

Waste and Water Management in the Time of COVID-19: A Tale of Six Countries

EaP CSF **COVID-19** POLICY PAPER

#PrepareEaP4Health

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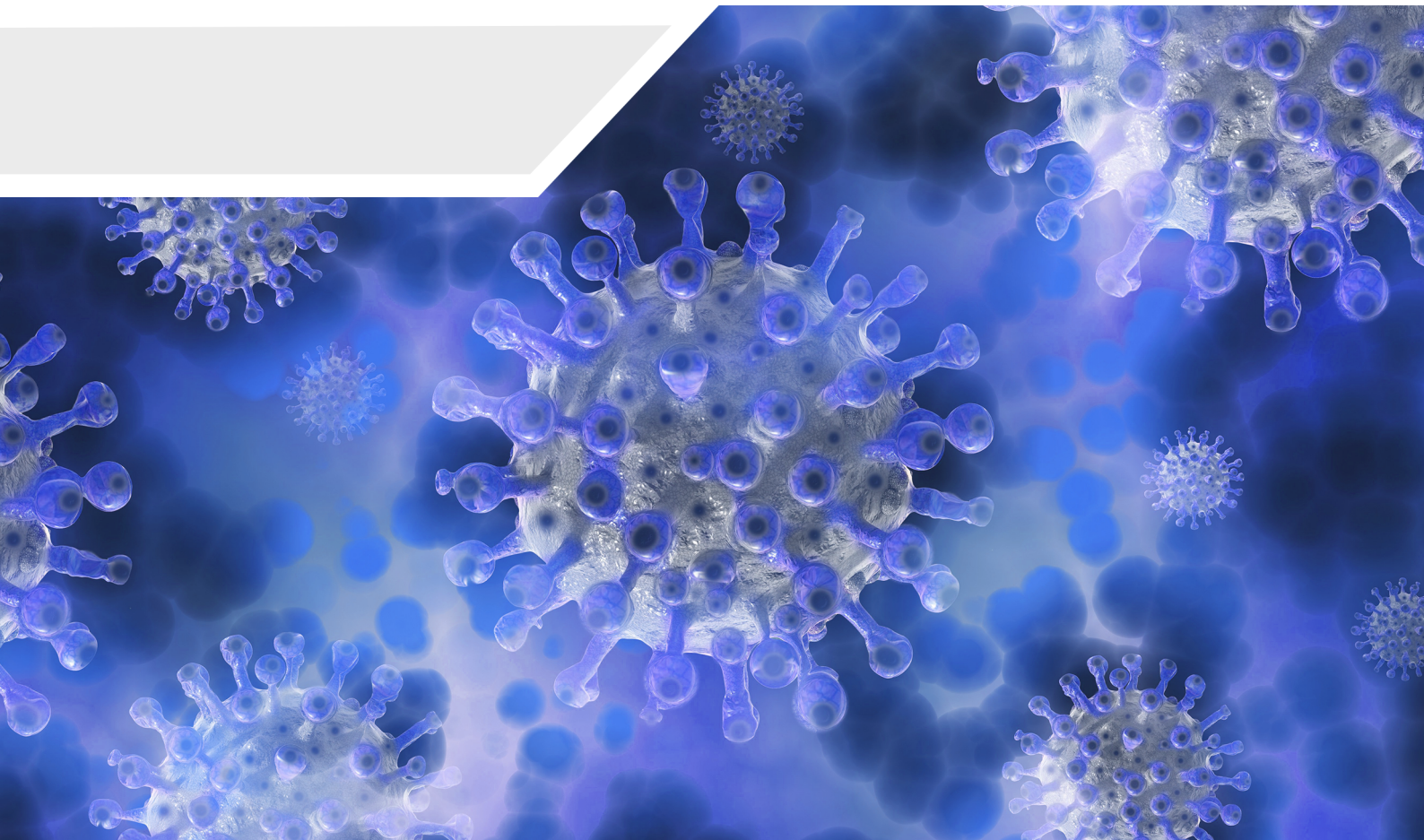


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Executive summary

With the ‘take-make-use-dispose-pollute’ approach currently dominating businesses strategies around the globe, excessive amounts of generated waste and waste water have posed a great challenge to most of the world’s economies. At the same time, with many nations’ commitment towards greater sustainability, this linear model is supposed to be replaced by the circular one with the ‘make-use-reuse-remake-recycle’ paradigm. Nevertheless, despite some attempts to facilitate the transition to circularity, even countries with the most up-to-date sustainability practices were unable to completely eradicate waste and waste water before the COVID-19 pandemic. Such deficiencies of both sectors made them vulnerable to the challenges posed by the current epidemiological crisis.

However, in the EU, a significant progress has been achieved with respect to minimizing the volumes of the disposed waste and maximizing the quality of the treated waste water. Though the advancement has not been of similar magnitude in the Eastern Partnership countries, this research evaluates the waste and water policies implemented in each EaP nation (Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine) to identify the advantages and gaps of their national approaches towards the management of both sectors. It then analyses the measures taken for waste and water treatment during the pandemic and concludes with recommendations for improvement.

Prior to the COVID-19 crisis, all the EaP nations were identified to have similar challenges in the waste and water sectors. In particular, all the countries experienced low integration of the separate waste collection, sorting and recycling practices into the general waste treatment system. In the water industry, obsolete waste water treatment facilities as well as insufficient coverage of rural areas with water and sanitation infrastructure were found to be some of the most pressing issues.

At the same time, the study also highlighted some important differences in waste and water management across the EaP nations. For instance, having signed the association agreements with the EU, Georgia, Moldova, and Ukraine managed to approximate their legislation regulating both sectors to the European standards. Armenia, Azerbaijan, and Belarus, in their turn, successfully completed a number of projects on the improvement of water supplies, waste and waste water treatment through a number of multilateral cooperation initiatives and direct EU assistance, all of which contributed to reaching the EaP 2020 Deliverable 16.

The COVID-19 pandemic had a dramatic impact on waste and water management sectors. In particular, in many countries, separate waste collection significantly decreased, which resulted in lower recycling rate that was eventually replaced by either incineration or landfilling. In addition, specific types of waste (such as plastics, etc.) as well as the overall volume of waste water experienced dramatic increase, while waste and waste water generation was shifted from industrial city areas to the ones with residential housing. All this put additional pressure on the linear economic model necessitating the ultimate transition to circularity.

Unfortunately, the measures taken by the EaP nations in the waste and water management sectors during the pandemic were not fully adequate. As a result, most of the national systems were not fully ready to properly treat the increased amounts of primarily unsorted waste and waste water with a supposedly higher share of chemical traces. Though Belarus appeared to be the only exception where both sectors experienced lower pressure due to the absence of any official lockdown measures, similarly to other countries of the region, the volume of medical waste there is highly likely to have increased as well. In such conditions, it is recommended that further reforms of both sectors should take place and intensified cooperation with the EU is strengthened.

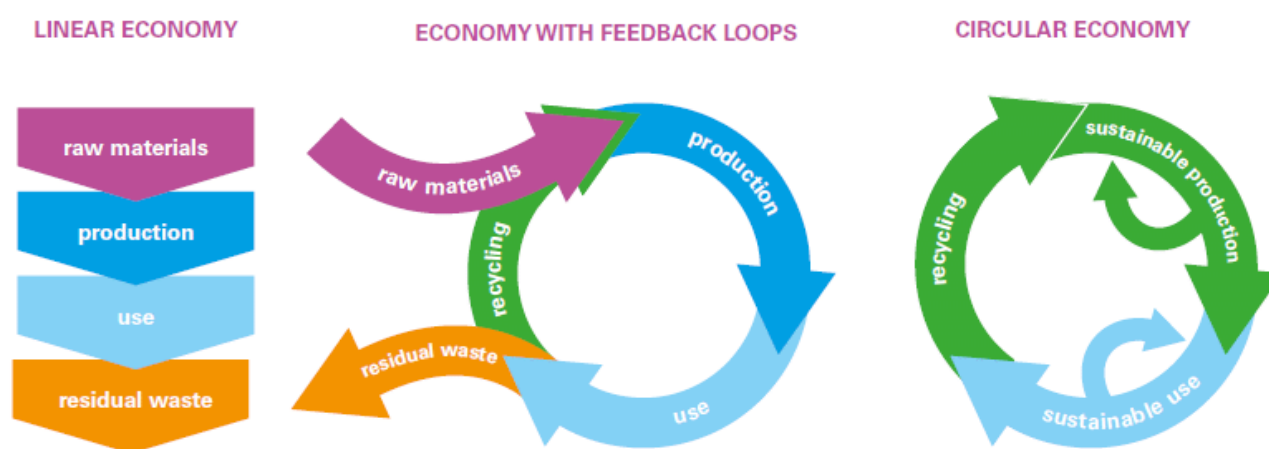
1. Introduction

1.1. Overview

Linear economy has been the dominating business model for a long time, as it follows the traditional ‘take-make-use-dispose-pollute’ pattern, in which businesses collect raw materials to transform them into goods that are used until finally being discharged as waste (Furkan Sariatli, 2017). Though being the most common economic model, it poses significant challenges for our ecosystems, since it puts additional pressure on them while reducing their productivity (Mark Esposito, Terence Tse, and Khaled Soufani, 2018). Hence, achieving greater sustainability for our future development does not seem to be possible without transitioning from this model to the one that minimizes its negative consequences. Here, circular economy – a different economic paradigm that follows the ‘make-use-reuse-remake-recycle’ pattern is generally viewed as the eventual solution that could prevent businesses from testing the physical limits of the globe (Federico Savini, 2019).

Nevertheless, while many governments view circular economy as the ultimate goal of their countries’ future economic transformation, ‘leapfrogging’ from linear economy to circular economy through the abrupt cut of waste does not seem to be possible. In fact, moving from linearity to circularity is most often expected to be conducted via an intermediary stage when most of the waste volumes are dramatically reduced through products’ reuse and recycling, though some lesser amount of waste is still generated (Manjur Moula, Jaana Sorvari, and Pekka Oinas, 2019). This type of economic model in transition is generally described as ‘the economy with feedback loops’ (*Figure 1*).

Figure 1: Economic models



Source: Manjur Moula, Jaana Sorvari, and Pekka Oinas (2019)

Although the transition to circularity has been named among the key priorities of some of the world’s key economies (including the EU), even countries exercising the best environmental practices are currently running ‘economies with feedback loops’. Indeed, they are unable to eliminate waste altogether despite significantly reducing its volumes through reusing and recycling old and disposed goods. In such conditions, the countries of the Eastern Partnership (EaP) region where most of the waste is still landfilled appear to be at the linear stage – i.e. even further away from circular economy. In fact, at the moment, they are taking some of the first steps towards following the best practices of waste processing and reduction.

While being essential for the ultimate transition to circular economy in order to ‘close the loop’, sustainable waste and water management appear to pose crucial importance for the economy with

feedback loops, as efficient waste and waste water processing are among the key prerequisites for a more efficient use of natural resources (Federico Savini, 2019). Advanced waste and waste water processing technologies can dramatically reduce the volumes of disposed trash and discharged sludge while contributing to a better environment and public health. At the same time, however, most of these technologies even in the most environmentally-conscious nations have already appeared to be easily disrupted by a major challenge. In particular, despite possessing well-developed waste and waste-water processing systems, amid the COVID-19 pandemic, some of the world's leading economies were unable to halt the dramatic increase in the generation of trash and sludge (IFC, 2020). As a result, they made a step back from reaching the UN Sustainable Development Goals and approaching circular economy.

1.2. Aim and scope

This research *aims* to evaluate the waste and water management policies implemented prior to and during the COVID-19 pandemic in the Eastern Partnership (EaP) countries. While starting with the best practices that are used in the EU-27, the paper then reviews the established waste and water management practices in each of the six EaP nations (Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine). Specifically, it identifies their strengths and weaknesses with respect to overall efficacy and the potential for the transition to circular economy. Later, having explored the direct connection between COVID-19 and waste and water sectors, the paper sets the objective of identifying the measures the EaP nations took to ensure that both sectors are able to sustain the hit of the crisis as well as the opportunities for improvement that the epidemiological crisis created. Finally, the paper provides individual recommendations for each EaP country and the EaP region on the facilitation of the transition of their waste and water sectors towards more sustainable modes.

While looking at the waste management practices, the current research focuses primarily on municipal solid waste and medical waste as these waste categories were particularly affected by the pandemic. In the sections covering water, the paper looks at waste water treatment and water supplies, as the stability of both was undermined by COVID-19 in all the EaP nations.

1.3. Methods

The core of the current paper is formed by secondary as well as primary data analyses. Here, the desk research included the assessment of the official waste and water management policies, practices, and initiatives implemented by the EaP countries as well as the EU-27 best practices related to the same sectors. In particular, policy evaluation reports and specific pieces of legislation were paid specific attention, as they contained precise statistical data on waste and water management endeavours as well as their efficiency. In addition, some earlier documents such as reports from international waste and water management workshops were used to assess the progress in the respective sectors of the EaP countries since the collapse of the USSR.

The primary data gathering included 10 structured interviews with industry experts from the EaP countries as well as 40 online surveys filled by the representatives of the EaP CSF network from each EaP country. Due to the current epidemiological conditions, the interviews were conducted via Zoom and the surveys were distributed and filled in online through Google Forms. Both contained four main open-ended questions: 1) How (if at all) did COVID-19 push the improvement of waste and/or waste water management systems in your country? 2) What were the main gaps in waste and water management in your country prior to COVID-19? 3) What specific measures (if any) were taken by the government/civil society/private sector of your country to address the negative impact of

COVID-19 on waste and wastewater management? 4) What are the opportunities for improvement in the waste and/or water management sector in your country?¹

Apart from that, the research uses the information obtained from the panel discussion and the Q&A session of the EaP CSF 12th Annual Assembly.

1.4. Limitations

Since the COVID-19 pandemic took most of the world's governments by a great deal of surprise, detailed studies exploring the direct impact that it had on specific industries and sectors are yet to be produced. In this sense, this paper appears to represent one of the first pioneering contributions to this body of knowledge covering two relatively broad topics – waste and water management. In this connection, due to the relative novelty of the current epidemiological challenge as well as other related issues, this research has a number of limitations that should be considered with respect to the factual information represented in its content.

Specifically, the statistical data obtained from secondary information sources pictures primarily the pre-pandemic status quo in the respective industries. In fact, due to the varying levels of reliability of the national approaches to statistical measurements of such indicators as e.g. solid waste generation per capital, total waste water production, etc., these data should be viewed as approximate and used for illustrative purposes. This also relates to the quantitative data obtained from international sources, as they often happen to be based on national statistics.

Additionally, as mentioned, quite a significant share of the factual information used in this paper was obtained through interviews and surveys (see 1.3. *Methods*). Although all the interviewees and participants are representatives of various governmental institutions, non-governmental and civil society organisations as well as non-partisan groups working on sustainable development, in general, and on waste and water management, in particular, the answers to the questions they provided may not necessarily represent the opinion of the organisations or institutions they represent. Apart from that, since some of the respondents appear to possess expertise only in one of the topics (e.g. waste management and not water management), the information obtained may not fully reflect the situation in the other sector.

2. Waste and water management in the EU and EaP countries. Overview of the current state.

2.1. European Union

Waste

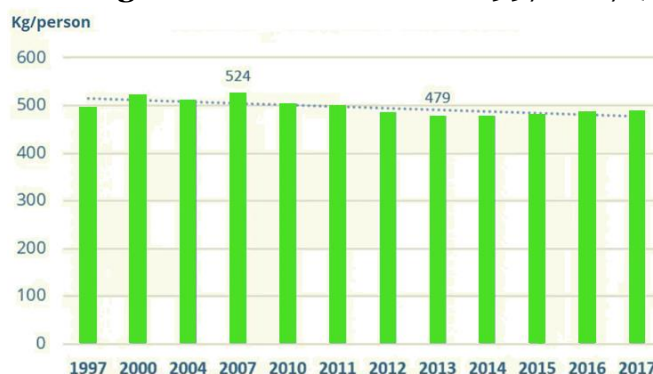
Having officially declared intention to shift the economies of all the member states towards a more sustainable circular economic model, the EU has made significant steps to reduce waste generation (*Figure 2*). Apart from that, the EU managed to develop a sound system of waste recycling that is augmenting its commitment to leave the linear economic approach altogether.

A well-developed EU waste legislation appears to represent one of the key strengths in the EU waste management system. This includes, among others, 2008 EU Waste Framework Directive (Directive 2008/98/EC), Directive 2000/76/EC of the European Parliament and of the Council on the

¹ Here, for the list of participating organisations, please, see *Appendix 1*.

incineration of waste (European Parliament and Council, 2000b), and Council Directive 1999/31/EC on the landfill of waste (European Council, 1999 and European Parliament and Council, 2000a).

Figure 2: Waste generation in the EU in 1997-2017 (kg/person)



Source: European Environmental Bureau (2019)

In 2018, the EU set new ambitious targets on waste management. In this connection, the promotion of the overall shift towards circular economy was declared among the key EU goals (European Parliament, 2015). That is why, in March 2020, the European Commission unveiled a new Circular Economy Action Plan, the main goal of which is to cut waste through *managing resources in a better way* so that waste generation is prevented, which stimulates a faster transition towards circular economy (European Commission, 2020a). This strongly aligns with the logic of the 2008 EU Waste Framework Directive (Directive 2008/98/EC) (European Commission, 2008). Specifically, apart from introducing the ‘polluter pays principle’ and the ‘extended producer responsibility’, the Directive highlights *waste prevention* as the core priority in the EU Waste Hierarchy (Figure 3):

Figure 3: Waste Management Hierarchy

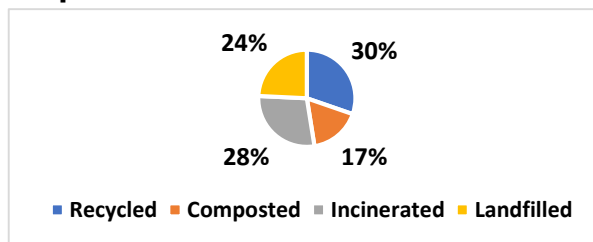


Source: European Commission (2008)

In practice, the current situation with waste management in the EU is quite promising. For instance, in 2017, the EU member states generated 487 kg of waste per person, which is eight kilograms less than in 1997 (European Environmental Bureau, 2019). If compared with the EaP where waste generation is steadily growing, the experience of the EU may serve as a good example, especially if the total share of the recycled and composted waste is considered (Figure 4):

It is quite remarkable that only 24% of the totally generated waste in the EU is landfilled. This generally aligns with the Waste Management Hierarchy, according to which, in case the prevention of waste or the re-use of products is not possible, recycling and composting should be preferred before waste is incinerated. Finally, waste disposal should be considered as the ultimate resort, as it is one of the most dangerous options posing threats to the environment and public health.

Figure 4: Solid waste treatment in the EU in 2017



Source: European Environmental Bureau (2019)

Most recently, the EU directives of 2018 required member states to recycle at least 55% of their municipal waste by 2025, 60% by 2030 and 65% by 2035 (European Environmental Bureau, 2018). Additionally, separate collection of bio-waste became mandatory and stricter schemes forcing producers pay for the collection of key recyclables were introduced (ibid). Finally, a new 10% cap on landfilling by 2035 was approved (ibid).

Water

The 1991 Urban Waste Water Treatment Directive (UWWTD) is one of the most important steps taken by the European Commission to control water pollution with waste waters from municipal and economic sectors and improve the resilience of ecosystems and protect biodiversity (Council of the European Union, 1991). The UWWTD has a significant role in steering the EU towards the European Green Deal's zero pollution ambition, as it requires member states to ensure that cities, towns, urban settlements collect and treat waste water sustainably to avoid pollution of rivers, lakes and seas (ibid). Hence, UWWTD plays a key role in protecting human health and sustaining the overall resilience of aquatic ecosystems.

Since the EU considers urban waste water treatment as fundamental to ensuring public health and environmental protection, significant efforts have been made to improve waste water management taken around Europe since the 1980s. As a result, in 2017, most of the EU countries collected and treated sewage to tertiary level from most of the municipal sources of waste water (European Environment Agency, 2020). In 2020, 69% of the population of EU-27 was connected to chemical (tertiary) waste water treatment and 13% to biological (secondary) treatment (ibid). Hence, the EU appears to have significant advantages over EaP countries in terms of general quality of waste water processing, as 95% of EU's waste water is collected and around 82% undergoes at least biological treatment (ibid).

2.2. Eastern Partnership Countries

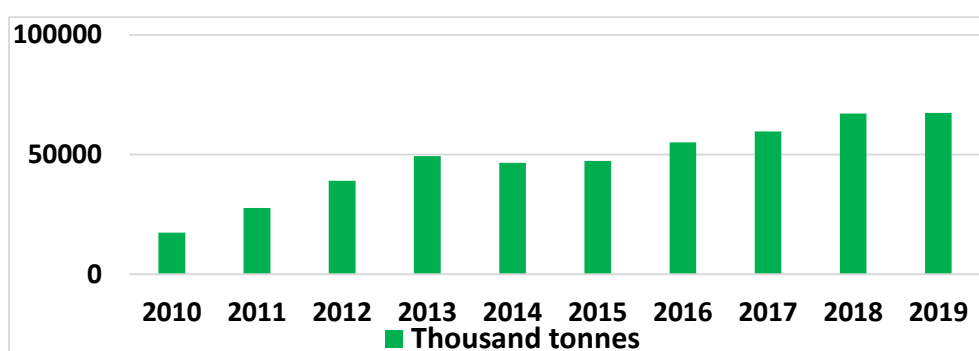
Though the EaP countries share similarities pertaining to the joint Soviet legacy, their current waste and water management systems happen to be at different sustainability and efficiency levels. For instance, while such countries as Belarus achieved significant practical progress in the field of separate waste collection, Georgia, Moldova, and Ukraine are more progressive in terms of synchronizing national waste and water management legislation with the European one. At the same time, such issues as illegal waste dumping still appear to be present in all EaP nations despite the general attempts to eliminate it. Similarly, while secondary waste water treatment was supposed to be inherited as a common Soviet legacy, not all the EaP countries are currently able to exercise it due to technical and financial constraints, since waste water treatment facilities need proper maintenance and upgrading. To view these comprehensive similarities and differences in detail, this part identifies the existing strengths and weaknesses of the studied sectors in each EaP country.

2.2.1. Armenia

Waste

In Armenia, solid waste is generally managed primarily through collection, transportation, and storage in one of 339 existing landfills (Unified website for the publication of the draft legal acts of Armenia, 2019). In 2017, the total area of municipal landfills in the country was 494 hectares (ibid). That is why, like in many other EaP nations, the country's growing waste generation appears to represent a significant challenge for both policymakers and the society in general (*Figure 5*). Here, absence of any strict waste treatment hierarchy puts a number of challenges to the country's waste management system (Government of Armenia, 2020). Nevertheless, prior to the COVID-19 pandemic, some remarkable initiatives that aimed to improve the overall system were launched.

Figure 5: Annual generation of municipal solid waste in Armenia



Source: Armenian Statistical Committee (2020)

- Strengths**

Waste management in Armenia is regulated by more than fifty laws and sub-legislative acts, more than 10 international treaties and agreements (Government of Armenia, 2020). Here, the 'Law on Waste' and 'Law on Waste Collection and Sanitary Cleaning' appear to form the core of the 'domestic' pillar of this legal framework. With respect to the international agreements, the 2017 ratification of the Minamata Convention banning uncontrolled transportation of products containing mercury was among Armenia's recent accomplishments (Ministry of the Environment of Armenia, 2019).

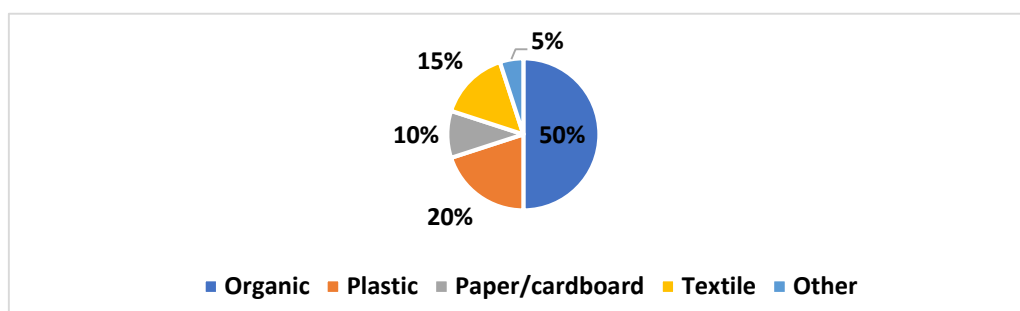
In parallel with legislative acts, Armenia also managed to take some steps towards streamlining the country's waste management system in pursuit for a safer and more efficient organization of the solid waste treatment process. Specifically, the 2017-2036 Solid Waste Management System Development Strategy was adopted in 2016 that set a plan to build nine new sanitary landfills across Armenia with each of them serving a specific designated region (Government of Armenia, 2016).

