advisory Agricultural Service (NAAS) would like to be see systematized information on types of farms, investments, projects and innovations directly related to the circular economy; Black Sea - Danube Association of Research and Development- quantity (reduction) of waste; volume (increase) of recycled goods / materials; carbon emissions (reduction); Black Sea NGO Network - production and import of plastics, recycling, quantities of solid waste, data for recycling per types, etc.

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The **main challenges** identified by the interviewed organizations are:

- change in the way of working and thinking;
- lack of awareness and limited access to funding;
- lack of financial resources to support the transformation of industrial production;
- zero waste implementation;
- improvement of the legal framework and economic environment;
- lack of infrastructure (facilities and installations) for processing, disposal and/or utilization of waste in some towns.

## 6. OUTLOOK, CONCLUSIONS and RECOMMENDATIONS

The introduction of circular economy in Bulgaria in general and in the Varna region specifically requires a comprehensive approach and should engage different stakeholders: governmental institutions, local authorities, businesses, academic and research organizations, consumers and NGOs. As stated above there are different type of challenges to circular economy implementation in Bulgaria: economic, political, social, etc. but most important ones identified by the interviewed are related to the **limited funding** available for SMEs to transform their production models as well as lack of funding at the country's disposal for introduction of the circular economy. Next major challenge is the **lack of information and data on national and regional level** on circular economy/waste management/recycling. A step in the right direction was the introduction of circular economy indicators by EC and collection of data for/by Eurostat.

A great challenge in transition to circular economy is also the behavior of general public and businesses. The public and the businesses must also gradually change the pattern of operation and turn from „consumer“ to „user“ and from owner to „sharer“ thus stimulating a **change in attitudes and the applied business models**. Funding for initiatives related to the reuse, sharing and extension of the product life cycle would be actions in the right direction by the public authorities.

Some **good practices** were identified by few of the interviewed organizations and they are listed in the table below.

**Table 3. Good practices in the field of circular economy**

Organization suggested GP	Short description of the GP
National Agricultural Advisory Service, Territorial department – Varna	<ol style="list-style-type: none"> <li>1. Application of the Bioactive system in farms.</li> <li>2. Sludge processing technology.</li> <li>3. Wastewater treatment at the local level.</li> </ol>

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Municipality of Devnya	<p>1. The “<b>Circular Economy for Straw</b>” practice of Agropolichim AD has been implemented by applying technology for utilization of biomass, which is converted into heat energy, which is considered to be environmentally friendly fuel. Its use contributes to the reduction of carbon monoxide emissions, which are among the main gases that favor the greenhouse effect and ozone depletion. Biomass combustion is within the limits where it is considered not to have a significant adverse effect on the environment. Biowaste waste is used for pellets instead of being discarded or rotted. In the production of pellets, pressing is used, without caustic substances from chemical additives. The ash produced by combustion can be used for fertilization.</p> <p>2. Another good practice is “<b>Sustainable Environment</b>” of <b>Devnya Tsimment AD</b>. For the production of cement, they extract limestone from their own quarries. The aim of the production is to reduce the environmental footprint by introducing carbon capture technologies to reduce CO2 emissions, water recycling and reduction of fresh water and wastewater consumption, replacement of fossil fuels and primary raw materials using public waste, by-products and recycled materials. The results of these activities are reduction of CO2 content in final products, reduction of CO2 in clinker, recycling of concrete and capture of CO2, conservation of nature reserves, using alternative resources as substitutes for natural raw materials. This ensures sustainable profitability through efficient management of all processes and resources and continuous innovation of products and services.</p> <p>3. Implementation of a project <b>SinCE-AFC - Enhancing the Entrepreneurship of SMEs in the Circular Economy of the Agri-Food Chain</b> under the Interregional Cooperation Program INTERREG EUROPE 2014-2020.</p>
Black Sea NGO Network	Manufacturers and large retail chains - focused on recyclable packaging, reduced use of plastics, separate collection, etc. There are many educational projects and campaigns to increase public engagement in various programs, incl. Black Sea Basin 2014-2020

There are also **recommendations provided** by the interviewed experts:

- Additional meetings, information, and demonstrations of circular economy;



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- to introduce activities for involvement of more participants in this process;
- to raise public awareness on the benefits of applying the concept of the circular economy;
- to provide stimuli/advantage to companies developing circular business models;
- to ensure an effective municipal separate collection of waste and recycling of waste with return of the product from recycling to production;
- to envisage policy measures for public awareness raising campaign;
- to envisage penalties for non-environmental production;
- to set up grant programs for projects for modernization of production,
- to envisage tax relieves for people and companies implementing circular economy,
- to provide specific support measures for start-ups following the concept of the circular economy.
- to provide specific measures for construction of centers for separate collection of widespread household waste, hazardous household waste (equipment, batteries and accumulators, fluorescent lamps, car tires, etc.) and non-hazardous waste (paper, cardboard, plastic, glass, bulky and other waste, textiles). ) and for construction of waste reuses centers.

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## ANNEX 1. Table with interviews with institutional actors

Organization	Name and position	Type of organization
Foundation “Recycle Art Academy”	Natalia Nikolva, Chairwoman of the Management Board	Regional/National/International NGO
Association of Recyclers and Traders of Second Hand Clothes	Sirma Zheleva , Secretary	Business Support Organization Representative/ Regional/National/International NGO Representative
Black Sea - Danube Association of Research and Development	Valeri Penchev, Executive Director/ Chairman of the Management Board	Business Support Organization Representative/ Regional/National/International NGO Representative

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Black Sea NGO Network	Ema Gileva, Legal representative/ member of Management Board	Regional/National/International NGO Representative- NGOs dealing with environmental issues
National Agricultural Advisory Service, Territorial department - Varna	Juri Zarev, Senior Expert - coordinator	Non-Institutional Regional Authority
Regional Unit – Varna, Directorate General “European Funds for Competitiveness”, Managing Authority of OPIC, Ministry of Economy - Bulgaria	Vladimir Bobev , Director of the unit	Non-Institutional Regional Authority
Regional Government of Varna	Silviya Aleksandrova, Deputy Governor	Institutional Regional Authority
Municipality of Varna, Ecology and Environmental Protection Directorate	Todor Kolev, Director	Institutional Regional Authority
Municipality of Devnya	Svilen Shitov, Mayor	Institutional Regional Authority

European Neighbourhood Instrument Cross-Border Cooperation	
Joint Operational Programme Black Sea Basin 2014-2020	
Programme priority	2. Promote coordination of environmental protection and joint reduction of marine litter in the Black Sea Basin
Project title:	Knowing Circular Economy in Black Sea Basin
eMS Code:	BSB-1021
Grant contract no	31113/11.03.2021
Project Deliverable:	T.1.2.1 Regional Specific Study
Partner	LP Varna Free University “Chernorizets Hrabar”

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Date	December 2021
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Joint Operational Programme Black Sea Basin 2014-2020 is co-financed by the European Union through the European Neighbourhood Instrument and by the participating countries: Armenia, Bulgaria, Georgia, Greece, Republic of Moldova, Romania, Turkey and Ukraine.

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