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1.3 ACTIVITY TITLE: INFORM KEY ACTORS

Comparative Analysis of Regional Studies

Programme priority	2. Promote coordination of environmental protection and joint reduction of marine litter in the Black Sea Basin
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1. Introduction

The aim of the regional studies was 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 partner's area. The methodology and specifications were developed by the Leading Partner and are common for all partners as to insure compatibility of results and comparability of data.

The analysis conducted by Odessa Region, Ukraine is considered that does not reflect the current situation following the Russian – Ukrainian War and it is not included in the comparative analysis. Nevertheless, a separate Chapter at the end of the current report, outlines the major findings of that Study with reference on December 2021.

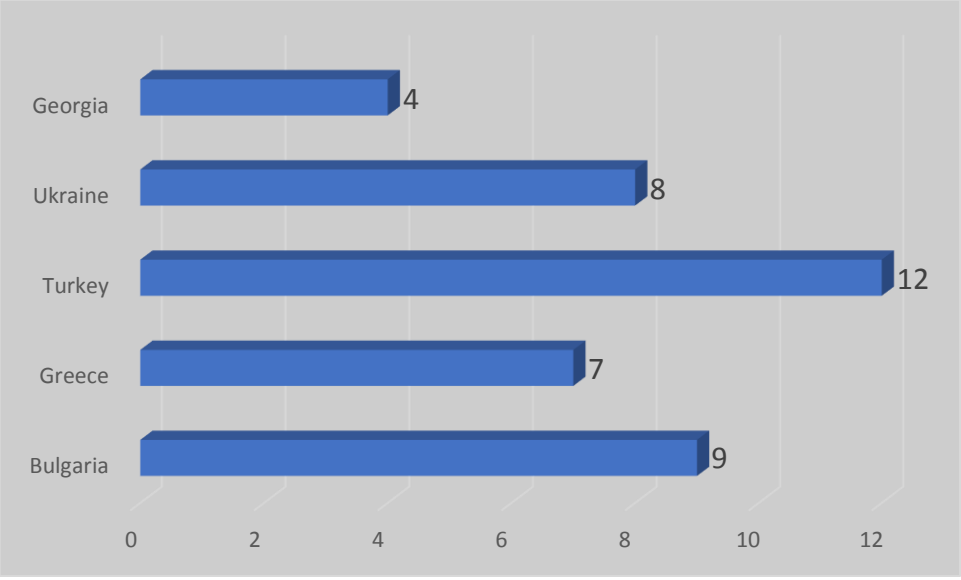
2. Methodology

The current report was drafted in favor of LB, Varna Free University, based **exclusively** on the Regional Reports as provided by the five (5) partners in charge.

All regional studies have been prepared in two steps:
1) Analysis of secondary data, available from different national and international institutions
2) Qualitative research based on interviews with the key stakeholders

The main contributors in terms of qualitative analysis were:

Participants per country



3. Legislation examined

A series of Legislative Acts, Laws and Plans have been identified as to meet the EU CIRCULAR ECONOMY ACTION PLAN targets. These are by country:

Bulgaria

- 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.
- Innovation Strategy for Smart Specialization (ISIS) of the Republic of Bulgaria 2021–2027 is still under development

Greece

- The National Waste Management Plan for the period 2021-2030
- The National Strategic Plan for Waste Prevention (NSPWP)
- The New climate law
- Regulatory initiatives in 2019-2021
- The National Plan on Circular Economy (NAPCE).
- National Recovery and Sustainability Plan – Greece 2.0
- The New Action Plan for the Circular Economy 2021-2025

Turkey

- The Waste Management Regulation 2015
- The Hazardous Waste Control Regulation 2016
- The Control of Packaging Waste 2017
- The National Waste Management Plan (2016- 2023)
- The Paris Climate Agreement And Green Reconciliation Action Plan
- The “Green Deal Action Plan”, 2021
- The Zero Waste Regulation 2019
- 11 Directives published on 2020 referring to:
    - Shopping Mall, Business Center, Commercial Enterprise and Plaza Guide
    - Educational Institution and Dormitories Guide
    - Residance and Sites Guide
    - Airport, Train and Bus Terminal Guide
    - Institution and Organization Guide
    - Rural Areas Guide
    - Local Administrations Guide
    - Zero Waste Blue Guide
    - Organized Industrial Zones and Industrial Facilities Guide
    - Healthcare Organizations Guide
    - Tourism Facilities HOREKA (Hotel, Restaurant, Cafeteria) Guide