Apart from landfilling, in 2018, the government decided to take a more advanced step in waste management through the construction of a waste processing plant in Hrazdan (assumed to contribute to the elimination of at least ten landfills) (Government of Armenia, 2018). The Armenian civil society, in turn, launched the ***Toprak Petq Chi*** ('I don't need a plastic bag') initiative – a waste prevention campaign disincentivizing the population to use single-use plastic bags (The Awesome Foundation, 2016). Additionally, ***SmartApaga LLC*** – a private waste management service – offers paid pickup of waste dedicated to recycling in exchange for bonus points and discounts that could be received at the project's partners (SmartApaga, 2020).

- **Weaknesses**

At the same time, despite some very important waste management initiatives, landfilling still appears to be Armenia's main waste treatment mechanism. At the moment, in all landfills waste is disposed without prior classification and sorting (UNFCCC, 2020). Additionally, all the landfills, except for the largest one near Yerevan are non-managed (ibid). Here, over 50% (weight) of municipal solid waste is organic (i.e. kitchen and garden waste) and thus could instead be composted (Acopian Center for the Environment, 2020). Plastic and paper/cardboard comprise around 20 and 10 percent, respectively (ibid). Finally, around 15% of waste weight relates to the refused-derived fuel (ibid). Hence, as seen, almost half of the landfilled waste could potentially be processed (Fig.2).

Figure 6: Composition of municipal solid waste in Armenia



Source: Acopian Center for the Environment (2020)

This situation does not look extremely surprising, given the remarkable omissions of the country's legislation regulating waste management (Biosophia, 2021). In fact, some of the key pieces of regulatory acts appear to be not stimulating sustainable waste treatment. For instance, 'Law on waste' misses the definition of waste hierarchy and does not explicitly set the priority order for waste handling simultaneously omitting some very important notions (e.g. 'separate collection', 'circular economy', etc.) (Government of Armenia, 2020). This appears to give further impetus to the challenge of spontaneous dumping while not putting any specific obligations on the population's conduct with respect to proper waste treatment (Biosophia, 2021).

Additionally, financial mechanisms regulating waste management in Armenia often appear to be inadequate (Dalma-Sona, 2021). For instance, the waste management fee is too low, which, apart from not including negative externalities of waste disposal, leads to the low level of responsibility among the citizens and organizations, poor implementation of the 'polluters pay' principle, insufficient funds for waste collection (Ecolur, 2021). This, coupled with no infrastructure for sorted collection and dry recyclables, contributes to the increased threats of hazardous waste to be disposed at the same landfill sites (Dalma-Sona, 2021).

In addition to that, Sanitek Armenia – the country's waste management monopolist – experiences significant problems with proper garbage collection. In fact, due to the insufficient number of dumpsters as well as waste collecting trucks (EaP Green, 2017)², waste is often not collected on time and the dumpsters are not properly and timely replaced (Civilnet, 2019). This makes the picture of waste treatment in Armenia look even worse, as lack of proper waste management policies complying with the environmental regulations leads to substantial land degradation and significant health threats, since such landfills appear to be a source of bacterial pollution and disease (Ecolur, 2018).

² As of 2018, Armenian regions have 774 waste collection trucks, of which only 204 were equipped with waste compacting mechanisms, and only 11, 868 garbage bins, which is insufficient for the country and thus results in inefficient and delayed waste collection (EaP Green, 2017)

Here, insufficient waste separation and recycling initiatives result in the growing amount of synthetic substances being dumped and thus posing a long-term environmental challenge (Khazer, 2021).

- **Medical waste**

In Armenia, the handling of medical waste is regulated by Decree № 03-N of the Minister of Health adopted on March 4, 2008 on approving sanitary rules and norms N 2.1.3-3 on “the hygienic and anti-epidemic requirements for the handling of medical waste” (Acopian Center for the Environment, 2020). These sanitary rules and norms define the sanitary and anti-epidemic requirements for the use (prevention of generation, collection, temporary storage, neutralization, liquidation, transport, and burial) of hazardous medical wastes generated by medical and related institutions and facilities (ibid). Though the requirements for the neutralization of medical wastes are different depending on their volumes, in general, there is mandatory separation of wastes at the generation source (i.e. medical institutions) (ibid).

Further processing, neutralization, storage, transportation, and disposal of medical wastes are carried out by two licensed companies – Ekologia VKH from Ejmiatsin and Ecoprotec LLC from Yerevan, which also has a non-official regional representation (EVN Report, 2019). With each of the companies equipped with three specialized vehicles with fridges that keep temperatures as low as 4-5°C, medical waste in Armenia is supposed to be collected every 24 hours in the summer and every 72 hours in winter (ibid). The collected waste is then incinerated at temperatures of 1,200-1,500 °C and the generated fly ash is then landfilled in pits built in accordance with certain requirements and at relevant depths (Acopian Center for the Environment, 2020).

In addition to incineration, the existing regulations, allow for an alternative treatment of biomedical waste in an autoclave at the facility where it is generated (EVN Report, 2019). Such practices are common in smaller medical facilities (e.g. polyclinics) where smaller number of patients receive medical services and where handing medical waste to a licensed company is not economically feasible (ibid). Nevertheless, after autoclaving (i.e. heat-based treatment), medical waste becomes sterilized and devoid of any possible pathogenic qualities and is discharges together with municipal waste (ibid). Though medical waste incineration represents the most common mechanism of treating this specific waste type, it is important to note that, due to the fact that the above-mentioned two companies are based in Yerevan and Ejmiatsin, there risks of improper waste treatment in remote communities (e.g. illegal improper incineration or burning, etc.) are quite significant, especially given the financial constraints that might limit autoclaving (Acopian Center for the Environment, 2020 and EVN Report, 2019).

Water

After the collapse of the USSR, having survived the stage nearing that of despair, the Armenian water sector has taken steps for improvement. This included investments in the infrastructure and water supply segments to cater for the growing consumption of water. On the other hand, due to such factors as climate change and poor transboundary water management issues, the waste water treatment sector of the country still seemed to be in need for further attention, as waste water management facilities did not fully comply with the required standards of purification allowing for the minimization of health and environmental risks (Biosophia, 2021).

- **Strengths**

After Armenia regained its independence, the specific attention of the government was given to the challenges of increased water demand, dilapidated infrastructure, water leakage and wastage as well

as high cost of service provision, which, with the help of the World Bank, were addressed through the establishment of Public Private Partnerships (World Bank, 2015). The government outsourced water supply management and waste water treatment to two foreign companies: the French SAUR Group CJSC and Veolia CJSC (Armenian Environmental Network, 2016). As a result, the water supply to the residents outside the capital was increased to 17 hours per day and the operators' energy consumption was cut by almost 50 percent (ibid).

Some other challenges associated with the energy crisis of the first post-Soviet decade were also addressed through successful small-scale solutions. For instance, due to electricity shortages in 1990s, the Soviet-era pumping system delivering waste water from the villages near Yerevan to the capital's waste water collectors and waste treatment plants was abandoned (Global Water Partnership, 2013). This resulted in such rural areas not receiving sufficient water-related sanitary services (ibid). Additionally, in the villages, the waste water was often leaked to the irrigation canals, which resulted in contamination of the cultivated lands by waste water and increased threat of a break-out of intestinal and epidemic diseases, especially during the summer (ibid).

This challenge, however, was successfully addressed in the village of **Parakar** through the implementation of an advanced and relatively cost-efficient waste water treatment system of the lagoon type (ibid). In particular, in 2010 the village community supported by partners from Country Water Partnerships of Armenia initiated and developed this first of its kind pilot project allowing for the treatment of the domestic waste water to the quality required for irrigation of water and using the treated waste water for irrigation purposes (ibid). The project also included a public awareness phase – the distribution of information leaflets and organization of round tables among the community members. As a result, the significant challenge of waste water treatment was successfully addressed.

• Weaknesses

Prior to the COVID-19 crisis, the major weaknesses of the Armenian waste water treatment were related to the absence of full-scale treatment mechanisms (Khazer, 2021). Specifically, after the collection of waste water from communal and industrial consumers around the country, the nearby wastewater treatment plants would only conduct mechanical treatment – i.e. screening and sedimentation of suspended solid particles – before discharging such semi-treated waste water directly into Armenia's rivers (Armenian Environmental Network, 2016). This means that, despite possessing 18 waste water treatment plants around the country, Armenia does not provide adequate biological treatment of its waste water – i.e., due to redundant technical facilities, it is not able to remove harmful microorganisms and chemical compounds from waste water (ibid and Khazer, 2021). Hence, only primary waste water treatment is conducted in most cases, though best practices require the follow-up implementation of secondary (biological) and tertiary (removal of 99.9% of impurities and providing water of drinking quality) treatment stages (Armenian Environmental Network, 2016).

As a result, the water zone is often exposed to harmful bacteria, viruses, microorganisms, microbes, heavy metals and other chemical compounds from the mining industries, which create significant health risks and contribute to the aggravation of the environmental problems (Center for Community Mobilisation and Support, 2021). Apart from representing threats to public health and the environment, improperly or semi-treated waste water often contaminates agricultural lands jeopardizing food safety (Global Water Partnership, 2013). This often happens due to obsolete infrastructure and difficulties with energy supplies, etc. That is why, modernizing the whole waste water treatment system seems to be essential (Public Awareness & Monitoring Centre, 2021).

Apart from the insufficient waste water purification, littering water bodies with solid waste often represents a significant challenge for the country (Civilnet, 2019). It could be viewed as a result of the inefficient solid waste management system that does not disincentivize the population from spontaneous dumping (Biosophia, 2021). This creates additional challenges not only to the water treatment system but also waste management policies pushing the country further away from *EaP 2020 Deliverable 16* ('Support the environment and adaptation to climate change').

2.2.2. Azerbaijan

Waste

Deficient waste management system inherited from the Soviet Union, chaotic dumping, lack of reliable information on solid waste management situation in the country were the main problems Azerbaijan had to deal with after the collapse of the USSR. However, since 2008-2009 the country has been improving the national waste management system with international assistance. To the moment, Azerbaijan has managed to build a policy agenda for the most important steps to take.

- **Strengths**

Azerbaijan's legislation on waste management is comprised of the Law of the Republic of Azerbaijan on industrial and domestic waste, other acts of the government and international agreements signed and ratified by the country. Additionally, the National Strategy on the Improvement of Solid Waste Management for the years of 2018-2022 was approved by the Presidential Decree No. 637, as a part of national environmental policy (EBRD, 2019a). The Strategy covers financial, institutional, technical, and capacity analyses of solid waste management system of the whole country and includes proposals for the expansion and enhancement of the municipal waste collection, transportation and utilization systems (ibid).

Since around half of the population resides in rural areas, waste collection services currently do not cover all the country's population (UN Azerbaijan, 2019). However, in the Greater Baku area (the city of Baku and the adjacent areas on the Absheron peninsula), the situation is different, as there the Baku City Executive Power and Tamiz Shahr (Clean City), a state-owned joint stock company, are the main entities responsible for the development and operation of the municipal waste management that is provided for the majority of the population (STAT, 2018).

In 2009, Azerbaijan launched the ***Integrated Solid Waste Management Project*** co-financed by the Government of Azerbaijan and the World Bank (World Bank, 2018). A new solid waste management system set-up in Azerbaijan's capital of Baku is the first of its kind in the region of South Caucasus (ibid). The new system established within the framework of the Integrated Solid Waste Management Project, improves disposal management, increases coverage of waste collection, and enhances waste-data information and financial management capacity in the Greater Baku area (ibid).

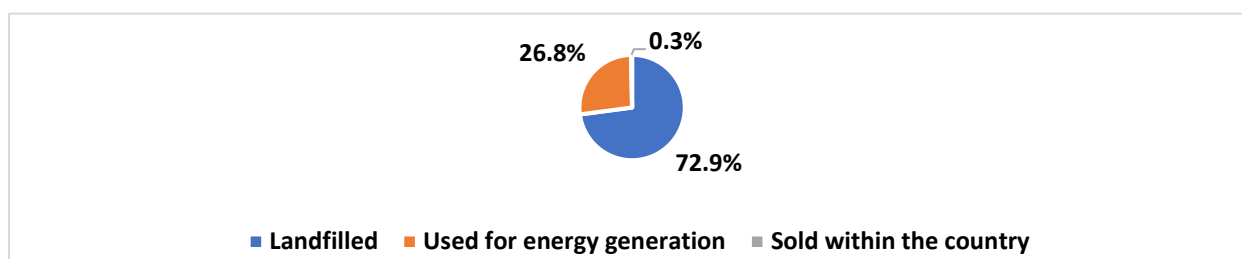
- **Weaknesses**

While collecting around 90% of the annually produced 1.8 million tonnes of municipal solid waste, Azerbaijan currently recycles only 2% of it (EBRD, 2016). In the country in general, about 90% of all the collected waste is sent to landfills and dumpsites (ENI-SEIS, 2016). Each district has a managed landfill, mostly in the centre. However, most of them (except for those in Baku) do not meet the international standards (ibid). Additionally, since the information on landfills and dumpsites is not officially collected, there is a problem with illegal dumping in most parts of the country (ibid). In

2019, 72.9% of the generated municipal solid waste was landfilled, 26.8% was used for energy generation, and 0.3% was sold within the country (*Figure 7*) (STAT, 2019).

Most of the municipal waste from Baku is incinerated (*ibid*). Nevertheless, with almost half of the population living in the capital, solid waste management represents a real issue there (EBRD, 2017). Indeed, the collection, storage and transport of the municipal solid waste from different districts of Baku are often uncoordinated and inadequate (ENI-SEIS, 2016). For instance, only around 2-5% of the waste collected from the Garadagh and Khazar districts reach the Balakhany landfill – the main landfilling site of the capital (EBRD, 2017). Instead, a significant part of the collected waste is often dumped at one of the numerous unauthorised dumps in these districts (EBRD, 2017).

Figure 7: Municipal solid waste management in Azerbaijan



Source: STAT (2019)

As there is no source separated collection of household waste in Azerbaijan (with the exception of a pilot project in two districts of Baku where wet and dry fractions are collected separately), solid waste recycling is quite challenging (Green Baku, 2021). In this sense, the reuse and recycling of waste is only conducted on a very limited scale (*ibid*). Unfortunately, in general, the industry does not express interest in using secondary raw materials (e.g. construction/demolition waste) for their own purposes, which significantly undermines the efforts on separate waste collection (ENI-SEIS, 2016).

According to the results of survey conducted among civil society organizations in Azerbaijan, some of the key gaps of the country's waste management system are as follows: uncoordinated transportation of household waste; lack of separated household waste collection; lack of real waste hierarchy (Green Baku, 2021, and Khazar University, 2021). It is worth noting that the key difference between waste management in Azerbaijan and the EU is the lack of extended producer responsibility in Azerbaijan and no plans to introduce it (ENI-SEIS, 2016).

- **Medical waste**

Similarly to other EaP nations, Azerbaijan has certain requirements for medical waste treatment. In particular, in 2007, the Cabinet of Ministers of the Azerbaijani Republic approved "Requirements on medical waste management" (Quanun, 2021). According to it, medical waste is divided into 4 main categories (A, B, C, D) with a specific set of regulations on the collection, storage, transportation, treatment, and utilization for each category (*ibid*). In general, however, medical waste is either incinerated or disinfected before being disposed as communal waste (*ibid*). However, due to the lack of proper monitoring institutions, the requirements are not always met and this situation needs an urgent solution (Khazar University, 2021).

Apart from the legal framework, the governmental agencies regularly organize events on medical waste management. Most recently, prior to the COVID-19 pandemic, one of such events was held in 2019 in Sumgayit by the Ministry of Ecology and Natural Resources (Ministry of Ecology and Natural Resources of Azerbaijan, 2019). The meeting was dedicated to the proper medical waste

management in the regions and involved representatives of medical institutions, local authorities and relevant agencies of the Sumgayit, Khizi, Absheron and Gobustan regions (ibid).

Water

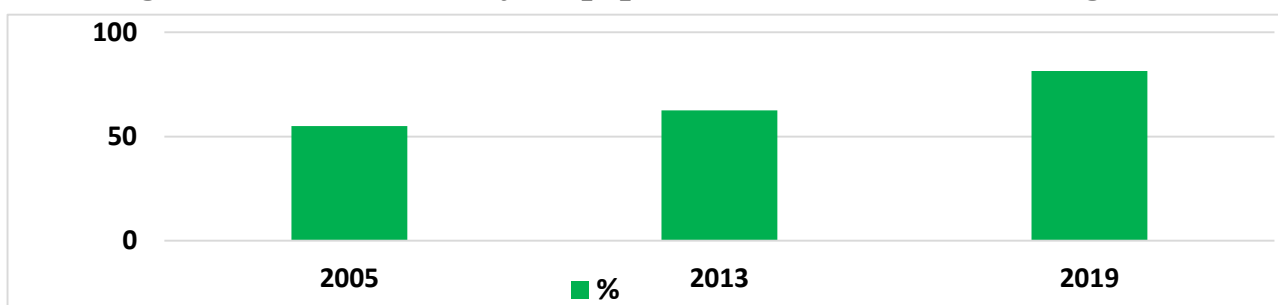
Since the collapse of the Soviet Union, the wastewater treatment in Azerbaijan has been conducted mostly at primary level and was not efficient enough to properly manage large amounts of industrial water discharges (Elshan Ahmadov, 2020). However, the balance of wastewater discharges in Azerbaijan has changed significantly since then. Specifically, the reduction of industrial wastewater discharges as a result of the less intense industrial output was accompanied with lowered treatment of municipal discharges (ibid). Hence, since there are still gaps in Azerbaijan's wastewater management, the country committed itself to the implementation of the 2030 Agenda for the sustainable development of the region.

- **Strengths**

Azerbaijan has adopted a number of legislative documents and implemented projects together with international organizations to improve its wastewater management system. Currently, apart from being guided by the Water Code of 1997, the country's water management sector is regulated by a number of core laws. These include, among others, the Law on sanitary and epidemiological well-being of 1992, the Law on land reclamation and irrigation of 1996, the Law on water supply and sanitation of 1999, the Law on environmental protection of 1999, the Law on environmental safety of 1999, the Law on municipal water management of 2001, and the Law on the safety of hydraulic structures of 2002 (CA Water Info, 2020). Azerbaijan also became a party to the United Nations Economic Commission for Europe (UNECE)-World Health Organization Regional Office for Europe (WHO/Europe) Protocol on Water and Health to the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) in 2003 (ibid).

Azerbaijan's Government adopted the State Programme on the socio-economic development of the regions for 2014-2018 and the State Programme on the socioeconomic development of Baku and its suburban settlements for 2014-2016, some of the most important parts of which are fully dedicated to water policy issues (UN Azerbaijan, 2019). Following the Programmes, in cooperation with **Azersu OJSC**, 23 out of 47 cities have already improved their water supply and waste water treatment sectors, and 9 have made their water supply better (UNECE, 2019). Specifically, while the access to safe drinking water among the country's population raised from 55 to 62.5% by 2013, in the following years, this indicator was further improved to 81.5% (ibid) (*Figure 8*). That is why, if in 2005 the centralized water supply system of Azerbaijan catered for 1.56 million people, in 2019 it covered 2.41 million people (ibid). The implemented activities helped to improve the environmental and health indicators in both the capital and regional centers.

Figure 8: Share of Azerbaijan's population with access to drinking water



Source: UNECE (2019)

Currently, the government of the country is actively working on the reconstruction of the existing old sewage systems and the construction of the new ones (ibid). Indeed, new sewage collectors with a total length of 3510 km have already been constructed to improve public access to sanitation on the Absheron Peninsula and regions of the country (ibid). In addition to that, the Ministry of Ecology and Natural Resources together with Azersu OJSC, Azerbaijan Land Reclamation and Water Management OJSC has developed an action plan for 2019-2030 (ibid), which includes a project on regulatory requirements for wastewater treatment; sewage treatment and discharge into natural water basins. Here, the key goals and measures presuppose minimization of waste water risks to small rivers, the construction and reconstruction of the collector drainage network for drainage of irrigated areas, and the organization of trainings and seminars on the proper disposal of waste water.

- **Weaknesses**

The survey distributed among the industry specialists from EaP CSF network identified that the main gaps in Azerbaijan's water management system relate to the following issues: absence of hierarchy in water management; illegal activities; lack of coordination in the water sector and insufficient professionalism among stakeholders (Azerbaijan Ornithological Society, 2021, Eco-World PU, 2021, Green Baku, 2021, and Khazar University, 2021).

In the waste water treatment sector of the capital, the Baku wastewater network itself serves 72% of the population (UNECE, 2019). However, only 50% of the waste water processed by the system is treated. Furthermore, 90% of the treated water undergoes mechanical treatment and only 10% is entitled to secondary biological treatment (ibid). In 2017, 32.7% of the population of the country was connected to wastewater collection systems overall (STAT, 2019). Since most of this was achieved in the urban areas (ibid), further improvement of the situation is needed.

Currently, waste water treatment plants are available only in 16 cities and regions with most of them being not fully efficient (Elshan Ahmadov, 2020). In many cases, the quality of water supplied to the population does not meet the required standards. Though the Azerbaijani government has already adopted a program on the construction of water supply and waste water treatment systems in more than 60 towns, local authorities still have to cooperate with donors to address these problems (ibid).

In places where commercial water is discharged into the Caspian Sea, oil recovery units have been built. However, modern oil recovery facilities, even properly operated, are not able to completely treat incoming waste water and can only reduce the amount of oil discharged by a reservoir. Unfortunately, while the amount of waste water in the fields is increasing annually, this increase is not accompanied by a corresponding expansion of the trap economy (ibid). That is why, at the moment, the constructed treatment facilities cannot provide effective treatment of the rising volumes of the waste water related to the oil industry (ibid).

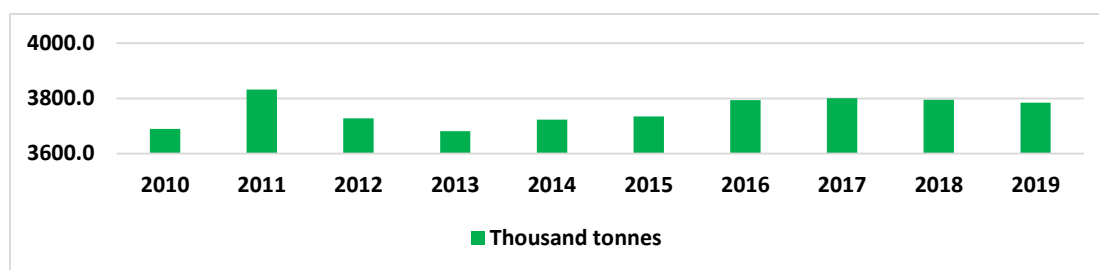
Another problem specific to Azerbaijan's economy relates to the deepening of oil and gas processing and the emergence of new and expansion of old petrochemical facilities (Green Baku, 2021). This leads not only to increased amount of waste water, but also to the fact that its composition becomes more complex and thus harder to be properly treated (ibid). The high pace of development of the oil industry is also accompanied by an increase in the amount of commercial waste water (ibid).

2.2.3. Belarus

Waste

Just like in other EaP countries, the growing consumption of goods in Belarus has led to the overall increase in generated waste. Just before the pandemic, the citizens annually generated almost 3.800 million tonnes of municipal solid waste (*Fig. 9*). Unfortunately, around 79-85% of such waste in Belarus is not recycled and thus is sent to landfills instead (National Statistical Committee of Belarus, 2020). More recently, however, a number of successful projects augmented the waste management system in Belarus, which helped to push the country forward towards reaching *Deliverable 16*.

Figure 9: Annual generation of municipal solid waste in Belarus



Source: National Statistical Committee of Belarus (2020)

- **Strengths**

Though after the collapse of the Soviet Union, the relatively well-established separate waste collection system in Belarus significantly deteriorated, in the past two decades, a number of important projects helped the country to partially revive it and take a leading place in the CIS in terms of waste recycling (SB, 2017). In fact, in recent years, eco-friendly habits have been actively developed by the Belarusian communities. For instance, the survey data show that around 65-70% of the population are taking part in at least some waste separation activities (BelarusDigest, 2017). As a result, a significant overall improvement has been achieved in the recycling sector, since in 2012 Belarus used to recycle only around 11% of waste materials, whereas by 2015 this figure rose to 21% (ibid).

This was also made possible through the construction of seven waste recycling plants and the creation of infrastructure for separate waste collection in the key cities of the country. In fact, the currently operating waste recycling facilities in Brest, Gomel, Grodno, Minsk, Mogilev, Baranovichi, and Novopolotsk have enough cumulative capacity to process up to 26% of all the recyclable waste generated in Belarus (Direktor, 2020). Additionally, most big cities have the established infrastructure for separate waste collection, with Minsk, the capital, offering up to 84% of the population special dumpsters for these purposes (Greenpeace, 2019).

With the help of large-scale and multi-target EU/UNDP projects, Belarus's national environmental legislation on municipal solid waste and water management was significantly improved to comply with international best practices (UNDP, 2019). As a result of the joint efforts, the 2007 Law on waste management was later amended in 2016 to better reflect the advanced sustainability practices: e.g. 'recycling' was defined and waste separation was mentioned to be done at sources, while dumping of recyclables at disposal sites was banned (ENI-SEIS, 2017). Additionally, the National Strategy on the management on municipal solid waste was adopted in 2017 (Vtoroperator.by, 2019). Apart from that, a number of successful pilot projects on waste management were successfully accomplished.

For instance, in **Kobryn** and **Masty**, local authorities were not able to organize separate waste collection due to the shortage of dumpsters and old waste collecting vehicles, low level of awareness among the local population and lack of general strategy (UNDP, 2019). This resulted in unregular waste collection, unauthorised landfilling in towns and nearby territories and lack of motivation to collect waste separately in presence of the overfilled containers. Additionally, hazardous waste (e.g. batteries, luminescent lamps, etc.) went directly to the landfills, which represented significant environmental and health threats. As a result of the joint efforts of EU/UNDP and local authorities, the challenge was addressed through incentivizing local population to separate waste and through the improvement of key elements in the waste management system (e.g. purchasing 1000 containers for separate waste collection and 12 garbage trucks for different types of waste as well as 920 bio bins) (ibid). This significantly contributed to meeting EaP 2020's *Deliverable 16*.

Additionally, almost a decade ago, to utilize the biogas potential of municipal landfills stemming from the high percentage of their biodegradable content, such investors as **Recovia AB** of Sweden were co-financed by NEFCO and Swedfund to start a number of landfill gas-to-energy projects (Recovia, 2020). At the moment, the company operates facilities in the municipal landfills of Vitebsk, Orsha, Novopolotsk, Gomel, and Mogilev where landfill gas is combusted to produce electricity. In Minsk, however, the first waste incineration plant is planned to be constructed instead (Belta, 2020).

- **Weaknesses**

Though the numbers on waste recycling in Belarus are moving closer to the ones of some EU countries, the nation does not fully implement a wider variety of methods in waste management such as e.g. organic waste composting and the use of solid waste as a fuel for power plants (Yauhenia Shershunovich and Irina Tochitskaya, 2018). Additionally, while sorting municipal solid waste into four major groups (paper, plastic, glass and other waste), Belarus currently lacks the capacity to recycle a number of materials, such as clothing and Tetra Pak cartons (BelarusDigest, 2017). That is why, despite the fact that donation initiatives and sharing communities partially deal with the former waste type, the latter still primarily ends up in landfills.

Apart from not completely efficient organization of the recycling system in many parts of the country, one of the reasons for the ultimate landfilling of potentially recyclable waste is related to a different structure of waste itself. In particular, in contrast to 1988 when most of the waste in a typical Belarusian trash bin would consist of glass, paper and biodegradable kitchen waste, in 2018, the greatest part of it would be constituted by polymer-based and similar hard-to-recycle packaging (Direktor, 2020). In this sense, reviving the Soviet-era waste management system would not help to successfully address this challenge, as a more advanced and up-to-date approach should be implemented. Unfortunately, the lack of such approach is one of the significant deficiencies of the Belarusian waste management system. This results in Belarus still operating 168 large landfills and 1.238 mini-landfills in rural areas, most of which are close to depleting their capacity (SB, 2017).

Though the operation of most of the landfills is officially controlled, separate waste collection has not become a well-established practice also because of social reasons. Specifically, it appears to be more common and thus efficient in urban areas, whereas rural areas still stick to landfilling and incinerating. This is partially so because of the lack of awareness, but also such elements of human nature as laziness and ignorance which still have to be dealt with (Greenpeace, 2017). This is further deteriorated by the problem of data accuracy related to the official statistics on waste, which is rooted in the decentralized system of reporting and blurred boundaries between the definitions of different type of waste (Yauhenia Shershunovich and Irina Tochitskaya, 2018). As a result, some types of waste could be classified as 'raw materials' and vice versa, etc.

Another barrier to preventing the spread of an efficient waste recycling system appears to be monopolistic practices of the authorities controlling waste management. For instance, in some cases, municipal powers exercising control over landfills often prevent private waste recycling initiatives from accessing landfills. For example, in 2016, *EcoFlekS*, a private secondary materials supplier, was denied access to the Orsha municipal landfill where it wanted to collect PET-bottles for further recycling (BelarusDigest, 2017). Here, since the local municipal authorities were afraid that EcoFlekS might compete with their own garbage sorting facility, most of the PET-bottles ended up in a landfill.

This reflects the disadvantages associated with the monopolistic nature of the Housing and Communal Services Ministry – Belarus’s sole waste management authority. In fact, it does not have any incentives to minimize its expenses and reorganize the system so that it better addresses the current needs of the waste treatment sector (ibid). Instead, being entitled to additional subsidized funding from local municipalities, it restricts the access of private business to waste.

- **Medical waste**

In Belarus, healthcare waste management is generally regulated by the “Sanitary-epidemiological requirements to medical wastes management” approved by the Ministry of Health in 2018 (Pravo.by, 2018). In principle, similarly to the methods used in Armenia, Belarus’s medical institutions and facilities are implementing two major schemes of dealing with medical waste: its disinfection prior to landfilling and incineration (ibid). Here, the incineration is conducted at the temperatures between 850 and 1200 °C, while disinfection is most often done through such methods as autoclaving (UNDP, 2015). While less dangerous types of medical waste are normally landfilled together with communal waste right after their disinfection, more dangerous wastes should be landfilled in special metal casing at specially-dedicated sites (Pravo.by, 2018).

The waste water associated with medical procedures and medical waste is required to be disinfected before discharge into the general sewage system (ibid). In this sense, though being required to be diluted with disinfectant at the 1:1 minimum rate, such waste water is not supposed to be treated separately from the rest of communal waste water. That is why, given the absence of tertiary waste water treatment and insufficient presence of secondary one in many regions of the country, medical waste water containing traces of medicines and chemicals has a high risk of infiltrating the water bodies that are further used for water supplies.

One of the most serious issues associated with the Belarusian medical waste treatment, however, appears to be the management of expired pharmaceutical products (medicines) and similar products, as their separate waste collection from the population as well as overall industrial treatment has not been well-developed and managed at the state level (tut.by, 2015). Indeed, since such types of pharmaceutical waste have to be pyrolytically incinerated, providing enough capacity to successfully manage the entire volume of expired medicines has not been easy to do due to the high capital costs associated with this undertaking (ibid). That is why a significant share of medical waste of this type still appears to be improperly treated (ibid).

Water

Though the collapse of the Soviet Union posed significant economic challenges to water management in Belarus, the water supply and waste water treatment systems inherited from the Soviet times still appear to be functioning at a decent level. For instance, most of the Belarusian households connected to the centralised water and sewage systems are entitled to secondary water treatment services, which significantly improves the quality of life as well as puts fewer threats to the nation’s public

health and the environment. Nevertheless, the significant age of some of the crucial equipment involved in the process poses substantial challenge to the government of the country.

- **Strengths**

Before 2004, around 90% of the generated waste water in Belarus was discharged into water bodies (Olga Kadatskaya, 2006). In the next decade (2005-2014), the total volume of such discharges was reduced by around 20% (UNECE, 2015). Most of the released waste water goes to surface water bodies, and about 31% of such water requires no treatment, whereas about two thirds (68%) undergoes primary and secondary treatment, leaving less than one percent to the waste water that is not adequately treated (ibid). This means that, although the Belarusian waste water management does not involve tertiary treatment, its overall organization appears to be at a decent level.

In fact, while in 2003 the Water Pollution Index showed that 41% of Belarus's surface waters were relatively clean and 58% were moderately polluted, a decade later, the combined percentage of clean and relatively clean water increased to 90.7% (ibid). This could be interpreted as a result of the joint efforts of the Belarusian authorities and international partners on the improvement of the waste water management system in the country. Indeed, such international donors as the World Bank managed to finance a number of regional projects on water and waste water improvement through strengthening utility performance by making it possible to replace the outdated water purification equipment with the up-to-date one (World Bank, 2019). Similarly, the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) are currently helping to transform the **Minsk Waste Water Treatment Plant** from a Soviet-era inefficient facility into a modern water purification and supply workshop with high quality indicators (Ramboll, 2018). These efforts push Belarus closer to reaching *Deliverable 16*.

As a result of such efforts, the coverage of the urban population served by a centralized water supply system reached 98%, while the centralized sewage coverage in urban areas mounted 92% (ibid). In this sense, given the relatively good quality of water purification and stability of supplies, both the healthcare and environmental standards in the urban areas of Belarus were improved.

- **Weaknesses**

One of the main weaknesses of Belarus's system of waste water treatment relates to the absence of control for the quality of the machinery used for the waste water treatment (Proektant.by, 2017). Here, despite all the necessary technical requirements for the proper waste water purification have already been developed, they are not always complied with. This happens mostly because the equipment used for the waste water treatment does not have to be certified, unlike in most other countries (ibid). In this case, the operators of waste water treatment facilities tend to procure the cheapest pieces of equipment with their quality characteristics not always being those that are required by the system. As a result, such a 'grey' market with uncertified machinery can potentially create environmental and health problems and threats in the foreseeable future.

Apart from that, the Soviet-era waste water treatment facilities constructed in the 1960-1980s cannot always provide the required level of waste water purification before its final discharge to the rivers (Viktor Anufriev, 2015). In this connection, despite undergoing primary and secondary treatment, waste water in Belarus may still contain nitrates and phosphates and organic elements (ibid). That is why, when it enters the rivers and water aquifers, it can significantly contribute to such negative effects as eutrophication, which, in its turn, may cause biodiversity loss.

Additionally, despite having high overall supply and wastewater service coverage in the country, Belarus's rural settlements are often deprived of them. In fact, 29% of the rural population lacks access to centralized water supply and 62% are not connected to the centralized sewage (UNECE, 2015). This, in its turn, means that Belarus still has significant room for improvement in this respect.

2.2.4. Georgia

Waste

In the last 10 years Georgia has made a significant step to improve its waste management system. Close cooperation with international organizations and the EU, the adoption of waste management laws and national strategy have contributed towards the enhancement of waste management in the country. However, despite a number of successful projects and strengthened legislative base, landfilling still appears to represent a serious issue.

- **Strengths**

Currently, solid waste management in Georgia is governed by a number of laws. This includes, among others, the Law on the environment protection, the Law on local self-government, the Law on ecological examination, the law on environmental impact permit, the Law on local fee collection, and the Law on public health (EaP CSF, 2016). In addition, in 2014, the **Waste Management Code** was adopted, whose objective is to improve waste management practices by mandating higher design and operational standards that are consistent with EU standards. In fact, having signed the Association Agreement with the EU, Georgia has to harmonize its waste management practices with those of the EU (ibid). Georgia is also a Party to the Stockholm Convention on Persistent Organic Pollutants and Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal as well as a signatory of the Minamata Convention on Mercury (ibid).

In addition to laws, codes, and conventions, in 2016, Georgia adopted a National Action Plan for 2016-2020, which provides a target timeline for recycling certain materials and a National Waste Management Strategy for 2016-2030 (EU Neighbours East, 2018). The Action Plan notes that the country should recycle 30 % of plastic by 2020, 50% by 2025 and 80% by 2030 (ibid). Hence, Georgian companies should take measures to prevent waste generation by 2020, which aligns with the EU's Waste Hierarchy concept as well as the general logic behind circular economy. Apart from working towards waste prevention, according to the Action Plan, by 2025, Georgia is also expected to establish the system of energy generation from waste that have not been reused or recycled (ibid). Following the Plan generally contributes to reaching EaP 2020's *Deliverables 15 and 16*.

- **Weaknesses**

While producing around 900,000 tons of waste on an annual and 8,186.3 m³ on a daily basis, Georgia still sends more than 75% of it to landfills (ibid). Unfortunately, with 56 registered landfills occupying more than 300 ha, landfilling represents a serious issue in the country, as only five of these sites have acquired environmental impact permits (ibid). In fact, some of the landfills in current operation were created during 1960s and the 1980s where no special measures to protect the environment were even considered to be in place (OECD, 2018).

The majority of landfills functioning under local government authorities operate without proper measures for groundwater protection, leachate collection, or treatment (ibid). Additionally, there are no waste management services in 28 unauthorised landfills and there are no sanitary landfills with

segregation of waste for energy production. The recycling facilities are scarce and limited, whereas composting is used by some farmers (World Bank, 2015).

Apart from that, the survey conducted by the researchers that involved environmental experts from EaP CSF's Georgia's network identified 'lack of financial resources for improvement and qualified personnel in waste management' among the core factors negatively influencing the progress of this sector in the country (CENN, 2021, Friends of the Earth Georgia, 2021, and Spectri, 2021).

- **Medical waste**

Medical waste treatment in Georgia is regulated by the Law of Georgia on Environment Protection, Law of Georgia on Environmental Impact Permit, Law of Georgia on Public Health and the Georgian Waste Management Code, which was adopted in 2014 and came into force in 2015 (Legislative Herald of Georgia, 2015). In general, these pieces of legislation presuppose that medical waste in the country is subject to two major types of treatment: incineration and disinfection (chemical or thermal, e.g. autoclaving) before ultimate disposal (ibid). Though most of the healthcare institutions are following these regulations, medical facilities in rural and remote areas are still in need of technical and financial assistance in order to follow proper medical waste treatment regulations (CENN, 2021).

Such assistance is often obtained through international sources. For instance, in 2016, within the framework of the Georgia Solid Waste Management Project, the EBRD allocated a sovereign loan of EUR 10 million to improve and modernise Georgia's solid waste management system, in general, and medical waste treatment facilities, in particular (IBEDC, 2016). Specifically, this project helped the country's medical institutions to procure a new fleet of modern rear-loaded vehicles and containers for solid waste management, some of which are being used for transporting and disposing disinfected medical waste (ibid).

At the same time, unfortunately, despite the introduction of a number of important regulations on healthcare waste treatment as well as the implementation of successful initiatives, it is still almost impossible to closely and fully monitor the process of medical waste collection, storage, transportation and treatment (CENN, 2021). Unfortunately, a great share of medical waste in Georgia ends up in landfills, some of which are illegal (ibid). Thus, medical waste management needs to be further improved.

Water

Following the Rose Revolution of 2003, serious measures were taken to address the issues in the water management sector. The Georgian government transferred the responsibility for water supply and sanitation from local authorities to state-owned companies. Since 2010, after the biggest two of them merged into the United Water Supply Company of Georgia (UWSCG), a total reconstruction of the water management system with the help of international donors began.

- **Strengths**

With the centralised sewage system operating in the country's 37 cities and towns, the network penetration appears to be quite high even despite being insufficiently well-maintained, as it reaches about 78% of the population (NISPA, 2015). The waste water treatment facilities, in turn, currently serve 33 towns (ibid). 19 of the country's waste water treatment plants with the total capacity of 1.39 million m³/day offer both primary and secondary treatment, whereas 4 plants with the total capacity of 0.03 million m³/day provide only primary (mechanical) waste water treatment (ibid).

Extensive waste water treatment projects were implemented in several regions of the country between 2008 and 2019 (ibid). Specifically, one of the key objectives of the State Strategy for Regional Development of Georgia for 2010-2017 was the development and improvement of municipal infrastructure, including water supply and sanitation systems. The Strategy aimed to create a favorable environment for investments in the water management sector, ensure access to safe drinking water and sanitation, restore and reconstruct water supply/sanitation infrastructure, and reducing water loss, etc. In 2019, 46% of the Georgian population was connected to a waste water collection system, while 34% was connected to wastewater treatment facilities (Geostat, 2021).

Apart from the official initiatives of the government, Georgia was able to implement a number of successful projects supported by international partners. Here, within the framework of the German-Georgian financial cooperation programme, KfW and the EU's Neighbourhood Investment Facility provided funds for the restoration of waste water treatment infrastructure in Chakvi, Batumi and the surrounding territories. As a result of this cooperation, the first modern wastewater treatment plant was built in Georgia's third-largest city (EIB, 2017).

- **Weaknesses**

Although Georgian Government is effectively working on the improvement of the water management system in the country, there are still challenges the state needs to address. In particular, some of the major problems that Georgia is facing in the water management sector relates to the absence of effective pollution prevention and water extraction control mechanisms, lack of effective water management, and poor conditions of municipal wastewater systems (EaP Green, 2015). Unfortunately, in most of the settlements that lack the waste water treatment facilities, wastewater is discharged directly to the water receivers leading to local rivers (ibid). In fact, untreated waste water appears to be a major cause of the surface water pollution in Georgia (Spectri, 2021).

In addition to that, despite a significant number of the waste water treatment plants operating in Georgia, the majority of such facilities are typically 10-25 years old; some are yet to be finished, and most of them not properly maintained (Friends of the Earth Georgia, 2021 and Spectri, 2021). As many facilities are out of order, none of the existing waste water plants is providing adequate treatment. Primary waste water treatment, in turn, appears to be sufficiently effective only in Tbilisi (GWP's Treatment plant serves Tbilisi, Rustavi and Gardabani), Rustavi, Kutaisi, Tkibuli, Gori and Batumi and its total estimated daily capacity is 0.7 million m³ (EaP Green, 2015). Finally, power supplies appear to be insufficient for the effective functioning of waste water treatment (ibid).

2.2.5. Moldova

Waste

In Moldova, about 3 million citizens annually generate around 2.5 million tonnes of waste, almost all of which is, unfortunately, sent to 1,867 landfills (Global Recycling, 2018). Nevertheless, some steps towards the improvement of the waste management system have been taken. Specifically, specialized sanitation services executing municipal waste management exist in all municipalities, regional centres, including small towns within the districts. In rural areas, however, waste is mainly transported to unauthorised waste sites by the individuals who generate it, as proper waste management services there are not organised (Ina Coseru, 2021).

Whilst the generation of municipal waste is influenced by many factors, the most important ones appear to be personal income, consumer behavior, the appearance of new packaged products on the market and demographic evolution (ibid). Greater level of the population's income accompanied by

urbanization resulted in the generation of a larger amount of waste per capita, with the one in rural areas being normally between 0.3 - 0.4 kg / inhabitant / day and the one in urban areas being about 0.9 kg / inhabitant / day respectively (UNEP, 2016). In 2014, the total amount of solid household waste generated and collected in both urban and rural areas was 2,437,943 m³, most of which went to 1,158 authorised landfills with the combined area of 1,235.5 hectares (ibid).

The institutional framework in Moldova on waste is assured by the Ministry of Agriculture, Regional Development and Environment, Environmental Agency, Inspectorate for Environmental Protection, local public authorities and the Ministry of Health, Labor and Social Protection responsible for Medical Waste.

• Strengths

The Financing Contract between the Republic of Moldova and the EIB on the implementation of the project “Solid Waste in the Republic of Moldova” was signed on October 18, 2019 (Regional Development Agency South, 2020). According to the document, the overall cost for creating the Solid Waste Management Infrastructure (MDS) in the country is estimated to be around EUR 200 million, with half the sum allocated by EIB and the other half by the EBRD through a blending mechanism (ibid). The investment program includes the integrated infrastructure of Solid waste management project which will be deployed in 8 Waste Management Regions: 3 in the Southern Development Region; 3 in the Development Region Center; and 2 in the North (ibid). To date, three feasibility studies for Regions 1, 5 and 8, respectively, have already been conducted by GIZ, and a pilot project is to be implemented in Region 5, which included Nisporeni, Călărași and Ungheni districts (ibid). The total investment costs for the three Regions are estimated at EUR 42 million (ibid).

In 2014, Moldova signed the Association Agreement with the EU, which includes obligations to improve waste management in the country (European Commission, 2014). For instance, one of the provisions presupposes the development of the Law on Waste which was elaborated in compliance with the EU Directive on Waste and adopted in 2016 (Global Recycling, 2018). In addition, the National Waste Management Strategy for 2013-2027 was developed in accordance with the EU directives, setting waste management goals in line with EU principles and dividing Moldova into 8 regions of waste management (ENI-SEIS, 2018). Legislatively, these documents appear to represent a significant step forward in Moldova’s way to the improvement of its waste management system.

Apart from that, the 2016 Law on Waste includes the “extended producers’ responsibility”, which is now being implemented through a number of additional regulations, e.g. the Regulation on Waste from Electric and Electronic Equipment and the Regulation on Packaging Waste (ibid). These regulations are setting up targets for the economic entities to collect waste by themselves or through collective associations, which receive authorization from the Environmental Agency (ibid). One of such associations already obtained authorization from the Environmental Agency and started to work with the economic entities through a questionnaire that needs to be filled in by the economic entities in order to identify the volume of their waste related to electric equipment and electronics (Ina Coseru, 2021).

The above mentioned pieces of legislation has been realized in practice through a number of initiatives. For instance, as a part of the EBRD’s Green Cities Framework, the **Chisinau solid waste project** presupposes that the capital city of Chisinau’s landfills will be cleaned up and upgraded to the EU standards (EBRD, 2020a). As a result, with the extended loan from of up to EUR10.5 million provided by EBRD, EIB, and EU, the existing dump site in Ciocana sector will be closed and a currently non-operational landfill site in Tintareni village will be improved in accordance with the EU regulations (WSP, 2020). In addition, the associate infrastructure (leachate

treatment plant, landfill gas collection, and access road) will be created and the existing transfer station will be upgraded to a small waste sorting line (Global Recycling, 2018). These measures will significantly improve the environmental situation in the capital region while benefiting the waste management system of the country in general (ibid).

In addition to that, a project titled ***‘Modernisation of local public services in the Republic of Moldova’*** was commissioned by the German Federal Ministry of Economic Cooperation and Development in cooperation with GIZ (ibid). This project aims to further improve the country’s legislation and institutional framework for regional development in order to improve local public services in rural areas. One of the sectors on which the project has a specific focus is solid waste management. As the initiative presupposes awareness raising and special training for local public officials, it is supposed to improve the overall waste treatment practices in the rural areas.

One of the demonstration projects dedicated to separate waste collection of municipal solid waste was launched in 2017 by Chisinau municipality in collaboration with the ABS Recycling Company (EBRD, 2017). To foster the recycling of almost half the volume of the waste produced in the municipality of Chisinau (around 300 tonnes/day), the ABS company built a line of waste sorting that facilitates separate waste collection (ibid). At the same time, in January 2021, the waste sorting initiatives of ABS was unfortunately terminated due to financial disputes with the municipality (Ina Coseru, 2021).

- **Weaknesses**

Though a lot of new projects aimed at improving Moldovan waste management have been implemented in the recent decades, the country is still not quite on the track towards transforming its economy from linear to a circular model. In fact, landfilling still appears to represent the most popular mechanism to handle most types of waste irrespective of their origin, level of hazard they may pose, as well as the potential for being recycled. In addition to that, separate waste collection still has not become too common to change the overall trend and let the waste treatment facilities recycle some significant portion of the country’s trash (Katerina Pochazkova, Tatiana Ivanova, and Alexandru Muntean, 2019). While this partially owes to the challenges of waste sorting that is not particularly well-managed, Moldova’s few recycling facilities cannot fully accommodate the entire amount of trash that could and should be sustainably processed (ibid).

Despite the fact that the country has already taken its first steps towards the development and implementation of its long-term waste management strategy, no large-scale waste treatment facilities have been created. Indeed, though the launch of several waste sorting and processing plants has long been promised, the projects appear to remain in draft form in most cases (Recycling and Waste World, 2015). This obviously leads to the accumulation of potentially recyclable waste that further deteriorates the environmental quality.

Another weakness of the Moldovan waste management system is its high disparity between the urban and rural areas. In fact, while the capital city of Chisinau has functional public service for waste collection, the settlements located in the rural areas most often do not have any (Katerina Pochazkova, Tatiana Ivanova, and Alexandru Muntean, 2019). In these circumstances, while some citizens of the country residing in non-urban areas deal with waste management through incinerating a big share of waste they produce, others prefer to dump the trash in places that are not necessarily specifically allocated for such purposes (ibid). As a result, illegal dumping appears to pose a significant challenge for the country’s waste management system (ibid).

On the other hand, even the existing officially regulated landfills do not correspond to the EU standards in most cases (EBRD, 2020a). In fact, since some of the landfills were created during the Soviet era, no environmental impact assessment as well as no specific measures preventing hazardous substances from interacting with underground water aquifers, etc. were foreseen (ibid). That is why most of the currently functioning landfilling sites that are officially operated by the country's waste management facilities appear to need significant upgrade to minimize the environmental and public health risks (WSP, 2018).