Georgia

- Law on Environmental Protection 2015
- Solid waste management (SWM) program 2015
- National Waste Management Strategy (NWMS) 2017
- National Waste Management Plan (NWMP) 2017
- Waste Management Code 2017
- Extended Producer Responsibility 2020
- Climate Action Plan and Green Economy strategy under development

The assessment of the legal framework in each country compared to the EU standards could be presented as follows:

Legislative Maturity per Country

Topic / Country	**Bulgaria**	**Greece**	**Turkey**	**Georgia**	**Ukraine**
Waste Management Plan	Adopted	Adopted	Adopted	Partially Adopted	Partially Adopted
Strategic Plan for Waste Prevention	Partially Adopted	Adopted	Partially Adopted	Partially Adopted	Missing
Climate Law	Partially Adopted	Adopted	Partially Adopted	Missing	Missing
National Plan on Circular Economy	Adopted	Adopted	Missing	Missing	Missing
Regulatory initiatives	Poor Progress	Poor Progress	Poor Progress	Missing	Missing

4. Quantitative Data Comparison

As to the EU Monitoring Framework, the key indicators of Circular Economy for Greece and Bulgaria are:

Monitoring Framework: Circular Economy Indicators Per Country

Indicator	Bulgaria	Greece	EU
I.Production and consumption			
1. Waste generation			
Generation of municipal waste per capita (Kg per capita)	*407 (2018)*	*524 (2019)*	*505 (2020)*
Generation of waste excluding major mineral wastes (Kg per capita)	*489 (2018)*	*85 (2018)*	*66 (2018)*
Generation of waste major mineral wastes (kg per capita)	*15,2 (2018)*	*13,3 (2018)*	*12.9 (2018)*
II. Waste management			
***1.* Recycling rates**			
Recycling rate of municipal waste (percentage)	*31.5 (2018)*	*21 (2019)*	*47.8 (2019)*
Recycling rate of all waste excluding major mineral waste (percentage)	*23 (2018)*	*27 (2018)*	*55 (2019)*
2.Recycling / recovery for specific waste streams			
Recycling rate of overall packaging waste (percentage)	*60.4 (2018)*	*60.1 (2019)*	*64.8 (2018)*
Recycling rate of plastic packaging waste (percentage)	*59.2 (2018)*	*37.6 (2019)*	*41.0 (2019)*
Recycling rate of wooden packaging (percentage)	*21.3 (2018)*	*24.5 (2019)*	*31.1 (2019)*
Recycling rate of electrical and electronic waste (e-waste) (percentage)	*66.7 (2018)*	*35.8 (2019)*	*38.9 (2018)*
Recycling of biowaste per capita (kg)	*7.0 (2018)*	*26 (2019)*	*90 (2020)*
Recovery rate of construction and demolition waste (percentage)	*24 (2018)*	*97 (2018)*	*88 (2018)*
III. Secondary raw materials			
1. Circular material use rate (percentage)	*1.3 (2019)*	*5.4 (2019)*	*12.8 (2020)*

Source: Eurostat

Following the above official data for EU countries (Bulgaria and Greece) and based on the findings of the regional studies, the following table has been created to evaluate each partner's country performance compared to the EU-average.

Circular Economy Indicators per Examined Country VS EU-Average

Indicator	Bulgaria	Greece	Turkey	Georgia	Ukraine
Generation of municipal waste per capita (Kg per capita)	Below Average	Above Average	Below Average	Below Average	Below Average
Generation of waste excluding major mineral wastes (Kg per capita)	Distorted Data	Above Average	Above Average	High	Extremely High
Generation of waste major mineral wastes (kg per capita)	Above Average	Above Average	Above Average	Above Average	N/A
Recycling rate of municipal waste (percentage)	Very Low	Very Low	Low	Low	Extremely Low
Recycling rate of all waste excluding major mineral waste (percentage)	Very Low	Very Low	Very Low	Very Low	Extremely Low
Recycling rate of overall packaging waste (percentage)	On Average	On Average	On Average	Very Low	Extremely Low
Recycling rate of plastic packaging waste (percentage)	**Very High**	On Average	High	Low	N/A
Recycling rate of wooden packaging (percentage)	Low	Low	N/A	N/A	N/A
Recycling rate of electrical and electronic waste (e-waste) (percentage)	**Very High**	On Average	**Very High**	On Average	Low
Recycling of biowaste per capita (kg)	Extremely Low	Extremely Low	Extremely Low	Extremely Low	Extremely Low
Recovery rate of construction and demolition waste (percentage)	Extremely Low	**Very High**	**Very High**	**Very High**	N/A
1. Circular material use rate (percentage)	Extremely Low	Low	Below Average	Extremely Low	Extremely Low

Notes per Country

Bulgaria

Bulgaria reduced their municipal waste per capita generation by more than 20% during 2000-2018.

Generation of municipal waste per capita: 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.

Generation of waste excluding major mineral wastes per GDP: 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.

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.

Greece

Greece has established a credible mechanism of data collection based on local, regional and central authorities. Greece **lags** European countries in recycling, with **only 11% of total waste being recycled**, far behind the EU-27 average (38%). However, in certain categories, as with packaging waste (64% in 2018), recycling rates in Greece have converged to the EU-27 average. Paper and cardboard packaging records a high recycling rate (92%), but plastics are relatively low (40%).

Turkey

Municipal Wastes are disposed of in regular waste disposal facilities in Turkey. Incineration facility is preferred for hazardous wastes. 67.2% of municipal waste was sent to landfills. 98.8% of the waste was collected. While 67.2% of the 32 million 209 thousand tons of waste collected in municipalities where waste service is provided is sent to landfills, 20.2% to municipal dumps and 12.3% to recycling facilities, 0.2% is burned in the open fields.

Georgia

In Georgia, over 900,000 tons of waste are generated each year, with more than 75% ending up in landfills, increasing pollution and creating long-term dangers to the environment and human health. Georgia's National Waste Management Strategy for 2016-2030 includes a recycling target timetable for specific waste kinds. For example, by 2025, the country should be recycling 50% of plastic waste and 80% by 2030. Georgia must execute a complicated combination of measures to minimize excessive trash creation and promote the transition to sustainable waste management in order to achieve this lofty target

Unfortunately, the issue of obtaining any reliable, official data in Georgia is still problem. This was the case in terms of presenting data for circular economy indicators in Georgia. Without having baseline data, it will not be possible to monitor the progress made in transition to CE, thus evaluating the success of the projects implemented and donor support received.

Georgia is yet to collect and publish waste management data on a regular basis. The 2015 WMC was the first to impose a legal need to collect data on the types and volumes of municipal waste. Articles 29 to 30 of the Waste Management Code contain the provisions that establish the data collection system

5. Conclusions

Overall

All examined regions / countries lag in achieving the EU goals of waste collection and recycling as a consequence of a variety of systemic and investments' reasons.

The questionnaires indicate that while there is an understanding of the concept of the Circular Economy there is very limited knowledge or experience of the practices involved in the CE.

There is a massive and urgent necessity to raise awareness of CE policies & practices and to use these as means of creating awareness, improving understanding and affecting future policies

Public authorities at all levels should realise their unique position to influence the transition to a circular economy. They should invest in building capacity both internally and externally within the areas under their administration to enable and support circular economy projects. Promoting an organisational culture of 'circular economy enablers' will support the introduction of innovative models of public governance that stimulate the circular economy and improve service to the public.

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.

Bulgaria

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.

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.

Greece

Circular Economy legislation is already well established while CE policies are far from deployed in the country. Only packaging and paper waste records a high recycling rate. Circular indicators are extremely low.

The mega-challenge the Greece faces is the way and the pace that this legislation will be transformed in action. Despite the legislative framework, the people's culture does not supports circular economy yet.

Turkey

In Turkey, the issue of circular economy has not yet been addressed in the context of the city.

A healthy waste management system could not be established due to factors such as the state's weak financial support for the circular economy and insufficient technical knowledge and equipment.

It has been determined that the infrastructure of the responsibilities required to fulfill by the European Union compliant Regulations and the companies is not fully established in Turkey.

Manufacturers are trying to understand the new regulations. However, it is evident that there is a lack of knowledge, experience and guidance.

In terms of industrial symbiosis towards CE, Turkish economy can showcase several achievements:

- A company's waste is frequently used as the raw material of another sector
- Companies aim to create minimum waste and to use clean energy,
- Industry tries to reuse solid, liquid and gas wastes (eg, the iron-steel industry produces zinc from flue gas, etc.).
- The Corporate Companies are well aware of the benefit and importance of circular economy in Samsun. However; creating awarness, establising platforms where information, studies and good practices are explained and shared will influence a wider range of organizations which will the pathway to a permanent presence of the subject in Samsun.