Though the 2017 Law on Waste includes a particular provision forcing local public authorities to create infrastructure for separate waste collection in order to reach the recycling targets set by this piece of legislation (30% until 2020 for plastic, glass, paper and metal), not a single mayoralty (out of the 900 existing) was able to establish one (EBRD, 2017). This is quite remarkable, as the EIB supported this initiative with EUR 100 million (ibid). Here, the main challenge appears to be represented by the lack of the overall vision and general strategy towards the reforms that is present among the local public authorities (Ina Coseru, 2021).

Apart from that, the institutional framework of the country appears to be insufficiently strong, as the Ministry of Agriculture, Regional Development and Environment would put greater emphasis on promoting agricultural interests in the first place and have a less sharp focus on the environmental protection (ibid). In fact, some of such policies favouring agriculture create further challenges for the environment (e.g., the promotion of irrigation leads to the salinization of fertile soils, etc.) (ibid). These issues seem to be raised now and again partially because the expert opinions environmental specialists are not always considered (ibid).

Apart from the Ministry itself, the subordinate institutions responsible for the implementation of the key environmental policies, enforcement and monitoring of the environment itself and issuing permits still happen to be relatively weak and prone to corruption, despite having undergone reforms (Terra 1530, 2021). This makes the implementation of the new legislation that is developed in compliance with the Association Agreement questionable. Additionally, the National Environmental Fund dedicated to funding environmental projects is currently supporting only the construction of new water supply systems (especially in the rural settlements of Moldova) and not the creation of such important pieces of infrastructure as waste water treatment plants and waste landfills (Ina Coseru, 2021). Though a comprehensive reform was supposed to turn the Fund into a more efficient entity through making it more independent from political pressure, the process is yet to be finished (ibid).

- **Medical waste**

According to the Sanitary Regulation on the management of waste resulting from medical activity, approved by Government Decision no. 696 of 11.07.2018, each hospital is obliged to have a central space for temporary storage of medical waste (World Bank, 2021). The waste derived from or resulting from medical activities (including hazardous waste), should be sealed in packaging made of materials that allow for its disposal with minimal risks to the environment and public health (ibid).

Additionally, the packaging in which the collection is made and which comes in direct contact with the hazardous waste resulting from medical activity, is for single use and is disposed of together with the contents (ibid). According to the List of wastes, the structure of waste from healthcare and related research includes sharp objects, fragments and human organs, including blood vessels and preserved blood; waste, the collection and disposal of which is subject to special measures to prevent infections; chemicals consisting of or containing dangerous substances; cytotoxic or cytostatic drugs; wastes the

collection and disposal of which are not subject to special measures for prevention of infections (ibid).

Medical waste is generally either incinerated (including pyrolytic incineration) or disinfected (primarily through autoclaving) before disposal as municipal solid waste (T, 2021). The treatment of infectious waste by incineration in facilities, located on the territory of medical institutions is carried out in the districts of Comrat, Telenesti, Calarasi, Ceadir-Lunga, Glodeni, Cimişlia, Drochia, Nisporeni, Ştefan Vodă (World Bank, 2021). The activity of collecting, transporting and autoclaving medical waste is organized by SRL “UISPAC” (Authorization 005 no.064 / 2015 of 27.10.2015) and SRL “Ecostat” (Authorization 005, no.071 / 2016 of 27.05.2016), the authorizations being issued by the Ministry of Agriculture, Regional Development and Environment (Particip.gov.md, 2021). The pyrolysis treatment of infectious waste is contracted with SRL “Trisung” from Cahul by some medical institutions from Comrat, Cahul, Vulcanesti, Taraclia, Soldanesti, Ialoveni districts (Ina Coseru, 2021).

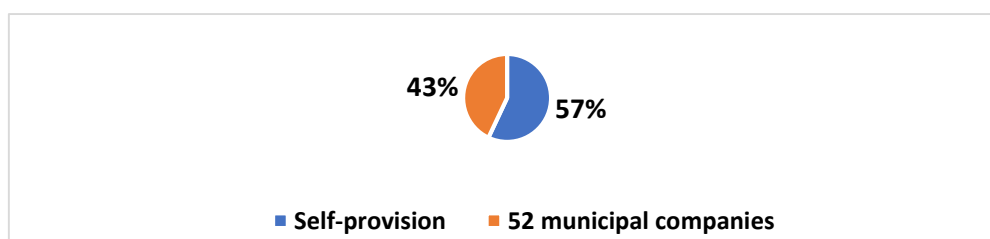
Water

Although the water quality of the rivers in Moldova has improved since the collapse of the Soviet Union, Moldova is still facing serious quality issues in terms of underground and surface waters (Eco-Sor, 2021). Here, the water pollution is caused primarily by insufficiently treated wastewater, discharges of untreated water from the municipal sewage system, inadequate management of solid household waste from the communal-housing sector as well as from accumulated animal manure, pesticide deposits from the agro-sector and oil deposits, gas stations, other sources of continuous pollution in the energy sector (ibid).

- **Strengths**

After the collapse of the USSR, the economic activity in Moldova was hampered, which resulted in the improvement of the water quality in the Dniester and Prut Rivers (Dniester Commission, 2017). This generally had a positive impact on the water provisions in the country, as surface waters (mostly rivers) appear to be the main source of drinking water in urban areas (ibid). In the rural areas, in contrast, water supplies are reliant on underground aquifers. Indeed, a decade ago, 43% of the country’s population (primarily from the urban areas) was provided water and sanitation services by 52 municipally-owned operators utilizing the country’s surface waters, the rest of Moldovans in rural areas relied on self-provision (World Bank, 2015) (*Figure 10*).

Figure 10: Provision of water supplies in Moldova



Source: World Bank (2015)

At the moment, the water sector in Moldova is regulated by the Ministry of Agriculture, Regional Development and the Environment, the Agency 'Apele Moldovei' ('Moldovan Waters'), the National Energy Regulatory Agency (ANRE), Environmental Agency and the National Center of Public Health (Eco-Tiras, 2021).

The Ministry of Agriculture, Regional Development and the Environment is in charge of the development of the regulatory framework for environmental protection, including water resources, water supply, and sewerage systems (Agentia de Mediu, 2019). The Environmental Agency is subordinated to the Ministry of Agriculture, Regional Development and the Environment and is responsible for controlling and monitoring water quality, allocation of permits and collection of the tax on water abstraction from operators and industries (ibid). The Agency 'Apele Moldovei' is a subdivision of the Ministry of Agriculture, Regional Development and the Environment and is in charge of the implementation of the water and sanitation services policies in rural and urban areas (Apele Moldovei, 2020). The National Center of Public Health is responsible for monitoring the quality of both drinking water quality and waste water (ibid).

Having signed the Association Agreement with the EU, Moldova has partially harmonised the legislation in the field of water to the European acquis (Ina Coseru, 2021). The new Law on Water entered into force in 2013, and the secondary legislation was further developed, which consisted of more than 20 regulations augmenting the framework law. One of such regulations is Regulation 950 that sets the limits of maximum allowable concentrations of chemicals in waste waters and the general discharge of waste waters into the sewage systems and water bodies (Yuliya Vystavna, Maryna Cherkashyna, and Michael van der Valk, 2018). Nevertheless, unfortunately, this regulation is still not fully respected by the municipal waste water treatment plants and economic entities (Ina Coseru, 2021).

The efforts of Moldova's international partners on the implementation of integrated water resources management approach of the EU Water Framework Directive should be noted as well. They are propelled primarily the EU Water Initiative Plus Programme (EUWI+), Austrian Development Agency and Swiss Agency for Development and Cooperation and aimed at strengthening the institutional framework in the field water supply and sanitation in the Republic of Moldova (ibid). Such initiatives made it possible to develop the **Management Plan for the Prut-Danube and Black Sea River Basin District**, which contains the component on the improvement of waste water treatment and raising capacities of all the state and non-state actors in the field of integrated water resources management in Moldova (Ina Coseru, 2021). Through such joint efforts, it was possible to establish 12 sub-basin Committees in the country with the participation of more than a hundred mayoralities in promoting integrated water resources management with a special focus on improvement of waste water treatment at the local level (ibid).

Another project financed by Global Environment Facility enables transboundary cooperation and integrated water resources management in the Dniester river basin and is jointly implemented by Ukraine and Moldova to develop a joint **Transboundary Diagnostic Analysis** and apply its recommendations through an intergovernmental commission formed from the representatives of state, academia and NGOs from Ukraine and Moldova (Agentia de Mediu, 2019). The project will focus on the improvement of waste water management in both countries in the basin of Dniester and will set up a healthy dialogue between the 2 states on the operation of the Novodnistrovsk hydropower plant (including the issues related to the release of water downstream the dam which will be sufficient for the water supply of the Moldovan population and maintenance of healthy ecosystem) (Ina Coseru, 2021).

Most recently, the EBRD granted around EUR 24 million to implement a large-scale project on the improvement of waste water treatment in Moldova through the **reconstruction of waste water treatment plant and the improvement of sludge treatment in the municipality of Chisinau** (ibid). Here, through the project is supposed to be finished in 2021, its efficient functioning will also depend on the economic entities discharging industrial waters in the sewage system of the capital city, which, in principle, should comply with Regulation 950, since otherwise

such waste water will contain higher concentration of chemicals and thus the plant itself will not be able to properly process it (ibid). In this connection, pre-treatment facilities that need to be built by the economic entities themselves should be paid specific attention to (ibid).

The EU, in general, and some of its members, in particular, allocated significant funds towards the construction of new **waste water treatment plants in the towns of Nisporeni and Cimislia** (funded by Czech Republic) as well as in **Cantemir** (EU-funded) (ibid). All these facilities that are supposed to be launched in 2021 will perform secondary waste water treatment (ibid).

- **Weaknesses**

Despite the successful development of a number of legislative initiatives on water management improvement, the survey conducted by the researchers among representatives of Moldova's environmental circles, revealed that successful implementation of these regulations is hampered by such factors as their weak enforcement and thus low compliance with them, lack of financial resources, and corruption (Eco-Tiras, 2021, MEGA, 2021, Terra-1530, 2021, Biotica, 2021, Eco-Sor, 2021, EcoContract, 2021, and Ormax, 2021).

In general, between 65% and 70% of all water resources in the Republic of Moldova are used for industrial heating and cooling as well as for the production of electricity by hydropower plants, while only 15%-20% goes for drinking and domestic purposes, and around 5%-10% for irrigation (ibid). Unfortunately, Moldova's rivers are often not suitable for sustainable water supplies, as they get dry during summer months and high concentration of minerals and pollutants in their waters makes them unsuitable to be used for the provision of drinking water (Eco-Tiras, 2021). This creates threats to sustainable water supplies to the urban areas, as most of them use surface water for water supply (ibid). While most of the rural areas use underground water aquifers as the key source of water supplies, the intensified agricultural practices in those regions appear to cause a major problem for the ground waters, as they significantly deteriorate the water quality (ibid).

Although water quality in Moldova is relatively stable, insufficient waste water management measures – e.g. lack of tertiary and secondary treatment in most areas – are aggravating the situation (Biotica, 2021). In fact, the country's water management system is often unable to fully address the challenges posed by the discharges from industries and households (ibid). This turns most of Moldova's internal rivers into highly-polluted water bodies, the water from which appears to pose threats to public health, if not properly treated (Ormax, 2021). In addition, surface water sources (e.g. artificial and natural lakes and ponds) have a tendency to high salinity and mineralization (ibid).

Due to the country's specific climatic conditions, floods and droughts pose major risks for water and sanitation services that are affected by the fact that the equipment is either old or does not exist (Ina Coseru, 2021). This is further deteriorated by such weather-related hazards as landslides, storms, and extreme winter temperatures (Biotica, 2021). As droughts result in lower dilution of pollution loads, especially in the Prut and Dniester Rivers, the water quality in them is being highly affected (KPC, 2013). That is why proper physical protection of water infrastructure is required to avoid an increased water stream at intake facilities and flooding of treatment facilities and/or pumping stations located close to rivers or in exposed areas.

Apart from the insufficiently well-functioning water management facilities, Moldova's water sector lacks professionals with relevant experience in water infrastructure and implementation of investment projects (MEGA, 2021). In fact, municipal representatives usually appoint utility management staff with no specific qualifications or competencies, and technical water sector staff receive insufficient training (Eco-Tiras, 2021). Unfortunately, Asociatia Moldova Apa-Canal

(AMAC), the national non-governmental water association, has limited coverage over capacity to promote specialized knowledge and best practices (ibid). Hence, in order to foster water sector performance as a key element of utility governance, incentives should be created by the government.

2.2.6. Ukraine

Waste

As a result of international projects and government's commitment to comply with the EU Directive within the framework of the Association Agreement with the EU, Ukraine has made a significant breakthrough in its waste management sector. However, since the population of Ukraine is bigger than the combined population of the rest of the Eastern Partnership countries, waste management sector is heavily loaded and requires huge investments and efforts to address the gaps in it.

- **Strengths**

In 2017, Ukraine adopted the National Waste Management Strategy, which is supposed to regulate the sector until 2030 (DLF, 2017). According to it, self-government authorities are obliged to set up a network of sites for the reuse of such goods as, e.g. home appliances, furniture, and clothing (ibid). Apart from that, the document sets the target of an 80% decrease in the volumes of using primary raw materials for waste for the period of 2019-2025 (ibid).

In 2018, The Ministry of the Environment developed the draft Law on waste management (EPL, 2018), while leaving the 1998 Law on waste in force (Verkhovna rada, 2000). According to it, the Ministry of Infrastructure is involved in programs of public procurement of industrial waste in infrastructure construction works (ibid). Healthcare waste management, in turn, is governed by the Decision of the Ministry of Health 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management' of 2015 (ibid). In 2019, Ukraine adopted the National Plan for Waste Management.

Apart from legislative initiatives, Ukraine managed to conduct international projects on waste management. For instance, the EBRD-sponsored '*Khmelnytskyi Solid Waste Project*' was launched to help the city of Khmelnytskyi to develop an integrated sustainable municipal solid waste management system, in line with the EU-Ukraine Association Agreement (2014) (EBRD, 2020b). The Project will ensure that international best-practices and standards are introduced to waste management in Khmelnytskyi in line with the National Waste Management Strategy as well as with EU directives on waste including the Circular Economy Package, Landfill Directive, Packaging Directive etc. and other best practices and standards (e.g. IPPC BAT/BREF) (ibid). One of the main strategic goals and priorities of the City is to provide residents and businesses with superior solid waste management services on a sustainable basis (ibid).

Even though not fully compliant with the EU regulations, Ukraine appears to be one of the most advanced countries within EaP in terms of adjusting its waste management laws to the EU ones. In fact, since 2010, Ukraine has introduced a new format of statistical reporting on waste management harmonised with Eurostat standards (IFC, 2020). This is so due to the country's commitments in accordance with the EU Association Agreement (Bilfinger, 2018).

- **Weaknesses**

The State Statistics Service of Ukraine (Ukrstat) and the Ministry of Regional Development, Construction and Utility Service of Ukraine (Minregion) are considered to be the main official sources of information on municipal solid waste. However, the data provided by them significantly

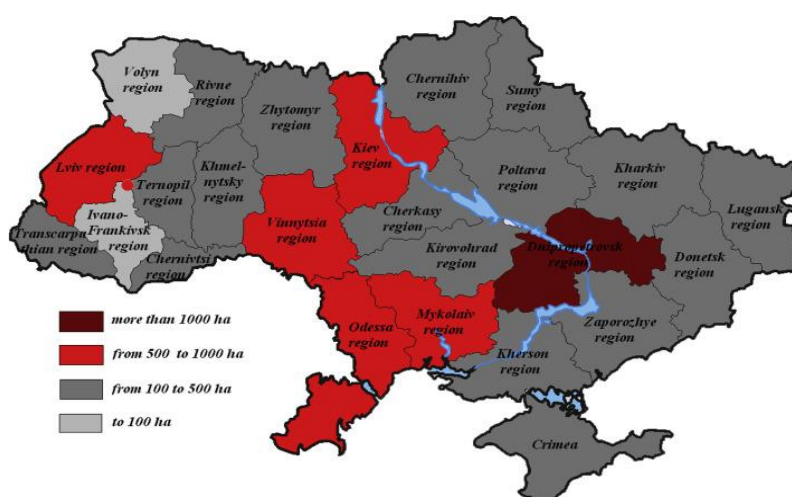
vary and thus do not seem to be reliable (ibid). At the same time, unreliability of data appears to be not the only challenges of the existing waste management environment in the country.

In fact, the lack of proper waste management infrastructure, government policy, business involvement and public response in Ukraine is widely recognized. According to Bilfinger, ‘Ukraine is currently positioned at the lowest level of the waste hierarchy with the absent or limited preventing framework, prevailing mix waste collection in preparation for use, recycling in a limited scope, other recovery steps implemented just initially and disposal to landfills as the main waste management technique’ (ibid). Apart from that, the introduction of new technologies is limited by the lack of integrated management decisions and by insufficient financial resources and economic incentives (CMS CMNO, 2021). As a result, out of 11.8 million tonnes of municipal solid and similar waste generated in Ukraine in 2019, only 198 tonnes were recovered and about 1 tonne was incinerated (Ukrstat, 2019), with the majority of waste being landfilled.

In general, the waste management issues in Ukraine are extremely pressing. Indeed, Ukraine’s total annual waste production equals to 45 million m³, the high volume of which is mainly buried on 6.7 thousand dumps and landfills with a combined area of more than 10 hectares (ibid). Footprint of municipal solid waste landfills is up to over 1000 ha in some regions of Ukraine (ibid) (*Figure 11*).

When it comes to medical waste, Ukraine’s healthcare facilities have at least a ‘three-bin’ sorting system, which presupposes that municipal solid waste, infectious healthcare waste and used sharp objects are separated at generation (EcoSource, 2021). However, most healthcare facilities are sorting more waste types: some types of medical plastic waste, medical glass waste, used gloves, anatomical waste, disposable used healthcare waste, laboratory waste, thermometers and light bulbs (Interecocentre, 2021). Moreover, the legal requirement for sorting is not specific, as the overarching waste law has not been approved yet; it makes the system inconsistent and incompatible with the waste treatment schemes and procedures used by the waste processing facilities (FAO, 2019).

Figure 11: Impact of municipal solid waste in Ukraine



Source: Natalia Makarenko and Oleg Budak (2017)

• Medical waste

At the moment, there are several pieces of legislation regulating medical waste management in Ukraine. Here, the most important documents include two laws (“On waste” and “On sanitary and epidemiological safety of population”), two Decisions of the Cabinet of Ministers (“On licensing rules

for hazardous waste management” and “On licensing rules of hazardous goods transportation”), and two Decisions of the Ministry of Health (“On state sanitary-epidemic rules and norms of medical waste management” and “On rules for disposal and destruction of pharmaceutical drugs”) (EPL, 2019). Apart from this, the Ministry of Energy and Environmental Protection operates a Registry of Licensed Companies for Hazardous Waste Management that has around 50 licensed organisations with an active license to manage medical waste in 12 regions of Ukraine (EPL, 2021). Unfortunately, this covers only about half of the regions of the country and among the 50 licensed organisations some are only allowed to collect and store hazardous medical waste, while others are allowed only to transport it (ibid). That means that these companies may not necessarily be able to manage all the waste in an environmentally friendly way, since they do not offer a full cycle of waste management operations from collection to disposal (UNDP, 2019). Additionally, the information on the capacities and specific technological processes involved is also not publicly available (ibid).

According to Arzu Akberov, head of the waste control department at the State Ecological Inspection of Ukraine, “in 2019, Ukrainian hospitals generated almost 98,000 tons of medical waste”, according to Arzu Akberov, head of the waste control department at the State Ecological Inspection of Ukraine (Kyiv Post, 2020). In fact, though incineration and disinfection are generally presupposed to be the main methods of medical waste treatment, only around one per cent of healthcare waste turns into environmentally safe ash, while the rest is buried across 6,000 authorised or 33,000 unauthorised landfills of the country (ibid). In this sense, despite the existent legislation which is supposed to turn medical waste management into a well-functioning system, this area seems to be in urgent need of further improvement.

Water

- **Strengths**

Ukrainian rivers relate to seven major river basins, all of them discharging into the Black Sea except the Western Bug flowing to the Baltic Sea (GermanWaterPartnership, 2021). Therefore, proper water management has a great impact on the environment in Ukraine as well as its neighbouring countries.

With international support, there is a number of successful projects that are currently going on to reform water management in the country. For instance, the EU and World Bank are currently implementing a project on the reconstruction of water supply and waste water treatment facilities in cities of **Zhytomyr** and **Ternopil** (National Ecological Centre of Ukraine, 2021). Additionally, the **Zaporizhzhia Wastewater and Sludge Treatment Project** is being implemented to reduce the environmental impact of waste water through its more advanced treatment in compliance with the EU standards (ibid). In general, the reconstruction of Ukraine’s waste water treatment facilities is supported by the World Bank under the Second Urban Infrastructure Project, which presupposes ‘the rehabilitation, reconstruction and upgrading of water, waste water, and solid waste facilities in ten cities so that their efficiency is increased and the operating costs are increased (ibid). In addition, such organization as the **EBRD** provided a 15 million EUR loan to **Lvivvodokanal** – the main water supplier of the city of Lviv (EBRD, 2019b). This initiative is supposed to finance critical rehabilitation and modernization of two operating wastewater treatment plants serving the city and neighbouring communities. The project is part of the Green Cities Framework 2 (ibid).

In Ukraine, water and sanitation utility is under the local government controlling jurisdiction with communal enterprise acting as the provider owned by the controlling jurisdiction (EcoResource, 2021). Ukraine is the only EaP country to be the part of the UNICEF led Global Water Sanitation and Hygiene Cluster or Global WASH Cluster, which aims to improve the coordination and the humanitarian response in the WASH Sector (ibid).

- **Weaknesses**

Water management of Ukraine needs further improvement. Due to the large territory and varying geographic conditions, not all Ukrainian households have direct access to stable and safe water supplies (National Ecological Centre of Ukraine, 2021). Here, though this situation is generally better in the urban areas, rural settlements are often self-reliant on water receiving most of it from underground aquifers through water wells (ibid).

Similarly, waste water system needs to be further improved, as, after the collapse of the Soviet Union, many facilities that were supposed to perform primary and secondary waste water treatment were not maintained well (ibid). In this sense, upgrading waste water purification to the secondary and tertiary levels is a challenge for the current and future generation of managers in the country's water sector. Additionally, similarly to many other EaP countries, rural areas of Ukraine do not fully cover all the households with centralized sewage network leading to proper waste water treatment facilities (ibid). This results in a significant share of undertreated waste water being discharged into the surface waters – i.e. rivers, lakes, etc. – which makes such water bodies contaminated with various substances posing significant threats to both public health and the environment (ibid).

For instance, the Dniester Basin extends into territories of Ukraine's seven regions (Lviv, Ivano-Frankivsk, Chernivtsi, Ternopil, Khmelnytskyi, Vinnytsia, and Odessa), covering 13% to 80% of their areas (Dniester Commission, 2020). Unfortunately, while covering 12% of the total territory of Ukraine and flowing into the Republic of Moldova, it is very polluted and presents a danger to human health (ibid). In fact, the recent research identified traces of medicines, pesticides, pharmaceuticals, and chemicals in its water (Anticoruptie, 2020). Hence, using it for water supplies raises concerns, as, for examples, in smaller settlements, waste water is not treated at all and is instead discharged directly into rivers (National Ecological Centre of Ukraine, 2021). Even before the pandemic, in the framework of the development plan of Dniester River Basin with the support of the EU, screening of the basin was conducted with an aim to determine the target pollutants in the river basins, which revealed medical waste to be a leading pollutant (EaP CSF, 2020).

2.3. EaP 2020 Deliverable 16

Forming an ambitious plan that covers four priority areas of the EU-EaP cooperation, the 20 Deliverables for 2020 aim to significantly improve the lives of citizens across the Eastern partners (European Council, 2017). Here, out of all the Deliverables endorsed by the 2017 Eastern Partnership Summit, Deliverable 16 ("Support the environment and adaptation to climate change") related to the "Stronger connectivity" topic is directly connected to the issues of waste and water management (European Council, 2017). Having agreed to deliver tangible results in order to achieve this target, by 2020, all EaP countries made significant steps to both upgrade their legislation so that it better reflects the environmental needs of the waste and water management sectors and implement tangible projects that would improve the lives of their respective citizens (European Council, 2020)³.