Georgia

Despite the ambitious declarations, Circular economy (is still in its infancy in Georgia. The country has recently embarked on an accelerated path towards a transition to a circular economy. With the concerted efforts of the government, civil society organizations, and international partners, Georgia initiated the development of the circular economy strategy and took some

important steps to include, for example, the introduction of the Extended Producer Responsibility (EPR) in the national Waste Management Code

Georgia lacks an integrated, comprehensive waste prevention legislation act or policy instrument. There are no defined preventative targets in the current national strategy. Plastic pollution in the waters and along the coasts poses a threat to aquatic life. Furthermore, plastics are made from non-renewable resources.

Annex: Snapsot of the Regional Study in Odessa, Ukraine

Authors: Prof. Oleg RUBEL / Ing. Katerina KURAKINA, December 2021

The vast majority of waste, including valuable and limited resources, are disposed of in landfills or incinerated. According to the State Statistics Service of Ukraine (2019), in 2018, waste disposal sites accumulated 12.9 billion tons of waste, which is 22.5 thousand tons per 1 square meter of the country's territory or 306.9 tons per person, which is 6.1% higher than in 2010. Statistics show that the extractive industry is the largest pollutant.

In the field of waste management, Ukraine is far behind the EU countries, which is, in particular, a consequence of the existing linear model of the economy, and creates significant risks for the environment and the population. The need to search for new sources of sustainable development in the context of qualitative and quantitative constraints on natural resources and environmental problems actualizes the implementation of the circular economy model, which envisages energy conservation, regenerative green consumption and production for sustainable development, following the example of the EU, which is a global leader in its implementation

Over 7 % of the country's territory is landfilled, and only 3 % of all waste is recycled. At present, Ukraine is ranked 9th in the world by the amount of waste (3.5 billion tons annually).

In 2017, the Government approved a National Waste Management Strategy that implements European principles for the management of all types of waste: solid household, industrial, construction, agricultural, hazardous etc

The National Strategy states that by 2023, 23 % of the population will start sorting garbage, and by 2030 this figure should be 48 %. Now in Ukraine only 3 % of all waste are recycled. Instead, according to the National Strategy, by 2023, recycling should increase to 15 %, and by 2030 to 30 % due to the commissioning of waste sorting lines and refineries. 250–300 new waste collection centres and 90 waste sorting lines should be available in Ukraine. And the number of landfills must be reduced from 5.5 thousand to 100–150, which would meet EU standards.

In 2019, the Cabinet of Ministers approved the National Waste Management Plan by 2030. The reform proposed by the Government envisages the introduction of circular economy principles and extended producer responsibility, which should stimulate businesses to minimize and recycle waste, implement the aforementioned five-stage waste hierarchy operating in the EU.

At the time of the research, the only waste processing plant in the country has ceased to operate, as had the four incineration plants, of which only the Kyiv-based Energy plant operated until August of 2018. It has been processing up to 25% of the municipal solid waste in Kyiv, all the while creating heat energy for dwellings. During 2017–2018, a number of foreign investors expressed their desire to build new waste processing plants in Ukrainian cities.

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of garbage is recycled; most of it is disposed into specially designated places (about 70%), a significant part of it is recycled (about 30%) and a small part (< 0.3%) is burned. As of 2017, Ukraine accumulated 12.4 billion tons of waste, including 0.37 billion tons in 2017. And in the structure of waste in 2017, the largest share is still occupied by coal preparation waste and waste generated during demolition works for the construction of mines, open-pit mines, coal mining, sludge and tailings of iron ore preparation, waste of iron ore mining, nickel and limestone mining, scrap (State Statistics Service of Ukraine, 2019). Regarding the partial disposal of this waste, there has been an increase in the reuse of blast furnaces, steelmaking and ferroalloy slags, but the problem remains acute. Instead, in Ukraine disposal is the most popular waste management measure. Today in Ukraine 95 % of household waste is landfilled where it has been stored for decades (for comparison, in Sweden this amount is less than 1 %). In Ukraine, approximately 5.500 rubbish dumps are currently in operation, and morover 27.000 unauthorized dumps are generated annually.

7 % of Ukraine's land is occupied by landfills and only 3 % of all waste is recycled. Most Ukrainian landfills are completely unsuitable for the prevention of environmental pollution, which is caused by unprocessed household waste. Each year, about 350,000 tonnes of waste is generated in Ukraine. At present, 54 mln. m^3 of garbage have been accumulated at official and unofficial garbage collection sites in Ukraine.

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