In particular, among other notable initiatives, Azerbaijan, Belarus, Georgia, Moldova and Ukraine adopted new laws on environmental assessment of strategies, plans, and investment projects (ibid). In addition to that, since 2017, Armenia, Belarus and Moldova were able to adopt four river-basin plans fully aligned with the EU benchmarks (ibid). Here, it should be noted that, via financial and technical assistance from the EU, all the mentioned countries received modern equipment to better monitor and reduce people's exposure to toxic pollutants (ibid). Finally, tracking online

³ For the examples of waste and water management projects in the EaP countries funded through the European institutions see *Appendix 2*

environmental data from all six EaP countries was made possible through the internet-based tracking tool hosted by the European Environment Agency (EEA) (ibid).

Countries also took individual steps to achieve the 2020 targets, in general, and Deliverable 16, in particular. For instance, as a part of the national environment policy, the Azerbaijani Government adopted the National Strategy on the Improvement of Solid Waste Management for the years of 2018-2022, which includes institutional, financial, technical, and capacity analyses of solid waste management system of the whole country and covers proposals for the expansion and enhancement of the municipal waste collection, transportation and utilization systems (EBRD, 2019a). In Georgia, in its turn, the National Waste Management Strategy for 2016-2030 aimed to initiate a system in which the population and private sector would fully cover the expenses of waste management and thus disincentivise waste disposal and pollution (Friends of the Earth Georgia, 2021). Similarly, as a part of Moldova's Law on waste, the extended producer's responsibility was introduced (Ina Coseru, 2021). Finally, with the approval of the National Waste Management Strategy until 2030, Ukraine aims to introduce and promote the principles of circular economy as well as the EU's waste hierarchy, which is generally supposed to contribute to reaching Deliverable 16 (DLF, 2017).

At the same time, though significant steps have been taken by each EaP nation to improve their respective waste and water management sectors, a strong need for further institutional reforms as well as stricter implementation of the existing environmental legislation appears to be one of the common burning issues for the entire region. Indeed, while the respective laws and regulations as well as infrastructure for proper waste and water management might be in place, they are not always followed and utilised in a proper way. Additionally, due to political and technical complexity, trans-boundary issues appear to pose additional challenge to the EaP countries (primarily on the issues of water management). In this respect, in conjunction with the recent rise of intergovernmental and political tensions in the North Caucasus, apart from financial and technical assistance, further support of the EU as a mediator might be of great importance.

3. The impact of COVID-19 on waste and water management

Though the COVID-19 pandemic appeared to take most of the national waste and water management sectors by surprise, not all the countries addressed the challenge in a similar way. For instance, while most of the EaP nations introduced strict national lockdowns, Belarus was the only exception that followed the 'business as usual' path. In this sense, while potentially exposing its own population to a greater risk, this country simultaneously caused a lesser disruption to the traditional economic ties. As a result, the waste and water management systems of Belarus were affected to a lesser extent than those of the remaining five nations who chose to implement stricter sanitary measures. On the other hand, there were some trends in waste and water management common to the entire world.

3.1. Waste separation

Waste separation amid the global pandemic became crucial, since the traces of COVID-19 on the surface of waste pose a threat to the public health. That is why, the World Health Organization (WHO) issued the Waste Management Guidance During COVID-19 Pandemic, according to which, medical, household and other hazardous waste types require special treatment to avoid potential public health risks. In the opinion of the United Nations Environment Programme (UNEP), 'Effective management of biomedical and health-care waste requires appropriate identification, collection, *separation*, storage, transportation, treatment and disposal, as well as important associated aspects including disinfection, personnel protection and training'.

Apart from the general waste separation, the separation between municipal solid waste and medical waste became crucial from both public health and environmental perspectives (UNEP, 2020). Though both types of waste may contain traces of COVID-19, which can stay on surfaces for up to 28 days (Samuel Sarkodie and Phebe Owusu, 2020), the share of potentially hazardous waste in medical trash is obviously higher. That is why separate treatment of medical waste could significantly improve the chances of minimizing risks associated with the spread of SARS-CoV-2.

In general, global practices of waste separation include segregation of healthcare waste at source, storage and transportation stages. Here, the emphasis is put on specific precautionary measures to prevent any potential risk of SARS-CoV-2 contagion by the personnel engaged in the waste management process (UNEP, 2020). In this respect, WHO recommends to put all types of potentially infectious waste in a bag and seal it, while putting additional emphasis on waste reduction.

Unfortunately, even prior to the pandemic, almost half (40%) of healthcare facilities worldwide did not segregate waste (World Health Organization, 2019). This means that, within the circumstances when no COVID-19-related waste separation legislation was adopted in the majority of countries, the current situation appears to be unfavourable, since both healthcare facilities and private households are producing more waste than usual, a great share of which could contain SARS-CoV-2 (UNEP, 2020). In this connection, the UNEP suggests immediate actions to be taken so that COVID-19-related or potentially related waste is separated from other waste volumes at the point of generation and then is sorted, segregated, and stored (ibid). Apart from this, some of the global best practices related to waste management during the pandemic include (ibid):

- Segregating waste as close to the source as possible (proximity principle);
- Placing segregated waste in identifiable, color-coded, labelled containers or bags, which are leak-proof and puncture resistant (particularly for sharps);
- Place instructions for proper waste segregation close to the container;
- Use double-layer bags. Waste is to be placed in a specialized bag or container, sealed, and then placed in the second bag or container;
- Incinerate or autoclave the waste (normally done either by health care institutions themselves or special waste treatment entities).

3.2. Increase in specific types of waste

The outbreak of the COVID-19 has amplified the already burdened waste management system. Strict measures taken all over the world to contain the spread of COVID-19 have led to a significant increase in the quantity of waste across countries. While the quantity of industrial waste has dropped, the *amount of municipal waste has skyrocketed*.

Globally, the volume of medical waste was estimated to increase by up to 40 percent since the outbreak of the pandemic (ibid). The stockpiling of masks, gloves, gowns and other protective equipment has led to an emergency situation due to the production of huge amount of *hazardous waste* from health facilities and households. That is why the existing hazardous waste treatment capacity in both EU and EaP countries is likely to be overwhelmed, leading to stockpiling and inadequate disposal. This, in its turn, creates additional challenges to all elements of waste treatment: separate waste collection, separate waste disposal, waste collection, recycling, etc.

Apart from that, at the beginning of the pandemic, the panic triggered by the uncertainties led to changes in consumer behaviour: people started buying huge amounts of food, toilet paper, face masks, gloves, cleaning products and alcohol-based sanitizers and similar chemicals (Samuel Sarkodie and Phebe Owusu, 2020). As a result, the disposal of perishable products and leftovers (i.e. potentially *compostable waste*) has significantly increased alongside such trash categories as *packaging*, which is often hard to recycle, and chemical waste. Additionally, the most obvious waste increase was seen among the single-use plastics, as most of people give preference to single-use products for preventive measures these times (ibid). In fact, according to the World Economic Forum, ‘the plastic pandemic is only getting worse during COVID-19’ (World Economic Forum, 2020a). In particular, this problem is aggravated by the wide-spread increasing use of plastic-based face masks, as their sales increased by USD166 billion only in China (Hari Sharma, et al, 2020).

The *discharge of hazardous waste and medical substances* into water is another serious issue that many countries are facing. Specifically, even prior to the pandemic, the screening of water from the Dniester River during the research conducted within the framework of the **GEF/UNDP/OSCE/UNECE** project ‘Enabling transboundary co-operation and integrated water resources management in the Dniester River Basin’ has indicated the high concentration of medical waste in the river waters (Dniester Commission, 2017). Similar traces of medical substances were detected in the Kura River basin (Elina Bakradze, Giorgi Kuchava, and Lali Shavliashvili, 2017). In this sense, given that these problems are highlighting the insufficient quality of waste water management in the respective countries, the situation with water quality is extremely likely to become even more challenging after the outbreak of the pandemic. Specifically, considering the soaring amount of medical waste and medicine-related substances generated during the pandemic, proper management of hazardous waste and wastewater is necessary to avoid further threats to public health and the environment (World Health Organisation, 2020).

3.3. A challenge to linear economy

Among other things, the pandemic shifted the majority of waste production from industrial and commercial centres to residential areas. Indeed, with many industries and businesses either suspending their activities altogether or limiting them during the prolonged lockdowns and post-lockdown recovery periods, most of the waste production was re-distributed from business districts to residential areas (IFC, 2020). This led to a remarkable increase in municipal waste quantities, which often did not allow for a proper and sustainable treatment of waste even in well-established and properly functioning waste management systems (ibid). In many cases, this happened due to the dramatically increased volume of trash that needed to be collected and disposed in a timely and diligent manner, which the waste treatment facilities were not ready for with the equipment and facilities limitations they had for the ‘business as usual’ mode (Interreg Europe, 2020).

In addition to the lack of additional pieces of equipment and absence of adequate waste treatment capacities, waste management systems experienced another challenge. In particular, with the specific attention attracted to healthcare and economic support, waste treatment in many countries was often not allocated enough financial resources to be able to increase its capacity to face the challenges related to the pandemic in a proper and resilient way (IFC, 2020). In such circumstances, many countries had to re-allocate their manpower and waste management resources to guarantee the waste collection and treatment during the pandemic. This, among others, often required re-setting priorities on specific waste fractions to be able to first guarantee the collection of residual waste, then bio-waste, then packaging waste, etc. (Interreg Europe, 2020).

Termination or suspension of waste separation was also considered among the core contributors to increased incidence of waste disposal and dumping. Apart from the radically increased waste

volumes preventing waste treatment systems from functioning as usual, most countries reduced the separation of waste (IFC, 2020). Unfortunately, apart from the cases when waste collected from the infected individuals was deliberately supposed to be unseparated (Interreg Europe, 2020), many people stopped separating waste for other reasons as well. Here, besides laziness and other individual factors, the termination of activities by many waste treatment facilities could be regarded among the most popular reasons in this respect (World Economic Forum, 2020a). As a result, the incidence of landfilling and even uncontrolled dumping significantly increased (UNEP, 2020).

The **City of Milan**, however, could be viewed as a role model in this respect, as it succeeded in keeping high waste separation rate despite being substantially hit by the virus (Interreg Europe, 2020). In fact, due to the decreased number of tourists, the city authorities were able to re-allocate the waste management staff to augment people's efforts on separate waste collection. Many other cities were not able to follow the same strategy and they resorted to waste incineration.

In general, waste incineration was regarded to be a more preferable waste treatment technique in many cities and communities, as it not only minimized the health risks to the personnel of the waste treatment plants, but also waste collectors and the waste disposing community members themselves (ACR+, 2020). That is why, this measure most often replaced the previously used separate collection and recycling, as such initiatives as 'quarantining' the outgoing waste by the population and the incoming waste by the waste treatment facilities was hard to be implemented everywhere (Interreg Europe, 2020). At the same time, such companies as the Portuguese **lipor** were quite successful in introducing an additional 72-hours storage for household waste prior to its separate treatment, which helped them to maintain their waste treatment business activities (lipor, 2020). Unfortunately, such positive examples still appear to be insufficiently numerous, as the pandemic represent a major challenge for the entire waste management system in all the countries.

As seen, during the pandemic, most of the well-designed and functioning waste management systems faced significant challenges that prevented them from processing trash in the most sustainable way. More importantly, the dramatic increase in waste generation caused many of such systems to suspend some of their activities (e.g. waste sorting and recycling). As a result, many countries experienced a recoil expressed in the increased landfilling and incineration instead of the planned recycling and reuse of waste. In this sense, the pandemic represented a major challenge to the linear economic system, since it was not able to tackle the challenge of rapid waste increase. Here, if circular economy was in use, the outcomes of the pandemic waste-wise would be different, as the waste amounts reduced through waste prevention would pose lesser pressure on the waste management system, which would allow it to successfully deal with the new status quo.

Similarly, increased amounts of waste water represented an additional challenge in most countries, since greater volumes of waste water needed to be purified with maximum efficiency to avoid COVID-related threats to the population and the environment (World Health Organisation, 2020). On the other hand, the existing waste water treatment facilities in many countries appeared to be unable to properly process waste water at the standards determined by the circumstances of the pandemic (Sampriti Kataki, et al, 2020). Specifically, in many EaP nations, with the absence of tertiary and often secondary water treatment, both medical and biologically hazardous substances are likely to penetrate the water bodies later used for the water supplies purposes. In this sense, apart from highlighting the necessity of tertiary water treatment provision, the pandemic necessitated the importance of sustainable water use when hazardous substances should be prevented from entering the water bodies through waste water itself. In this sense, waste minimization in general and sustainable use of resources could be viewed as a target for the post-pandemic recovery.

4. Policy response during the COVID-19 pandemic and opportunities for improvement

As previously mentioned, though most of the EaP countries introduced lockdown after the outbreak of the pandemic, Belarus was the only exception. In that country, this resulted in a lesser shift in waste generation from industrial centres to residential outskirts. However, the overall patterns in waste management in all the countries appeared to be similar, especially with the growing number of COVID-19 patients. That is why, despite exercising a somewhat different approach towards tackling the epidemiological crisis, each EaP nation was pushed backwards from *Deliverable 16*.

4.1. Armenia

Waste

Since waste management in Armenia is one of the least well-managed areas, it has unfortunately not been given full attention during the COVID-19 pandemic. Additionally, the Armenian-Azeri armed conflict of 2020 diverted attention and funds from the sector (Dalma-Sona, 2021). This all created prerequisites for further increase in municipal waste volumes and thus made *Deliverable 16* less feasible to be achieved (ibid).

- **Strengths**

Due to a rapid increase in the number of infected by SARS-CoV-2, the Armenian government introduced strict lockdown in mid-May and later extended it several times (CIS, 2020). Like in many other countries, though being associated with such negative outcomes as business bankruptcy and recessing economic activities, strict lockdown simultaneously contributed to such positive factors as the general decrease in industrial waste (ibid). Due to the lowered amount of produced goods and services, waste generation shifted from the industrial parts of the urban areas to residential districts. In parallel with this shift, civil society-driven initiatives managed to stimulate the installation of separate waste collection bins in some areas of Yerevan (EcoLur, 2021 and Armenian Forests, 2021).

- **Weaknesses**

Greater reduction of industrial waste associated with lower economic activities of the manufacturing enterprises and services resulted in larger volumes of municipal solid waste being produced in residential areas around the country (ibid). Indeed, most people staying in their homes after the introduction of the restrictive measures started to produce excessive amounts of trash that was not possible to handle for the existing waste treatment facilities (ibid). In this connection, even if some separate waste collection took place in residential areas, it was unfortunately not substantial for the entire waste treatment system to adjust its activities to the new reality. As a result, landfilling and illegal dumping intensified (Center for Community Mobilisation and Support, 2021).

As seen, apart from highlighting the deficiencies in the waste management system that were observed prior to the COVID-19 pandemic, the epidemiological crisis created a sudden unexpected challenge to the very approach towards conducting economic activities in the country. Indeed, linear economy where waste prevention is not considered was dramatically shaken (EcoLur, 2021). In fact, Armenian waste management was not ready for such a dramatic increase in waste generation (Biosophia, 2021). That is why, if circular economy was in place and a great share of waste could be prevented, the pressure on waste treatment would be more bearable. Hence, further opportunities for improvement would lie in the additional legislative and financial promotion of separate waste

collection, sorting, recycling, and waste prevention practices – the most emphasized element in the EU Waste Hierarchy (EcoLur, 2021 and Public Awareness & Monitoring Centre, 2021).

- **Medical waste**

Like in other EaP countries, the COVID-19 pandemic put additional stress to the system of medical waste management, as the volume of such waste significantly increased (UN Armenia, 2020). At the same time, with improperly functioning system in many remote areas of the country prior to the epidemiological crisis, healthcare waste treatment had little chance to be improved during the pandemic. Indeed, in 2020, the UN noted that a significant share of medical waste is not processed in full compliance with the existing regulation (ibid). Quite predictably, though key hospitals and medical institutions in the main cities generally followed the regulations, healthcare facilities in villages and towns were not properly controlled and thus could have potentially engaged in uncontrolled waste incineration and dumping (EcoLur, 2021). Though specific details will need to be further revealed after the crisis, it is obvious that the system of medical waste management in Armenia need to be further improved.

Water

Among EaP countries, Armenia appears to represent a nation with some of the least well-organised water management systems. At the same time, due to the successful projects conducted prior to the pandemic in such fields as water supplies, some problems were safely avoided.

- **Strengths**

Though waste water management of Armenia still needs improvement, due to the reforms conducted in the water supply sector prior to the pandemic, water supplies were less affected by COVID-19 in some regions of the country. The reason to this was that most of the water supplies in such cities as Yerevan were gradually transferred from ground water to mountain water sources (Sputnik, 2018). In fact, having analysed the challenges caused by the malfunctioning water pumps, prior to the pandemic, with international assistance from the EU, EBRD, EIB, etc., Armenia managed to replace pumped water supplies with the ones not requiring pumping – i.e. the ones utilizing the country's landscape advantages and delivering fresh water to the urban areas by means of gravitation (EBRD, 2018). As a result, even with inefficient waste water management system letting potentially contaminated waste water reach rivers and underground water aquifers, a significant part of the population is not affected, as it obtains water supplies from a different source (ibid).

Additionally, in 2020, together with the EU and other partners, the government launched the 'EU for Sevan Lake' project presupposing water purification and tree planting along the lake banks (Public Awareness & Monitoring Centre, 2021). This aims to further improve the situation.

- **Weaknesses**

With insufficient purification of waste water before its discharge to rivers and other water bodies, the Armenian waste water management system appears to be significantly challenged by the COVID-19 pandemic (Center for Community Mobilisation, 2021). Indeed, in the absence of secondary and tertiary treatment, mechanical processing of waste water is insufficient to minimize all the risks associated with traces of SARS-CoV-2 still present in it (ibid), as it is possible to track the virus in the waste water for a prolonged period of time (Evan Paleologos, et al, 2020). Additionally, since most of the nation's hospitals flooded with patients generated excess volumes of waste water that

contained traces of the virus as well as medicines and chemicals (disinfectants, etc.) (ibid), further opportunities for making the water sector more efficient lie in the upgrade of water purification.

Additionally, during the lockdown, some industrial enterprises intensified unsustainable water management practices so that civil society activists had to oppose them. For instance, in the **Lori and Big Ayrum** regions, local communities had to oppose the mining sector that engaged in uncontrolled waste water discharges (Center for Community Mobilisation, 2021). Hence, additional legislative initiatives and stricter penalties should be applied to the polluters in the future.

4.2. Azerbaijan

Waste

The outbreak of the pandemic put global waste and waste water management systems to the test. Azerbaijan is among those developing countries that have a long way to improve its waste and water management sectors. Hence, the epidemiological crisis exerted unprecedented pressure on them.

- **Strengths**

According to the information provided by the Ministry of Ecology and Natural Resources of Azerbaijan (2021), the following measures were implemented to address the COVID-19 crisis:

- The government coordinated collection and utilization of hazardous medical waste from medical institutions and quarantine hotels;
- The government purchased and delivered plastic bags to such institutions to collect and transport hazardous medical waste;
- The Ministry of Ecology and Natural Resources sent warning instructions to the relevant executive bodies and large shopping centers, as well as to all medical institutions to ensure the management of hazardous medical waste is done in accordance with the legislation.

Another positive step by the Azerbaijani government during the COVID-19 crisis was the adoption of the Law on environmental protection, according to which the sales of polyethylene bags and plastic cups should be limited (ibid). To achieve this, the regulation on polyethylene bags entered into force on January 1, 2021 and a similar regulation for single-use plastic products will be enacted on July 1, 2021 (ibid). To discourage the businesses from using plastic-containing packaging, the new law presupposes that entrepreneurs should bear an administrative liability in case of import, production, sale and delivery of plastic bags up to 15 microns thick, as well as of disposable tableware to buyers at trade, public catering and service objects (ibid). In line with this, a trial set of special waste bins for face masks and gloves has been installed in some sites of the capital (Eco-World PU, 2021).

Apart from the government, some positive steps to improve waste management under pandemic were taken by other actors. For instance, international organizations and NGOs operating in the country took certain measures to address the adverse effects of COVID-19. This included, among others, the German-Azerbaijani Chamber of Commerce (**AHK Azerbaijan**) that organized and delivered a Training Course on Water & Waste Water Management for Industries in Azerbaijan.

- **Weaknesses**

As about 90% of all collected waste in Azerbaijan is sent to landfills and dumpsites (STAT, 2019), the current crisis poses a serious threat to public health. This is so due to the fact that the implementation

of strict lockdown measures in the country led to an increase in the volume of municipal waste, a great share of which is landfilled at one of the numerous unauthorised dumps (Green Baku, 2021). Hence, to avoid the potential risks posed by the COVID-19 pandemic, separate waste collection appears to be very important. Here, the problem lies in the absence of separate household waste collection system in the country (with the exception of a pilot project in two Baku districts) (ibid). Thus, apart from the improvement of solid waste management in terms of organising separate waste collection, waste sorting and recycling as well as minimisation should be considered as the best practices that the country could borrow from the EU to reach *Deliverable 16*.

Similarly, with the increased amount of medical waste, despite some deliberately elaborated regulations, not all the facilities were able to properly treat this type of waste (Eco-World PU, 2021). In such conditions, further international cooperation in a form similar to the EU COVID-19 Solidarity Programme that provided financial assistance to the EaP countries to help them tackle the epidemiological crisis (EU, 2020) should be viewed as a direction to follow in the future, as international assistance with funds and procedures would help to reform the system.

- **Medical waste**

As mentioned before, after the breakout of the COVID-19 crisis, the Azerbaijani government coordinated collection and utilization of hazardous medical waste from medical institutions and quarantine hotels; purchased and delivered plastic bags to such institutions to collect and transport hazardous medical waste (Ministry of Ecology and Natural Resources of Azerbaijan, 2021). Additionally, the Ministry of Ecology and Natural Resources sent warning instructions to the relevant executive bodies and large shopping centers, as well as to all medical institutions to ensure the management of hazardous medical waste is conducted in accordance with the legislation (ibid). Specifically, for the healthcare institutions, specific instruction on “Collection, neutralization and disposal of medical waste during the fight against COVID-19” was delivered (ibid). Apart from that, the Ministry of Ecology and Natural Resources provided transportation and disposal of 5648 m³ of hazardous medical waste generated in 58 medical institutions and quarantine hotels (Quanun, 2021). It should also be noted that, although within the framework of EU4Environment Project, several waste management projects have been successfully implemented in Azerbaijan, no specific initiatives on medical waste treatment have yet been launched in the country by the EU (Ministry of Ecology and Natural Resources of Azerbaijan, 2021).

Water

Though some improvements have been made in the water supply and waste water management sectors prior to the COVID-19 pandemic, the crisis substantially challenged these industries. At the same time, both the government of the country as well as local and international initiatives launched a number of campaigns to overcome the hardships of these turbulent times.

- **Strengths**

Amid the COVID-19 crisis, the government of Azerbaijan has issued the development concept 'AZERBAIJAN 2020: LOOK INTO THE FUTURE' (President of Azerbaijan, 2020). Among other issues, the concept considers comprehensive reforms in the water management sector, improved access of the country's population to enhanced water supply services and sewer system. Specifically, the cities and villages are expected to be provided with purifying installations and the system of monitoring in the water management sphere is supposed to be improved (ibid).

It is worth noting that international organizations and NGOs operating in a country also took measures to address the adversities of COVID-19. For instance, **AHK Azerbaijan** in cooperation with the German '**Arqum GmbH**' organised the 'Sustainable Water and Wastewater Management' workshop to demonstrate best practices in water and wastewater treatment to Azerbaijani companies (Arqum, 2020). 20 employees from Azerbaijani small and medium-sized enterprises that are municipal service providers in the field of water management and state institutions participated in an online training series on the effective measures and methods for saving resources (ibid).

Additionally, in 2020, the President of Azerbaijan approved the Action Plan on Ensuring the Effective Use of Water Resources in 2020-2022, which presupposes significant improvement of water supplies (President of Azerbaijan, 2020). Specifically, 10 fresh water reservoirs are expected to be built to collect water from mountain rivers, and 22 reclamation canals will be repaired to ensure the efficient use of water resources (ibid). In addition, the Commission for the Efficient Use of Water Resources was instructed to coordinate measures on the implementation of the Action Plan, cooperate with NGOs, specialists, international experts to facilitate its realisation (Turan, 2020).

Azerbaijan also took important steps towards the improvement of transboundary water management after the COVID-19 crisis. In particular, the country's government released a scenario report 'Azerbaijan after the pandemic: development scenario' (OECD, 2020). This report scopes the cooperation between Azerbaijan and Russia on environmental problems in the Caspian Sea (ibid).

- **Weaknesses**

33 percent of the water reserves in Azerbaijan are local inland waters and 66 percent are transboundary rivers, meaning that access to fresh water requires large investments (ibid). Lack of investment to treat the waste water discharged to the transboundary rivers complicates the situation related to the current epidemiological crisis (Eco-World PU, 2021). Although Azerbaijan has an extensive water supply system built during the Soviet era, it requires comprehensive reconstruction.

In addition, since around 31% of the Azerbaijani population resides in water-scarce areas, water shortage represents a real challenge in Azerbaijani regions (Water Scarcity Clock, 2020). This is even more important during the COVID-19 crisis when access to clean water is essential, as scarcity and lack of proper technology for waste water treatment may worsen the current situation. In this respect, the 2020 dramatic shallowing and contamination of the Kura river with salty seawater which was revealed by local ecological activists is viewed by many as an unfolding ecological disaster (Azerbaijan Ornithological Society, 2021). That is why the government of Azerbaijan should urgently take steps to address these issues and intensify international cooperation on transboundary issues. Here, though the EU funds are providing financial assistance in this respect, further cooperation with local neighbours should be considered in the future (UNECE, 2021).

4.3. Belarus

Waste

Unlike other EaP countries, Belarus experienced lesser changes in waste management during the coronavirus pandemic. In fact, similarly to Sweden, Belarus did not introduce any lockdown measures and both businesses and state institutions continued functioning without any substantial adjustments (Revera, 2020). That is why some of the advanced practices (e.g. recycling) that were in place in the country were not substituted by the less advanced ones (e.g. incineration). At the same time, medical waste volumes significantly increased, which put additional pressure to both healthcare and waste management sectors (Ministry of Health, 2021 and Nerush, 2021).

- **Strengths**

Since no significant legislative changes related to the COVID-19 pandemic were introduced by the Belarusian government, the general level of waste management practices has technically remained unchanged since the outbreak (Revera, 2020). At the same time, the long-awaited gradual improvement of the general waste management system took its further steps that were planned before the pandemic. For instance, separate waste collection and disposal as well as waste sorting became officially obligatory in the urban areas of the country since the 1st of September 2020 (Onliner, 2020). In addition to the obligations imposed on the population, all the entities associated with waste management as well as local authorities are now supposed to facilitate separate waste collection through providing the necessary tools (e.g. separate trash bins and dumpsters, etc.) (Ecoidea, 2020). That is why, quite counterintuitively, some aspects of waste management in Belarus during the pandemic appeared to be more sustainable than before.

In addition, waste incineration by the population was officially banned by the same set of September 2020 regulations (ibid). This waste treatment technique was quite popular among the citizens of the rural areas where separate waste collection rate was the lowest in the country. As a result, before the new regulation was activated, a significant share of the potentially recyclable waste was burnt instead of being sent to the waste recycling facilities. That is why, with the new rules, the government expects the overall recycling level to be further improved, which will make an additional positive impact on the waste management system of Belarus and contribute to achieving EaP 2020's *Deliverable 16*.

Internationally, the EU continued supporting Belarus through providing financial assistance and technical expertise. Most recently, this support was transformed into the construction of the first EU regulations compliant regional landfill in **Pukhovichi** augmented with a loan of USD5 million (EBRD, 2021). This project is assumed to improve the EaP's 'Environment and connectivity' priority level, in general, and contribute to reaching *Deliverable 16* (European Council, 2020).

Finally, though the disposal of specific waste types (e.g. single-use face masks) made a sharp increase for some short period of time (primarily at the beginning of the pandemic), the physical lack of stock of these products forced the population to rely more on the multi-use substitutes (Mogilev Online, 2020). Indeed, due to the impossibility to organize stable supplies of single-use face masks, Belarus's businesses from the apparel industry (e.g. **Mark Formelle, Svitanak**, etc.) as well as state-owned companies producing medical uniforms launched their own initiatives to provide the population with the multi-use masks (Mark Formelle, 2020, Svitanak, 2020, and BT, 2020). As a result, the Ministry of Health even issued an instruction on how such masks should be washed and disinfected in home conditions. In the end, such initiatives ultimately reduced the pressure on the country's waste treatment system, as they hampered a significant amount of additional waste from being produced.

- **Weaknesses**

At the same time, most of the pandemic-related 'achievements' within the waste management system appear to raise some concerns. For instance, though separate waste collection, disposal and sorting have become officially binding during the pandemic, no further substantial legislative steps that could minimize the risks to the waste treatment associates as well as the overall population have been taken (Nerush, 2021). With the only general descriptive rule stating that single-use face masks should be first put into plastic bags before their final disposal (MART, 2020), no additional measures seem to have been introduced by the country's policymakers (Revera, 2020). This generally means that, though the population of Belarus is going to follow the separate waste collection regulations during the pandemic, with no specific precautionary measures, the people engaged in waste collection, sorting, recycling, and disposing will be exposed to significant health threats.

Following the same logic, though separate waste collection was officially declared to be obligatory even in the rural areas, no substantial improvement in the rural waste separation and collection has been achieved (ibid). In these circumstances, given that non-urban population is no longer allowed to incinerate waste, the new regulations may lead to some waste being left untreated and just illegally dumped (Nerush, 2021). In the circumstances of the pandemic, this may generally mean that the potentially hazardous waste types (e.g. from the infected people) may end up in water bodies or public spaces, which will further debilitate the epidemiological situation in the country.

Though the disposal of single-use masks has been reduced, it appears to be quite difficult to link it to specific sustainable initiatives of the government and businesses. In fact, in Belarus, the obligatory wearing of masks was introduced only in mid-November 2020 (ibid). In addition, due to the absence of the overall lockdown and no strict penalties for not wearing masks, many Belarusians still appear to not use them even in public spaces (Office Life, 2020).

Additionally, since the volumes of medical waste significantly increased, the system of its treatment was challenged (Nerush, 2021). In this respect, despite the EU assistance through the EU COVID-19 Solidarity Programme, not all the medical waste was properly managed, as its quantity significantly increased (ibid and EU, 2020). In this sense, the pandemic should be viewed as an opportunity to transform the entire waste management of the country in all its aspects.

On the other hand, since the most evident post-pandemic recession is likely to put its limitations on the practical measures to improve the recycling part of the waste management system, changing the approach within to the production and consumption of commodities within the Belarusian economy itself could facilitate the transition of the country from linear economy to the economy with feedback loops and then circular economy. Indeed, waste reduction through steps aimed at waste prevention could reduce the amounts of waste generated in the country and thus put a lesser pressure on both the waste treatment facilities (e.g. sorting and recycling plants) and landfills themselves.

- **Medical waste**

Though the volume of medical waste generated during the COVID-19 pandemic is likely to have significantly increased, it is hard to obtain adequate statistical data clearly describing the situation in the country without distortions. In fact, with the real number of infected being periodically closed from the public by the government, the amount of medical waste from healthcare institutions has not been revealed (Ministry of Health, 2021). Similarly, despite the fact that the medical institutions are obliged to follow the official regulations on medical waste treatment, it is hard to assess the extent to which all such regulations were followed during the pandemic.

At the same time, similarly to other EaP countries, Belarus received international support for the improvement of its healthcare system's response to COVID-19. In particular, a bank loan of EUR 15 million was allocated by the EIB for the filling the existing gaps in Belarus's healthcare system during the crisis (EIB, 2020). It is supposed that part of this loan will be dedicated to the improvement of medical waste treatment facilities that will ultimately be able to process this type of potentially hazardous waste in compliance with the European safety and environmental regulations (ibid).

Water

In general, Belarus appears to possess some of the most decent indicators in quality of water supply and waste water management among the EaP countries. However, lack of tertiary (chemical) water treatment and age of most of water facilities pose significant challenges not only to the country's

environment, but also to public health. In the conditions of the current pandemic, these challenges appear to be magnified, especially with respect to the human dimension.

- **Strengths**

Unlike many other countries in the EaP region, Belarus has both primary and secondary treatment stages for most of the municipal waste water that is generated in the country (Viktor Anufriev, 2015). Hence, given that the SARS-CoV-2 virus was detected in waste water after about a week from the time of its discharging, extending the waste water treatment procedures itself helps to minimize the risks for public health (Samuel Sarkodie and Phebe Owusu, 2020). In addition, treating waste water not only mechanically but also biologically can further reduce the threats that the contaminated waste water may pose (ibid). In this sense, if compared to some other EaP countries, the existing waste water management system of Belarus appears to be at a more advantageous position with respect to the pandemic-related challenges.

- **Weaknesses**

At the same time, since no specific COVID-19-related regulations were directly targeting the water sector, the deficiencies of the existing water management system of Belarus appear to represent challenges for the population of the country (Nerush, 2021). In fact, due to the absence of lockdown and no strict control over the infected individuals, potentially hazardous waste water containing the virus is being run through the waste water infrastructure and thus reaching the waste water treatment facilities on a daily basis. Here, given that such water undergoes only primary and secondary treatment before being discharged to the water bodies, it can pose significant threats.

In addition, no significant technical differences in the treatment of communal and medical waste water pose additional challenges in the times of COVID-19 pandemic (ibid). With a presumably greater number of the infected treated by hospitals, greater volumes of waste water discharged from these institutions presumably containing traces of medicines from medical institutions were generated (Ministry of Health, 2021). This challenge, in turn, has not been thoroughly explored.

In this sense, in the future, taking the opportunity to upgrade waste water treatment in Belarus will mean improving public health conditions for a great share of the population. Here, since the primary and secondary stages have already been in use, it would be useful for the government to focus on the introduction of the efficient tertiary treatment (Nerush, 2021).

4.4. Georgia

Waste

Georgia was one of the first countries in the EaP region to impose strict lockdown measures to avoid the spread of COVID-19. Although Georgia's waste management system was insufficiently prepared and the existing gaps pose a serious threat to the health of the population under the crisis, the government managed to take certain measures to minimize those risks.

- **Strengths**

Georgia was one of the first EaP countries to impose strict lockdown measures after the first COVID-19 cases in the country (CENN, 2021). Although the waste management system of Georgia should still be improved, the government managed to take some important measures to mitigate the potential risks potentially affecting this sector (ibid). In particular, during the pandemic, apart from issuing recommendations to put face masks into plastic bags prior to disposal, the Georgian

government increased fines for the pollution with construction and medical waste by 25 times for individuals and by 10 times for legal entities (OECD, 2020). This is a very important step towards preventing the pollution of the environment by hazardous waste and reaching *Deliverable 16*.

Another important step taken by Georgia is the adoption of the national strategy, aiming to make waste management industry fully self-sufficient by 2030 through initiating a system in which the population and private sector would fully cover the expenses (Friends of the Earth Georgia, 2021). This new system has been gradually introduced since 2020 (ibid). In the long run, it will help to respond to such crisis situations like COVID-19 quicker and in a more efficient way.

• Weaknesses

Landfilling appeared to be a serious issue in Georgia even under the pandemic (Spectri, 2021). In fact, though sending the collected waste to landfills within the circumstances of the pandemic is supposed to be a reasonable measure, more than 75% of the total waste produced in a country is still landfilled (OECD, 2020). In this respect, lack of environmental impact permits in most of landfills operating in the state country a serious threat to the health of the population (CENN, 2021).

Currently, the majority of landfill sites functioning under local authorities operate without proper measures for groundwater protection, leachate collection, or treatment (ibid). The lack of waste management services in spontaneous landfills worsen the overall situation (ibid). Additionally, while composting is observed by some farmers, the recycling facilities in Georgia are still scarce (Friends of the Earth Georgia, 2021). In this connection, since half a decade before the pandemic, only in the Ajara region, organics, plastic, paper and paperboard (i.e. potentially recyclable materials) constituted the biggest share of municipal solid waste, dramatically increased waste generation under the crisis put substantial pressure on the waste management system of Georgia and the country's linear economic model (CENN, 2021). In this respect, separate waste collection and recycling appear to represent the issues of great concern for the post-pandemic recovery.

The COVID-19 crisis has revealed that the recycling facilities in Georgia are scarce and limited, thus, it is nearly impossible to handle the huge amount of municipal waste produced after the breakout of the global pandemic. In this regard, the current crisis may serve as an opportunity for the local government to focus on waste management and allocate sufficient funding to build and obtain well-equipped recycling facilities. More importantly, Georgia's post-COVID waste management strategy should not only focus on waste reuse and recycling but also consider waste prevention. Although the country has a long way to improve its economy and switch to a circular model, it has enough capacity to do so, given Georgia's willingness to closely cooperate with the EU and international donors.

• Medical waste

To mitigate the negative effects of the global COVID-19 crisis, the Georgian Government issued recommendations on the proper and safe disposal of face masks (CENN, 2021). According to it, they should first be put into plastic bags before further disposal (ibid). Apart from that, fines for the pollution with medical waste were increased by 25 times for individuals and by 10 times for legal entities (OECD, 2020).

At the same time, despite some steps taken to mitigate the threats posed by medical waste during the pandemic, proper medical waste treatment is still not fully controlled and managed. In, since a significant share of this waste type ended up in unauthorized landfills prior to the current epidemiological crisis, it is hard to expect that the problem has been completely eradicated during

the pandemic. In this sense, the implementation of all regulations on proper medical waste management should be further enforced.

Water

Though the water system of Georgia was not fully prepared for the outbreak of COVID-19, both the government of the country as well as civil society launched a number of important initiatives to mitigate the pandemic's negative impact on the system. At the same time, although some of these initiatives were effective, the crisis revealed some significant challenges that the system is facing. In this respect, the post-COVID revival of Georgia's economy should align with the overall improvement of the country's water management system.

- **Strengths**

Georgia has a long way to improve its water management system, however, there are already positive signs that are worth mentioning. It is noteworthy that, amid the outbreak of COVID-19, the government and civil society took certain measures to avoid the potential health risks imposed by the crisis. Specifically, in September 2020, Georgia's Environmental Outlook (GEO) – a representative of Georgia's civil society, in cooperation with the Slovak Development Agency conducted the meeting on the topic of 'Implementation opportunities of the EU Wastewater Treatment Directive (N 91/271 / EEC) - concerning urban waste-water treatment' to discuss and the methodologies for identifying sensitive areas and establishing the boundaries of agromelioration (CENN, 2021). In addition, GEO and the Slovak partners discussed the model of construction costs of the waste water treatment facilities and systems (ibid).

The government, in its turn, also developed a number of initiatives. For instance, the Ministry of Environmental Protection and Agriculture of Georgia issued order №2-531 of 2020 on Template for Charter of Water User Organization, according to which water user organizations will have to provide the government with more detailed information on their activities (FAO, 2020). This is supposed to ensure the efficient use of water resources and thus contribute to reaching *Deliverable 16*.

- **Weaknesses**

Efficient waste water treatment and water supply are very important to prevent the spread of COVID-19. However, the absence of effective water management and poor conditions of municipal waste water systems are the main challenges Georgia should address to mitigate the negative impact of the COVID-19 crisis on public health (Friends of the Earth Georgia, 2021). Most of the settlements in Georgia lack waste water treatment facilities (CENN, 2021). Thus, wastewater is discharged directly to the water receivers leading to local rivers, which may cause surface water pollution (ibid).

Intermittent water supply is another serious challenge Georgia has to deal with. Water supply in most of Georgian regions ranges from 4 hours to 24 hours per day, posing a significant health risk during the coronavirus disease (COVID-19) pandemic (CENN, 2021). Almost 92% of urban and about 64% of the rural population receive piped water. Only 20% of rural residents have access to sewerage systems, while in urban areas 84% of residents have access to such systems (ibid). In total, 36% of the population benefit from wastewater treatment, which needs to be improved (ibid).

That is why, in the future, the Georgian water sector should focus on upgrading its waste water treatment facilities alongside spreading water supply and sewage networks around the country. Besides, taking into account the fact that most of the waste water treatment plants operating in Georgia are typically not well-maintained, the local government should intensify the process of the

construction of new plants and reconstruction of old ones. In addition, since biological treatment is not conducted and mechanical treatment is not enough to purify the wastewater and minimize the amount of hazardous pollutants in it, the government should allocate a sufficient amount of financial resources to improve the country's wastewater treatment capacity after the pandemic. Here, international assistance could be viewed as an important asset.

4.5. Moldova

Waste

Though the waste management sector of Moldova was pushed towards greater sustainability by a number of successful local initiatives and joint international projects, the current epidemiological crisis happened to demonstrate that these transformations were not sufficient enough to minimize the health risks. In fact, the healthcare sector in the rural areas appeared to pose unprecedented challenge for waste management of the country, as the organization of proper treatment of medical waste needed financial support from abroad. On the other hand, the secured additional funding in this respect is supposed to significantly improve the existing waste treatment facilities.

- **Strengths**

Despite the unprecedented number of challenges that the Moldovan waste management system had to experience under the COVID-19 pandemic, the country's strong ties with international partners helped to improve the situation in some of the most critical areas. In particular, just at the end of 2020, with the special assistance from World Bank and EBRD, Moldova managed to secure emergency funding, which is supposed to assist in addressing the issues of medical waste treatment and sanitary water supplies in the rural areas e.g. through purchasing 40 pieces of equipment to neutralize medical waste (World Bank, 2020 and EBRD, 2020a). Though the epidemiological situation still remains complex, this funding would give impetus to the gradual transformation of waste management practices in the country into more resilient and sustainable ones.

In the capital region, in turn, the previously-launched and soon-to-be-completed Chisinau solid waste project was additionally supported by the international partners (EBRD, 2020a). As it is supposed to upgrade the facility with additional protective installations to minimise the potential environmental and health impacts, its launch is likely to improve the overall environmental and epidemiological situation in the capital. Indeed, as the stockpiled municipal solid waste in the residential areas of Chisinau are often not collected in a timely and appropriate manner, their concentration close to the households appears to pose further threat to public health. In this respect, the launch of a new landfill site that complies with the EU regulations will minimize the concentration of potentially hazardous substances within the capital, improve the management of leachate and contribute to the improvement in waste collection.

- **Weaknesses**

Since Moldova appears to represent one of the least economically advanced countries in the EaP region with significant budget limitations, the outbreak of the pandemic posed dramatic challenges for most of the country's industries and spheres of life (MEGA, 2021). Here, insufficiently developed waste management system, in general, and medical waste management and disposal, in particular, coupled with lack of adequate and appropriate water supply and sanitation conditions particularly in the rural areas made the country especially vulnerable (ibid and Eco-Sor, 2021). In such circumstances of the overwhelming threat, Moldova was unprepared to effectively organize and manage its medical waste management in the regions without foreign assistance (Biotica, 2021).

Apart from that, due to the insufficient coverage of the population by the waste treatment network, Moldova's municipal waste management experienced a shock similar to most other EaP countries (Eco-Sor, 2021). In particular, due to the deteriorating epidemiological situation and the resulting quarantine measures, the population of the country concentrated in the households significantly increased generation of municipal solid waste (ibid and UN Moldova, 2020). Hence, since most of the non-urban areas of the country are experiencing insufficient access to waste management, most of the potentially hazardous municipal solid waste containing traces of SARS-CoV-2 disposed during the pandemic is being dumped or landfilled (Ormax, 2021).

In the post-pandemic period, the country has an opportunity to focus on a number of key issues that could potentially help to more successfully address similar challenges in the future. In particular, this includes the expansion of separate waste collection, waste sorting, and recycling programmes beyond the capital to all regions of the country, alongside the improvement of the existent waste treatment facilities and augmentation of their materiel – i.e. procuring additional waste collecting trucks, dumpsters, etc. Finally, given the country's limited financial capacity to cope with the entire amount of generated waste solely through its processing, the general concept of goods' production and consumption should focus on waste prevention so that lesser volumes of trash are produced.

- **Medical waste**

During the pandemic, Moldova appeared to be among the EaP countries receiving the greatest share of assistance from the EU and other international donors (World Bank, 2020). For instance, within the framework of the “Moldova Emergency COVID-19 Response Project”, the World Bank provided immediate support on augmenting Moldovan laboratories and intensive care units not only with PPE but also with disinfectants and similar chemical substances that could minimise the biological hazard associated with medical waste (ibid). Apart from that, further measures aimed to raise awareness of the necessity to properly handle medical waste were conducted.

At the same time, for the medical waste resulted from COVID-19, additional incineration capacities should be assured through the financial support coming from EU, the World Bank, EBRD, and other institutions, as regional healthcare facilities often do not have adequate facilities at their disposal to treat medical waste in compliance with all the required safety and environmental regulations (Ina Coseru, 2021). The collection of medical waste should also be assured not only from the central and municipal hospitals of the Chisinau and Balti municipalities, but also from the Centers of Public Health in the villages and towns, where medical waste, resulting from the COVID-19 pandemic is not always properly managed in compliance with the existing regulations (ibid).

Water

Though Moldovan water sector has been undergoing significant transformation, the current pandemic posed significant challenges for it. In fact, many of the measures undertaken by the government to combat the aftermath of COVID-19 were considered to be not adequate. Nevertheless, some regional and local initiatives launched in cooperation with international partners prior to the crisis managed to bring their dividend when the epidemiological situation in the country worsened.

- **Strengths**

The new laws and regulations in the field of sewage systems, integrated water resources management, and waste management introduced between 2016 and 2018 are currently serving as a

good basis for water management under COVID-19. Apart from that, the projects implemented in Moldova between 2016 and 2018 contributed to the rehabilitation of water supply and waste water treatment systems, making it more resilient to the current crisis. Here, Moldova's close cooperation with international development agencies and NGOs such as UNDP, EU, EBRD, etc. significantly facilitated the completion of such projects and generally contributed to the fields of environmental protection and waste management in the country.

For instance, the ***EU4Moldova: Focal Regions***' programme funded by the EU and implemented by UNDP and UNICEF supports smart, green, inclusive and sustainable socio-economic development in the Cahul and Ungheni regions and is going to last until 2024 (UNDP, 2020a). Within the framework of this programme, in 2020, a new water supply system was constructed in the centre of the Ungheni municipality (ibid). This new water supply network is supposed to provide safe drinking water to more than 24,000 people (ibid).

In addition, as a result of Moldova's cooperation with international organizations and the adoption of the new National Program on the Implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025, the local water management system got further impetus for improvement (ibid). Indeed, the Protocol covers the measures for the improvement of water safety, adequate supplies of good quality water, sustainable use of water resources and the creation of optimal conditions for the prevention of water-related diseases. At the same time, despite the significant achievements, the current pandemic managed to put additional pressure on the existing water management system. In this respect, the Government of the Republic of Moldova should increase the scope of cooperation with international agencies amid the COVID-19 crisis to increase its water management capacity and introduce new policies to address the threats posed by the global pandemic to the quality of water.

• Weaknesses

Given the specifics of the pandemic, the steps taken by the government of Moldova to address the negative impact of COVID-19 on the country's water management system seem to be insignificant. In particular, since the outbreak of the pandemic, no major policies were implemented in the sector to adjust the existing system to the new challenges. As a result, unfortunately, the problem of poor overall water quality was further augmented by the SARS-CoV-2 challenge (Terra-1530, 2021).

The significant disparities between urban and rural areas in terms of water supply and access to the sewage systems is another issue Moldova has to deal with during the COVID-19 crisis (Eco-Sor, 2021). For instance, according to the latest census conducted in 2014, only 55.3 percent of the total population of Moldova most of which was concentrated in the urban areas had access to a sewage system, which raises even more significant concerns during the current pandemic (UN Moldova, 2020). Additionally, while 69.5 percent of the people residing in urban areas have access to hot water supplies, only 21.5% of the population in rural areas have access to hot water (ibid). In the times when such simple precautionary measures as washing hands are of additional importance, lack of sustainable supplies of this essential appears to potentially negatively influence the overall epidemiological situation (Terra-1530, 2021).

In fact, less than 10% of localities in Moldova have sewage systems and only a few of them have functional sewage treatment plants (UN Moldova, 2020). As the majority of settlements in Moldova are remote from big cities, they cannot be connected to the centralized sewage system. (Eco-Sor, 2021). The absence of sewage treatment plants leads to undesired results: wastewater reaches the soil and rivers, which causes serious pollution (Eco-Tiras, 2021). This, in turn, significantly impacts the environment and the general health of the population even without the COVID-19 threats (ibid).

Nowadays, when the traces of SARS-CoV-2 were discovered in waste water many days after its discharge, safeguarding a well-functioning waste water management system appears to be an issue of primary importance for the well-being of people and environmental sustainability.

Unfortunately, in Moldova, where the intermittent water supplies in some villages force people to draw water from shallow open wells, waste water treatment appears to be of secondary importance (Eco-Sor, 2021). In fact, with the self-provision of drinking water, such concerns brought about by the COVID-19 pandemic as the potentially contaminated drinking water coupled with the poor water sanitation that could lead to the spread of SARS-CoV-2 should be raised. Indeed, with 70% of rural residents still not having stable water supplies, this situation appears to be alarming in the current conditions (SECO, 2017).

The post-crisis revival plan should thus take into account the gaps of the current water management. Specifically, since disparities in water supply between the rural and urban population and the lack of access of the rural population to quality water and sewage systems worsen the overall epidemiological situation, the government should invest in the construction of new water supply and sewage systems across the country, especially in rural areas. Apart from that, the pandemic appears to be a good opportunity for the government to involve specialists from all over the country and abroad to train local staff and improve the capacity of the water management system.

4.6. Ukraine

Waste

Though Ukraine appears to be among the three EaP countries with the most significant improvement in waste management legislation, the country experienced significant challenges in this sector during the COVID-19 pandemic. In fact, despite international support and targeted EU assistance, the general trend of substantially increased waste generation posed a big problem to the waste management bodies of the country. Though some of these problems are currently being addressed by the country both on independent and coordinated bases, further efforts should be applied to make additional steps forward and eradicate such issues as illegal dumps, as they threaten public health.

- **Strengths**

According to CMS CMNO (2021), it is possible to highlight the following developments during 2020: (a) adoption of the first reading of the Draft Law “On Waste Management” which, if fully adopted, will become a framework law that establishes system for municipal waste management in Ukraine; (b) the Ministry for Communities and Territories Development of Ukraine is working on development of the Draft Law “On Disposal of Wastewaters of Settlements” which is aimed at implementation of the EU acquis requirements to wastewater management; (c) the Law of Ukraine “On Environmental Impact Assessment” was amended to allow the public to file suggestions and comments within environmental impact assessment procedure via post or email.

Overall, at the national level, a National Coordination Council has been set up, as per Presidential decree, to lead and oversee the COVID 19 response. A technical working group at the Ministry of Health has been activated to support the response. At the regional level, operational task forces were created (UNOCHA, 2020). However, it includes only planned response in relation to waste and water management (ibid). In October 2020, the EU committed to provided 60 million Euro assistance package to further boost the country's resilience and address the socio-economic impact of the COVID-19 pandemic in Ukraine, which includes the ‘Climate package for a sustainable economy’ programme, which covers the support to the circular economy and waste management (EU, 2020).

Like in many other EaP and EU countries that introduced quarantine measures, waste generation in central parts of big cities was reduced due to closure of most businesses, such as e.g. cafes, restaurants and other catering places (Eap CSF, 2020). As a result, the burden on waste management in such areas substantially decreased due to significantly minimised volumes of waste – i.e. the process associated with the halt of many industrial activities (ibid).

Ukrainian Government managed to take certain measures to minimize the negative impacts of COVID-19 on waste management sector. The inclusion of water supply, sewerage, waste management in the list of priority economic activities in its State Program was one of the significant steps taken by the local government amid the breakout of the pandemic (OECD, 2020).

During the pandemic, civil society of Ukraine has been particularly active. For instance, NGOs such as **‘Zero Waste Lviv’** (Lviv) in partnership with **‘Ekoltava’** (Poltava) conducted their own independent study on the impact of COVID-19 on the generation of solid waste in Ukraine (IRF, 2020). As a result of their findings in the cities of Poltava and Lviv, recommendations on safe collection of solid waste as well as on personal protective equipment were produced (ibid). Of particular interest is the activism of **‘Zero waste hairstylist’** NGO, which is pushing towards the reuse and reduction of waste in the beauty industry through raising awareness among companies producing and selling beauty products (Zero Waste Hairstylist, 2021).

Apart from local NGOs, international organisations were active in reaching out to Ukraine with their help. For instance, **Medicins Sans Frontieres** organized a number of training seminars for healthcare workers in Donetsk and Zhytomyr on the proper use of protective equipment, infection prevention and control, how to manage the flow of patients through triage, screening and isolation, and *safe waste management* organized in the conditions of the COVID-19 pandemic (MSF, 2020).

- **Weaknesses**

Due to the introduced lockdown, waste production in Ukraine shifted from business to residential areas where it substantially increased in comparison to the pre-pandemic times (Interecocentre, 2021). This was so mainly due to the higher concentration of residents staying in their households most of the time. Additionally, with the pandemic, the structure formation of household waste has changed. However, the government did not take special measures to address the COVID-19-related waste, neither with respect to municipal solid waste nor with respect to medical waste (ibid).

Here, the situation with medical waste appears to be quite tricky. In particular, since around 700-1000 tonnes of healthcare waste are generated in Ukrainian hospitals and other healthcare facilities annually, very few of such institutions actually submit statistical reports on its volume. In such circumstances, it is unfortunately likely that unreported healthcare waste goes to numerous illegal landfill sites around Ukraine (UNDP, 2020b). Within the current epidemiological crisis, such uncontrolled dumping of healthcare waste poses threats to the environment and public health.

Inefficient economic instruments in the field of waste management (e.g. low tariffs and no incentives for effective waste management), the low level of waste recycling, and the lack of incentives for the circular economy both for the population and business are the key impediments on the way to a better waste management system and reach Deliverable 16. Thus, the post-COVID revival strategy should cover the above-mentioned aspects to increase the resilience of its economy and waste management system against such crises like the one we are going through.

- **Medical waste**

Although there is currently available statistics on medical waste for 2020 and 2021, environmental experts believe that the tonnage is likely to significantly increase (perhaps even in several times), as the coronavirus pandemic and massive use of protective gear by medical staff and Ukrainian citizens had the same trends as in most other countries of the world. For instance, DSL-2010, the only entity in Kyiv dealing with medical waste treatment reported at least a two-time increase in medical waste generation in 2020 (Kyiv Post, 2020). In fact, while the enterprise used to burn around 7-8 tonnes of medical waste per week in the previous years, in 2020, the numbers ranged between 20 and 30 tonnes (ibid).

In the conditions when state hospitals are not allowed to sign contracts directly with waste disposal companies since each contract has to go through the e-procurement system ProZorro, medical waste disposal is often taken care of by the lowest bidders with dodgy background (ibid). In these circumstances, while unauthorized and illegal dumping still happens to be a salient issue, absence of a well-functioning waste management scheme for the growing volumes of medical waste creates substantial problems not only for the waste treatment but also for the healthcare system per se.

Water

The Ukrainian water sector did not manage to face the COVID-19-related challenges without any major adjustments. Nevertheless, the initiatives implemented in the major cities increased the chances of minimizing the spread of SARS-CoV-2 through water supplies and waste water treatment facilities. Unfortunately, this success was not spread to the rural areas and war-torn regions.

- **Strengths**

The pre-pandemic Ukraine's cooperation with Japan resulted in the modernization of the **Bortychi sewage treatment plant** at the capital region, which inspired a number of the follow-up initiatives (JICA, 2015). Here, a joint **Ukrainian-French project** on the modernization of water supplies to the city of Mariupol was launched right in the middle of the first wave of the pandemic (Government of Ukraine, 2020). The project is supposed to significantly increase the quality of water supplies to the city often suffering from irregular access to drinking water (ibid). Given the importance of such projects within the circumstances of COVID-19, Ukraine is taking some visible steps not only to minimize risks to public health during the pandemic but also to create a more resilient infrastructure for the long-term perspective, which contributes to reaching *Deliverable 16*.

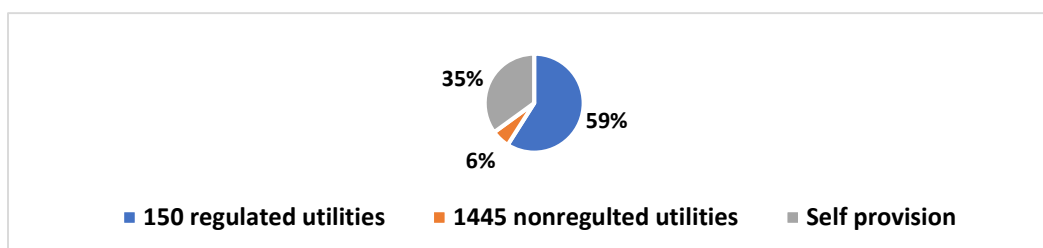
The government itself made important steps to mitigate the COVID-19 challenges in the water sector. For instance, **the State Service of Ukraine on Food Safety and Consumer Protection** launched a series of checks at the country's water supplies and waste water treatment facilities to make sure all the sanitary norms are followed so that the epidemiological situation does not further deteriorate (SSUFSCP, 2020). Though it identified a number of discrepancies, the follow-up directives that give guidance on the improvement of the situation were introduced (ibid).

- **Weaknesses**

In general, with a significant share of the population relying on themselves in terms of water provision and sanitary services (*Figure 12*), the Ukrainian water sector appeared to be challenged by the pandemic. Indeed, though access to stable water supplies and sewage systems are offered in most of the country's urban areas, the rural areas appear to have limited access to water and even less open access to the centralized sewage system (GermanWaterPartnership, 2021). Hence, in the

conditions when stable flow of water, in general, and hot water, in particular, appears to be directly related to the effectiveness of COVID-19 preventive measures, Ukraine's rural areas do not seem to be adequately protected from the spread of the disease. Similarly, lack of adequate waste water treatment facilities may contribute to the deterioration of the epidemiological situation, given the durability of SARS-CoV-2 virus in waste water and the potential exposure of local population to it. Unfortunately, during the pandemic, the 'already weak administrative control has been further weakened, which encourages illegal handling of sewage and waste treatment' (ibid)

Figure 12: Sources of water provision in Ukraine



Source: Danube Water Programme (2015)

Within the conditions of the ongoing armed conflict in Eastern Ukraine, the territories that appear to be on the frontline or not under control of Ukraine experience significant problems with both water supplies and waste water treatment. In particular, the Donetsk is currently experiencing significant challenges with water provision, which, in the conditions of COVID-19 pandemic may have dramatic impact on the epidemiological situation of the entire region. Specifically, while using the centralized water supply system constructed half a century ago and currently operated by Voda Donbasu – a state monopolist – the local population faces financial challenges to pay the bills that is coupled with the instability of water supplies and its quality owing to the obsolete pipeline system (UNICEF Ukraine, 2020). More importantly, however, water supplies to the region's 3.7 million people are constantly being interrupted by the ongoing hostilities damaging the existing infrastructure and impeding access to workers (ibid).

In such conditions, the outbreak of COVID-19 pandemic managed to take the entire region's water supply and waste water management system by surprise. In fact, unlike the rest of the country, the regions at war were not able to take the full spectrum of risk prevention measures to at least organise monitoring of the situation and quick repairment of the damaged pieces of infrastructure related to water supplies and waste water treatment due to the fact that some of the dedicated facilities were located on the uncontrolled territories or at the frontlines. For instance, on the 25th of December 2020, new shelling took place in close vicinity of the sewage treatment plant at Golmovskyi – i.e. on a territory not controlled by Ukraine (Reliefweb, 2020). In these circumstances, taking additional anti-COVID-19 measures does not seem to be on the current agenda.

In the future, however, upgrading waste water treatment facilities to the EU standards should be done. This includes, among other measures, the introduction of tertiary (chemical) waste water treatment, which significantly improves the quality of processed water discharged into the rivers and lakes. In the rural areas, the provision of adequate access to high-quality water sources as well as efficient sanitary services needs to become a priority for the post-COVID-19 reforms over there.

5. Conclusions and recommendations

5.1. Conclusions

As demonstrated, the efficiency of waste and water management sectors in EaP countries appears to differ from country to country. Here, though such nations as Georgia, Moldova, and Ukraine are among the most advanced countries in terms of taking steps to synchronise their legislation with the EU regulations governing these two sectors, the implementation of waste and water treatment imperatives appears to be weak in practice. On the other hand, though Armenia, Azerbaijan, and Belarus have not signed association agreements with the EU, some important initiatives on improving their waste and water management have been taken, with Belarus representing the most successful case where the quality of waste separation and secondary water treatment are getting closer to that of the EU. Unfortunately, however, due to a number of factors, waste and water management in Armenia and Moldova seem to be facing the greatest number of challenges.

This picture was further developed in the conditions of the COVID-19 pandemic, as both sectors experienced additional pressure in each EaP country. Here, though Belarus was the only country where no lockdown measures were introduced, waste and waste water treatment (especially in the medical sector) had to be taken specific care of there as well. It is unfortunate that overall the generation of municipal solid waste and medical waste as well as its specific types (e.g. single-use plastics, face masks, etc.) went up. In such conditions, none of the EaP nations was able to address the growing challenges on its own and thus completely reach *Deliverable 16*. That is why the financial assistance and expertise of the EU in a form of the *EU COVID-19 Solidarity Programme for the Eastern Partnership* as well as other multilateral programmes were of specific importance.

5.2. Country-specific recommendations

5.2.1. Armenia

Waste

Despite some powerful civil society initiatives aimed at introducing separate waste collection and recycling that were created by local activist businesses and individuals, further improvement in the overall organization and management of waste treatment as well as the revisiting of major approach towards waste generation and disposal should be done. These measures should include as follows:

- Introduction of a binding separate waste collection scheme with the legislative support from the government/local authorities;
- Awareness raising among the population to improve compliance with the to-be-introduced regulation on separate waste collection;
- Improvement of the existing waste treatment facilities and introduction of new (incl. sorting and recycling plants, waste incinerators, and landfills);
- Further investment into waste collection and treatment infrastructure to safeguard the transition of the population to separate waste collection (incl. procurement of additional waste collecting trucks, dumpsters, waste bins for separate waste types, etc.);
- Elimination of the existing illegal and unregulated landfills and dumps as well as legislative initiatives to prevent their further creation (e.g. increased fines);

- Legislative and financial stimulation of waste reduction, reuse, and recycling (e.g. subsidies for waste minimization, reuse, and recycling) as well as capacity building through participation in the EU4Environment, EU4Climate, and EUWI programmes.
- Actual demonopolisation of the waste management market and expansion of waste collection, sorting, and treatment facilities all over Armenia.

Water

Similarly to the waste management sector, water supplies and waste water treatment in Armenia require additional improvement. That is why such initiatives should be considered to be viewed as examples for the further improvement of the following areas:

- Waste water facilities of Armenia should be upgraded and secondary and tertiary treatment should be introduced;
- Access to sustainable water supplies as well as adequate sewage facilities among the country's population should be significantly increased;
- Instead of upgrading all obsolete pumping systems for water supplies, Armenian mountainous landscape should be used for the creation of new and more efficient ones, which would reduce/minimise the electricity consumption;
- Investments in the provision of waste water treatment in the rural areas should be increased;
- Successful regional and local initiatives on waste water management and water supplies should be expanded to other regions of the country;
- Further water management capacity should be built through active participation in the EU4Environment, EU4Climate, and EUWI initiatives.

5.2.2. Azerbaijan

Waste

Azerbaijan's active cooperation with international development agencies and willingness to improve its deficient waste management system inherited from the Soviet Union has led to positive achievements in the waste management sector. However, lack of reliable information on the situation with solid waste management and the absence of the source-separated collection of household waste in Azerbaijan which makes waste recycling quite challenging represent a serious gap in the Azerbaijani waste management sector. Thus, the following recommendations should be taken into account by the local authorities to improve waste management in Azerbaijan:

- Collection of information on landfills and dumpsites across the country;
- Elimination of illegal landfills and dumpsites;
- Introduction of source-separated collection of household waste across the country;
- Increase the government investment in the construction of solid waste recycling facilities;

- Facilitation of the investment process in waste management infrastructure and waste management services;
- Implementation of awareness-raising and outreach campaigns and educational activities on waste separation and negative impacts of hazardous waste;
- Involvement of the private sector in the waste management projects;
- Enforcement of the implementation of relevant (waste management) legislation through the establishment of special monitoring structures;
- Strengthening waste management capacity through international cooperation with the EU and adoption of its best practices in the field (e.g. more active participation in the EU4Environment, EU4Climate, and EUWI programmes).

Water

Although Azerbaijan is gradually implementing the best practices in the water sector and improving the capacity of its water management sector, water scarcity in urban areas and the lack of proper sewage systems is still a serious problem the government is trying to address. Taking into account Azerbaijan's economic capacity and the existing institutional framework the following steps can be taken to improve the water sector:

- Assessment of the country's water resources and water distribution in accordance with the main economic and natural zones;
- Definition of the possibilities of water reuse and determination of the irreversible water loss;
- Development and adoption of the Water Management Action Plan;
- Involvement of experts, civil society members, researchers, and other interested stakeholders in the process of development of the Water Management Action Plan;
- Strengthening of the bilateral water cooperation on the Kura River between Azerbaijan and Georgia;
- Establishment of the bilateral water cooperation on the Aras River between Azerbaijan, Armenia and Iran;
- Elimination of monopoly over water supply and privatization of water supply network and water sewage facilities across the country;
- Facilitation of the investment process in water management infrastructure and water services;
- Introduction of relevant regulations considering sanitary and preventive measures to remove and reuse sludge from centralized systems and other sanitation facilities;
- Capacity building in water management through intensified cooperation with the EU via EU4Environment, EU4Climate, and EUWI programmes, etc.

5.2.3. Belarus

Waste

In general, the overall indicators on waste recycling in Belarus appear to be some of the most favourable ones among the EaP countries, which means that a lot of positive steps have been made in the direction of pushing the country towards a more sustainable economic model. However, despite the successful projects implemented in cooperation with international partners, the country is still far behind being turned into a nation with circular economic model. Further improvement of Belarus's waste management sector should include the following measures:

- Final elimination of the remaining uncontrolled landfills and the prevention of new ones;
- Expansion of separate waste collection policies beyond urban areas and introduction of separate waste collection in the rural areas;
- Additional improvement of the existing waste treatment facilities (e.g. refurbishment or the existing landfills in compliance with the EU regulations, etc.);
- Additional investment in the expansion of waste treatment infrastructure so that it is able to process greater amounts of waste (e.g. the construction of new sorting and recycling plants);
- De-monopolisation of the waste management business stimulating more efficient waste treatment;
- Further legislative and financial stimulation of sustainable individual waste management practices and waste management businesses (e.g. introduction of tax reliefs for waste management companies, discount for individuals exercising separate waste collection in the rural areas, etc.);
- Minimisation of waste production by individuals and enterprises/businesses through financial and legislative stimulation.

Water

Though the Soviet-era legacy of Belarus included a relatively advanced and well-maintained water sector, a number of international projects were involved in the improvement of waste water management facilities in the most recent time. Though they are expected to make the environmental and epidemiological situation even better, such projects appear to be not fully capable of the comprehensive transformation of the overall water sector. In such conditions, the following measures and initiatives should be implemented to further improve the system:

- Certification of all new waste water treatment equipment;
- Demonopolisation of the waste water treatment system to promote efficiency-stimulating competition within the sector;
- Increasing the transparency of the waste water treatment sector;
- Modernisation of the existing waste water treatment facilities so that they comply with the EU standards;

- Upgrading the waste water treatment system so that it provides tertiary water treatment;
- Reduction of the discharges of untreated waste water into the country's water bodies (i.e. rivers and lakes);
- Further expansion of water infrastructure in the rural areas with the provision of stable water supplies and access to adequate waste water treatment facilities.

5.2.4. Georgia

Waste

As a result of close cooperation with international development agencies and the EU, the adoption of waste management laws and national strategy, solid waste management of the country has improved. However, despite several successful waste management projects and strengthened legislative base, there is a lot of work to do on the way to achieving a cleaner and safer environment. The following steps can be taken to improve Georgia's waste management sector:

- Collection of information on (illegal) landfills and dumpsites across the country;
- Elimination of illegal landfills and dumpsites;
- Introduction of source-separated collection of household waste across the country;
- Increase the government investment in the construction of solid waste recycling facilities;
- Facilitation of the investment process in waste management infrastructure and waste management services so that the recycling targets stemming from the Association Agreement with the EU are met;
- Implementation of awareness-raising and outreach campaigns and educational activities on waste separation and negative impacts of hazardous waste;
- Involvement of the private sector in the waste management projects;
- Strengthening the capacity of inspecting and controlling executive structures;
- Increasing transparency in the operation of these power structures;
- Identification of the most environmentally friendly disposal routes for residual waste.

Water

Poor water supply and sanitation infrastructure left from the Soviet Union, intermittent water supply and poor drinking water quality are the main challenges that Georgia faces in terms of water management. The following measures should be taken by the Government to address the most challenging issues:

- Identification of the water-scarce territories;
- Definition of the possibilities of water reuse and determination of the irreversible water loss;

- Assessment of the country's water resources and water distribution in accordance with the main economic and natural zones;
- Outline measures for the protection of water, prevention of water bodies from pollution, efficient wastewater treatment;
- Construction of waste water treatment plants serving rural areas;
- Reconstruction and modernization of the existing waste water treatment plants operating in Georgia;
- Equipment of waste water plants with all necessary facilities for the biological (i.e. secondary) treatment;
- Equipment of the settlements in Georgia with waste water treatment facilities;
- Construction of efficient facilities to prevent the discharge of waste water directly to the water receivers leading to local rivers;
- Strengthening of the bilateral water cooperation on the Kura River between Azerbaijan and Georgia;
- Facilitation of the investment process and capacity building in water management infrastructure and water services through active engagement in the EU4Environment, EU4Climate, and EUWI programmes.

5.2.5. Moldova

In order to improve the situation in waste and waste water sectors, it is important to improve the institutional framework of the country and separate the environmental component from the actual Ministry of Agriculture, Regional Development and Environment so that an independent Ministry of the Environment is created. It is also important to finalise the institutional reform of the subordinated institutions in the field of environment, so they would have sufficient capacity to implement environmental policies and control the implementation of the environmental legislation, as well as qualitatively monitor the state of the environment and inform the population about its quality. Unfortunately, since such issues as low salaries appear to be a matter of corruption in state organisations (including in the field of the environment), they should be also addressed. New mechanisms of reporting on the implementation of the Association Agreement results are needed. It is important that the state officials focus on the actual implementation of laws already developed in compliance with the Association Agreement so that more benefits are brought to the local population.

Waste

Despite a number of successfully implemented projects mitigating the challenges of waste generation has significantly increased, the country is in need for new initiatives as well as the enforcement of old ones. Here, specific attention should be given to the compliance with the Association Agreement with the EU and reaching specific targets on waste management, as they have not been met. In this connection, Moldova's policymakers should:

- Implement the Law on waste so that the unmet 2020 target where 30% of plastic, glass, paper and metal should be recycled;

- Take measures on eliminating illegal and unregulated dumps and landfills (e.g. through the increased fines on individuals exercising unsustainable waste treatment practices, etc.);
- Upgrade the existing landfills so that they respond to the most advanced waste treatment standards;
- Expand the waste collection system so that it caters for not only the capital region but also regional centres and rural areas;
- Augment the existing waste treatment materiel of the respective entities dealing with waste collection, sorting, processing, etc. (e.g. procure additional waste collecting trucks, dumpsters, etc.);
- Conduct qualified training for the personnel engaged in the waste management sector (potentially, with the help of international cooperation);
- Develop clear, safe, and effective medical waste treatment procedures for the country's healthcare facilities.

Additionally, though feasibility studies have been conducted for 8 waste regions of Moldova designated by the National Strategy on Waste Management, specific improvements (e.g. the creation of waste management infrastructure for each region) should be achieved.

Water

Moldova is still facing serious issues in water management. The lack of infrastructure, funds and specialized staff with experience in water infrastructure management and implementation of investment projects and the absence of proper physical protection of water infrastructure are the most pressing issues that the country has to address as soon as possible. The following measures should be applied to improve the overall capacity of water management in Moldova:

- Construction of wastewater treatment plants in rural areas;
- Reconstruction and modernization of the existing wastewater treatment plants operating in Moldova;
- Equipment of wastewater plants with all necessary facilities for the biological (i.e. secondary) treatment;
- Equipment of the water infrastructure with proper physical protection;
- Construction of efficient facilities to prevent the discharge of wastewater;
- Intensification and strengthening of transboundary water management among Moldova and Ukraine.
- Establishment of the monitoring committee, who will be in charge of the assessment and monitoring of the water pollution and quality of the Dniester River Basin;
- Facilitation of the investment process in water management infrastructure and water services;

- Develop and introduce capacity-building programs to train special personnel for water infrastructure management;
- More actively engage in the EU capacity-building programs (e.g. EU4Environment, EU4Climate, and EUWI) to train special personnel for the implementation of investment projects in the water management sector.

5.2.6. Ukraine

Waste

Although Ukraine managed to establish close cooperation with international organizations and signed the Association Agreement with the EU, the country's waste management system is not efficient enough. The current situation can be used by the government as an opportunity to focus on waste management sector. The following measures should be taken as initial steps towards a cleaner and greener Ukraine:

- Final adoption of the comprehensive Law on waste;
- Development and introduction of efficient economic instruments in the field of waste management;
- Development and introduction of incentives for businesses to use secondary raw materials;
- Implementation of awareness-raising and outreach campaigns and educational activities on waste separation and negative impacts of hazardous waste;
- Facilitation of the investment process in waste management infrastructure and waste management services;
- Involvement of the private sector in the waste management projects;
- Ensuring the implementation of relevant (waste management) legislation and initiatives in compliance with the targets derived from the EU Association Agreement;
- Establishment of the separate waste collection system across the country so that the sustainable waste management targets (e.g recycling of 30% of waste) are met.

Water

Though Ukraine represents a big country with uneven economic and population distribution patterns, water supplies and waste water treatment are not functioning equally well all over its territory. In this connection, the following steps should be considered:

- The existing waste water treatment facilities should be modernized and upgraded so that they could all offer secondary and tertiary treatment;
- Water supplies and waste water treatment should be improved in the country's rural areas so that a greater share of the population gets access to uninterrupted reliable water provisions as well as the access to adequate sewage system;

- Discharge of untreated water into surface water bodies should be minimized to prevent deterioration of the environment and public health;
- Communication among the water sector management bodies on the trans-boarder river issues should be enhanced (e.g. a water management communication panel could be established between Ukraine and Moldova on the issues related to the Dniester river, etc.);
- Water supplies and waste water treatment on the territories that are currently not controlled by the Ukrainian government should be inspected and improved when the armed conflict ends.

5.3. Recommendations for the EaP region

5.3.1. Eastern Europe

Waste

Though Belarus, Moldova, and Ukraine significantly vary in terms of the population, economic development, and geographical conditions, all the three EaP countries appear to be facing similar challenges in their waste management systems. In this respect, it looks reasonable that some of the measures that could help each of them to improve the quality and efficiency of their waste sector could be the same. In addition to that, as both Belarus and Moldova boarder Ukraine, these three nations could expand their cooperation within the waste management domain to improve their individual odds in the future. In this connection, some of the common recommendations for all these Eastern European countries could be as follows:

- Waste hierarchy should be introduced and prioritized;
- Waste separation, sorting, and recycling should be further expanded beyond urban areas;
- Additional waste treatment facilities (e.g. waste incinerators, sorting and recycling plants) should be launched;
- Legislation stimulating the population and businesses to minimize waste production and conduct separate waste collection should be further expanded.

Here, since Moldova and Ukraine have signed association agreements with the EU, their internal legislation should further be synchronized with the EU's best practices. Additionally, specific waste management targets (e.g. the 2020 target on recycling) should be met.

Water

In the water sector, all the three EaP's Eastern European countries share a number of similarities despite diverging economic and urbanization patterns, which directly influence the access to water supplies and waste water facilities. Here, some of the most vivid commonalities could be transformed into the following recommendations on improvement:

- Water supplies in the rural areas of each country should be significantly improved;
- Waste water treatment facilities should be upgraded to be able to conduct secondary and tertiary water treatment so that the overall water quality is improved;

- The discharge of untreated waste water into the surface water bodies should be minimized to prevent the threat to the environment and public health;
- Waste water treatment in the rural areas should be significantly improved and the local population should be provided access to adequate sanitation (sewage) facilities.

Similarly to waste management, water sectors of Moldova and Ukraine should be further synchronized with the EU regulations and specific targets should be met in compliance with the association agreements signed by both countries.

5.3.2. South Caucasus

Waste

Insufficient and uncoordinated waste collection is one of the common problems that the countries of South Caucasus face. The lack of data on the existing waste stream quantities and qualities and proper equipment for waste recycling remains the main issue in all three countries of the region. Considering the scarce resources and interdependence of these countries, coordinated measures should be taken to improve the overall waste management capacity in the region. The following steps may be the ones to start with:

- The development and implementation of an integrated waste management strategy that covers:
 - the current trends of waste streams in the region;
 - the future expected trends waste streams in the region;
 - the waste hierarchy (waste prevention, preparation for reuse, etc.);
 - the capacity and availability of nearby waste treatment facilities;
- The regional integrated waste management strategy should include long-term (10–20 years) and short-term (3–5 years) targets for the improvement of the waste management system performance and should be regularly reviewed (every 1.5-2 years).
- Since Georgia appears to be the region's most advance nation in terms of synchronized legislation with the EU regulations (due to the signed Association Agreement), the country's experience should be followed by Armenia and Azerbaijan in terms of updating their own national legislative and regulatory standards in the field.

Water

Although the sewage and water supply systems in the region are not well-developed enough and there disparities between urban and rural areas, the governments of Armenia, Azerbaijan, and Georgia closely cooperate with international development agencies to address these issues and properly manage their internal waters. However, due to the low level of regional cooperation between the three countries the overall water management system of the region has a room for improvement. Thus, the following steps should be taken on the regional level:

- Development of inter-state cooperative bodies for water management;

- Facilitation of the investment process in transboundary water management infrastructure and water services;
- Development and adoption of the regional strategy for wastewater collection and treatment;
- Involvement of experts from all three countries (and abroad if required) in the development of the regional water management strategy;
- A review of economic instruments for water management in the region;
- Strengthening of the bilateral water cooperation on the Kura River between Azerbaijan and Georgia;
- Establishment of the bilateral water cooperation on the Aras River between Azerbaijan, Armenia and Iran;
- Involvement of civil society actors, international experts, and other interested stakeholders in the policy-making on water management.

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Appendix 1

Organisations that contributed to the current research

Country	Organisation	Expertise	
		Waste	Water
Armenia	Centre for Community Mobilization and Support	+	-
	“Khazer” Ecological and Cultural NGO	+	+
	Eco-Lur Information NGO	+	+
	“Armenian Forests” Environmental NGO	+	+
	“Biosophia” Centre for Health, Environmental, and Agricultural Development (NGO)	+	+
	“Dalma-Sona” Human Rights, Social, Educational, Environmental protection Fund	+	+
	Public Awareness and Monitoring Centre	+	+
Azerbaijan	Khazar University	+	+
	Green Baku	+	-
	Eco-World PU	+	+
	Azerbaijan Ornithological Society	-	+
Belarus	“Nerush” Ecological Society	+	+
	Ministry of Health	+	-
	Central Research Institute for the Integrated Use of Water Resources	-	+
Georgia	Friends of the Earth Georgia/Greens Party of Georgia	+	+
	CENN – Caucasus Environmental NGO Network	+	-
	Imereti Scientists' Union “Spectri”	+	+
	Guerrilla Gardeners Tbilisi (Civic Movement)	+	-
	Ministry of Environmental Protection and Agriculture	+	+
	Georgian Water and Power	+	+
Moldova	Association of Waste Recovery	+	-
	Eco-Tiras International Association of River Keepers	-	+
	Moldovan Environmental Governance Academy (MEGA)	+	+
	Terra-1530	+	+
	Ecological Society “Biotica”	+	+
	AO Eco-Sor	+	+
	REC Moldova	+	-
	EcoContact	+	+
	Ormax ACT	+	+
Ukraine	National Ecological Centre of Ukraine	-	+
	Centre “EcoResource” (State Scientific & Technical Centre for inter-sectorial & regional	+	+

	problems of the Environmental Safety and Resource Conservation)		
	GermanWaterPartnership e.V.	+	+
	Green Generation	+	-
	Zero Waste Hairstylist NGO	+	-
	Interecocentre	+	+
	CMS CMNO	+	+
	Enviroment-People-Law	+	+

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Appendix 2

EaP countries' interaction with the EU on waste and water management

Country	Framework	Entered into force	Key responsible bodies in the country	Obligations on waste and water				Examples of EU support contributing to achieving Deliverable 16	
				Waste		Water		Waste	Water
				Key obligations	Key gaps	Key obligations	Key gaps		
Armenia	<ul style="list-style-type: none"> The Armenia-EU Comprehensive and Enhanced Partnership Agreement (CEPA) Various multilateral EaP formats: EU4Environment, EU4Energy, EUWI+, etc. 	2021	<ul style="list-style-type: none"> Ministry of Nature Protection State Committee on Water Systems 	<ul style="list-style-type: none"> Approximation of Armenian legislation to EU waste directives Preparation of waste management plans in line with waste hierarchy and waste prevention programmes Classification of landfill sites Establishment of system for disseminating environmental information Establishment of national strategy reducing biodegradable content in landfilled waste Development of control and monitoring procedures on operating and closed landfills Application of permit systems and waste 	<ul style="list-style-type: none"> Law on Waste does not include waste hierarchy Separate waste collection is still to be developed into a system Polluter pays principle not fully enabled Environmental tax and penalty for landfilling of unsorted solid waste inadequate Waste sorting and recycling is yet to be developed 	<ul style="list-style-type: none"> Approximation of Armenian legislation to 5 EU directives (Water Framework Directive, Floods Directive, Urban Wastewater Directive, Drinking Water Directive, Nitrates Directive) Amendment to the Water Code on sanitation Reforms of water policies, establishment of an adequate governance framework and institutional capacities Infrastructure upgrades and quality management Institutional capacity building 	<ul style="list-style-type: none"> Total harmonization of legislation yet to be achieved Institutional capacity needs to be further strengthened Infrastructure was not upgraded everywhere Water governance still needs further improvement Management of transboundary water issues still hampered by politics 	<p><u>EU4Armenia:</u></p> <ul style="list-style-type: none"> 'Restoring living conditions in Armenia' – a EUR 340k project on energy efficiency improvement and stimulation of products' reuse Kotayk Solid Waste project (EUR 3.7m) – improvement of waste management system in the Kotayk Province <p><u>EU4Environment:</u></p> <ul style="list-style-type: none"> Assistance in assessing investment needs to develop the Deposit Refund System for Armenia's packaging waste 	<p><u>EU4Armenia:</u></p> <ul style="list-style-type: none"> Communal Infrastructure Programme (EUR 15.4m) - rehabilitation and construction of water/sewage infrastructure in cities and communities throughout Armenia (except Yerevan) and construction of waste water treatment plant in Nor Akunq Yerevan Water Supply Improvement Project (EUR 5.5m) – rehabilitation of water distribution networks, installation of water meters
		2017	<ul style="list-style-type: none"> Water Resources Management Systems Ministry of Health 						

				<p>acceptance procedures at landfills</p> <ul style="list-style-type: none"> • Development of register of waste collection and transport establishments and undertakings • Introduction of full recovery mechanism in accordance with polluter pays principle and extended producer responsibility principle • Establishment of system ensuring relevant waste is subject to treatment before landfilling • Introduction of obligations for operators to take necessary prevention and remediation measures incl. liability for costs • Introduction of strict liability for dangerous occupational activity 		<ul style="list-style-type: none"> • Intensified cooperation on transboundary water management 		<p><u>EBRD, EU, and E5P:</u></p> <ul style="list-style-type: none"> • EUR 5.5m loan for implementation of solid waste management solutions in Kotayk and Gegharkunik <p><u>EIB:</u></p> <ul style="list-style-type: none"> • EUR 8m for improvement of solid waste disposal in Yerevan 	
Azerbaijan	<ul style="list-style-type: none"> • New EU-Azerbaijan Partnership Agreement (tbd) • EU-Azerbaijan 	To be signed (still negotiated)	<ul style="list-style-type: none"> • Ministry of Foreign Affairs (negotiations) • Ministry of Ecology and Natural Resources 	<ul style="list-style-type: none"> • Approximation of laws in the field of environment; • Effective monitoring of pollution levels and assessment of environment; Establishment of a system of information on the state of the environment; 	Due to the lack of proper monitoring bodies EPR schemes do not work properly and are not followed by producers	<ul style="list-style-type: none"> • Recast of the National Water Strategy (NWS); • Development of a National Water Action Programme; • Secondary Legislation Development; 	<p>The monitoring of water is not strong enough;</p> <p>The monitoring infrastructure and quality management should be improved;</p>	<p>Thirty companies, mostly from food and construction materials sectors, received training on circular economy.</p>	<p>EUWI+:</p> <p>On request of the Ministry of Ecology and Natural Resources in Baku and the European Union Delegation Baku, the EUWI+ project facilitated</p>

Partnership Agreement	1999	<ul style="list-style-type: none"> Ministry of Economy 	<ul style="list-style-type: none"> Waste reduction, recycling and safe disposal; Implementation of the Basel Convention Developing draft action plan for waste management (national or municipal level); Initiating/assisting the establishment of Extended Producers Responsibility (EPR) schemes; Initiating awareness raising campaigns on the Green Economy transition for general public 		<ul style="list-style-type: none"> Transition from pilot basin to country scale timely implementation of EU Water Framework Directive (WFD) principles for integrated water resources management and River Basin Management Plan harmonization in transboundary basins; Strengthening of the monitoring of the water bodies status and upgrade needed infrastructure and quality management Establishment of a system of information on the state of the environment; Combating local, regional and transboundary air and water pollution; Ecological restoration of water quality; Implementation of the Basel Convention 	<p>The information on the state of the environment is not accessible for all groups and not reliable enough;</p> <p>Transboundary water pollution remains as a serious issue;</p> <p>Ecological restoration of water quality is not achieved yet;</p> <p>Basel Convention is not fully implemented</p>	<p>the execution of a targeted survey of delta water salinization in early August 2020.</p> <p>In 2019 EU Provided the newly opened Water Laboratory with equipment to detect industrial chemicals and pesticides in water</p> <p>Public awareness campaign "Save the water" launched in Aug. 2018 with the support of EUWI+</p>
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Belarus	<ul style="list-style-type: none"> • Agreement on EU-Belarus Partnership Priorities (tbd) • Various multilateral EaP formats: EU4Environment, EU4Energy, EUWI+, etc. 	<p>To be signed (still negotiated)</p> <p>2009-2018</p>	<ul style="list-style-type: none"> • Ministry of Foreign Affairs (Negotiations) • Ministry of Natural Resources and Environmental Protection • Ministry of Housing and Communal Services • Ministry of Health 	<p>No clear obligations, but suggested general priorities:</p> <ul style="list-style-type: none"> • Achievement of greener decision-making • Introduction of circular economy and creation of new growth opportunities • Improvement of ecosystem services and livelihoods • Stimulation of knowledge-sharing and coordination 	<ul style="list-style-type: none"> • Insufficiently developed infrastructure for separate waste collection in rural areas • Inadequate awareness of proper waste management (separate waste collection, etc.) • Insufficient recycling capacities (too few recycling plants) • Few landfills compliant with EU standards 	<p>No specific obligations, but specific priorities:</p> <ul style="list-style-type: none"> • Implementation of Integrated Water Resources Management principles aligned with EU legislation • Ratification and implementation of UNECE-WHO/Europe Protocol on Water and Health • Strengthening transboundary water cooperation with Latvia and Lithuania • Development and implementation of river basin management plans based on principles of EU Water Framework Directive • Reform of economic instruments for managing water sources and infrastructure 	<ul style="list-style-type: none"> • Not all pieces of Belarusian water-related legislation comply with European standards • Ministerial agreement with Latvia on transboundary cooperation in development • Transboundary cooperation with Lithuania only on exchange of information on water quality • River basin management plans missing for most rivers • Reform of economic instruments for managing water sources and infrastructure to be further developed 	<p><u>EU:</u></p> <ul style="list-style-type: none"> • Development of Integrated Solid Waste Management Strategy in Minsk region (EUR 270k) • Awareness raising on separate waste collection <p><u>E5P and EBRD:</u></p> <ul style="list-style-type: none"> • Grant of EUR 2-5m to construct Belarus's first environmentally-friendly landfill in compliance with EU regulations (Pukhovichi Solid Waste Project) <p><u>EU4Belarus:</u></p> <ul style="list-style-type: none"> • EUR 15m grant towards improvement of waste management in Grodno and Brest regions 	<p><u>EU4Energy:</u></p> <ul style="list-style-type: none"> • Covenant of Mayors – demonstration projects on improved energy efficiency in waste water management (EUR 400k) <p><u>EUWI+:</u></p> <ul style="list-style-type: none"> • Strategic environmental assessment of the Draft National Water Strategy till 2030, capacity building for laboratories monitoring surface and ground water and other technical assistance (EUR 8.9m in total) <p><u>EU:</u></p> <ul style="list-style-type: none"> • Improvement of waste and waste water governance in Masty, Grodno Region (installation of water heat pump, infrastructure upgrades) – grant of up to EUR 200k
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Georgia	<ul style="list-style-type: none"> • The Georgia-EU Association Agreement • Various multilateral EaP formats: EU4Environment, EU4Energy 	<p>2016</p> <p>2016-2019</p>	<ul style="list-style-type: none"> • Ministry of Environmental Protection and Agriculture • Ministry of Health 	<ul style="list-style-type: none"> • Adopt the 3rd National Environmental Action Programme of Georgia (2017-21); • Start implementation of the National Radioactive Waste Management Strategy; • Implement the National waste management strategy and measures foreseen in the 2016-2020 action plan; • Continue approximation of legislation of Georgia to EU acquis and implement the provisions of EU Directives and Regulations as envisaged in the relevant Annexes of the Association Agreement; • Approximate legislation of Georgia to EU acts and international instruments as envisaged by the Association Agreement in accordance with the relevant Annexes thereof 	<ul style="list-style-type: none"> • The National waste management strategy and measures foreseen in the 2016-2020 action plan are not fully implemented; • The legislation of Georgia is not fully approximated to EU acquis; • The provisions of EU Directives and Regulations as envisaged in the relevant Annexes of the Association Agreement are not fully implemented 	<ul style="list-style-type: none"> • Adopt the 3rd National Environmental Action Programme of Georgia (2017-21); • Approximate legislation of Georgia to EU acquis and implement the provisions of EU Directives and Regulations as envisaged in the relevant Annexes of the Association Agreement; • Draw up a roadmap for the ratification and implementation of multilateral environmental agreements, including among others UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, and UNECE Convention on the Transboundary Effects of Industrial Accidents; • Conduct public consultation and adoption of River Basin Management Plan (RBMP); 	<ul style="list-style-type: none"> • The National waste management strategy and measures foreseen in the 2016-2020 action plan are not fully implemented; • The legislation of Georgia is not fully approximated to EU acquis; • The provisions of EU Directives and Regulations as envisaged in the relevant Annexes of the Association Agreement are not fully implemented; • Water information system is not well-developed and does not contain vital information 	<p>Numerous projects and financing programs with the framework ENI Single Support Framework (SSF)</p>	<ul style="list-style-type: none"> • Numerous projects and financing programs with the framework of ENI Single Support Framework (SSF) • Trainings and workshops on the Application of a Strategic Environmental Assessment (SEA) for the River Basin Management Plans (RBMP) in Georgia; • EU provided laboratory equipment to detect industrial chemicals and pesticides in water
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						<ul style="list-style-type: none"> • Establish monitoring system for the future implementation of the programme of measures of the formalised RBMPs; • Develop key pilot measures for programme of measures implementation related to EU Water Directives; • Develop water information system; • Strengthen stakeholder involvement mechanisms for participative RBM Planning 			
<i>Moldova</i>	<ul style="list-style-type: none"> • Moldova-EU Association Agreement • Various multilateral EaP formats: EU4Environment, EU4Energy 	<p>2016</p> <p>2016-2019</p>	<ul style="list-style-type: none"> • Ministry of Agriculture, Regional Development and Environment • Ministry of Health, Labour and Social Protection 	<ul style="list-style-type: none"> • Preparation of waste management plans in line with waste hierarchy and waste prevention programmes • Classification of landfill sites • Establishment of system for disseminating environmental information • Establishment of national strategy reducing 	<ul style="list-style-type: none"> • Separate waste collection is still to be developed into a system • Polluter pays principle not fully enabled • Environmental tax and penalty for landfilling of unsorted solid waste inadequate 	<ul style="list-style-type: none"> • Approximation of Moldovan legislation to 5 EU directives (Water Framework Directive, Floods Directive, Urban Wastewater Directive, Drinking Water Directive, Nitrates Directive) • Reforms of water policies, establishment of an adequate governance framework 	<ul style="list-style-type: none"> • Total harmonization of legislation yet to be achieved • Institutional capacity needs to be further strengthened • Infrastructure was not upgraded everywhere 	<p><u>EIB:</u></p> <ul style="list-style-type: none"> • Loan of EUR 100m to improve municipal solid waste management system (upgrades to waste collection, introduction of separate waste collection, treatment of recyclable materials) 	<p><u>'EU4Moldova:</u></p> <ul style="list-style-type: none"> • Creation of excellence centre through piloting demonstrative new energy efficiency technologies and renewable energy sources in Festelita community, Stefan-Voda district (EUR 800k)

				<p>biodegradable content in landfilled waste</p> <ul style="list-style-type: none"> • Development of control and monitoring procedures on operating and closed landfills • Application of permit systems and waste acceptance procedures at landfills • Development of register of waste collection and transport establishments and undertakings • Introduction of full recovery mechanism in accordance with polluter pays principle and extended producer responsibility principle • Establishment of system ensuring relevant waste is subject to treatment before landfilling • Introduction of obligations for operators to take necessary prevention and remediation measures incl. liability for costs • Introduction of strict liability for dangerous occupational activity 	<ul style="list-style-type: none"> • Waste sorting and recycling is yet to be developed 	<p>and institutional capacities</p> <ul style="list-style-type: none"> • Infrastructure upgrades and quality management • Institutional capacity building • Intensified cooperation on transboundary water management 	<ul style="list-style-type: none"> • Water governance still needs further improvement • Management of transboundary water needs to be further promoted and intensified 	<p><u>EBRD and E5P:</u></p> <ul style="list-style-type: none"> • Chisinau landfill revamp (loan of EUR 9 million to municipality and EUR 9+5 million as a grant) 	<ul style="list-style-type: none"> • Clean Water for Cahul' – an EU funded project of 14m • Rehabilitation of the water supply system in the Rayon Nisporeni – 5m
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				<ul style="list-style-type: none"> Start implementation of the National Radioactive Waste Management Strategy 					
Ukraine	<ul style="list-style-type: none"> Ukraine-EU Association Agreement Various multilateral EaP formats: EU4Environment, EU4Energy 	<p>2017</p> <p>2016-2019</p>	<ul style="list-style-type: none"> Ministry of Environmental Protection and Natural Resources Ministry of Health 	<ul style="list-style-type: none"> Adoption and implementation of the National Waste Management Strategy until 2030 Classification of landfill sites Establishment of system for disseminating environmental information Establishment of national strategy reducing biodegradable content in landfilled waste Development of control and monitoring procedures on operating and closed landfills Application of permit systems and waste acceptance procedures at landfills Development of register of waste collection and transport establishments and undertakings 	<ul style="list-style-type: none"> Separate waste collection is still to be developed into a system Polluter pays principle not fully enabled Environmental tax and penalty for landfilling of unsorted solid waste inadequate <p>Waste sorting and recycling is yet to be developed</p>	<ul style="list-style-type: none"> Approximation of the national legislation to 5 EU directives (Water Framework Directive, Floods Directive, Urban Wastewater Directive, Drinking Water Directive, Nitrates Directive) Reforms of water policies, establishment of an adequate governance framework and institutional capacities Infrastructure upgrades and quality management Institutional capacity building Intensified cooperation on transboundary water management 	<ul style="list-style-type: none"> Approximation of the national legislation with the EU directives on water yet to be fully achieved; Implementation of legislation needs to be further strengthened Infrastructure needs further upgrading and improvement Transboundary cooperation needs to be intensified 	<p><u>EU4Environment:</u></p> <ul style="list-style-type: none"> Piloting industrial waste mapping in two municipalities of Ukraine Assistance in creation of Climate Fund <p><u>EBRD:</u></p> <ul style="list-style-type: none"> Loan of EUR 20 million to finance the Lviv Solid Waste Management project Grant package of EUR 36.5 million for Khmelnytskyi to join the EBRD Green Cities Initiatives <p><u>EIB</u></p> <ul style="list-style-type: none"> Ukraine municipal infrastructure framework loan of around EUR 400 	<p><u>EUWI+:</u></p> <p>Development of the first part of the management plan for the Dnipro River Basin</p> <p><u>EBRD:</u></p> <ul style="list-style-type: none"> Lviv Wastewater Project (loan of EUR 15 million) Dnipropetrovsk Municipal Water and Waste-water Project (loan of EUR 20 million) Zaporizhzhia Water Utility and Investment Project (financed with EBRD's USD 28 million)

				<ul style="list-style-type: none"> • Introduction of full recovery mechanism in accordance with polluter pays principle and extended producer responsibility principle • Establishment of system ensuring relevant waste is subject to treatment before landfilling • Introduction of obligations for operators to take necessary prevention and remediation measures incl. liability for costs • Introduction of strict liability for dangerous occupational activity • Start implementation of the National Radioactive Waste Management Strategy 				<p>mln to improve urban development, including water supply and sewage</p>	
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The Eastern Partnership Civil Society Forum (EaP CSF) is a unique multi-layered regional civil society platform aimed at promoting European integration, facilitating reforms and democratic transformations in the six Eastern Partnership countries - Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. Serving as the civil society and people-to-people dimension of the Eastern Partnership, the EaP CSF strives to strengthen civil society in the region, boost pluralism in public discourse and policy making by promoting participatory democracy and fundamental freedoms. For more information, please visit the EaP CSF website at www.eap-csf.eu.

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